Appendix K – Terrestrial Ecology

Environmental Statement
East-West Arterial Extension:
Section 2 (Woodland Drive – Lookout Road)
Section 3 (Lookout Road – Frank Sound Road)

Appendix K.1 - UMAM Mapping and Sheets

Field Verification Points Map (UMAM Locations)

East-West Arterial Extension,
Environmental Impact Assessment

Field Verification

Figure 1 of 2

Field Verification Points (2023 & 2024)

- 2023
- 2024

EIA Study Area

0 ¼ ½ 1 Mile

Sources: Cayman DOE and ESRI

East-West Arterial Extension,
Environmental Impact Assessment

Field Verification

Figure 2 of 2

Field Verification Points (2023 & 2024)

- 2023
- 2024

EIA Study Area

0 ¼ ½ 1 Mile

Sources: Cayman DOE and ESRI

Table of UMAM Scores

2023 Field Data Points		
Name	**Habitat Type**	**UMAM**
115	Man-Modified Without Trees	0.4
111	Semi-Deciduous Forest	0.65
10	Invasive Species - Casuarina	0.3
105	Man-Modified With Trees	0.5
102	Man-Modified Without Trees	0.4
103	Seasonally Flooded Mangrove Forest	0.6
100	Seasonally Flooded Mangrove Forest	0.67
2	Man-Modified Without Trees	0.35
3	Man-Modified Without Trees	0.35
6	Seasonally Flooded Mangrove Forest	0.63
7	Seasonally Flooded Mangrove Forest	0.77
8	Dry Shrubland	0.75
9	Dry Shrubland	0.85
11	Mangrove Lagoon	0.87
16	Man-Modified Without Trees - Pasture	0.45
18	Ponds, Pools and Mangrove Lagoons	0.63
19	Ponds, Pools and Mangrove Lagoons	0.67
20	Seasonally Flooded Mangrove Forest	0.7
22	Man-Modified Without Trees	0.2
23	Man-Modified Without Trees	0.4
24	Man-Modified Without Trees	0.35
26	Man-Modified Without Trees	0.5
29	Seasonally Flooded Mangrove Forest and Woodland	0.5
30	Ponds, Pools and Mangrove Lagoons	0.63
32	Ponds, Pools and Mangrove Lagoons	0.6
34	Invasive Species - Casuarina	0.45
36	Dry Shrubland	0.5
37	Dry Shrubland	0.45
38	Coastal Shrubland	0.35
39	Dry Shrubland	0.7
41	Coastal Shrubland	0.35
42	Coastal Shrubland	0.6
45	Dry Forest Woodland	0.6
46	Dry Forest Woodland	0.55
47	Dry Forest Woodland	0.55
49	Semi-Deciduous Forest	0.6
50	Seasonally Flooded/Saturated Seim-Deciduous Forest	0.57
53	Seasonally Flooded Mangrove Shrubland	0.6
54	Semi-permanently Flooded Grasslands	0.83
55	Semi-permanently Flooded Grasslands	0.3
104	Salt Tolerant Succulents	0.55
101	Ponds, Pools and Mangrove Lagoons	0.67
106	Palm Hammock	0.7
108	Palustrine Emergent Marsh/Wetland	0.6
109	Palustrine Emergent Marsh/Wetland	0.63
114	Semi-Deciduous Forest	0.5
112	Semi-Deciduous Forest	0.7
113	Semi-Deciduous Forest	0.6
33	Ponds, Pools and Mangrove Lagoons	0.63
44	Invasive Species - Casuarina	0.4
27	Salt Tolerant Succulents	0.5
12	Ponds, Pools and Mangrove Lagoons	0.53
40	Coastal Shrubland	0.5

2024 Field Data Points		
Name	**Habitat Type**	**UMAM**
A01	Seasonally Flooded Mangrove Forest	0.73
A02	Seasonally Flooded Mangrove Forest	0.77
A03	Seasonally Flooded Mangrove Forest	0.77
A04	Seasonally Flooded Mangrove Forest	0.73
A05	Seasonally Flooded Mangrove Forest	0.73
B01	Seasonally Flooded Mangrove Forest	0.5
A06	Man-Modified With Trees	0.35
B02	Seasonally Flooded Mangrove Forest	0.57
A07	Seasonally Flooded Mangrove Shrubland	0.53
B03	Seasonally Flooded Mangrove Forest	0.6
A08	Seasonally Flooded Mangrove Forest	0.67
A09	Seasonally Flooded Mangrove Forest	0.7
A10	Seasonally Flooded Mangrove Forest	0.7
A11	Seasonally Flooded Mangrove Forest	0.63
A12	Seasonally Flooded Mangrove Forest	0.77
B04	Man-Modified Without Trees	0.65
A13	Dry Forest Woodland	0.75
B05	Man-Modified Without Trees	0.65
A14	Dry Forest Woodland	0.7
A15	Dry Forest Woodland	0.6
B06	Seasonally Flooded Mangrove Forest	0.9
A16	Seasonally Flooded Mangrove Forest	0.67
B07	Seasonally Flooded Mangrove Forest	0.8
A17	Ponds, Pools and Mangrove Lagoons	0.63
B08	Seasonally Flooded Mangrove Forest	0.8
A18	Seasonally Flooded Mangrove Forest	0.63
B09	Man-Modified With Trees	0.6
A19	Seasonally Flooded Mangrove Forest	0.63
A20	Seasonally Flooded Mangrove Forest	0.77
B10	Seasonally Flooded Mangrove Forest	0.73
A21	Seasonally Flooded Mangrove Forest	0.67
B11	Seasonally Flooded Mangrove Forest	0.77
B12	Seasonally Flooded Mangrove Forest	0.7
B13	Seasonally Flooded Mangrove Forest	0.77
A23	Man-Modified With Trees	0.65
A24	Man-Modified With Trees	0.6
B14	Ponds, Pools and Mangrove Lagoons	0.73
B15	Dry Shrubland	0.55
A22	Seasonally Flooded Mangrove Forest	0.67

Map of Average UMAM Scores

East-West Arterial Extension,
Environmental Impact Assessment

Average Habitat Value (UMAM)

Figure: A

Field Verification Points (2023 & 2024)

- 2023
- 2024

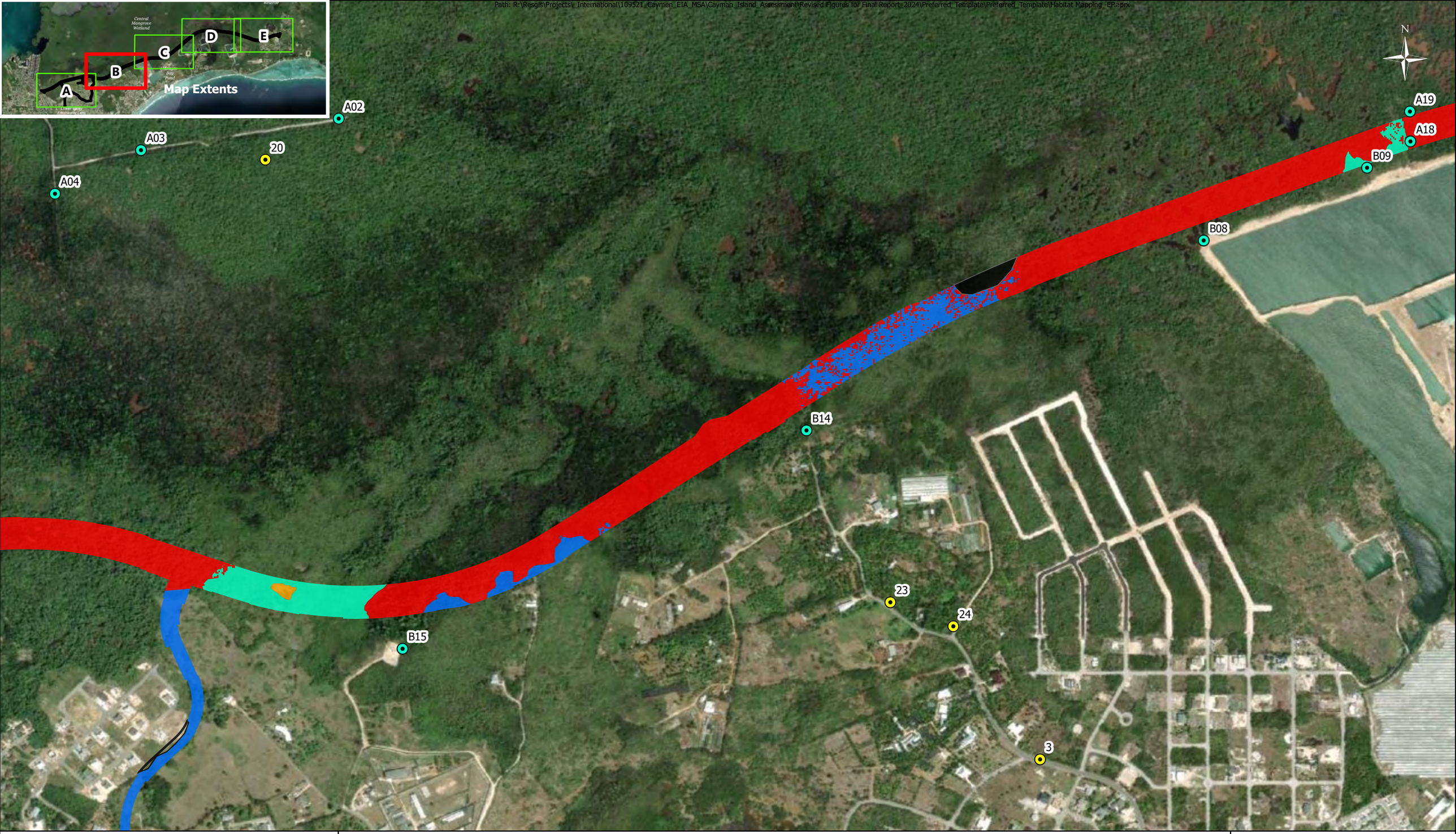
Habitat (Average UMAM Score)

- Man-modified Land Uses (No Habitat) - 0.00
- Invasive Species - Casuarina - 0.38
- Man-modified without Trees - 0.43
- Pasture - 0.45
- Man-modified with Trees - 0.54
- Seasonally Flooded / Saturated Semi-deciduous Forest - 0.57
- Dry Forest and Woodland - 0.63
- Ponds, Pools and Mangrove Lagoons - 0.66
- Seasonally Flooded Mangrove Forest and Woodland - 0.70
- Palm Hammock - 0.7

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

0 300 600 Feet



East-West Arterial Extension,
Environmental Impact Assessment

Average Habitat Value (UMAM)

Figure: B

Field Verification Points (2023 & 2024)

- 2023
- 2024

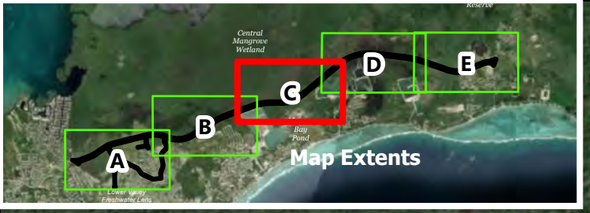
Habitat (Average UMAM Score)

- Man-modified Land Uses (No Habitat) - 0.00
- Invasive Species - Casuarina - 0.38
- Man-modified without Trees - 0.43
- Pasture - 0.45
- Man-modified with Trees - 0.54
- Seasonally Flooded / Saturated Semi-deciduous Forest - 0.57
- Dry Forest and Woodland - 0.63
- Ponds, Pools and Mangrove Lagoons - 0.66
- Seasonally Flooded Mangrove Forest and Woodland - 0.70
- Palm Hammock - 0.7

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

0 300 600 Feet



A09
A10
A11
A12
A18
A19
B08
B09

N

Meagre

East-West Arterial Extension,
Environmental Impact Assessment

Average Habitat Value (UMAM)

Figure: C

Field Verification Points (2023 & 2024)
- 2023
- 2024

Habitat (Average UMAM Score)
- Man-modified Land Uses (No Habitat) - 0.00
- Invasive Species - Casuarina - 0.38
- Man-modified without Trees - 0.43
- Pasture - 0.45
- Man-modified with Trees - 0.54
- Seasonally Flooded / Saturated Semi-deciduous Forest - 0.57
- Dry Forest and Woodland - 0.63
- Ponds, Pools and Mangrove Lagoons - 0.66
- Seasonally Flooded Mangrove Forest and Woodland - 0.70
- Palm Hammock - 0.7

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

0 300 600 Feet

East-West Arterial Extension,
Environmental Impact Assessment

Average Habitat Value (UMAM)

Figure: D

Field Verification Points (2023 & 2024)

- 2023
- 2024

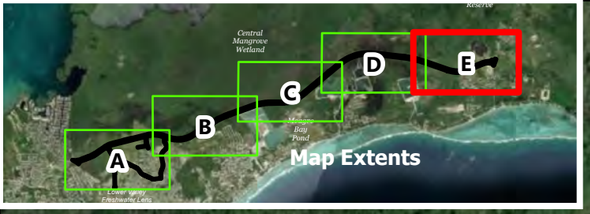
Habitat (Average UMAM Score)

- Man-modified Land Uses (No Habitat) - 0.00
- Invasive Species - Casuarina - 0.38
- Man-modified without Trees - 0.43
- Pasture - 0.45
- Man-modified with Trees - 0.54
- Seasonally Flooded / Saturated Semi-deciduous Forest - 0.57
- Dry Forest and Woodland - 0.63
- Ponds, Pools and Mangrove Lagoons - 0.66
- Seasonally Flooded Mangrove Forest and Woodland - 0.70
- Palm Hammock - 0.7

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

0 300 600 Feet



111
115
22
A13
B04
B05
A14
N

East-West Arterial Extension,
Environmental Impact Assessment

Average Habitat Value (UMAM)

Figure: E

Field Verification Points (2023 & 2024)
- 2023
- 2024

Habitat (Average UMAM Score)
- Man-modified Land Uses (No Habitat) - 0.00
- Invasive Species - Casuarina - 0.38
- Man-modified without Trees - 0.43
- Pasture - 0.45
- Man-modified with Trees - 0.54
- Seasonally Flooded / Saturated Semi-deciduous Forest - 0.57
- Dry Forest and Woodland - 0.63
- Ponds, Pools and Mangrove Lagoons - 0.66
- Seasonally Flooded Mangrove Forest and Woodland - 0.70
- Palm Hammock - 0.7

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

0 300 600 Feet

2023 UMAM Sheets

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		45

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100 - Dry forest and woodland			Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Dry forest and woodland located north of Bodden Town Rd.

Assessment area description

To the south there is Boddentown Road. East and West is residential/commercial. South side of Boddentown Rd coastal shrubland with small pond.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
	None

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Minimal insect life observed. 1-2 species of birds, 2-3 species of butterflies (one Dryas iulia)

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	45
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	5
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	N/A
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact
6	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact
0	0

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	5
III. Regeneration/recruitment	7
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	6
VI. Plants' condition.	7
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	4
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	4

Current	With Impact
6	0

Additional Notes: Native - silver palm (Cocothrinax proctorii), west indian almond (Terminalia catappa), gumbo limbo (bursera simaruba), wild olive (Bontia daphnoides). Invasive - tan-tan (Leucaena leucocephala), asain leatherleaf (Colubrina asiatica) , butterfly orchid tree (Bauhinia divaricata), seashide mahoe (Thespesia populnea), Australian pine (Casuarina equisetifolia)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		46

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100	**Dry forest and woodland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Dry forest and woodland located north of Bodden Town Rd. AA is located on a slope.

Assessment area description

To the south there is Boddentown Road and a beach/coastal shrub. To the east and west is residental, the north is a contiguous forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.) **None**
Functions	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Insects, honeybees and pollinators

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	46
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	7
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	2
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	**With Impact**
5	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	**With Impact**
0	**0**

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	7
III. Regeneration/recruitment	5
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	8
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	6

Current	**With Impact**
6	**0**

Additional Notes: West Indian almond (Terminalia catappa), frangipani (Plumeria obtussa), gumbo limbo (Bursera simaruba), Cayman agave (Agave caymanensis), beach naupaka (Scaevola taccada), Asian latherleaf (Colubrina asiatica), Prtia/ mahoe (Thespesia populnea), grey nicker (Guilandina bonduc).

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.55	0.00

Impact Delta (ID)	
Current - w/Impact	0.550

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		40

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1214	**Coastal Shrub**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Uplands adjacent to beach/Caribbean Sea

Assessment area description

Coastal shrub between Boddon Town Rd and beach.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Boddon Town Road north of AA. Beach to the south of AA. Australian pine to the east of AA. Residential to the west.	**None**
Functions	Mitigation for previous permit/other historic use
Wildlife habitat, erosion stabilization, weather event buffer	**N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various avian and insect species	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds, woodpeckers, termite nests, pollinators, butterflies, geckos.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	40
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS and MM	07/26/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	6
	b. **Invasive plant species.**	4
	c. **Wildlife access** to and from AA (proximity and barriers).	6
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact	
5	0	Additional Notes: Invasives on fringe, birds, insects able to access. Erosion stabilization seaward.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	With Impact	
		Additional Notes: N/A

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	4
	III. Regeneration/recruitment	8
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	3
	VI. Plants' condition.	6
	VII. Land management practices.	4
	VIII. Topographic features (refugia, channels, hummocks).	3
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	6

Current	With Impact	
5	0	Additional Notes: Native - seagrape (Coccoloba uvifera), cayman agave (Agave caymanensis), coconut palm (Cocos nucifera), silver palm (Coccothrinax proctorii), gumbo limbo (Bursera simaruba), cocoplum (Chrysobalanus icaco). Invasive- Egyptian crowfoot (Dactyloctenium aegyptium), beach naupaka (Scavola taccada), grey nicker (Guilandina bonduc), australian pine (Casuarina equisetifolia). Minimal invasive species. Good recruitment of native species. minimal topo features. Adjacent land management practices impact AA. Seagrape 8-10" DBH, 20-25 ft tall.

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	With Impact
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		42

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1214	**Coastal Shrub**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Half Moon Bay south of AA

Assessment area description

Coastal shrub south of Boddon Town Road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Boddon Town Road north of AA. Residential east and west of AA. Half Moon Bay to the south of AA.	**None**
Functions	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Parrot (Amazona leucocephala caymanensis), butterflies, grackel, geckos

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, RH, TS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	42
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS, RH, TS and MM	07/25/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	5
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	7

Current	With Impact
6	0

Additional Notes: Coastal shrub fragrmented by road. Invasives on fringe, birds able to access, but road splits shrub habitat and surrounded by fence on northern boundary. Stops erosion into half moon bay. Invasives on fringe.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	5
III. Regeneration/recruitment	6
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	6
VI. Plants' condition.	6
VII. Land management practices.	6
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	6

Current	With Impact
6	0

Additional Notes: Native - seagrape, cocoplum, royal poiciana, gumbo limbo Invasives: Asutralian pine, tan-tan. Sooty mold, dieback, snags. Seagrape dense and mature with recruitment.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		8

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Dry shrubland

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
National Trust Property, lagoon, mangroves	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds, rat holes

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	8
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	9
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	9
	f. **Hydrologic connectivity** (impediments and flow restrictions).	6
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	Additional Notes:
8	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
0	**0**	N/A

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	7
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	6
	VI. Plants' condition.	7
	VII. Land management practices.	7
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	7

Current	**With Impact**	Additional Notes:
7	**0**	Native - silver palm (Cocothrinax proctorii), Logwood/bloodwood (Haematoxylum campechianum), Balbis' airplant (Tillandsia baldbisiana), simpson's stopper (Myrcianthes fragrans), gumbo limbo (Bursera simaruba), strangler fig (Ficus aurea).

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	**With Impact**
0.75	0.00

Impact Delta (ID)	
Current - w/Impact	0.750

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		9

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

AA appears to be seasonally flooded semi-deciduous forest and shrubland

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
National Trust Property, mastic trail	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Parrots, small yellow and gray birds, butterflies, rat holes.

Additional relevant factors:

East a little more shrubland. Coconut palms, agave cayman.

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	9
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	9
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	N/A
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	9
	f. **Hydrologic connectivity** (impediments and flow restrictions).	9
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	9

Current	**With Impact**	Additional Notes:
9	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes: N/A
	0	

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	7
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	8
	VII. Land management practices.	8
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	7

Current	**With Impact**	Additional Notes:
8	**0**	Native - gumbo limbo (Bursera simaruba), mangrove fern (Acrostichum aureum), silver palm (Coccothrinax proctorii), pink trumpet tree (Tabebuia heterophylla), Cayman agave (Agave caymanensis), wild olive (Bontia daphnoides)

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	**With Impact**
0.85	0.00

Impact Delta (ID)	
Current - w/Impact	0.850

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		38

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Dry shrubland north of Boddentown Road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Boddentown Rd to the south. Residental to the east and west. Continious shrubland to the north.	**None**
Functions	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds Butterflies

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	38
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	5
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	4
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact
3	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	
b. Reliability of **water level indicators**.	
c. Appropriateness of **soil moisture**.	
d. **Flow rates**/points of discharge.	
e. **Fire frequency**/severity.	
f. **Type of vegetation**.	
g. **Hydrologic stress** on vegetation.	
h. **Use by animal**s with hydrologic requirements.	
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
k. **Water quality data** for the type of community.	
l. **Water depth, wave energy, and currents**.	N/A

Current	With Impact
	0

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	3
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	1
VI. Plants' condition.	7
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	4
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	5

Current	With Impact
5	0

Additional Notes: Native - gumbo limbo (Bursera simaruba), black mastic (Terminalia eriostachya), silver palm (Coccothrinax protorii), wild olive (Bontia daphnoides), foliage flower (Phyllanthus angustifolius), Invasive - tan-tan (Leucaena leucocephala).

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.40	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.400

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		49

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Semi-Deciduous Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Rocky wooded area north of Boddenton Rd. Adjacent to construction site. Uplands to west.

Assessment area description

Rocky wooded area north of Boddenton Rd. Adjacent to construction site.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
SW- residential. Construction site to east. West continuous forest	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

birds, Cayman racer (Cubophis caymanus)

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	49
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	8
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	N/A
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
	f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	2

Current	**With Impact**	Additional Notes:
5		Adjacent to construction site to east and development to south. Minimal invasives.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
		N/A

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	4
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	6
	VI. Plants' condition.	7
	VII. Land management practices.	2
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	5

Current	**With Impact**	Additional Notes:
7		Native - black mastic (Terminalla eriostachya), gumbo limbo (Bursera simaruba), wild olive (Bontia daphnoides), frangipani (Plumeria obtusa), pitch apple (Clusia rosea), Thomson's dwarf schomburgkia (Mymercophila thomsoniana), large-flowered cactus (Selenicereus grandiflorus), Balbis' airplant (Tillandsia balbisiana), butterfly ordchid tree (Bauhinia divaricata).

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		111

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Semi-Deciduous Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Seasonally flooded deciduous forest. Surrounded by Mastic Forest and trail. Mangroves to the west.

Assessment area description

Seasonally flooded deciduous forest. Surrounded by Mastic Forest and trail. Mangroves to the west.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Forest- National Trust. Central Mangrove Wetland	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Caribean dove, parrot, west indian woodpecker, bananaquit (Coereba flaveola)

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, RH, TS and MM	**07/27/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	111
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, RH, TS and MM**	**07/27/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	8
	b. **Invasive plant species.**	8
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	4
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
	f. **Hydrologic connectivity** (impediments and flow restrictions).	1
Current / **With Impact**	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	4
5	Additional Notes:	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
Current / **With Impact**	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	
	Additional Notes: N/A	

.500(6)(c) Community Structure X Vegetation ____ Benthic ____ Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	8
	III. Regeneration/recruitment	6
	IV. Age, size distribution.	9
	V. Snags, dens, cavity, etc.	6
	VI. Plants' condition.	7
	VII. Land management practices.	8
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	N/A
Current / **With Impact**	X. Upland assessment area	8
8	Additional Notes: Native - Sapodilla, mangrove fern, strangler fig, bastard mahogany, royal palm, bahinia, calabash. DBH - 16" - strangler fig, Mahogany - 9" DBH, Height - 40'. Older more mature forest.	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.65	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.650

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		112

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Semi-Deciduous Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Seasonally flooded deciduous forest. Surrounded by Mastic Forest and trail. Mangroves to the west.

Assessment area description

Seasonally flooded deciduous forest. Surrounded by Mastic Forest and trail. Mangroves to the west.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Forest- National Trust. Central Mangrove Wetland	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds/nests, geckos, woodpecker, warbler spp., thrush, parrot, wasps

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, RH, TS and MM	**07/27/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	112
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS, RH, TS and MM	07/27/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support		a. Quality and quantity **of habitat support** outside of AA.	8
		b. **Invasive plant species.**	9
		c. **Wildlife access** to and from AA (proximity and barriers).	8
		d. **Downstream benefits** provided to fish and wildlife.	6
		e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
		f. **Hydrologic connectivity** (impediments and flow restrictions).	2
Current	**With Impact**	g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
		h. Protection of wetland functions provided by uplands (**upland** AAs only).	3
6		Additional Notes:	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
Current **With Impact**	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	
	Additional Notes:	N/A

.500(6)(c) Community Structure	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	9
X Vegetation	IV. Age, size distribution.	4
	V. Snags, dens, cavity, etc.	4
_____ Benthic	VI. Plants' condition.	8
	VII. Land management practices.	7
_____ Both	VIII. Topographic features (refugia, channels, hummocks).	6
	IX. Submerged vegetation (only score if present).	N/A
Current **With Impact**	X. Upland assessment area	6
8	Additional Notes:	Yellow mastic, pitch apple, silver thatch, simpson's stopper, gumbo limbo, orchid, smokewood. No invasives. Abudant recruitement and plants in good condition. Younger plant age - gumbo - 5"DBH, hieght - 27'

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.70	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.700

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		113

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Semi-Deciduous Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Mastic Forest (Semi-deciduous forest). Central Mangrove Wetland to west.

Assessment area description

Semi-deciduous forest

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Forest- National Trust	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Rat holes, west Indian woodpecker, warbler, cuban frog

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, RH, TS and MM	**07/27/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	113
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS, RH, TS and MM	07/27/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	8
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	5
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	8

Current	With Impact	
5		Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	With Impact	
		Additional Notes: N/A

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	6
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	6
	VI. Plants' condition.	6
	VII. Land management practices.	8
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	7

Current	With Impact	
7		Additional Notes: Native - Gumbo limbo, ficus bejamina, silver palm, royal palm, bastard mahogany, fiddlewood, pecil catcus, palmetto, mangrove fern, lancewood,

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		11

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Mangrove Lagoon**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

mangrove lagoon

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mangroves adjacent, continuous	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

honeybees, mosquitos, butterfly, birds, small mud crabs

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	11
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	9
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	N/A
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	9
	f. **Hydrologic connectivity** (impediments and flow restrictions).	9
Current / **With Impact**	g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A
9	Additional Notes: No invasives. Optimal widlife access.	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	9
	b. Reliability of **water level indicators**.	9
	c. Appropriateness of **soil moisture**.	9
	d. **Flow rates**/points of discharge.	8
	e. **Fire frequency**/severity.	9
	f. **Type of vegetation**.	9
	g. **Hydrologic stress** on vegetation.	9
	h. **Use by animal**s with hydrologic requirements.	9
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	8
Current / **With Impact**	k. **Water quality data** for the type of community.	N/A
	l. **Water depth, wave energy, and currents**.	8
9	Additional Notes: Deep, no currents. Approriate water levels and flows.	

.500(6)(c) Community Structure X Vegetation ____ Benthic ____ Both	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	8
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	6
	VI. Plants' condition.	8
	VII. Land management practices.	9
	VIII. Topographic features (refugia, channels, hummocks).	5
	IX. Submerged vegetation (only score if present).	N/A
Current / **With Impact**	X. Upland assessment area	N/A
8	Additional Notes: Native - black mangrove (Avicennia germinans), buttonwood (Conocarpus erectus), mangrove fern (Acrostichum aureum).	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.87	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.870

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		32

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools and Mangrove Lagoons**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

mangrove lagoon

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Quarry, residential, continuous mangrove shrubland	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Insect life, birds, fish

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	32
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	7
	b. **Invasive plant species.**	6
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	N/A
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	Additional Notes:
5		Sourrounded by residential, quarry and mangrove shrubland.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	8
	b. Reliability of **water level indicators**.	8
	c. Appropriateness of **soil moisture**.	7
	d. **Flow rates**/points of discharge.	7
	e. **Fire frequency**/severity.	9
	f. **Type of vegetation**.	7
	g. **Hydrologic stress** on vegetation.	8
	h. **Use by animal**s with hydrologic requirements.	6
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	4
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
	k. **Water quality data** for the type of community.	N/A
	l. **Water depth, wave energy, and currents**.	4

Current	**With Impact**	Additional Notes:
7		Deep. No currents, but flow observed. Fish activity

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	6
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	N/A
	VI. Plants' condition.	7
	VII. Land management practices.	2
	VIII. Topographic features (refugia, channels, hummocks).	4
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	N/A

Current	**With Impact**	Additional Notes:
6		Native - white mangrove (Laguncularia racemosa), black mangrove (Avicennia germinans), buttonwood (Conocarpus erectus), seaside mahoe (Thespesia populnea), Australian pine (Casuarina equisetifolia)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		54

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5240 - semi-permanently flooded grasslands	**Not grass. Acrostichum wetland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Open, oval shaped, Acrostichum aureum wetland. Surrounded by 2230 (seasonally flooded/ saturated semi-deciduous forest)

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by seasonally flooded forest. Hurricane shelter and call tower to the south.	**None**
Functions	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

3 species of lizards, abundant land crabs, birds, butterflies, expected insect life

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	54
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS and MM	07/25/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	N/A
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	9
f. **Hydrologic connectivity** (impediments and flow restrictions).	9
g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
9	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	6
c. Appropriateness of **soil moisture**.	N/A
d. **Flow rates**/points of discharge.	9
e. **Fire frequency**/severity.	9
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	N/A
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	With Impact
8	0

Additional Notes: No standing water present.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	N/A
VI. Plants' condition.	9
VII. Land management practices.	N/A
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
8	0

Additional Notes: Native - Mangrove fern/ golden leather fern (Acrostichum aureum), mangrove rubbervine (Rhabdadenia biflora)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.83	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.830

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		55

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5240 - semi-permanently flooded grasslands			Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Semi-permiantly flooded grasslands adjacent to road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential, roads, commercial property (mostly developed, lagoon to northeast.	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Pollinators, birds

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	55
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	2
b. **Invasive plant species.**	3
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	1
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
h. Protection of wetland functions provided by uplands (**upland** AAs only).	2

Current	**With Impact**
3	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	**With Impact**
0	**0**

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	5
II. Invasive/exotic plant species	5
III. Regeneration/recruitment	3
IV. Age, size distribution.	3
V. Snags, dens, cavity, etc.	1
VI. Plants' condition.	6
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	1
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	3

Current	**With Impact**
3	**0**

Additional Notes: Native - gumbo limbo (Bursera simaruba), orange geiger (Cordia sebestena). Invasive - bristlegrass (Setaria geniculata/ parviflora), egyptian crowfoot (Dactyloctenium aegyptium), silky sesban (Sesbiana sericea), tan-tan (Leucaena leucocephala)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.30	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.300

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		100

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5250	**Seasonally Flooded Mangrove Forest and woodland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Part of central mangrove wetland. Mosquito ditches.

Assessment area description

Raised access road with adjacent mosquito ditches with culverts.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
West - urban/ residential, N, S, E - undevelped mangrove habitat.	**Central mangrove wetland**

Functions	Mitigation for previous permit/other historic use
Avian habitat, nursery, mosquito control, severe weather buffer, erosion control	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various avian, amphibian and reptile species	**Grand Cayman Parrot**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Moorehen, yellow warbler, damsel fly, gecko, rats

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, RH, TS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	100
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	JS, RH, TS and MM	07/25/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	10
c. **Wildlife access** to and from AA (proximity and barriers).	10
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	With Impact
7	0

Additional Notes: Surrounded by residential and development. Access road - disturbed vegetation, no invasives, good wildlife habitat, moderate down stream benefits, culverts - hydro connectivity, high dependency of downstream benefits.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	9
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	8
l. **Water depth, wave energy, and currents**.	5

Current	With Impact
7	

Additional Notes: Seasonally flooded. Red mangroves and wrack line present. Soil - mucky. High turbidity, stagnant. Low fire frequency. Dense mangroves in turbid water. Water depth - ~3.5 ft, no currents. Salinity - 30ppt on north side, 26 - ppt on south side.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	5
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	With Impact
6	0

Additional Notes: Native - red, black mangroves, mangrove fern. No invasives. Low recruitment. DBH - 3-4". Height: 10-15'. One dead mangrove. Black sooty mold. Ditches and culverts. Possible historic use/empoundment for mosquitto control.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.67	0.00

Impact Delta (ID)	
Current - w/Impact	0.670

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		6

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5252	**Seasonally Flooded Mangrove Forest and woodland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Adajacent to Central mangrove wetland and Mastic Trail.

Assessment area description

Seasonally flooded mangrove forest/ very shrubby vegetation with a few taller trees.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central mangrove wetland and Mastic Trail	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butteflies, egret

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	6
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	8
f. **Hydrologic connectivity** (impediments and flow restrictions).	8
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
8	**0**

Additional Notes: AA surrounded by mangrove and woodlands. Minimal invasive species present. Easy widlife access. Provides benefits to central mangrove weltand.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	7
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	6
e. **Fire frequency**/severity.	6
f. **Type of vegetation**.	1
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	4
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**
6	

Additional Notes: Seasonally flooded. Mucky soil. Desirable species.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	4
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	2
VI. Plants' condition.	7
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	3
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
5	**0**

Additional Notes: Native - black mangrove (Avicennia germinans), mangrove fern (Acrostichum aureum), buttonwood (conocarpus erectus), flat-leaf flat sedge (Cyperus planifolius), pine fern (Amenia adiantifolia), bermuda grass (Cynodon dactylon). Desirable species, with minimal reccruitment. Vegetation more shruby with a few tall trees. DBH - 2-3" Height: 3-6 feet. Taller trees - 20'. Minimal topo features.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.63	0.00

Impact Delta (ID)	
Current - w/Impact	0.630

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		7

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5282	**Seasonally Flooded Mangrove Forest and woodland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
	Central Mangrove System	

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Adjacent to Mastic Trail and within the Mastic Reserve. Ultimately connects to the central mangrove system.

Assessment area description

Seasonally flooded mangrove forest and woodland on south side of access road (not paved).

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
National Trust Land, Mastic Trail, Central Mangrove System	**Habitat is located within the Mastic Reserve**

Functions	Mitigation for previous permit/other historic use
Wildlife Habitat, Reduce Erosion, Buffer Upland Areas from Extreme Weather Events,	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various Avian, Amphibian and Reptile Species	**Grand Cayman Parrot**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Insects, birds, sapsucker (red head)

Additional relevant factors:

National Trust Land, Mastic Trail and Mastic Reserve

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	7
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	8
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
8	**0**

Additional Notes: Minimal invasive species, appropriate species. Access to AA. Habitat fragmented by unpaved road. Connected to central mangrove habitat.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	9
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	2
e. **Fire frequency**/severity.	9
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	4
h. **Use by animal**s with hydrologic requirements.	N/A
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**
7	

Additional Notes: No standing water observed. Approriate soil mositure and vegetation type. No standing water available for salinty reading.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	3
VI. Plants' condition.	8
VII. Land management practices.	9
VIII. Topographic features (refugia, channels, hummocks).	5
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
8	**0**

Additional Notes: Native - Balbis' airplant (Tillandsia balbisian), Simpson's stopper (Myrcianthes fragrans), coconut palm (Cocos nucifera), lancewood (Ocotea coriacea), black mangrove (Avicennia germinans), mangrove fern (Acrostichum aureum). DBH - 4", height - 10-20'.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.77	0.00

Impact Delta (ID)	
Current - w/Impact	0.770

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		34

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
7000	**Invasive Species - Casuarina**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**Meagre Bay Pond**	**Invasive**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Uplands area located on the southern boundary of Meagre Bay Pond

Assessment area description

Thick vegetation dominated by invasive trees and shrubs.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
South of Bodden Town Road and residential. East and west - resdiental. North Meagre Pond	**None**
Functions	Mitigation for previous permit/other historic use
Barrier/protection/stabilization, Wildlife habitat	**N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various Avian Species	**N/A**

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	34
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	6
	b. **Invasive plant species.**	2
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
	f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	4

Current	With Impact	
5	0	Additional Notes: North - Meagre Bay Pond, East and West - Upland Habitat dominated by invasives, South - Bodden Town Road and Residential Structures. Runoff from roadway and adjacent lands to the south flows north through the assessment area.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	
0	0	Additional Notes: N/A

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	2
	II. Invasive/exotic plant species	2
	III. Regeneration/recruitment	2
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	2
	VI. Plants' condition.	6
	VII. Land management practices.	3
	VIII. Topographic features (refugia, channels, hummocks).	3
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	3

Current	With Impact	
4	0	Additional Notes: Australian pine, scavola, seagrape, silver palm, seaside mahoe, bauhinia

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.45	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.450

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		10

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
7000	**Invasive species - Casuarina**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Uplands. Adjacen to beach/ Caribbean Sea

Assessment area description

Australian pines in an undeveloped lot, along the coast and south of Bodden Town Road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Caribbean Sea	**None**
Functions	Mitigation for previous permit/other historic use
barrier/protection, habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

None

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	10
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	2
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	2
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
	f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	2

Current	**With Impact**	Additional Notes:
3	**0**	Surrounded by development and Caribbean sea. Mostly invasive.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	**With Impact**	Additional Notes:
0	**0**	N/A

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	2
	II. Invasive/exotic plant species	1
	III. Regeneration/recruitment	2
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	3
	VI. Plants' condition.	7
	VII. Land management practices.	4
	VIII. Topographic features (refugia, channels, hummocks).	1
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	4

Current	**With Impact**	Additional Notes:
3	**0**	Australian pine, scavola, seagrape, silver palm, seaside mahoe, bauhinia

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.30	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.300

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		26

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
18311	**Man-modified without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Raised access road adjacent to access site.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Development to east, Bodden Town Road to the south and drag racing strip to the north.	**None**
Functions	Mitigation for previous permit/other historic use
barrier/protection, habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflies

Additional relevant factors:

Trash/litter - moderate

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	26
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	3
	b. **Invasive plant species.**	3
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	1
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	Additional Notes:
4	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	N/A
	b. Reliability of **water level indicators**.	N/A
	c. Appropriateness of **soil moisture**.	8
	d. **Flow rates**/points of discharge.	N/A
	e. **Fire frequency**/severity.	1
	f. **Type of vegetation**.	8
	g. **Hydrologic stress** on vegetation.	N/A
	h. **Use by animal**s with hydrologic requirements.	6
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
	k. **Water quality data** for the type of community.	N/A
	l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**	Additional Notes:
6	**0**	

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	8
	II. Invasive/exotic plant species	4
	III. Regeneration/recruitment	2
	IV. Age, size distribution.	2
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	7
	VII. Land management practices.	7
	VIII. Topographic features (refugia, channels, hummocks).	1
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	3

Current	**With Impact**	Additional Notes:
5	**0**	Bursera simaruba, Delonix regia, Ficus benjamina, Psychotria nervosa. Invasives locate d on fringe.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		22

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
18311	**Man-modified without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Man-modified without trees.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by developed area with trees.	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflies

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	22
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	1
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	1
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	0
h. Protection of wetland functions provided by uplands (**upland** AAs only).	1

Current	With Impact
2	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact
0	0

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	1
II. Invasive/exotic plant species	1
III. Regeneration/recruitment	1
IV. Age, size distribution.	1
V. Snags, dens, cavity, etc.	1
VI. Plants' condition.	6
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	1
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	2

Current	With Impact
2	0

Additional Notes: Euphoribia sp. (Chamaesyce/ Euphoribia bruntii), goose grass (Eleusine indica), guinea grass (Panicum maximum/ Megathyrsus maximus)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.20	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.200

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		23

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
18311	**Man-modified without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Man-modified without trees.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
South of road. Surrounded by agricultural in all directions	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Dragonfly, birds

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	23
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	6
	c. **Wildlife access** to and from AA (proximity and barriers).	3
	d. **Downstream benefits** provided to fish and wildlife.	N/A
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	0

Current	**With Impact**	Additional Notes:
4	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes: N/A
0	**0**	

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	5
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	4
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	2
	VI. Plants' condition.	7
	VII. Land management practices.	3
	VIII. Topographic features (refugia, channels, hummocks).	2
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	5

Current	**With Impact**	Additional Notes:
4	**0**	Red mombin (Spondias purpurea), Cocnut palm (Cocos nucifera), bana (Musa paradisaca), tan-tan (Leucaena leucocphala), weeping fig (Ficus benjamina)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.40	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.400

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		2

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified Without Trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

N/A

Assessment area description

Upland grassland that has been cleared and is currently used for livestock/cattle.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
N/A	**N/A**

Functions	Mitigation for previous permit/other historic use
Food source and pastureland for livestock	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly,

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	2
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	2
	b. **Invasive plant species.**	5
	c. **Wildlife access** to and from AA (proximity and barriers).	2
	d. **Downstream benefits** provided to fish and wildlife.	4
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	1
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	2

Current	With Impact	Additional Notes:
3	0	Residential housing and Shamrock Road adjacent to AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	Additional Notes:
	0	

.500(6)(c) Community Structure	I. Appropriate/desirable species	5
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	5
X Vegetation	IV. Age, size distribution.	4
	V. Snags, dens, cavity, etc.	3
Benthic	VI. Plants' condition.	5
	VII. Land management practices.	3
Both	VIII. Topographic features (refugia, channels, hummocks).	3
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	4

Current	With Impact	Additional Notes:
4	0	Frequently grazed by cattle.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.35	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.350

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		12

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools, Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Located on the edge of an active mining operation. Apart of the Central Mangrove Wetland

Assessment area description

Small open water area located on the northwestern boundary of an active mine.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active mine located to the south	**Central Mangrove Wetland**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	12
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
5	0

Additional Notes: Active mine located to the South. Within the Central Mangrove Wetland. Buffers/protects the downstream Central Mangrove Wetland from mining activities.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	7
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	5
l. **Water depth, wave energy, and currents**.	6

Current	With Impact
6	0

Additional Notes: Salinity 35 PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	5
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	3
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	2

Current	With Impact
5	0

Additional Notes: Vegetation appears to be stressed from nearby mining activities. Mangrove canopy is thin, recruitment and regeneration is low. Roots and trunks of plants are smothered with sediment.

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	With Impact
0.53	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.530

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		16

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Pasture**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
	N/A	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Historically classified as man-modified with trees, area has been cleared and is now man-modified without trees. Landuse is primarily agriculture/livestock.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by additional man-modified with trees and man-modified without trees areas. Agriculture and livestock.	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Ibis, Smooth Bill, Yellow Warbler, Grackle, Cattle Eegret, Night Heron, Mocking Bird, Black neck stilt, Green heron, Cattle

Additional relevant factors:

Cattle fencing and pens present

Assessment conducted by:	Assessment date(s):
RM & TS	**07/28/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	16
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/28/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	7
	b. **Invasive plant species.**	1
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
	f. **Hydrologic connectivity** (impediments and flow restrictions).	3
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	5

Current	With Impact	
5	0	Additional Notes: Primary use is for agriculture/cattle. Neighboring land is similar use.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	With Impact	
0	0	Additional Notes: Uplands

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	1
	III. Regeneration/recruitment	3
	IV. Age, size distribution.	4
	V. Snags, dens, cavity, etc.	2
	VI. Plants' condition.	7
	VII. Land management practices.	3
	VIII. Topographic features (refugia, channels, hummocks).	2
	IX. Submerged vegetation (only score if present).	0
	X. Upland assessment area	6

Current	With Impact	
4	0	Additional Notes: Appears to be recently cleared.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.45	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.450

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		18

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools and Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Isolated Pond

Assessment area description

Small isolated pond. Likely used as a cattle pond or borrow pit.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by man-modified with trees and man-modified without trees habitat. Used as agriculture/livestock.	**N/A**
Functions	Mitigation for previous permit/other historic use
Water source for livestock	**N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Minnow, Grackle, Green Heron, Dragonfly, Butterfly, Cattle.

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	18
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	4
g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Isolated cattle pond or borrow pit located in an agricultural area/cattle pasture.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	6
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	6

Current	With Impact
7	0

Additional Notes: Minnows Present, Salinity 8 PPT, Low Turbidity

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	7
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	5
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	5

Current	With Impact
6	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		19

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools, Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA within Central Mangrove Wetland

Assessment area description

Mangrove lagoon located within the Central Mangrove Wetland

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Access road. Area historically used for mosquitto control?	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Fish, Butterfly, Grackle, Galehen, Little Blue Heron

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	19
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
7	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	6
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	7
d. **Flow rates**/points of discharge.	4
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	7

Current	With Impact
7	0

Additional Notes: Salinity 22 PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	5
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	6
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
6	0

Additional Notes: Sooty mold present on the majority of mangrove leaves.

Raw Score = Sum of above scores/30
(if uplands, divide by 20)

Current	With Impact
0.67	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.670

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		20

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5250	**Seasonally Flooded Mangrove Forest and Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA within Central Mangrove Wetland

Assessment area description

Mangrove forest located within the Central Mangrove Wetland

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Access road. Area historically used for mosquitto control?	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle, Black Racer, Green Heron

Additional relevant factors:

Mosquitto control area?

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	20
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	8
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
7	0

Additional Notes: AA within the Central Mangrove Wetland

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	5

Current	With Impact
7	0

Additional Notes: Salinity 40 PPT (North), 33 PPT (South),

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	7
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	6
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
7	0

Additional Notes: Sooty mold present on the majority of mangrove leaves. Mangroves in this area are not as mature as other areas.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.70	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.700

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		27

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Salt Tollerent Succulents	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Located in the upland area adjacent to mangrove, ponds, pools, and lagoons habitats.

Assessment area description

Low lying land, appears to be periodically flooded. Sparse Canopy.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mine access road borders the East side.	**N/A**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	27
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	2
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	2
g. **Dependency** of downstream habitats on quantity or quality of discharges.	2
h. Protection of wetland functions provided by uplands (**upland** AAs only).	4

Current	With Impact
4	0

Additional Notes: Mine access road located to the East. Mangroves, ponds, pools, and lagoons habitat located to the South, West and North.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact
0	0

Additional Notes:

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	6
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	2
VI. Plants' condition.	8
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	7

Current	With Impact
6	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		29

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5250	**Seasonally Flooded Mangrove Forest and Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located on the North side of Bodden Town Road,

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, Bodden Town Road, Meagre Bay Pond, Active mine access road.	**Central Mangrove Wetland**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	29
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
5	0

Additional Notes: Bodden Town Road located to the South, Small dumping area located to the North of AA. Moderate amount of trash located within the AA.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	5
b. Reliability of **water level indicators**.	6
c. Appropriateness of **soil moisture**.	6
d. **Flow rates**/points of discharge.	4
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	6
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	1
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	6
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
k. **Water quality data** for the type of community.	
l. **Water depth, wave energy, and currents**.	

Current	With Impact
5	0

Additional Notes: No water present within the AA at the time of survey.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	6
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	3
VI. Plants' condition.	7
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	5
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
5	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		30

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools, Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Meagre Bay Pond	**N/A**	**Protected Area**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA Within the Central Mangrove Wetland

Assessment area description

Southern shoreline of Meagre Bay Pond

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential Area and Bodden Town Rd located to the South. Active mining operations located to the East and West.	**Unique**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Wood Pecker, Grackle, Fish, Frigate Bird, Smooth-billed Ani, Turn, Fish

Additional relevant factors:

Has an established protected area management plan from the Cayman Islands Government.

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	30
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	8
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Bodden Town Rd located to the south and two active mines are located to the east and west. Stormwater runoff from Bodden Town Rd driectly enters Meagre Bay Pond. Large stands of Australian Pine are locaed along the southern shoreline.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	8
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	7
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	6

Current	With Impact
7	0

Additional Notes: Salinity - 18 PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	6
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	5
VI. Plants' condition.	6
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	2
X. Upland assessment area	

Current	With Impact
6	0

Additional Notes: Very sparse benthic vegetation. Majority of bottom is composed up sand/silt and rock.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		33

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools, Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Pease Bay Pond

Assessment area description

Medium Sized Pond/Lagoon. Sand and Rocky bottom. Mangroves on shoreline.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by additional man-modified with trees and man-modified without trees areas. Agriculture and livestock.	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Residential and Industrial located to the West and South. Solar located to the North. Active mining located to the North and East.

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	33
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	6
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes: Residential and Industrial located to the West and South. Solar located to the North. Active mining located to the North and East. Some areas of the shoreline have been hardened with rip rap along the mine access road.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
7	**0**

Additional Notes: Salinity 16PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	5
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	7
VII. Land management practices.	6
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	3
X. Upland assessment area	5

Current	**With Impact**
6	**0**

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		36

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland area located adjacent to seaonally flooded mangrove shrubland.

Assessment area description

Upland shrubland area dominated by small Ironwood shubs. Downward slopping southeast towards wetland mangrove shurbland.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences	**N/A**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle, Mocking Bird

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	36
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support		a. Quality and quantity **of habitat support** outside of AA.	5
		b. **Invasive plant species.**	5
		c. **Wildlife access** to and from AA (proximity and barriers).	6
		d. **Downstream benefits** provided to fish and wildlife.	5
		e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
		f. **Hydrologic connectivity** (impediments and flow restrictions).	5
Current	**With Impact**	g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
		h. Protection of wetland functions provided by uplands (**upland** AAs only).	7
6	**0**	Additional Notes: Major amounts of trash present within the AA.	

.500(6)(b) Water Environment (n/a for uplands)		a. Appropriateness of **water levels and flows**.	
		b. Reliability of **water level indicators**.	
		c. Appropriateness of **soil moisture**.	
		d. **Flow rates**/points of discharge.	
		e. **Fire frequency**/severity.	
		f. **Type of vegetation**.	
		g. **Hydrologic stress** on vegetation.	
		h. **Use by animal**s with hydrologic requirements.	
		i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
		j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
Current	**With Impact**	k. **Water quality data** for the type of community.	
		l. **Water depth, wave energy, and currents**.	
	0	Additional Notes:	

.500(6)(c) Community Structure		I. Appropriate/desirable species	5
		II. Invasive/exotic plant species	4
		III. Regeneration/recruitment	5
X Vegetation		IV. Age, size distribution.	5
		V. Snags, dens, cavity, etc.	3
Benthic		VI. Plants' condition.	5
		VII. Land management practices.	3
Both		VIII. Topographic features (refugia, channels, hummocks).	5
		IX. Submerged vegetation (only score if present).	
Current	**With Impact**	X. Upland assessment area	5
		Additional Notes:	
4	**0**		

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Delta (ID)	
Current - w/Impact	0.500

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		37

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located on the North side of Bodden Town Road.

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, Bodden Town Road, Atlantic Ocean	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	37
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	5
	c. **Wildlife access** to and from AA (proximity and barriers).	5
	d. **Downstream benefits** provided to fish and wildlife.	4
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	**With Impact**	Additional Notes:
4	**0**	Rockwall Present, Bodden Town Road located to the South, Moderate amount of trash located alond the edge of the AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
	0	

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	4
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	5
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	5
	VI. Plants' condition.	6
	VII. Land management practices.	5
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	5

Current	**With Impact**	Additional Notes:
5	**0**	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.45	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.450

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		39

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland area located adjacent to seaonally flooded mangrove shrubland.

Assessment area description

Shrubland area with large black limestone features.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Parkers Raceway, Bodden Town Road	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	39
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	6
	b. **Invasive plant species.**	6
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	With Impact	Additional Notes:
6	0	Significant amounts of trash located to the West just outside the AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	Additional Notes:
	0	

.500(6)(c) Community Structure	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	6
	III. Regeneration/recruitment	9
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	7
	VII. Land management practices.	7
	VIII. Topographic features (refugia, channels, hummocks).	10
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	7

X Vegetation

_____ Benthic

_____ Both

Current	With Impact	Additional Notes:
8	0	Large black limestone outcrops and voids in terrain which support succulent habitat and capture stormwater.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.70	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.700

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		44

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
7000	**Invasive Species Casuarina**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located along Bodden Town Road. Located on the coast for the Atlantic Ocean.

Assessment area description

Monoculture of invasive species Casuarina.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, plots of land with Australian Pine monocultures, Atlantic Ocean, Meagre Bay Pond	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Recently Burned

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	44
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	1
c. **Wildlife access** to and from AA (proximity and barriers).	4
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	**With Impact**
4	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	**With Impact**
	0

Additional Notes:

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	1
II. Invasive/exotic plant species	1
III. Regeneration/recruitment	5
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	5
VI. Plants' condition.	5
VII. Land management practices.	7
VIII. Topographic features (refugia, channels, hummocks).	5
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	3

Current	**With Impact**
4	**0**

Additional Notes: Recently Burned

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.40	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.400

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		47

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100	**Dry Forest and Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located on the North side of Bodden Town Road.

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, Bodden Town Road	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Grackle, Grand Cayman Parrot, Butterflys

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	47
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	6
	c. **Wildlife access** to and from AA (proximity and barriers).	5
	d. **Downstream benefits** provided to fish and wildlife.	3
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	With Impact	
5	0	Additional Notes: Bodden Town Road located to the South, Single-family residences located to the North. Moderate amount of trash located within the AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	
	0	Additional Notes:

.500(6)(c) Community Structure	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	6
	III. Regeneration/recruitment	4
X Vegetation	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	6
_____ Benthic	VI. Plants' condition.	5
	VII. Land management practices.	5
_____ Both	VIII. Topographic features (refugia, channels, hummocks).	6
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	5

Current	With Impact	
6	0	Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.55	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.550

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		50

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Seasonally Flooded / Saturated Semi-Deciduous Forest**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA is apart of a depressional area which transports storwater towards the Central Mangrove Wetland.

Assessment area description

Seasonally flooded areas. Lots of depressional pockets which pool and retain water throughout. Currently used for agriculture/livestock.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Wetland	**N/A**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Green Iguana

Additional relevant factors:

Livestock/cattle currently on site.

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	50
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes: Livestock/cattle use.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	8
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	6
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	3
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	3
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
6	**0**

Additional Notes: Rain event during survey.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	5
VII. Land management practices.	2
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
5	**0**

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.57	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.570

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		53

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5252	**Seasonally Flooded Mangrove Shrubland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located on the North side of Bodden Town Road.

Assessment area description

Jagged black limestone wetland area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, Bodden Town Road	**N/A**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grand Cayman Parrot, Purple Galluiine, Green Iguana

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	53
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Minor amount of trash on the edge of the weltand.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	6
b. Reliability of **water level indicators**.	6
c. Appropriateness of **soil moisture**.	6
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	5
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	5

Current	With Impact
6	0

Additional Notes: Salinity - 25 PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	5
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	5
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
6	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		101

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Ponds, Pools, Mangrove Lagoons**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located on the North side of Bodden Town Road,

Assessment area description

Monoculture of invasive species Casuarina.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, Bodden Town Road, Meagre Bay Pond, Active mine access road.	**Central Mangrove Wetland**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	101
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Bodden Town Road located to the South, Small dumping area located to the West of AA.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	5

Current	With Impact
7	0

Additional Notes: Salinity - 15 PPT

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	8
VII. Land management practices.	7
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
7	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.67	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.670

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		102

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified Without Trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA located along Bodden Town Road. Located on the coast for the Atlantic Ocean.

Assessment area description

Recently cleared land upland coastal area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Single-family residences, plots of land with Australian Pine monocultures, Atlantic Ocean, Meagre Bay Pond	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Recently Cleared

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	102
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	3
d. **Downstream benefits** provided to fish and wildlife.	4
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	7

Current	**With Impact**
5	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	**With Impact**
	0

Additional Notes:

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	3
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	5
IV. Age, size distribution.	1
V. Snags, dens, cavity, etc.	1
VI. Plants' condition.	5
VII. Land management practices.	1
VIII. Topographic features (refugia, channels, hummocks).	3
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	2

Current	**With Impact**
3	**0**

Additional Notes: Recently Cleared

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.40	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.400

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		103

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
5250	**Seasonally Flooded Mangrove Forest and Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA within Central Mangrove Wetland

Assessment area description

Mangrove forest, fragmented by accecss roads.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Access road. Area historically used for mosquitto control?	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle, Green Heron, Yellow Warbler, Flicker

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	103
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	RM & TS	07/26/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
7	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	6
b. Reliability of **water level indicators**.	7
c. Appropriateness of **soil moisture**.	7
d. **Flow rates**/points of discharge.	3
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	5
l. **Water depth, wave energy, and currents**.	5

Current	With Impact
6	0

Additional Notes: Milky white substance floating ontop of the water, Salinity - 25 PPT (North) & 24 PPT (South).

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	3
IV. Age, size distribution.	4
V. Snags, dens, cavity, etc.	6
VI. Plants' condition.	5
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	4
X. Upland assessment area	

Current	With Impact
5	0

Additional Notes: Algal matting present, Sooty mold present on the majority of mangrove leaves.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		104

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Salt Tollerent Succulents	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland area located on the Southwestern edge of the Central Mangrove Wetland

Assessment area description

Open upland area with karst formations dominated by succulents.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Cenetral Mangrove Wetland to the North. Cattle pasture and agriculture located to the South.	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Grand Cayman Parrot, Grackle, Butterfly

Additional relevant factors:

Derelict vehicles located in AA

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	104
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	7
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	3
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	5

Current	With Impact	Additional Notes:
6	0	Property fencing and derelict vehicles within AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	Additional Notes:
	0	

.500(6)(c) Community Structure	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	7
X Vegetation	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	2
_____ Benthic	VI. Plants' condition.	7
	VII. Land management practices.	3
_____ Both	VIII. Topographic features (refugia, channels, hummocks).	5
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	5

Current	With Impact	Additional Notes:
5	0	Karst formations

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.55	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.550

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		105

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
18311	**Man-modified With Trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland area located on the Southwestern edge of the Central Mangrove Wetland

Assessment area description

Sparsly forested upland area used for agriculture and livestock.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
N/A	**N/A**
Functions	Mitigation for previous permit/other historic use
	N/A

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly, Grackle, Grand Cayman Parrot, Cattle Eegret

Additional relevant factors:

Cattle fencing

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	105
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	7
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	3
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
	f. **Hydrologic connectivity** (impediments and flow restrictions).	2
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact	
5	0	Additional Notes: Cattle fencing

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	With Impact	
	0	Additional Notes:

.500(6)(c) Community Structure	I. Appropriate/desirable species	5
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	5
X Vegetation	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	4
_____ Benthic	VI. Plants' condition.	6
	VII. Land management practices.	2
_____ Both	VIII. Topographic features (refugia, channels, hummocks).	4
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	5

Current	With Impact	
5	0	Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		106

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Palm Hammock	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland area located on the Southwestern edge of the Central Mangrove Wetland

Assessment area description

Mature palm hammock

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Wetland located to the North	**Not previously catalogued habitat**

Functions	Mitigation for previous permit/other historic use
Upland buffer for Central Mangrove Wetland	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Green Iguana, Flicker, Termite Mounds, Wasps

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	106
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support		a. Quality and quantity **of habitat support** outside of AA.	7
		b. **Invasive plant species.**	8
		c. **Wildlife access** to and from AA (proximity and barriers).	9
		d. **Downstream benefits** provided to fish and wildlife.	6
		e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
		f. **Hydrologic connectivity** (impediments and flow restrictions).	3
Current	**With Impact**	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
		h. Protection of wetland functions provided by uplands (**upland** AAs only).	6
6	**0**	Additional Notes:	

.500(6)(b) Water Environment (n/a for uplands)		a. Appropriateness of **water levels and flows**.	
		b. Reliability of **water level indicators**.	
		c. Appropriateness of **soil moisture**.	
		d. **Flow rates**/points of discharge.	
		e. **Fire frequency**/severity.	
		f. **Type of vegetation**.	
		g. **Hydrologic stress** on vegetation.	
		h. **Use by animal**s with hydrologic requirements.	
		i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
		j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
Current	**With Impact**	k. **Water quality data** for the type of community.	
		l. **Water depth, wave energy, and currents**.	
	0	Additional Notes:	

.500(6)(c) Community Structure		I. Appropriate/desirable species	8
		II. Invasive/exotic plant species	8
		III. Regeneration/recruitment	9
X Vegetation		IV. Age, size distribution.	9
		V. Snags, dens, cavity, etc.	8
_____ Benthic		VI. Plants' condition.	8
		VII. Land management practices.	4
_____ Both		VIII. Topographic features (refugia, channels, hummocks).	7
		IX. Submerged vegetation (only score if present).	
Current	**With Impact**	X. Upland assessment area	8
		Additional Notes:	
8	**0**		

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.70	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.700

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		108

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Palustrine Emergent Marsh/Wetland	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA is an isolated, low lying area, whithin an area predominantly used by cattle.

Assessment area description

Seasonally flooded herbaceous area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Wetland	**N/A**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Dense population of Green Iguana

Additional relevant factors:

Livestock/cattle currently on site.

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	108
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	RM & TS	07/25/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	7
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	4
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	4
g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Livestock/cattle use.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	7
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	2
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	5
l. **Water depth, wave energy, and currents**.	6

Current	With Impact
6	0

Additional Notes: Rain event during survey.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	7
III. Regeneration/recruitment	7
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	5
VII. Land management practices.	2
VIII. Topographic features (refugia, channels, hummocks).	4
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
6	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		109

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Palustrine Emergent Marsh/Wetland	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

AA is an isolated, low lying area, whithin an area predominantly used by cattle.

Assessment area description

Seasonally flooded herbaceous area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Wetland	**N/A**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Dense population of Green Iguana

Additional relevant factors:

Livestock/cattle currently on site.

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	109
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	7
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	4
g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	With Impact
6	0

Additional Notes: Livestock/cattle use.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	2
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	5
l. **Water depth, wave energy, and currents**.	6

Current	With Impact
7	0

Additional Notes: Rain event during survey.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	7
III. Regeneration/recruitment	8
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	4
VI. Plants' condition.	7
VII. Land management practices.	2
VIII. Topographic features (refugia, channels, hummocks).	5
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	With Impact
6	0

Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		115

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified Without Trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

N/A

Assessment area description

Upland grassland that has been cleared and is currently used for livestock/cattle.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
N/A	**N/A**

Functions	Mitigation for previous permit/other historic use
Food source for livestock	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterfly

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	115
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	5
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	2
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
	f. **Hydrologic connectivity** (impediments and flow restrictions).	2
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact	Additional Notes:
4	0	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	Additional Notes:
	0	

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	5
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	3
	VI. Plants' condition.	5
	VII. Land management practices.	2
	VIII. Topographic features (refugia, channels, hummocks).	3
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	4

Current	With Impact	Additional Notes:
4	0	Frequently grazed by cattle.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.40	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.400

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		114

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
2230	**Semi-deciduous forest**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Mastic Forest (Semi-deciduous forest), Central Mangrove Wetland (West)

Assessment area description

Semi-deciduous forest

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Wetland	**Mastic Forest, Mastic Trail**
Functions	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	114
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	RM & TS	07/25/23

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	6
	b. **Invasive plant species.**	4
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
	f. **Hydrologic connectivity** (impediments and flow restrictions).	4
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	5

Current	With Impact	Additional Notes:
5	0	Mastic Trail, Mastic Forest, Younger portion of the forest. Young growth, appears to maybe have been cleared within the last 10 years.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	With Impact	Additional Notes:
	0	

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	4
	III. Regeneration/recruitment	5
	IV. Age, size distribution.	4
	V. Snags, dens, cavity, etc.	5
	VI. Plants' condition.	6
	VII. Land management practices.	4
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	7

Current	With Impact	Additional Notes:
5	0	Native - Gumbo Limbo, ficus benjamina. Invasive - Cogon grass

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		3

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Man-modified without trees.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Surrounded by residential, roads, agricultural	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Insects, birds

Additional relevant factors:

Trash/litter - moderate

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

Form 62-345.900(1), F.A.C. [effective date]

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	3
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	3
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	N/A
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
g. **Dependency** of downstream habitats on quantity or quality of discharges.	N/A
h. Protection of wetland functions provided by uplands (**upland** AAs only).	2

Current	With Impact
4	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact
0	0

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	4
II. Invasive/exotic plant species	4
III. Regeneration/recruitment	3
IV. Age, size distribution.	1
V. Snags, dens, cavity, etc.	0
VI. Plants' condition.	6
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	1
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	3

Current	With Impact
3	0

Additional Notes: Tecoma stans, Leucaena leucocephala, Haematoxylum campechianum, Bourreria venosa, Setaria geniculata/ parviflora (bristle grass)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.35	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.350

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		24

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
18311	**Man-modified without trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Man-modified without trees.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Sourrounded west and south by roads. Surrounded by agriculture.	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Lizards, butterflies, smooth billed anil (birds)

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/25/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	24
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/25/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	7
c. **Wildlife access** to and from AA (proximity and barriers).	4
d. **Downstream benefits** provided to fish and wildlife.	N/A
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	2
g. **Dependency** of downstream habitats on quantity or quality of discharges.	0
h. Protection of wetland functions provided by uplands (**upland** AAs only).	0

Current	With Impact
3	0

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact
0	0

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	4
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	1
VI. Plants' condition.	7
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	1
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	6

Current	With Impact
4	0

Additional Notes: Alamo vine (Merremia dissecta, coconut palm (cocos nucifera), logwood/bloodwood (Haematoxylum campechianum), tan-tan (Leucaena leucocephala), red mombin (Spondias purpurea), guinea grass (panicum maximum/megathyrsus maximus)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.35	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.350

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		41

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1214	**Coastal Shrub**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Caribean sea south of AA. Uplands

Assessment area description

Coastal shrub south of Boddon Town Road.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential, road	**None**

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

gecko, anole, birds

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS and MM	**07/26/23**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	41
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS and MM**	**07/26/23**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	2
d. **Downstream benefits** provided to fish and wildlife.	2
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	1
g. **Dependency** of downstream habitats on quantity or quality of discharges.	1
h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	With Impact
3	0

Additional Notes: Fragmented by road. Invsavies on fringe. Birds access. Stops erosion into Half Moon Bay.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.
b. Reliability of **water level indicators**.
c. Appropriateness of **soil moisture**.
d. **Flow rates**/points of discharge.
e. **Fire frequency**/severity.
f. **Type of vegetation**.
g. **Hydrologic stress** on vegetation.
h. **Use by animal**s with hydrologic requirements.
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
k. **Water quality data** for the type of community.
l. **Water depth, wave energy, and currents**.

Current	With Impact

Additional Notes: N/A

.500(6)(c) Community Structure

X Vegetation
_____ Benthic
_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	4
IV. Age, size distribution.	4
V. Snags, dens, cavity, etc.	2
VI. Plants' condition.	6
VII. Land management practices.	2
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	5

Current	With Impact
4	0

Additional Notes: Native - seagrape (Coccoloba uvifera), bourreria (Bourreria venosa)

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.35	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.350

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

2024 UMAM Sheets

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A1

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the north of the AA. Urban residential development located to the west.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential development nearby to the west	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Yellow warbler, Loggerhead flycatcher, Land Crab, Smooth-billed Ani, White-winged dove, Butterfly

Additional relevant factors:

Mangroves are impounded for mosquitto control use. Very little flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A1**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
7	**0**

Additional Notes: Access roads for mosquito control fragments habitat and hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	5
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	6
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	9
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	4
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: N @ 21PPT, S @ 19PPT. Depth: N @ 17in, S @ 16". Green film substance observed on the waters surface.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	9
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	9
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
8	**0**

Additional Notes: 40% Black Mangrove, 20% White Mangrove, 10% red mangrove, 30% Buttonwood; >30FT crown height; moderate crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.73	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.730

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A2

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the northwest of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
	Central Mangrove Wetland

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Common gallinule, butterflys, Smooth-billed Ani, Grackle, Tri-colored heron.

Additional relevant factors:

Mangroves are impounded for mosquitto control use on the south side. No impoundment evidence on the northern side. Some flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A2**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
8	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	4
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	9
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	9
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: N @ 22.8PPT, S @ 21.2PPT. Depth: N @ 16in, S @ 20". Green film substance observed on the waters surface, high turbidity.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	6
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	8
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	9
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
8	**0**

Additional Notes: 60% Black Mangrove, 35% Red Mangrove, 5% Buttonwood. 10-30FT height, Crown density: Good/Full overall, however Buttonwood looks stressed due to possible overinundation.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.77	0.00

Impact Delta (ID)	
Current - w/Impact	0.770

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A3

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the northwest of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
	Central Mangrove Wetland

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflys, Tri-colored heron, Grackle

Additional relevant factors:

Mangroves are impounded for mosquitto control use on the south side. No impoundment evidence on the northern side. Some flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A3**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	10
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
8	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	4
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	9
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	9
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: N @ 33PPT, S @ 30PPT. Depth: N @ 14in, S @ 19". Green film substance observed on the waters surface, high turbidity.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	6
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	8
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	9
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
8	**0**

Additional Notes: 45% Black Mangrove, 40% Red Mangrove, 5% White Mangrove, 10% Buttonwood. 10-30FT height, Crown density: Good/Full overall, however Buttonwood looks stressed due to possible overinundation.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.77	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.770

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A4

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the northwest of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
	Central Mangrove Wetland
Functions **Stormwater runoff storage and treatment, Wildlife habitat**	Mitigation for previous permit/other historic use **N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) **Coastal avian, marine and terrstrial species.**	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflys, Fish, Grackle, Lizard

Additional relevant factors:

Mangroves are impounded for mosquitto control use on the west side. No impoundment evidence on the eastern side. Some flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A4**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
8	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	9
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	3
k. **Water quality data** for the type of community.	9
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: W @ 25PPT, E @ 29PPT. Depth: W @ 36in, E @ 18". Green film substance observed on the waters surface, high turbidity.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	4
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	6
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 50% Black Mangrove, 40% Red Mangrove, 5% White Mangrove, 5% Buttonwood. 10-30FT height, Crown density: All mangrove are showing lower than usuall crown density. Black sooty mold present on leaves and limbs.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.73	0.00

Impact Delta (ID)	
Current - w/Impact	0.730

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A5

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the northwest of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
	Central Mangrove Wetland

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflys, yellow warbler

Additional relevant factors:

Mangroves are impounded for mosquitto control use on the south side. No impoundment evidence on the nothern side. Some flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A5**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	9
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
8	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	4
k. **Water quality data** for the type of community.	5
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: N @ 27PPT, S @ 26PPT. Depth: N @ 6in, S @ 30". Green film substance observed on the waters surface.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	5
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 30% Red Mangrove, 40% White Mangrove, 30% Buttonwood. 10-30FT height, Crown density: All mangrove are showing good crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.73	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.730

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A6

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified with trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Adjacent to the central mangrove wetland

Assessment area description

Man-modified habitat, stock piles of aggregate and overburden scattered throughout, haul equipment stagging area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lime Rock Mine	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Laydown and operations yard for the lime rock mine	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflys, Loggerhead kingbird

Additional relevant factors:

Some evidence of soil staining present within the AA

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A6**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	4
	b. **Invasive plant species.**	4
	c. **Wildlife access** to and from AA (proximity and barriers).	4
	d. **Downstream benefits** provided to fish and wildlife.	5
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	1
	f. **Hydrologic connectivity** (impediments and flow restrictions).	5
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	3

Current	**With Impact**	Additional Notes:
4	**0**	Active lime rock mine.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	**With Impact**	Additional Notes:
0	**0**	

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	2
	IV. Age, size distribution.	3
	V. Snags, dens, cavity, etc.	4
	VI. Plants' condition.	2
	VII. Land management practices.	1
	VIII. Topographic features (refugia, channels, hummocks).	4
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	2

Current	**With Impact**	Additional Notes:
3	**0**	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.35	0.00

Impact Delta (ID)	
Current - w/Impact	0.350

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A7

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Seasonally Flooded Mangrove Shrubland	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer to the central mangrove wetland

Assessment area description

Mangrove shrubland adjacent to active lime rock mine, no standing water present, significant amounts of waste, debris and limerock deposits throughout the AA.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine, Adjacent to Central Mangrove Wetland	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Avian and terrestrial species	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Yellow warbler, Anhinga

Additional relevant factors:

Soul staining and dispossed 55 gallon drums present in the assessment area.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	A7
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

Current	With Impact
5	0

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	4
d. **Downstream benefits** provided to fish and wildlife.	5
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	3
g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

Current	With Impact
6	0

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	6
c. Appropriateness of **soil moisture**.	6
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	6
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	6
h. **Use by animal**s with hydrologic requirements.	2
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	6

Additional Notes: Dry season - no standing water present

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

Current	With Impact
5	0

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	4
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	5
VI. Plants' condition.	4
VII. Land management practices.	1
VIII. Topographic features (refugia, channels, hummocks).	3
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Additional Notes: 10% Black Mangrove, 55% White Mangrove, 35% Buttonwood. ~10FT height, Crown density: All mangrove are showing low crown density. Black sooty mold present on leaves and limbs.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	With Impact
0.53	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.530

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A8

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Adjacent to mine pits and upland areas used in an active lime rock mine operation.

Assessment area description

Seasonally flooded mangrove forest. Depression and shallow pooling common throught the habitat.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Grackle

Additional relevant factors:

Abandoned limerock mine road to the north.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A8**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	6
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
7	**0**

Additional Notes: Salinity: 30PPT. Dry season, very little standing water present, no flow, some algae growing on the surface of depressional pools.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 100% Black Mangrove. 10-30FT height, Crown density: All mangrove are showing moderate crown density. Black sooty mold present on leaves and limbs.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.67	0.00

Impact Delta (ID)	
Current - w/Impact	0.670

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A9

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer mangroves for the Central Mangrove Wetland and the active lime rock mine.

Assessment area description

Seasonally flooded mangrove forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine, Central Mangrove Wetland	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Tri-colored heron, Anhinga, Stilt, Butterfly, Fiddler crab

Additional relevant factors:

Active lime rock mine nearby.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A9**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	8
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	8
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
8	**0**

Additional Notes: Salinity: 25PPT. Dry season. Sedimentation present on mangroves adjacent to mining operation.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	8
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 15% Black Mangrove, 80% White Mangrove, 5% Buttonwood. 10-30FT height, Crown density: All mangrove are showing moderate crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.70	0.00

Impact Acres =	0.00

Impact Delta (ID)	
Current - w/Impact	0.700

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A10

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer mangroves for the Central Mangrove Wetland and the active lime rock mine.

Assessment area description

Seasonally flooded mangrove forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine, Central Mangrove Wetland	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Stilts, White-winged doves

Additional relevant factors:

Active lime rock mine nearby.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A10**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	8
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	8

Current	**With Impact**
8	**0**

Additional Notes: Salinity: 27PPT. Dry season. Tannic water

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	8
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	8
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 15% Black Mangrove, 80% White Mangrove, 5% Buttonwood. 10-30FT height, Crown density: All mangrove are showing moderate crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.70	0.00

Impact Acres =	0.00

Impact Delta (ID)	
Current - w/Impact	0.700

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A11

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer mangroves for the Central Mangrove Wetland and the active lime rock mine.

Assessment area description

Low density Seasonally flooded mangrove forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine, Central Mangrove Wetland	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Kingbird

Additional relevant factors:

Active lime rock mine nearby.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A11**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	6
h. **Use by animal**s with hydrologic requirements.	4
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
7	**0**

Additional Notes: Dry season. No pools or water present within the AA.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	3
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
6	**0**

Additional Notes: 95% Black Mangrove, 5% Buttonwood. 10-30FT height, Crown density: All mangrove are showing very low crown density. Black sooty mold present on leaves and limbs.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A12

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer mangroves for the Central Mangrove Wetland and the active lime rock mine.

Assessment area description

High density Seasonally flooded mangrove forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine, Central Mangrove Wetland	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Grackle

Additional relevant factors:

Active lime rock mine nearby.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A12**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	4
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	5
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
7	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	5
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	7
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
8	**0**

Additional Notes: Salinity 23 PPT. Dry season.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	8
VII. Land management practices.	6
VIII. Topographic features (refugia, channels, hummocks).	9
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
8	**0**

Additional Notes: 80% Black Mangrove, 20% White Mangrove. >30FT height, Crown density: All mangrove are showing high crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.77	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.770

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A13

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100	**Dry Forest Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Downsloping towards a depressional wetland. Small isolated pool of freshwater located outside of the AA to the east.

Assessment area description

Karst outcrops scattered throughout with a ~20ft canopy of mixed hardwood species.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Trail to the north. Cleared land adjacent to the East.	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Aavian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

White-winged dove, Bananaquit, Cayman Parrot, Bull finch.

Additional relevant factors:

Karst deposits found throughout measuing to be approximatly 1-3ft above ground level.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A13**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	8
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	8
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	8

Current	**With Impact**	Additional Notes:
7	**0**	Karst formations allow for stormwater to pool and store for wildlife utilization.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
	0	

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	8
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	8
	IV. Age, size distribution.	8
	V. Snags, dens, cavity, etc.	10
	VI. Plants' condition.	7
	VII. Land management practices.	5
	VIII. Topographic features (refugia, channels, hummocks).	9
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	7

Current	**With Impact**	Additional Notes:
8	**0**	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.75	0.00

Impact Delta (ID)	
Current - w/Impact	0.750

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A14

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100	**Dry Forest Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Karst outcrops scattered throughout with a ~10-20ft canopy of mixed hardwood species.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Trail to the north. Cleared land adjacent to the west.	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Aavian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Smooth-billed Ani, Green Iguana, White-winged dove, Mocking bird.

Additional relevant factors:

Karst deposits found throughout measuing to be approximatly 1-3ft above ground level.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A14**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
	f. **Hydrologic connectivity** (impediments and flow restrictions).	5
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	5

Current	**With Impact**	Additional Notes:
7	**0**	Recently cleared upland habitat located to the west of the AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
	0	

.500(6)(c) Community Structure X Vegetation Benthic Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	7
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	7
	VII. Land management practices.	4
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	6

Current	**With Impact**	Additional Notes:
7	**0**	Fringe effect on edge of woodland habitat present.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.70	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.700

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A15

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1100	**Dry Forest Woodland**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Lagoons and Mangroves located to the East.

Assessment area description

Small amounts of karst outcrops scattered throughout with a ~10-20ft canopy of mixed hardwood species.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Trail to the East.	

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Bananaquit

Additional relevant factors:

Access road present. Significant amount of dumping/trash along the edges of the access road.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A15**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	5
	c. **Wildlife access** to and from AA (proximity and barriers).	6
	d. **Downstream benefits** provided to fish and wildlife.	7
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
	f. **Hydrologic connectivity** (impediments and flow restrictions).	6
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	**With Impact**	Additional Notes:
6	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	**With Impact**	Additional Notes:
	0	Occasional pooling of water in adjacent depressional areas on either side of the access road.

.500(6)(c) Community Structure	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	5
	III. Regeneration/recruitment	6
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	7
	VII. Land management practices.	6
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	6

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	Additional Notes:
6	**0**	Fringe effect on edge of woodland habitat present.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A16

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Shallow surface water flow ways adjacent to the AA.

Assessment area description

Seasonally flooded mangrove forest.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active lime rock mine to the south. 2ft AGL abandoned road present.	**Central Mangrove Wetland**
Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Stilts, Anhinga

Additional relevant factors:

Mangroves are impounded for mosquitto control use on the south side. No impoundment evidence on the nothern side. Some flushing from tidal fluctuations.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A16**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	4
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes: Impoundments to the south and west.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	6
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	5
h. **Use by animal**s with hydrologic requirements.	4
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
k. **Water quality data** for the type of community.	
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: 51PPT. Dry season. Seasonally flooded, no water present at the time of the assessment. Advantatious roots ~1 foot up above ground level.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	5
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 30% Black Mangrove, 60% White Mangrove, 10% Buttonwood. 10-30FT height, Crown density: All mangrove are showing good crown density.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.67	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.670

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A17

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
	Ponds, Pools, Mangrove Lagoons	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Buffer to Meagre Bay Pond

Assessment area description

Mangrove lagoon

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Meagre Bay Pond, Active lime rock mine.	**Meagre Bay Pond**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Tern, Stilt, Anole, Smooth-billed Ani, Cattle Egret

Additional relevant factors:

Dry season, No standing water.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A17**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	6
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	6
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	5
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	5

Current	**With Impact**
7	**0**

Additional Notes: Salinity: 30PPT. Dry season. Seasonally flooded, no water present at the time of the assessment. Mangrove pneumatophores @ 13in above ground.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	8
III. Regeneration/recruitment	5
IV. Age, size distribution.	5
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	4
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
6	**0**

Additional Notes: 70% Black Mangrove, 25% White Mangrove, 5% Buttonwood. ~10FT height, Crown density: All mangrove are showing very low crown density and stunted growth.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A18

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Central Mangrove Wetland to the North

Assessment area description

Seasonally flooded mangroves with large karst deposits scattered throughout.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active limerock mine	**Adjacent to the Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

See Taylors notes

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A18**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	7
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes: Abandoned road running North to South through the AA. Approximatly ~2FT above grade.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	7
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	3
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
k. **Water quality data** for the type of community.	
l. **Water depth, wave energy, and currents**.	4

Current	**With Impact**
7	**0**

Additional Notes: Dry Season. No standing water present at time of assessment. Pneumatphore height approximatly 6in above ground.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	8
II. Invasive/exotic plant species	7
III. Regeneration/recruitment	6
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	5
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
6	**0**

Additional Notes: 10% Black Mangrove, 75% White Mangrove, 15% Buttonwood. 10-30FT height, Crown density: All mangrove are showing moderate crown density but with stunted growth. Black sooty mold present on leaves and limbs.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.63	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.630

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A19

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Central Mangrove Wetland to the North

Assessment area description

Seasonally flooded mangroves with large karst deposits scattered throughout.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active limerock mine to the South.	**Adjacent to the Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Bananaquit

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
RM & TS	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A19**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
6	**0**

Additional Notes: Karst deposits and small upland islands scattered throughout.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	5
h. **Use by animal**s with hydrologic requirements.	3
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
k. **Water quality data** for the type of community.	
l. **Water depth, wave energy, and currents**.	4

Current	**With Impact**
7	**0**

Additional Notes: Dry Season. No standing water present at time of assessment.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	7
III. Regeneration/recruitment	7
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	5
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
6	**0**

Additional Notes: 45% Black Mangrove, 20% White Mangrove, 35% Buttonwood. 10-30FT height, Crown density: All mangroves are showing low crown density. Black sooty mold present on leaves and limbs. Lead tree present on edge of habitat.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.63	0.00

Impact Delta (ID)	
Current - w/Impact	0.630

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A20

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the north of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Cattle pasture to the south	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Cayman Parrot, Butterfly, Yellow Warbbler, Land Crab, Whistling Duck, Common Gallinule

Additional relevant factors:

Access road running East to West.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A20**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	8
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	9
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
8	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	6
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	4
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	4
k. **Water quality data** for the type of community.	8
l. **Water depth, wave energy, and currents**.	6

Current	**With Impact**
7	**0**

Additional Notes: Salinity: N @ 27PPT, S @ 31PPT. Green film substance observed on the waters surface, high tannins

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	6
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	9
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
8	**0**

Additional Notes: 20% Black Mangrove, 50% White Mangrove, 30% Buttonwood. 10-30FT height, Crown density: Good/Full overall, however Buttonwood looks stressed.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.77	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.770

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A21

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the north of the AA.

Assessment area description

Low quality mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
North sound to the north.	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Fish, West Indian Woodpecker, Butterfly, Cayman Parrot.

Additional relevant factors:

Access road running North to South.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A21**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	8
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
7	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	6
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	8
l. **Water depth, wave energy, and currents**.	6

Current	**With Impact**
7	**0**

Additional Notes: Salinity: W @ 22PPT, E @ 19PPT. Green film substance observed on the waters surface

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	4
IV. Age, size distribution.	4
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	4
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
6	**0**

Additional Notes: 30% Red Mangrove, 5% Black Mangrove, 65% White Mangrove, 30% Buttonwood. <10FT height, Crown density: Very Low Crown Density on all species. Black sooty mold on leave and limbs throughout.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.67	0.00

Impact Delta (ID)	
Current - w/Impact	0.670

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A22

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North sound located to the north of the AA.

Assessment area description

Mangrove forest within mosquitto control area.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
North sound located to the north of the AA.	**Central Mangrove Wetland**

Functions	Mitigation for previous permit/other historic use
Stormwater runoff storage and treatment, Wildlife habitat	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian, marine and terrstrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Cayman Parrot, Butterfly, Yellow Warbbler, Land Crab, Common Gallinule

Additional relevant factors:

Access road running East to West.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A22**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
h. Protection of wetland functions provided by uplands (**upland** AAs only).	

Current	**With Impact**
7	**0**

Additional Notes: Access roads for mosquitto control fragments habitat and some hydrologic conectivity.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	4
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	5
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	7
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	4

Current	**With Impact**
6	**0**

Additional Notes: Salinity: N @ 26PPT, S @ 25PPT. Green film substance observed on the waters surface, high tannins

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	6
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	
X. Upland assessment area	

Current	**With Impact**
7	**0**

Additional Notes: 30% Red Mangrove, 35% White Mangrove, 35% Buttonwood. 10-30FT height, Crown density: Good/Full overall, however Buttonwood looks stressed.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.67	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.670

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A23

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified with trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Stormwater flows north to the cenetral mangrove wetland.

Assessment area description

Man-modified with trees. Monoculture of Buttonwood.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central Mangrove Weltand to the North	

Functions	Mitigation for previous permit/other historic use
Livestock grazing area and Wildlife habitat.	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Avian and terrestrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Hickity turtle, Snowy Egret, Yellow warbler, Cayman parrot, Smooth-billed Ani, Land Crab

Additional relevant factors:

Active cattle operation

Assessment conducted by:	Assessment date(s):
RM & TS	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A23**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**RM & TS**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	8
	c. **Wildlife access** to and from AA (proximity and barriers).	7
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
	f. **Hydrologic connectivity** (impediments and flow restrictions).	6
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	8

Current	**With Impact**	
7	**0**	Additional Notes: Karst deposits at the surface of the AA. Evidence of flashy hydrology in the AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.
	b. Reliability of **water level indicators**.
	c. Appropriateness of **soil moisture**.
	d. **Flow rates**/points of discharge.
	e. **Fire frequency**/severity.
	f. **Type of vegetation**.
	g. **Hydrologic stress** on vegetation.
	h. **Use by animal**s with hydrologic requirements.
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).
	k. **Water quality data** for the type of community.
	l. **Water depth, wave energy, and currents**.

Current	**With Impact**	
0	**0**	Additional Notes:

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	6
	II. Invasive/exotic plant species	8
	III. Regeneration/recruitment	4
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	5
	VI. Plants' condition.	6
	VII. Land management practices.	5
	VIII. Topographic features (refugia, channels, hummocks).	5
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	5

Current	**With Impact**	
6	**0**	Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.65	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.650

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		A24

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man-modified with trees**	**Direct Impact**	Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
N/A	**N/A**	**N/A**

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Man-modified habitat with small trees present. Karst deposits are scattered throughout. Some depressional areas with pools of water are also present in the AA. Possibly for agricultural use.

Assessment area description

Historic agricultural field, heavy land disturbances present.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Active construction to the West of the AA. Residential to the South of the AA.	

Functions	Mitigation for previous permit/other historic use
Livestock grazing area and Wildlife habitat.	**N/A**

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Avian and terrestrial species.	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Hickity turtle, Snowy Egret, Yellow warbler, Cayman parrot, Smooth-billed Ani, Land Crab

Additional relevant factors:

Piled up fencing and vegitation from clearing activites present within the AA.

Assessment conducted by:	Assessment date(s):
RM & TS	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**A24**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**RM & TS**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

		Enter Notes below (do NOT score each subcategory individually)
.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	6
	d. **Downstream benefits** provided to fish and wildlife.	7
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
	f. **Hydrologic connectivity** (impediments and flow restrictions).	7
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	7

Current	**With Impact**	
6	**0**	Additional Notes: Used for agriculture.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	
0	**0**	Additional Notes: Salinty of small pools: 15PPT

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	7
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	7
	VII. Land management practices.	5
	VIII. Topographic features (refugia, channels, hummocks).	6
	IX. Submerged vegetation (only score if present).	
	X. Upland assessment area	6

Current	**With Impact**	
6	**0**	Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B1

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Mangroves located on other side of road, and impacted mine site

Assessment area description

Mangrove fringe dominated by black and white mangrove edge of the site

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mine, open water pond, piles	

Functions	Mitigation for previous permit/other historic use
Isolated, no downstream benefits	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, butterflies	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds, butterflies, small burrow holes

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B1**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	2
	b. **Invasive plant species.**	8
	c. **Wildlife access** to and from AA (proximity and barriers).	3
	d. **Downstream benefits** provided to fish and wildlife.	2
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	2
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	1
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	Additional Notes:
3	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	6
	b. Reliability of **water level indicators**.	7
	c. Appropriateness of **soil moisture**.	7
	d. **Flow rates**/points of discharge.	2
	e. **Fire frequency**/severity.	7
	f. **Type of vegetation**.	7
	g. **Hydrologic stress** on vegetation.	8
	h. **Use by animal**s with hydrologic requirements.	2
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	4
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	8
	k. **Water quality data** for the type of community.	7
	l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**	Additional Notes:
6	**0**	Salinity 22ppt. Water depth - 10"+

.500(6)(c) Community Structure	I. Appropriate/desirable species	8
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	5
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	5
	VII. Land management practices.	1
	VIII. Topographic features (refugia, channels, hummocks).	4
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	N/A

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	Additional Notes:
6	**0**	Black Mangrove 70%, White Mangrove 10%, Height = less than 10'.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.50	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.500

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B2

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Located East of isolated open water and roadway. Mine adjacent.

Assessment area description

15'-20' tall black mangrove dominated. White mangroves present.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
road, pond, mangroves	
Functions	Mitigation for previous permit/other historic use
stormwater filtration and storage	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, small reptiles, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

insects - mosquitoes, termites, anoles, birds

Additional relevant factors:

Salinity 26ppt, algal presence

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B2**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	3
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	6
	d. **Downstream benefits** provided to fish and wildlife.	2
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
	f. **Hydrologic connectivity** (impediments and flow restrictions).	3
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	Additional Notes:
4	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	7
	b. Reliability of **water level indicators**.	8
	c. Appropriateness of **soil moisture**.	10
	d. **Flow rates**/points of discharge.	6
	e. **Fire frequency**/severity.	7
	f. **Type of vegetation**.	10
	g. **Hydrologic stress** on vegetation.	6
	h. **Use by animal**s with hydrologic requirements.	2
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	N/A
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
	k. **Water quality data** for the type of community.	7
	l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**	Additional Notes:
7	**0**	Salinity 26ppt. Water depth - 3".

.500(6)(c) Community Structure	I. Appropriate/desirable species	8
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	4
	IV. Age, size distribution.	6
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	5
	VII. Land management practices.	2
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	N/A

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	Additional Notes:
6	**0**	Black Mangrove 70%, White Mangrove 10%, buttonwood - 20%.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.57	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.570

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B3

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

West of mine access road. South of mine pond. Old access road to the south.

Assessment area description

10'-20' black and white mangroves, no standing water

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mine access road and old access road.	

Functions	Mitigation for previous permit/other historic use
Minimal habitat, stormwater (minimal)	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Coastal avian	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Butterflies

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B3**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	3
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
g. **Dependency** of downstream habitats on quantity or quality of discharges.	3
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
6	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	6
b. Reliability of **water level indicators**.	5
c. Appropriateness of **soil moisture**.	5
d. **Flow rates**/points of discharge.	N/A
e. **Fire frequency**/severity.	N/A
f. **Type of vegetation**.	7
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	2
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	N/A
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**
6	**0**

Additional Notes: Salinity 26ppm. No water, but mangroves present.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	4
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	6
VI. Plants' condition.	4
VII. Land management practices.	2
VIII. Topographic features (refugia, channels, hummocks).	2
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
6	**0**

Additional Notes: 10-20ft height, 10% logwood, Black Mangrove 65%, White Mangrove 20%, buttonwood 5%. Soil is dry and compact causing shallow roots.Dead branches and sooty mold present.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.60	0.00

Impact Delta (ID)	
Current - w/Impact	0.600

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B4

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1831	**Man modified without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Mangroves located to north and west. Adjacent to Mastic Reserve.

Assessment area description

Area appears to have been cleared in recent years

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Reserve to the north/north west of AA.Residential to south/ east	**Cleared**
Functions **Habitat and foraging.**	Mitigation for previous permit/other historic use
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) **birds, butterflies, insects**	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

birds, butterflies, insects

Additional relevant factors:

No standing water, no visable water at surface

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B4**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
	f. **Hydrologic connectivity** (impediments and flow restrictions).	7
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	7

Current	**With Impact**	Additional Notes:
6	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	
	b. Reliability of **water level indicators**.	
	c. Appropriateness of **soil moisture**.	
	d. **Flow rates**/points of discharge.	
	e. **Fire frequency**/severity.	
	f. **Type of vegetation**.	
	g. **Hydrologic stress** on vegetation.	
	h. **Use by animal**s with hydrologic requirements.	
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	
	k. **Water quality data** for the type of community.	
	l. **Water depth, wave energy, and currents**.	

Current	**With Impact**	Additional Notes:
0	**0**	

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	6
	III. Regeneration/recruitment	9
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	8
	VII. Land management practices.	3
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	6

Current	**With Impact**	Additional Notes:
7	**0**	

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.65	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.650

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B5

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1813	**Man made without trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Uplands

Assessment area description

AA cleared. FAC wet plants present. Surrounded by forest all around. Mastic Reserve nearby to the north/west. Residential and roadway to south. Construction site to south.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mastic Reserve	
Functions	Mitigation for previous permit/other historic use
Habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, butterflies, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds, butterflies

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B5**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	6
	b. **Invasive plant species.**	7
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	7
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	2
	f. **Hydrologic connectivity** (impediments and flow restrictions).	7
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	**With Impact**	
6	**0**	Additional Notes: Mastic Reserve nearby to the north/west. Residential and roadway to south. Construction site to south.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	N/A
	b. Reliability of **water level indicators**.	N/A
	c. Appropriateness of **soil moisture**.	N/A
	d. **Flow rates**/points of discharge.	N/A
	e. **Fire frequency**/severity.	N/A
	f. **Type of vegetation**.	N/A
	g. **Hydrologic stress** on vegetation.	N/A
	h. **Use by animal**s with hydrologic requirements.	N/A
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	N/A
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
	k. **Water quality data** for the type of community.	N/A
	l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**	
0	**0**	Additional Notes: No surface water presesnt. Uplands

.500(6)(c) Community Structure X Vegetation _____ Benthic _____ Both	I. Appropriate/desirable species	7
	II. Invasive/exotic plant species	7
	III. Regeneration/recruitment	9
	IV. Age, size distribution.	4
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	8
	VII. Land management practices.	3
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	6

Current	**With Impact**	
7	**0**	Additional Notes:

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.65	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.650

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B6

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally flooded mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Mastic Reserve to the west. National Trust Property. PEM lagoons to southeast.

Assessment area description

Black mangrove dominated area. Mangrove heights 10'-30' tall.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
National Trust trail. Adjacent to Mastic Reserve.	**Adjacent to Mastic Reserve. National Trust property.**

Functions	Mitigation for previous permit/other historic use
Habitat and water storage	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
birds, butterflies, small reptiles	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

birds, butterflies, reptiles (anoles)

Additional relevant factors:

On National Trust trail

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B6**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	9
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	9
	d. **Downstream benefits** provided to fish and wildlife.	9
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	9
	f. **Hydrologic connectivity** (impediments and flow restrictions).	9
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	9
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	9

Current	**With Impact**	Additional Notes:
9	**0**	

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	8
	b. Reliability of **water level indicators**.	9
	c. Appropriateness of **soil moisture**.	9
	d. **Flow rates**/points of discharge.	8
	e. **Fire frequency**/severity.	7
	f. **Type of vegetation**.	9
	g. **Hydrologic stress** on vegetation.	10
	h. **Use by animal**s with hydrologic requirements.	N/A
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
	k. **Water quality data** for the type of community.	8
	l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**	Additional Notes:
9	**0**	Salinity = 40 ppt

.500(6)(c) Community Structure	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	10
	III. Regeneration/recruitment	7
	IV. Age, size distribution.	9
	V. Snags, dens, cavity, etc.	9
	VI. Plants' condition.	9
	VII. Land management practices.	8
	VIII. Topographic features (refugia, channels, hummocks).	8
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	N/A

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	Additional Notes:
9	**0**	Black mangroves 80%, buttonwood 20%, height 10'-30'

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.90	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.900

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B7

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally flooded mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North of mine site. West of old mine access road. South of Central Mangrove.

Assessment area description

Seasonally flooded mangrove impounded by old access road

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mine site	**Adjacent to old access road**

Functions	Mitigation for previous permit/other historic use
Stormwater treatment and habitat	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
avian, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

West Indian wood pecker, termites, other birds

Additional relevant factors:

Per NRA area to the west is drier and dominated by logwood trees.

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B7**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	5
f. **Hydrologic connectivity** (impediments and flow restrictions).	6
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
7	**0**

Additional Notes: Adjacent to old access road causing a lack of hydrologic connection to wetland.

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	7
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**
8	**0**

Additional Notes: Salinity = 38 ppt

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	8
IV. Age, size distribution.	9
V. Snags, dens, cavity, etc.	9
VI. Plants' condition.	8
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
9	**0**

Additional Notes: Black mangroves 95%, buttonwood 5%. Height 10'-30' tall with a few mangrove trees greater than 30 feet. Abundant recruitment. Abundant snags and deadwood.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.80	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.800

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B8

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally flooded mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

South of central mangroves. North of mines

Assessment area description

seasonally flooded mangroves north of mines. Central mangroves to north

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central mangroves, mines	

Functions	Mitigation for previous permit/other historic use
Habitat, stormwater treatment	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, insects, small reptiles	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

birds, insects

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B8**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	5
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	6
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	7
g. **Dependency** of downstream habitats on quantity or quality of discharges.	6
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
7	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	9
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	9
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	9
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	9
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	8

Current	**With Impact**
9	**0**

Additional Notes: Salinity = 55 ppt. Tanins present in water. Water depth - 12".

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	10
III. Regeneration/recruitment	8
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	8
VII. Land management practices.	3
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
8	**0**

Additional Notes: Black mangroves - 90%, Wite mangroves - 10%. Height 10'-30'. Dieback present

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.80	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.800

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B9

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1813	**Man-modified upland with trees**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

North of mines and pond. Adjacent to seasonally flooded mangroves.

Assessment area description

Disturbed upland area between pond, mine and seasonally flooded mangroves.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mine, pond, mangroves	
Functions	Mitigation for previous permit/other historic use
Habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, insects, reptiles	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Eveidnece of crabs, birds - observed two Cayman parrots.

Additional relevant factors:

No surface water observed in AA.

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/15/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B9**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/15/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	5
	b. **Invasive plant species.**	9
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	6
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	3
	f. **Hydrologic connectivity** (impediments and flow restrictions).	5
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	4
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	6

Current	**With Impact**	Additional Notes:
6	**0**	North of mine and pond. Adjacent to seasonally flooded mangroves.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	N/A
	b. Reliability of **water level indicators**.	N/A
	c. Appropriateness of **soil moisture**.	N/A
	d. **Flow rates**/points of discharge.	N/A
	e. **Fire frequency**/severity.	N/A
	f. **Type of vegetation**.	N/A
	g. **Hydrologic stress** on vegetation.	N/A
	h. **Use by animal**s with hydrologic requirements.	N/A
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	N/A
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
	k. **Water quality data** for the type of community.	N/A
	l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**	Additional Notes:
0	**0**	

.500(6)(c) Community Structure	I. Appropriate/desirable species	8
	II. Invasive/exotic plant species	9
	III. Regeneration/recruitment	5
	IV. Age, size distribution.	5
	V. Snags, dens, cavity, etc.	7
	VI. Plants' condition.	6
	VII. Land management practices.	4
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	6

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	Additional Notes:
6	**0**	Logwood, buttonwood, white mangroves, shrub species.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.60	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.600

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B10

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Mangrove dominated system with black, white and red mangroves. Mangrove height - 10-30'

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mosquito ditches, access road (gravel), mangroves on both sides	
Functions	Mitigation for previous permit/other historic use
Habitat, stormwater storage	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

yellow warblers, fish, butterflies, heron

Additional relevant factors:

access road separates both, north side salinity 35 ppt, south side salinity 27 ppt.

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/14/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B10**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/14/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	8
c. **Wildlife access** to and from AA (proximity and barriers).	8
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	4
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
7	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	8
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	4
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	8
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	7
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	6
k. **Water quality data** for the type of community.	7
l. **Water depth, wave energy, and currents**.	6

Current	**With Impact**
7	**0**

Additional Notes: 6 feet deep on south side, 24" on north side.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	7
VII. Land management practices.	6
VIII. Topographic features (refugia, channels, hummocks).	8
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
8	**0**

Additional Notes: black mangroves 40%, red mangroves 40%, buttonwood 10%, white mangrove 10%, 10'-30' height

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.73	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.730

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B11

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Mangrove forest with mosquito ditches

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)

Functions	Mitigation for previous permit/other historic use
Habitat, stormwater treatment	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, butterflies, fish	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Birds, gallinule, butterflies, aquatic bug, fish

Additional relevant factors:

Access road seegments AA

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B11**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support	a. Quality and quantity **of habitat support** outside of AA.	7
	b. **Invasive plant species.**	10
	c. **Wildlife access** to and from AA (proximity and barriers).	8
	d. **Downstream benefits** provided to fish and wildlife.	8
	e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
	f. **Hydrologic connectivity** (impediments and flow restrictions).	7
	g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
	h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**	
8	**0**	Additional Notes: high water level AA.

.500(6)(b) Water Environment (n/a for uplands)	a. Appropriateness of **water levels and flows**.	9
	b. Reliability of **water level indicators**.	9
	c. Appropriateness of **soil moisture**.	9
	d. **Flow rates**/points of discharge.	6
	e. **Fire frequency**/severity.	7
	f. **Type of vegetation**.	9
	g. **Hydrologic stress** on vegetation.	7
	h. **Use by animal**s with hydrologic requirements.	6
	i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
	j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
	k. **Water quality data** for the type of community.	6
	l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**	
7	**0**	Additional Notes: North 30ppt, south 35ppt, water level up to access road, green algae on north side. Turbid water. Water depth - 10" on north, 12" on south.

.500(6)(c) Community Structure	I. Appropriate/desirable species	9
	II. Invasive/exotic plant species	10
	III. Regeneration/recruitment	4
	IV. Age, size distribution.	7
	V. Snags, dens, cavity, etc.	8
	VI. Plants' condition.	9
	VII. Land management practices.	6
	VIII. Topographic features (refugia, channels, hummocks).	7
	IX. Submerged vegetation (only score if present).	N/A
	X. Upland assessment area	N/A

X Vegetation

_____ Benthic

_____ Both

Current	**With Impact**	
8	**0**	Additional Notes: black mangroves 5%, red mangroves 80%, buttonwood 5%, white mangrove 10%, 10'-30' height (20-30').

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.77	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.770

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B12

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangrove Forest**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Central Mangrove wetlands to north, mangrove forest to south. Bisected by mosquito road

Assessment area description

Seasonally flooded mangrove forest

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Mosquito road, mangrove forest	**Hydrology disconnected from N/S sides**
Functions	Mitigation for previous permit/other historic use
Water storage, habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Yellow warbler, Inca dove

Additional relevant factors:

salinity 35ppt on south side, 36 ppt on north side

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B12**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	7
d. **Downstream benefits** provided to fish and wildlife.	7
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	5
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
7	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	7
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	5
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	9
h. **Use by animal**s with hydrologic requirements.	6
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	5
k. **Water quality data** for the type of community.	6
l. **Water depth, wave energy, and currents**.	

Current	**With Impact**
7	**0**

Additional Notes: 18" deep on north and 18" on south side.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	5
IV. Age, size distribution.	7
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	7
VII. Land management practices.	4
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
7	**0**

Additional Notes: black mangroves 30%, red mangroves 30%, buttonwood 10%, white mangrove 30%, Height - 10'-30'.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.70	0.00

Impact Delta (ID)	
Current - w/Impact	0.700

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B13

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Seasonally Flooded Mangroves**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Within cow pasture, connected with mangroves that are around mosquito roads

Assessment area description

Seasonally flooded mangroves adjacent to cow pasture uplands.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Cow pasture, mosquito roads	
Functions	Mitigation for previous permit/other historic use
Water retention, habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Avian, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Grackle, crab holes, insects, butterflies, tri-colored heron, egret

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B13**
Impact or Mitigation:	**Assessment Conducted by:**	**Assessment Date:**
Impact	**JS, MM, LK**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	9
c. **Wildlife access** to and from AA (proximity and barriers).	9
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	7
f. **Hydrologic connectivity** (impediments and flow restrictions).	8
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
8	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	9
d. **Flow rates**/points of discharge.	6
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	9
g. **Hydrologic stress** on vegetation.	8
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	9
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	8
k. **Water quality data** for the type of community.	9
l. **Water depth, wave energy, and currents**.	7

Current	**With Impact**
8	**0**

Additional Notes: salinity 21 ppt. Water depth - 4" deep. Mud crabs present. Some turbidity observed.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	9
II. Invasive/exotic plant species	9
III. Regeneration/recruitment	5
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	7
VII. Land management practices.	5
VIII. Topographic features (refugia, channels, hummocks).	6
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
7	**0**

Additional Notes: black mangroves 10%, buttonwood 40%, rahdbadenia vines cover mangroves, 10'-30' height (more 10-20ft).

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.77	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.770

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B14

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
3112	**Mangrove Lagoon**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

South of Central mangrove mangroves. Surrounded by residential development and agriculture.

Assessment area description

Lagoon surrounded by white mangroves, manmade with trees adjacent, adjacent to residential and roadway

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Central mangroves to the north	
Functions	Mitigation for previous permit/other historic use
Habitat	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, reptiles, insects, fish	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

green iguanas, fish

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B14**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	7
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	8
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	6
f. **Hydrologic connectivity** (impediments and flow restrictions).	8
g. **Dependency** of downstream habitats on quantity or quality of discharges.	7
h. Protection of wetland functions provided by uplands (**upland** AAs only).	N/A

Current	**With Impact**
7	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	8
b. Reliability of **water level indicators**.	9
c. Appropriateness of **soil moisture**.	8
d. **Flow rates**/points of discharge.	8
e. **Fire frequency**/severity.	7
f. **Type of vegetation**.	7
g. **Hydrologic stress** on vegetation.	7
h. **Use by animal**s with hydrologic requirements.	8
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	8
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	8
k. **Water quality data** for the type of community.	8
l. **Water depth, wave energy, and currents**.	8

Current	**With Impact**
8	**0**

Additional Notes: salinity 7 ppt, Water depth - 20" deep.

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	7
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	7
IV. Age, size distribution.	8
V. Snags, dens, cavity, etc.	8
VI. Plants' condition.	7
VII. Land management practices.	6
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	N/A
X. Upland assessment area	N/A

Current	**With Impact**
7	**0**

Additional Notes: Logwood. Invasives - tan-tan, seaside mahoe. White mangroves 70%, black mangroves 15%, buttonwood 15%, 10'-30' height (closer to 30' tall).

Raw Score = Sum of above scores/30 (if uplands, divide by 20)

Current	**With Impact**
0.73	0.00

Impact Delta (ID)	
Current - w/Impact	0.730

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART I - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.400 F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
		B15

FLUCCs code	Further classification (optional)	Impact Type	Assessment Area Size
1500	**Dry Shrubland**		Acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Upland adjacent to prision and developed areas. Central Mangrove wetland to the north. Adjacent to cell tower.

Assessment area description

Dry shrubland

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Adjacent cell tower and prison	

Functions	Mitigation for previous permit/other historic use
Habitat	

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Birds, reptiles, insects	

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Yellow warbler, butterflies

Additional relevant factors:

Assessment conducted by:	Assessment date(s):
JS, MM, LK	**05/16/24**

UNIFORM WETLAND MITIGATION ASSESSMENT WORKSHEET - PART II - IMPACT
Form 62-345.900(2), F.A.C. (See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name:	Application Number:	Assessment Area Name or Number:
-	-	**B15**
Impact or Mitigation:	Assessment Conducted by:	Assessment Date:
Impact	**JS, MM, LK**	**05/16/24**

Scoring Guidance	**Optimal (10)**	**Moderate(7)**	**Minimal (4)**	**Not Present (0)**
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Enter Notes below (do NOT score each subcategory individually)

.500(6)(a) Location and Landscape Support

a. Quality and quantity **of habitat support** outside of AA.	6
b. **Invasive plant species.**	6
c. **Wildlife access** to and from AA (proximity and barriers).	6
d. **Downstream benefits** provided to fish and wildlife.	4
e. Adverse impacts to wildlife in AA from **land uses** outside of AA.	4
f. **Hydrologic connectivity** (impediments and flow restrictions).	N/A
g. **Dependency** of downstream habitats on quantity or quality of discharges.	5
h. Protection of wetland functions provided by uplands (**upland** AAs only).	5

Current	**With Impact**
5	**0**

Additional Notes:

.500(6)(b) Water Environment (n/a for uplands)

a. Appropriateness of **water levels and flows**.	N/A
b. Reliability of **water level indicators**.	N/A
c. Appropriateness of **soil moisture**.	N/A
d. **Flow rates**/points of discharge.	N/A
e. **Fire frequency**/severity.	N/A
f. **Type of vegetation**.	N/A
g. **Hydrologic stress** on vegetation.	N/A
h. **Use by animal**s with hydrologic requirements.	N/A
i. **Plant community composition** associated with water quality (i.e., plants tolerant of poor WQ).	N/A
j. **Water quality of standing water by observation** (I.e., discoloration, turbidity).	N/A
k. **Water quality data** for the type of community.	N/A
l. **Water depth, wave energy, and currents**.	N/A

Current	**With Impact**
0	**0**

Additional Notes:

.500(6)(c) Community Structure

X Vegetation

_____ Benthic

_____ Both

I. Appropriate/desirable species	6
II. Invasive/exotic plant species	6
III. Regeneration/recruitment	5
IV. Age, size distribution.	6
V. Snags, dens, cavity, etc.	7
VI. Plants' condition.	6
VII. Land management practices.	7
VIII. Topographic features (refugia, channels, hummocks).	7
IX. Submerged vegetation (only score if present).	8
X. Upland assessment area	6

Current	**With Impact**
6	**0**

Additional Notes:
Logwood, caster bean, tatch palm, Stachytarpheta jamaicensis.

Raw Score = Sum of above scores/30 (if uplands, divide by 20)	
Current	**With Impact**
0.55	0.00

Impact Acres =	0.00

Functional Loss (FL) [For Impact Assessment Areas]:	
FL = ID x Impact Acres =	0.000

Impact Delta (ID)	
Current - w/Impact	0.550

NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigaiton bank.

Appendix K.2 - Terrestrial Habitat Descriptions

Attachment K.2
Terrestrial Habitat Descriptions

Terrestrial Habitat Descriptions

Habitat classifications and descriptions are based on the Vegetation Classification for the Cayman Islands (Burton, 2007). Based on the desktop and field evaluations previously discussed, additional subclassifications were also included. The broad classifications encountered, and additional subclassifications for the Proposed Project are detailed as follows:

1.0 Man-Modified

This habitat classification includes any land which has been altered or disturbed due to a variety of human activities including habitat conversion for use as residential, commercial, or industrial activities. These areas may also include activities managed for agricultural purposes, or those that come under the influence of agricultural practices, specifically, the growing of fruits, crops or the keeping of livestock.

Man-modified Without Trees

This habitat subclassification is defined as any land without trees which has been modified. Although these areas are classified as man-modified, they still may contain a vegetative component suitable for providing functional habitat to important species. Per Burton (2008b), this would include seasonally flooded grasslands, medium or short tropical/subtropical grassland with broad-leaved evergreen or semi-evergreen shrubs, or saturated tropical/subtropical perennial forb vegetation.

Plant species noted during the field evaluation included, but were not limited to: buttonwood (*Conocarpus erectus*), sea-purselane (*Sesuvium portulacastrum*), seaside heliotrope (*Heliotropium curassavicum*), queen of the night (*Selenicereus grandifloras*), white button (*Spilanthes urens*), beach naupaka (*Scaevola taccada*), bay vine (*Ipomoea pes-caprae*), chick weed (*Chamaesyce/Euphorbia hypericifolia*), prostrate sandmat (*Euphorbia prostrata*), cutleaf groundcherry (*Physalis angulata*), Australian pine (*Casuarina equisetifolia*), buff coat (*Waltheria indica*), seaside mahoe (*Thespesia populnea*), Euphorbia (*Chamaesyce/ Euphorbia bruntii*), goose grass (*Eleusine indica*), Alamo vine (*Merremia dissecta*), coconut palm (*Cocos nucifera*), logwood/bloodwood (*Haematoxylum campechianum*), tan-tan (*Leucaena leucocephala*), red mombin (*Spondias purpurea*), banana (*Musa paradisiacal*), weeping fig (*Ficus benjamina*), gumbo limbo (*Bursera simaruba*), royal poinciana (*Delonix regia*), wild coffee (*Psychotria nervosa*), guinea grass (*Panicum maximum/ Megathyrsus maximus*) and ackee fruit (*Blighia sapida*).

Field biologists also observed butterflies, Greater Antillean grackle (*Quiscalus niger caymanensis*), black-necked stilt (*Himantopus mexicanus*), black-crowned night heron (*Nycticorax nycticorax*), glossy ibis (*Plegadis falcinellus*), Grand Cayman parrot, western cattle egret (*Bubulcus ibis*), yellow warbler (*Setophaga petechia*), tri-colored heron (*Egretta tricolor*), green heron (*Butorides virescens*), northern mockingbird (*Mimus polyglottos*), dragonflies, anoles, and smooth-billed ani (*Crotophaga ani*).

Figure 1: Man-Modified Without Trees (July 2023 and May 2024 Field Evaluation)

Man-modified With Trees

This habitat subclassification is defined as any land with trees which has been modified. Although these areas are classified as man-modified, they still may contain a vegetative component suitable for providing functional habitat to important species. This habitat subclassification would include any man-modified areas which have established a dominance of woody vegetation, including broad-leaved evergreen or semi-evergreen trees.

Plant species noted during the field evaluation included, but were not limited to: saltwort (*Batis maritima*), samphire (*Blutaparon vermiculare*), sea-purselane (*Sesuvium portulacastrum*), white button (*Spilanthes urens*), buttonwood, logwood (*Haematoxylum campechianum*), and yellow root (*Morinda royoc*). Field biologists also observed Greater Antillean grackle.

Figure 2: Man-Modified With Trees (July 2023 and May 2024 Field Evaluation)

Commercial

This habitat subclassification includes areas that have been developed for commercial use and contain minimal vegetation or vegetation is present but is maintained. These areas consist of hotels, automotive facilities, retail developments, and other businesses.

Institutional

This habitat subclassification includes areas that have been developed for institutional use and contain minimal vegetation or vegetation is present but is maintained. These areas include schools, parks, and municipal areas.

Pasture

This habitat subclassification includes pastureland used for livestock grazing.

Figure 3: Cattle Pasture (July 2023 Field Evaluation)

Residential

This habitat subclassification consists of residential land use ranging from low to medium density single family homes, to multiple dwelling units. These areas contain minimal vegetation or vegetation is present but is controlled.

Figure 4: Residential (July 2023 Field Evaluation)

Roads

This habitat subclassification includes paved roads extending through residential and commercial areas, as well as unpaved access roads through rural or agricultural areas.

Figure 5: Roads (July 2023 and May 2024 Field Evaluation)

2.0 Man-Made Ponds

This habitat subclassification includes man-made (artificial) ponds.

Figure 6: Man-made excavated pond (July 2023 and May 2024 Field Evaluation)

3.0 Upland

Dry Forest and Woodland

Dry forest is defined as a class of vegetation characterized by a closed tree canopy, with interlocking crowns generally providing 60-100% cover. Woodland, by comparison, is characterised by an open canopy, with tree crowns constituting just 25-60% cover. The canopy height of forest and woodland ranges from 16 metres down to 4.5 metres in height, below which shrubland species dominate. Per Burton (2008b), vegetative communities included in this habitat

are lowland semi-deciduous forest, seasonally flooded/saturated semi-deciduous forest, xeromorphic semi-deciduous forest, lowland/submontane drought-deciduous forest woodland, and tropical/subtropical semi-deciduous woodland.

During the field evaluation, biologists identified the following plant species in this habitat: pink trumpet tree (*Tabebuia heterophylla*), devil head (*Morisonia ferruginea*), lead tree, queen of the night, bloody head (*Capparis flexuosa*), shamrock (*Tecoma stans*), silver palm, West Indian almond (*Terminalia catappa*), gumbo limbo, wild olive (*Bontia daphnoides*), tan-tan, Asian leatherleaf (*Colubrina asiatica*), butterfly orchid tree (*Bauhinia divaricata*), seaside mahoe (*Thespesia populnea*), Australian pine, grey nickel, Cayman agave, and frangipani (*Plumeria obtussa*). Insects observed included honeybees (*Apis* sp.), and Julia butterfly (*Dryas iulia*).

Figure 7: Dry Forest and Woodland (July 2023 and May 2024 Field Evaluation)

Invasive Species – Casuarina

This habitat is defined as invasive, or monoculture habitats dominated by invasive woody species (primarily *Casuarina*). Invasive plant species observed were Australian pine, beach naupaka, seaside mahoe, scaevola (*Scaevola taccada*), Asian leatherleaf, seagrape, tan-tan, parrot berry, orange geiger (*Cordia sebestena*), gumbo limbo, lavender (*Tournefortia gnaphalodes*), and *Cenchrus tribuloides*.

Field observations also recorded domestic chicken (*Gallus domesticus*), butterflies, and small birds.

Figure 1: Australian Pine (*Casuarina equisetifolia*) (July 2023 Field Evaluation)

Palm Hammock

This habitat consists of forest community composed of predominantly palms and is found on sandy type soils. Observed woody species were coconut palm, silver palm, match head (*Phyla nodiflora*), logwood/bloodwood, northern needle-leaf (*Tillandsia balbisiana*), yellow root, prickly pear (*Opuntia dillenii*), wire wiss (*Smilax habanensis*), and queen of the night. Field observations consisted of green iguana (*Iguana iguana*), northern flicker (*Colaptes auratus gundlachi*), termite mounds, and wasps.

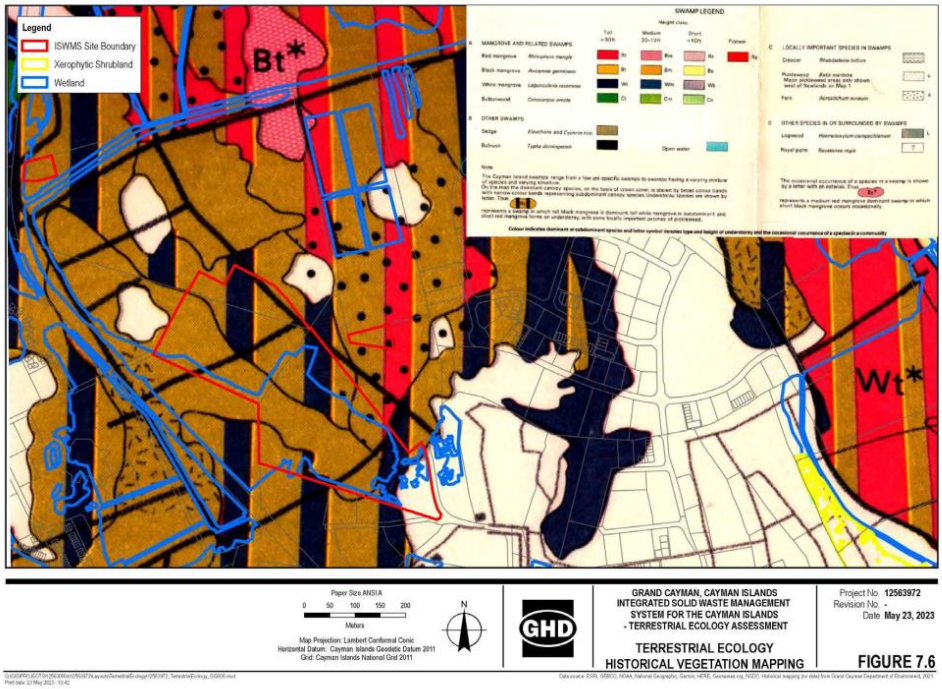
Figure 2: Palm Hammock (July 2023 Field Evaluation)

4.0 Wetland Habitats

Wetland habitats within the EIA study area support a variety of floral and faunal species. Mangrove species are especially prominent within the EIA study area wetland habitats, including

red mangrove, white mangrove, black mangrove, and buttonwood. Historic mapping of dominant mangrove species found during the May 2024 field evaluation can be found in **Figure 7-6**.

Figure 7.6 Terrestrial Ecology historical vegetation mapping



Ponds, Pools, Mangrove Lagoons

This habitat is defined as natural and man-modified areas of standing permanent and temporary water and associated vegetation. This habitat category consists of semi-permanently flooded grasslands, aquatic vegetation, tidal tropical/sub-tropical forb vegetation, mangrove pools/ponds/lagoons, man-made ditches and ponds, pools, and flooded marl pits.

During the field evaluation, biologists documented the following plant species in this habitat: black mangrove, buttonwood, mangrove fern, white mangrove, seaside mahoe (*Thespesia populnea*), Australian pine (*Casuarina equisetifolia*), seagrape, red mangrove, and sea-purselane.

Field observations also included Greater Antillean grackle, black-necked stilt, tri-colored heron, magnificent frigatebird (*Fregata magnificens*), northern flicker, smooth-billed ani, yellow warbler, minnows, green heron, dragonflies, butterflies, cattle, honeybees, mosquitoes, and mud crabs.

Figure 10: Ponds, Pools, and Mangrove Lagoons (July 2023 and May 2024 Field Evaluation)

Seasonally Flooded Mangrove Forest and Woodland

This habitat consists of forests of mangroves and mangrove associates, mostly growing on deep autochthonous peat with the surface 0 to 50 centimetres above mean high spring tide and located far enough inland to be free of tidal inundation under all conditions. Summer rainfall stratifies freshwater flooding over the more saline groundwater, with buttonwood, black mangrove, and mangrove rubber vine (*Rhabdadenia biflora)* all producing opportunistic rootlets to exploit the transient freshwater layer. (Burton, 2007).

During the field evaluation, biologists observed rat holes, mosquitos, termites, ants, common gallinule (*Gallinula galeata*), yellow warbler, damsel fly, geckos, butterflies, snowy egret (*Egretta thula*), common ground dove (*Columbina passerina*), northern flicker, West Indian woodpecker (*Melanerpes superciliaris caymanensis*), yellow-bellied sapsucker (*Sphyrapicus varius*), Greater Antillean grackle, and green heron in this habitat.

Plant species observed consisted of kapok tree (*Ceiba sp*.), black mangrove, red mangrove, white mangrove, mangrove fern, buttonwood, flat-leaf flat sedge (*Cyperus planifolius*), pine fern (*Amenia adiantifolia*), bermuda grass (*Cynodon dactylon*), Balbis' airplant, Simpson's stopper, coconut palm, lancewood (*Ocotea coriacea*), sea-purslane, tan-tan, lucy Julia (*Stylosanthes hamata*), coat button (*Tridax procumbens*), *Spermacoce tetraquetra*, parrot berry, grey nickel, gumbo limbo, slender false buttonwood (*Spermacoce verticillate*), Australian pine, *Chiococca parviflora*, beach naupaka, seaside mahoe, and round-leaf sage (*Lantana involucrata*).

Figure 11: Buttonwood (left) and Black Mangrove (right) (July 2023 Field Evaluation)

Figure 3: White Mangrove (left) and Red Mangrove (right) (July 2023 Field Evaluation)

Figure 4: Seasonally Flooded Mangrove Forest and Woodland (July 2023 and May 2023 Field Evaluation)

Seasonally Flooded/Saturated Semi-deciduous Forest

This habitat consists of areas at the intersection between lowland semi-deciduous forest and seasonally flooded mangrove. It generally consists of forests of flood-tolerant trees in shallow peat over saturated oxisol soil (Burton, 2007).

During the field evaluation, biologists documented the following plant species in this habitat: gumbo limbo, mangrove fern, silver palm, pink trumpet tree, Cayman agave, wild olive, mangrove rubber vine, bamboo, bastard mahogany (*Trichilia glabra*), duppy bush (*Phyllanthus angustifolius*), snowberry (*Chiococca alba*), and wire wiss.

Field observations also included green iguana, Cuban tree frog (*Osteopilus septentrionalis*), and Caribbean dove (*Leptotila jamaicensis*).

Figure 14: Seasonally Flooded/Saturated Semi-deciduous Forest (July 2023 Field Evaluation)

Appendix K.3 - List of Species (NBAP)

Key Species Tables and Species Action Plans from the *National Biodiversity Action Plan* of 2009

Table of Contents

The following Key Species tables are reproduced from the Cayman Islands National Biodiversity Action Plan of 2009. Part 1 and Part 2 classifications correspond to the draft National Conservation Law. The National Conservation Law, 2013, is available as Supplement No. 1 published with Extraordinary Gazette No. 9 dated 5th February, 2014.

KEY SPECIES for MANGROVE			
Category	**Detail**	**Scientific Reference**	**NBAP**
PART 1			
Mammals	All bats *are protected under part 1*	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat:		
	Grand Cayman Parrot	*Amazona leucocephala caymanensis*	SAP
	Greater Antillean grackle	*Quiscalus niger caymanensis / bangsi*	
	West Indian Whistling-duck	*Dendrocygna arborea*	SAP
	White-crowned pigeon	*Patagioenas leucocephala*	
Corals	All soft corals (including Gorgonians & Telestaceans)	*Anthozoa all species*	
Reptiles	American crocodile	*Crocodylus acutus*	
Invertebrates	Echinoderms	*Echinodermata all species*	
Invertebrates	Sponges	*Porifera all species*	
PART 2			
Reptiles	Hickatee (Taco River Slider)	*Trachemys decussata angusta*	
Fish	All bony fish - except those specifically listed in Part 1 or elsewhere in Part 2	Teleostei species	
Fish	Mosquito fish	*Gambusia xanthosoma*	SAP
Fish	Mosquito fish	*Limia caymanensis*	SAP
Invertebrates	White Land crab	*Cardisoma guanhumi*	SAP
Invertebrates	Lobsters	Palinura species	
Invertebrates	Spiny lobster	*Panulirus argus*	SAP
Invertebrates	Queen conch	*Strombus gigas*	SAP
Plants	Black mangrove	*Avicennia germinans (= nitida)*	
Plants	Buttonwood	*Conocarpus erectus*	
Plants	White mangrove	*Laguncularia racemosa*	
Plants	Red mangrove	*Rhizophora mangle*	
Plants	Green algae	Chlorophyta species	
Plants	Brown algae	Phaeophyta species	
Plants	Red algae	Rhodophyta species	

KEY SPECIES for POOLS, PONDS AND MANGROVE LAGOONS			
Category	**Detail**	**Scientific Reference**	**NBAP**
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat: Herons, egrets, waterfowl West Indian Whistling-duck Antillean nighthawk (Rickery-dick)	Aves *Dendrocygna arborea* *Chordeiles gundlachii*	 SAP
Invertebrates	Pygmy Blue butterfly	*Brephidium exilis thompsoni*	SAP
PART 2			
Birds	Blue-winged teal	*Anas discors*	
Reptiles	Hickatee (Taco River slider)	*Trachemys decussata angusta*	
Reptiles	Grand Cayman Water snake	*Tretanorhinus variabilis lewisi*	
Fish	Mosquito fish	*Gambusia xanthosoma*	SAP
Fish	Mosquito fish	*Limia caymanensis*	SAP
Invertebrates	Isopod	*Anopsilana crenata*	
Plants		*Ruppia maritima*	
INVASIVE			
Reptiles	Red-eared slider	*Trachemys scripta*	
Plants	Water Snowflake	*Nymphoides indica*	

KEY SPECIES for FARM AND GRASSLAND			
Category	**Detail**	**Scientific Reference**	**NBAP**
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat: Grand Cayman parrot Brac parrot West Indian Whistling-duck	Aves *Amazona leucocephala caymanensis* *Amazona leucocephala hesterna* *Dendrocygna arborea*	 SAP SAP SAP
Reptiles	Grand Cayman Blue iguana	*Cyclura lewisi*	SAP
Plants		*Agalinis kingsii*	
PART 2			
none			
INVASIVE			
Birds	Monk parakeet (Parrot SAP)	Myiopsitta monachus	SAP

KEY SPECIES for DRY SHRUBLAND

Category	Detail	Scientific Reference	NBAP
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat:	Aves	
	Bananaquit	*Coereba flaveola sharpei*	
	Vitelline warbler	*Dendroica vitellina crawfordi / vitellina*	SAP
	Caribbean elaenia	*Elaenia martinica caymanensis*	
	Cuban bullfinch	*Melopyrrha nigra taylori*	
	Western spindalis	*Spindalis zena salvini*	
	Red-legged thrush	*Turdus plumbeus coryi*	
	Loggerhead kingbird	*Tyrannus caudifasciatus caymanensis*	
	Thick-billed vireo	*Vireo crassirostris alleni*	
	Yucatan vireo	*Vireo magister caymanensis*	
Reptiles	Grand Cayman Blue iguana	*Cyclura lewisi*	SAP
Reptiles	Sister Islands Rock iguana	*Cyclura nubila caymanensis*	SAP
Invertebrates	Little Cayman snail	*Cerion nanus*	SAP
Plants		*Banara caymanensis*	SAP
Plants		*Consolea millspaughii caymanensis*	SAP
Plants		*Pleurothallis caymanensis*	
PART 2			
Reptiles	Grand Cayman Blue-throated anole	*Anolis conspersus*	
Reptiles	Wood slave gecko	*Aristelliger praesignis praesignis*	
Reptiles	Grand Cayman Ground boa	*Tropodophis caymanensis*	
Reptiles	Cayman racer	*Alsophis cantherigerus*	
Reptiles	Little Cayman Green anole	*Anolis maynardi*	SAP
Reptiles	Grand Cayman Blue-throated anole	*Anolis conspersus*	
Invertebrates	Little Cayman cicada	*Diceroprocta caymanensis*	
Invertebrates	Grand Cayman cicada	*Diceroprocta cleavesi*	
Invertebrates	Cayman Brac cicada	*Diceroprocta ovata*	
Invertebrates	Centipede	*Leptophilus caribeanus*	
Plants	Corato	*Agave caymanensis*	
Plants		*Allophylus cominia var. caymanensis*	
Plants		*Banara caymanensis*	SAP
Plants		*Buxus bahamensis*	
Plants	Ironwood	*Chionanthus caymanensis*	SAP
Plants	Silver thatch	*Coccothrinax proctorii*	SAP
Plants	Broadleaf	*Cordia sebestena caymanensis*	SAP
Plants		*Dendropemon caymanensis*	SAP
Plants		*Euphorbia cassythoides*	
Plants		*Evolvulus squamosus*	
Plants	Banana orchid	*Myrmecophila thomsoniana minor / thomsoniana*	SAP
Plants		*Phyllanthus caymanensis*	
Plants		*Pilostyles globosa caymanensis*	
Plants		*Phyllanthus caymanensis*	
Plants		*Scolosanthus roulstonii*	
Plants	Satinwood	*Zanthoxylum flavum*	

KEY SPECIES for FOREST AND WOODLAND

Category	Detail	Scientific Reference	NBAP
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat:		
	Grand Cayman parrot	*Amazona leucocephala caymanensis*	SAP
	Brac parrot	*Amazona leucocephala hesterna*	SAP
	Northern flicker	*Colaptes auratus gundlachi*	
	White-crowned pigeon	*Patagioenas leucocephala*	
	Caribbean dove	*Leptotila jamaicensis collaris*	
	West Indian woodpecker	*Melanerpes superciliaris caymanensis*	
	Western spindalis	*Spindalis zena salvini*	
	Loggerhead kingbird	*Tyrannus caudifasciatus caymanensis*	
	Thick-billed vireo	*Vireo crassirostris alleni*	
	Yucatan vireo	*Vireo magister caymanensis*	
Invertebrates	Soldier crab (Hermit)	*Coenobita clypeatus*	SAP
Invertebrates	Cayman Brown Leaf butterfly	*Memphis vericordia danielana*	
Invertebrates	Swallowtail butterfly (endemic)	*Heraclides andraemon tailori*	
Invertebrates	Cayman Zoe julia	*Dryas iulia zoe*	
Plants		*Aegiphilia caymanensis*	SAP
Plants		*Buxus bahamensis*	
Plants		*Casearia staffordiae*	
Plants	Ironwood	*Chionanthus caymanensis*	SAP
Plants	Ghost orchid	*Dendrophylax fawcettii*	SAP
Plants		*Encyclia kingsii*	
Plants		*Epiphyllum phyllanthus var. plattsii*	SAP
Plants	Old George	*Hohenbergia caymanensis*	SAP
Plants		*Pisonia margarettiae*	SAP
Plants		*Pleurothallis caymanensis*	
Plants		*Terminalia eriostachya margaretiae*	
Plants		*Tolumnia (= Oncidium) calochilum*	
Plants		*Tolumnia (= Oncidium) variegata*	
PART 2			
Reptiles	Western Grand Cayman Blue-throated anole	*Anolis conspersus conspersus*	
Reptiles	Eastern Grand Cayman Blue-throated anole	*Anolis conspersus lewisi*	
Reptiles	Cayman racer	*Alsophis cantherigerus*	
Reptiles	Yellow galliwasp	*Celestus crusculus maculatus*	
Invertebrates	Little Cayman cicada	*Diceroprocta caymanensis*	
Invertebrates	Grand Cayman cicada	*Diceroprocta cleavesi*	
Invertebrates	Cayman Brac cicada	*Diceroprocta ovata*	
Plants		*Allophylus cominia var. caymanensis*	
Plants	Cayman Silverbush	*Argythamnia proctorii*	
Plants		*Beloglottis costaricensis*	
Plants	Yoke wood	*Catalpa longissima*	
Plants	Cedar	*Cedrela odorata*	SAP
Plants		*Celtis trinervia*	
Plants	Ironwood	*Chionanthus caymanensis*	SAP
Plants	Silver Thatch palm	*Coccothrinax proctorii*	SAP
Plants		*Colubrina arborescens*	
Plants	Clamcherry	*Cordia laevigata*	
Plants		*Crossopetalum caymanense*	
Plants		*Daphnopsis americana*	
Plants		*Dendropanax arboreus*	
Plants		*Drypetes sp.*	
Plants	Smokewood	*Erythroxylum confusum*	
Plants		*Faramea occidentalis*	
Plants		*Jatropha divaricata*	
Plants		*Licaria triandra*	
Plants	Lignum vitae	*Lignum vitae*	
Plants		*Margaritaria nobilis*	
Plants	Banana orchid	*Myrmecophila thomsoniana minor / thomsoniana*	SAP
Plants		*Oeceoclades maculata*	
Plants		*Prosthechea cochleata*	
Plants		*Rauvolfia nitida*	
Plants		*Tillandsia festucoides*	
Plants		*Trichilia havanensis*	
Plants	Bull rush	*Zamia integrifolia*	
Plants	Satinwood	*Zanthoxylum flavum*	

KEY SPECIES for URBAN AND MAN-MODIFIED AREAS

Category	Detail	Scientific Reference	NBAP
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2. Of special significance to this habitat:	Aves	
	Grand Cayman parrot	*Amazona leucocephala caymanensis*	SAP
	Brac parrot	*Amazona leucocephala hesterna*	SAP
	West Indian Whistling-duck	*Dendrocygna arborea*	SAP
	Greater Antillean grackle	*Quiscalus niger caymanensis*	
Invertebrates	Swallowtail butterfly (endemic)	*Heraclides andraemon tailori*	
Invertebrates	Cayman Zoe julia	*Dryas iulia zoe*	
Plants	Ghost orchid	*Dendrophylax fawcettii*	SAP
Plants	Old George	*Hohenbergia caymanensis*	SAP
Plants	Tea banker	*Pectis caymanensis var. robusta*	SAP
PART 2			
Birds	White-winged dove	*Zenedia asiatica*	
Reptiles	Eastern Grand Cayman Blue-Throated anole	*Anolis conspersus lewisi*	
Reptiles	Grand Cayman racer	*Alsophis cantherigerus caymanus*	
Reptiles	Cayman Brac racer	*Alsophis cantherigerus fuscicauda*	
Reptiles	Little Cayman racer	*Alsophis cantherigerus ruttyi*	
Reptiles	Grand Cayman Water snake	*Tretanorhinus variabilis lewisi*	
Reptiles	Grand Cayman Ground boa (Lazy snake)	*Tropidophis caymanensis caymanensis*	
Reptiles	Little Cayman Ground boa (Wood snake)	*Tropidophis caymanensis parkeri*	
Reptiles	Cayman Brac Ground boa (Lazy snake)	*Tropidophis caymanensis schwartzi*	
Reptiles	Cayman Brac Blind snake	*Typhlops biminiensis epactia*	
Reptiles	Grand Cayman Blind snake	*Typhlops caymanensis*	
Reptiles	Taco River slider (Hickatee)	*Trachemys decussata angusta*	
Plants	Silver Thatch palm	*Coccothrinax proctorii*	SAP
Plants	Banana orchid	*Myrmecophila thomsoniana minor / thomsoniana*	SAP
INVASIVE			
Birds	Monk parakeet (Parrot SAP)	*Myiopsitta monachus*	SAP
Reptiles	Red-eared slider	*Trachemys scripta*	

KEY SPECIES for ROADS			
Category	**Detail**	**Scientific Reference**	**NBAP**
PART 1			
Mammals	All bats are protected under part 1	Chiroptera	SAP
Birds	All birds are protected under part 1, unless specifically listed in part 2.	Aves	
Reptiles	Grand Cayman Blue iguana	*Cyclura lewisi*	SAP
Reptiles	Lesser Cayman Islands iguana	*Cyclura nubila caymanensis*	SAP
PART 2			
Invertebrates	White Land crab	*Cardisoma guanhumi*	SAP
Plants		*Epiphyllum phyllanthus var. plattsii*	SAP
Plants		*Pisonia margarettiae*	SAP
Plants	Cayman sage	*Salvia caymanensis*	SAP
Plants		*Turnera triglandulosa*	SAP
INVASIVE			
Birds	Monk parakeet (Parrot SAP)	*Myiopsitta monachus*	SAP

TERRESTRIAL SPECIES

Bats

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Mammalia, Order: Chiroptera

There are nine species of bats in the Cayman Islands. None are Vampire Bats. Bats constitute our only extant native mammals. Bats are not rodents: the common term *"rat bats"* is a misnomer.

Status

Distribution: While many species are distributed widely throughout the Caribbean, Central and South America, the Big Brown bat *Eptesicus fuscus minor*, the smallest known representative of *E. fuscus*, is a subspecies endemic to Grand Cayman (Morgan 1994). The subspecies found on Cayman Brac is the same as the Cuban subspecies. Neither is recorded on Little Cayman.

Conservation:

Big Brown bat *Eptesicus fuscus minor* is listed as Lower Risk/least concern (IUCN), however, the status of the Cayman Islands' population is currently unknown. There has been recent evidence of roost desertion on Grand Cayman. Three were observed in a garage roof, indicating that some may utilise artificial structures.

Buffy Flower bat *Erophylla sezekorni* is listed as Lower Risk/least concern(IUCN), however, the status of the Cayman Islands' population is currently unknown. It is currently unknown whether *E. sezekorni* is a genetically distinct population in the Cayman Islands.

Antillean Nectar bat *Brachyphylla nana nana* is listed as Lower Risk/near threatened (IUCN). The status of the Cayman Islands' population is currently unknown. Furthermore, no roosting sites have ever been located, making protection of critical habitat difficult.

Jamaican Fruit bat *Artibeus jamaicensis parvipes* is listed as Lower Risk/least concern (IUCN). The population on Grand Cayman will likely recover following Hurricane Ivan, given maintenance of undisturbed roosting areas and foraging sites over the next few years.

Brazilian Free-tailed bat *Tadarida brasiliensis muscala* is listed as Lower Risk/near threatened (IUCN). The status of the Cayman Islands' population is currently unknown, though calls have been documented via Anabat and a D-20 Petterson bat detector (Freeman 1979, Simmons et al 1978). A colony of est. 8,000-30,000 appears to have abandoned the large cave in Old Man Bay. Sixteen were observed in the Salina Cave, pre-hurricane Ivan.

Pallas' Mastiff bat *Molossus molossus* is listed as Lower Risk/least concern (IUCN). Currently there is no critical concern for the status of the local population of *M. molossus minor*, which is known only from the Cayman Islands and Cuba.

Red bat *Lasiurus borealis* (subspecies unknown) is listed as Lower Risk/least concern (IUCN), however the status of the Cayman Islands' population is currently unknown. Only three individuals have ever been recorded on Grand Cayman; with singles in the Lower Valley Forest, the Botanic Park and Northward.

Waterhouse's Leaf-nosed bat *Macrotus waterhousii minor* is listed as Lower Risk/least concern (IUCN). The population in Little Cayman currently appears stable, but should be monitored. In Grand Cayman, roosts have been abandoned at Old Man Bay, Spotts Bat Cave, the Agriculture Pavilion Cave, and Pirate's Cave side tunnel.

White-shouldered Bat *Phyllops falcatus* is listed as Lower Risk/near threatened (IUCN), however, the status of the Cayman Islands' population is currently unknown. This bat has always appeared rare on Grand

Cayman (Morgan 1994, Band 2007) and, if still present, likely is threatened due to Hurricane Ivan and anthropogenic destruction of its mature *dry forest* habitat (Band 2007). More intensive monitoring is needed to assess the possibility of this species having been extirpated on Grand Cayman.

Legal: *Bats* currently have no legal protection in the Cayman Islands. Pending legislation, *bats* would be protected under the National Conservation Law (Schedule I). The Department of Environment would be the lead body for legal protection.

Natural history

The following is an abbreviated overview of the natural history of bats in the Cayman Islands. For more detail see the DoE report "*The status of bats in the Cayman Islands 2006*".

Bats occupy a variety of ecological niches, making them important indicators of a healthy and functional natural environment. Some, such as Pallas' Mastiff bat *Molossus molossus*, are insectivorous, consuming night-flying insects including mosquitoes. Others are nectivorous and frugivorous, pollinating many species of native plants and dispersing their seeds. Only two of Cayman' nine species of bats eat cultivated fruit, however, this propensity results in conflict situations arising with fruit-growers and farmers. While damaging some fruit, bats equally contribute to pollination, and effective removal of insect fruit pests. Seed dispersal by bats helps maintain forest diversity, and contributes to natural reseeding and restoration of degraded habitats.

Individual bats may live up to 30 years, but most bear only a single pup each year. This low productivity makes bats vulnerable to extinction and slow to recover numbers following losses.

Caves provide crucial habitat for several species of bats. Some species are especially sensitive to human disturbance of their roost sites, and may desert an otherwise suitable site *en-mass* if disturbed. Spring and early summer months are critical periods, when flightless youngsters are present, and may be deserted if parents are disturbed. Other species are more adaptable to living alongside humans.

In the face of natural habitat loss some, such as Pallas' Mastiff bat, will colonize roof cavities. This can result in undesirable noise, droppings and odours. For this reason, a *Bat Conservation Project* has long been operative in the Cayman Islands. Volunteer workers inspect roof spaces, construct and emplace bat houses, and assist with advice on exclusion methods; removing bats safely and permanently from roof spaces. To-date, with the cooperation of Caribbean Utilities Co., Ltd (CUC) the *Bat Conservation Project* has erected over 95 bat houses on utility poles around Grand Cayman, providing an alternative roost for bats, while maintaining their eco-system services within *urban and man-modified areas*.

Associated Habitats and Species for *Bats*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
	Cayman parrot *Amazona leucocephala.*
9. Mangrove	*E. fuscus, M. molossus, L. borealis.*
13. Pools, ponds and mangrove lagoons	Most species of insectivorous bats benefit from the insects associated with *pools, ponds and mangrove lagoons.*
14. Dry shrubland	*E. sezekorni, L. borealis, M. waterhousii.*
15. Dry forest	*E. fuscus, E. sezekorni, B. nana, A. jamaicensis, T. brasiliensis, M. molossus, L. borealis, M. waterhousii, P. falcatus.*
16. Caves	*E. sezekorni, B. nana, A. jamaicensis, T. brasiliensis, M. waterhousii, E. fuscus on GC and M. molossus on Brac.*
17. Farm and grassland	*E. fuscus, E. sezekorni, B. nana, A. jamaicensis, T. brasiliensis, M. molossus, L. borealis, M. waterhousii, P. falcatus.*

18. Urban and man-modified areas	*T. brasiliensis, M. molossus, P. falcatus, A. jamaicensis.*

Current Factors Affecting *Bats*

- *Disturbance of natural roosts:* many species of bats are highly sensitive to human disturbance of roost sites, elevating the risk of accidental disturbance by visiting members of the public and inappropriate scientific research methods. Deliberate disturbance of roosts arises from cultural fear of bats, blanket persecution of (all) species as crop pests, and deliberation acts of vandalism.

- *Disturbance of man-made roosts:* hygiene and disturbance issues associated with bats occupying roof cavities makes most people unwilling to share their houses with bats. Inappropriate exclusion of bats can result in animals being trapped and dying in roof cavities. Humane exclusions guard against trapping, and are only performed outside of the breeding season. Where feasible, impact of humane exclusion may be mitigated by on-site placement of an artificial bat box.

- *Loss of natural roosts:* clearance of vegetation and in-filling of caves in land slated for development and dumping of garbage in caves contribute to a loss of natural roost sites.

- *Loss / fragmentation of natural habitat:* land clearance and development impact nature roosting and feeding habitats for bats.

- *Landscaping:* non-native landscaping reduces natural food availability for many species of bats.

- *Incidental factors:* disruption of traditional flight lines, motor traffic, mosquito control, power lines, and wind turbines can result in the incidental death of bats. A study by Edward B. Arnett (BCI), financed largely by the American Wind Energy Association, conducted at Florida Power & Light Co's Mountaineer Wind Energy Centre, indicated that its 44 turbines may have caused between 1,300 and 2,000 bat deaths in a six-week period, 2005.

- *Cultural:* along with snakes and frogs, bats are shunned as "frightening" creatures by many cultures and by phobic individuals.

- *Predation by non-native species:* rats have the potential to significantly impact colonies.

- *Conservation efforts:* despite their lack of protected status, bats in the Cayman Islands have benefited from an effective long-term voluntary Bat Conservation Programme.

Opportunities and Current Local Action for *Bats*

The National Trust for the Cayman Islands has a long established Bat Conservation Programme, run by Ms. Lois Blumenthal. This programme raises public awareness through the media, PowerPoint presentations to public groups and schools, and an informational website: www.Caymanwildlife.org.

The Bat Conservation Programme also assists with the active management of bat colonies which establish in roof spaces. Volunteer workers inspect roof spaces, construct and emplace bat houses, and assist with advice on exclusion methods; removing bats safely, humanely and permanently from roof spaces. To-date, with the cooperation of Caribbean Utilities Co., Ltd (CUC) the Programme has erected over 95 bat houses on utility poles around Grand Cayman, providing an alternative roost for bats, while maintaining their eco-system services within *urban and man-modified areas*.

SPECIES ACTION PLAN for *Bats*

The Proposed Actions for *Bats* are largely based on the research and recommendations of Dr. Annie Band, arising from her long-term studies, and an assessment of bats funded by DoE in conjunction with the Bat Conservation Programme, following Hurricane Ivan "*The status of bats in the Cayman Islands*" (Band 2006).

OBJECTIVES	TARGET
1. Establish legal protection for all bats in the Cayman Islands.	2006
2. Reduce impact resulting from conflict situations between bats and humans.	ongoing
3. Improve understanding of, and protect, key habitat, especially natural roost sites.	2015
4. Expand educational programmes to inform the public, allay fears, facilitate timely and practical management, and raise awareness of the ecological role of bats.	ongoing

Bats PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Targeted awareness towards the promotion of the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1-4
PL2. Protect *Bats* under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-4
PL3. Act to protect all known established natural roosts, and implement protection of newly discovered natural roosts, and critical foraging habitat.	DoE	CIG MP NT	2010	1,3
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2,3
PL5. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	2,3
PL6. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	2,3
PL7. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	ongoing	3
Safeguards & Management				
SM1. Maintain and expand bat house construction and placement initiative under the current Bat Conservation Programme, towards conserving *M. molossus.*	NT	DoE IntC MP	ongoing	2
SM2. Develop and implement sustainable management strategies for conservation of *A. jamaicensis* and *B. nana*, which reasonably mitigate local farmers for damage to their fruit crops.	DoE DoA	DoT NT CIG MP IntC	2015	2,3,4
SM3. Eradicate Monk parakeets *Myiopsitta monachus* from the Cayman Islands, towards removing this crop-pest.	DoE	MP	2009	2
SM4. Use the *Environmental Protection Fund* to	CC	DoE NT	2015	3

purchase and protect / establish management agreements with landowners of the *caves* and *forest and woodland* associated with the Old Man Bay (Bat) Caves, Grand Cayman to assist in the preservation of *E. fuscus* and *A. jamaicensis*. This system is also a historic roost site for *T. brasiliensis.*		MP CIG IntC		
SM5. Investigate feasibility of establishing Cayman Brac Bluff Cave site as a protected area/ establish management agreements with landowners, towards preserving the only known roost of *E. sezekorni*.	CC	NT MP DoE CIG IntC	2010	3
SM6. Investigate feasibility of establishing Miller's Cave system as a protected area / establish management agreements with landowners, towards preserving *A. jamaicensis*.	CC	NT MP DoE CIG IntC	2010	3
SM7. Investigate feasibility of establishing Dolphin. Cave (Sybil McLaughlin's property on Queen's Highway) as a protected area / establish management agreements with landowners, to assist in the preservation of *A. jamaicensis*.	CC	NT MP DoE CIG IntC	2010	3
SM8. Investigate status of the Salinas Reserve cave, to assist in the preservation of *A. jamaicensis, M. waterhousii* and *T. brasiliensis*.	CC NT	MP DoE IntC	2010	3
SM9. Investigate the feasibility of establishing protected caves at two sites on Cayman Brac bluff, one at the base, the other a single cave with small opening about 20 feet up on the bluff face - the latter being home to ca. 500 *M. molossus.*	CC	NT MP DoE CIG IntC	2010	3
SM10. Investigate feasibility of restoring the Agriculture Pavilion Cave, and establishing the site as a protected area. This is currently inaccessible to bats due to the dumping of garbage. Cleanup and fencing would be a simple inexpensive way to restore this cave roost for potential recolonisation by *A. jamaicensis* and *M. waterhousii,* in line with DoA's Agritourism initiative.	DoA	NT MP DoE CIG IntC	2010	3
SM11. Investigate feasibility of establishing Spot Bay Bat Cave as a protected area / establish management agreements with landowners, to assist in the preservation of *Macrotus waterhousii*.	CC	NT MP DoE CIG IntC	2010	3
SM12. Encourage maintenance and planting of mature fruit trees in developed areas. *P. falcatus*, for example, will roost adjacent to housing complexes if mature *Ficus* remain.	DoE QEIIBP	NT	2008	2,3
SM13. Supply native trees suitable for bats feeding and roosting, through the *Native Tree Nursery*.	DoE QEIIBP	NT	2008	2,3
SM14. Use the *Environmental Protection Fund* to purchase and protect / establish management agreements with landowners of a *cave* suitable for establishment as a "show-cave". Develop on-site access and interpretation to facilitate visitation by school-groups, towards educating students regarding the geological and biological interest of *caves*.	CC	DoE NT MP CIG DE	2015	2,3,4
SM15. Control predation by rats and cats.	DEH DoE HS DoA	NT	2007	3
SM16. Restore damaged roosting habitat where possible.	DoE NT		2010	3

	MP			
SM17. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	2,3,4
SM18. Implement associated HAPs.	DoE		2015	1,2,3,4
Advisory				
A1. Maintain communications with planning agencies and developers, towards early identification of potential development conflicts, and effective mitigation action towards the preservation / incorporation of roosts into new developments. This measure will be of particular importance to species such as *B. nana* and *E. sezekorni.*	DoE	DoP NRA MP	ongoing	2,3
A2. Work with planners to encourage maintenance of mature fruit trees in developments. *P. falcatus*, for example, will roost adjacent to housing complexes if mature *Ficus* trees remain.	DoE	DoP NRA MP	ongoing	2,3
A3. Promote the use of native plants in landscaping, through maintenance of existing vegetation and use of a *Recommended Planting Palette* in new developments.	DoP	DoE	2009	2,3,4

Bats PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Further monitoring via mist-netting is needed to assess whether *P. falcatus* and *E. sezekorni* are still present on Grand Cayman, and if so, determine extent of population recovery.	DoE NT	IntC	2010	3
RM2. Augment existing studies with more sophisticated radio-telemetry efforts and acoustical monitoring via Anabat or Sonobat.	DoE NT	IntC	2010	3
RM3. Determine location of new roost sites for all species, a priority being species for which no roost sites are currently known, such as *B. nana*, and species with a dependency on primary forest, such as *P. falcatus*.	DoE NT	IntC	2010	3
RM4. Determine foraging habitat requirements and key sites for all species (mature forest appears critical to some species, such as *P. falcatus*, others are able to adapt to secondary forest, and low-development farmland and plantation).	DoE NT	IntC	2010	3
RM5. Extend bat monitoring programme, to monitor populations, impact of development and effectiveness of conservation management efforts.	DoE NT	IntC	2010	3
RM6. Promote international links and facilitate visiting scientists when their methods and studies have the potential to benefit the conservation of Cayman Islands bats.	DoE NT	IntC	ongoing	3
RM7. Ban unnecessarily invasive research techniques, which might encourage desertion of roosts, with particular attention to sensitive species such as *E. sezekorni*.	DoE NT	IntC	ongoing	2,3
RM8. Work with international experts to determine appropriate management of specific sites and species, especially where species are sensitive to critical environmental conditions, or disturbance, such as *E. sezekorni*.	DoE NT	IntC	ongoing	3
RM9. Investigate feasibility of implementing *Parrot Jam Project* – a financial / PR incentive scheme to offset crop damage suffered by local fruit farmers.	DoE MP DoA	DoT NT CIG	2012	2,3,4
RM10. Construct quarters for visiting scientists in Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE		2012	2,3,4
Communication & Publicity				
CP1. Continue proactive public awareness initiative, to raise awareness of the Bat House Conservation Programme to conserve *M. molossus*, and reduce incidental deaths of the endemic *Eptesicus fuscus.*	NT	DoE IntC	ongoing	2,4
CP2. Raise public awareness of the sensitivity of some bats species to disturbance, such as *E. sezekorni.*	NT	DoE	ongoing	2,3,4
CP3. Subject to SM14, utilise a "show colony" site to raise public awareness of the importance of bats.	CC	DoE NT MP CIG DE	2015	2,3,4
CP4. Establish a schools involvement programme to run in conjunction with appropriate RM actions.	NT	DoE DE IntC	2010	2,3,4

CP5. Establish a lectures and publicity programme for all visiting scientists.	DoE NT	IntC	ongoing	4
CP6. Raise awareness of the value of native landscaping for wildlife.	DoE DoP NT QEIIBP	MP CN GC OS SB LCN	2010	3
CP7. Investigate potential for red-light / infra-red live streaming link to active colony, to that the public can view a colony in action.	DoE NT	IntC	2010	3,4
CP8. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG DoT QEIIBP	DoE NT MP	2010	4

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Informational website: www.Caymanwildlife.org

TERRESTRIAL SPECIES

Brown booby *Sula leucogaster*

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Pelecaniformes, Family: Sulidae
Genus: Sula, Species: leucogaster

The Brown booby *Sula leucogaster* is the most common of the three West Indian boobies, breeding on cays off the coast of the Yucatan Peninsula, Panama, Columbia, Venezuela, and throughout the West Indies. This species has a large range, with an estimated global breeding Extent of Occurrence of 50,000-100,000 km² (IUCN). The Brown booby is one of the Cayman Islands' six breeding seabirds.

Status

Distribution: The Brown booby is resident in the Cayman Islands, and breeds only on Cayman Brac. It is vagrant in Grand Cayman: most commonly juveniles displaced during stormy weather.
Conservation: The Brown booby *Sula leucogaster* has a large global population, estimated to be ca. 200,000 individuals (IUCN). Global population trends have not been quantified, but the species is not believed to approach the thresholds for the population decline criterion of the IUCN Red List (i.e. declining more than 30% in ten years or three generations). As a result, it is listed as least concern globally (IUCN); however, the Cayman Island's birds have undergone a significant population decline during the past 30 years. Once an abundant breeder in the Islands, despite historical exploitation, with ca. 480 individuals reported in the 1980s, numbers fell to below 100 individuals by the end of the 1990s. The last estimate of numbers was 350 (max.) individuals in 2007 (Bradley *in prep*.). The slight recovery observed in recent years may have suffered a severe set-back with the advent of hurricane Paloma, Nov 2008.
Legal: The Brown booby *Sula leucogaster* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

The Cayman Brac colony has been noted in ornithological records since 1888. Following a decline > 80% during the 1980-90s, the colony appears stabilized.

Year	Nesting Pairs	Fledglings	Total
1983	170	140	480
1996	32	20	84
2000	49	5	103
2001	61	8	130
2003	60-80		
2007	80-110		

Natural history

The striking adult plumage of the Brown booby comprises chocolate brown head and upperparts, sharply defined from white belly and abdomen. In juveniles, the belly and abdomen remain light brown. Bobbies forage for fish in coastal areas, and further out at sea, plunging into the water from some height. Courtship between prospective mates comprises pair flights, territorial displays, and symbolic nesting building. This may last 4-8 weeks, during which time the pair bond is formed / renewed. Nesting is confined to inaccessible *maritime cliffs*: a simple scrape on bare rock, or a more elaborate collection of seagrass, Sargassum, flotsam, sticks and stones. Locally, a single prolonged breeding season is evident (Bradley 1994, 1997). Peak nesting period is Oct-Apr, however breeding has been observed in all months. Clutches of 1-2 white eggs are laid. In cases where both eggs hatch, the second is usually dispatched by "sibling murder" within the first two weeks.

Absent from the fossil record of the Sister Islands (Morgan 1994), it remains unclear as to whether the Brown and Red-footed Boobies were ever sympatric on the Brac and Little Cayman, or whether they have always segregated, possible as a result of habitat preference.

Associated Habitats and Species for *Brown booby*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
1. Open sea 7. Maritime cliffs and ironshore 11. Coastal shrubland 16. Caves	*Verbesina caymanensis* White-tailed tropicbird *Phaethon lepturus* Cayman parrot *Amazona leucocephala* Sister Islands Rock iguana *Cyclura nubila caymanensis*

Current Factors Affecting *Brown booby*

- *Development:* the northwest section of the large bluff-top land parcel on which many of the birds nest has commenced subdivision into residential bluff-edge plots.

- *Human disturbance:* the Lighthouse trail facilitates access to and disturbance of the Brown boobies which nest along the Bluff lip. The unwillingness of sitting birds to vacate nests coupled with a lack of access restriction and on-site interpretation means that visitors tend to approach close to nesting birds. Since the 1990s the area has became increasingly popular with climbers and cavers. At one point, some 250 climbers used 75 routes. About 15 of these routes were close to nesting sites. This activity has now relinquished somewhat. Tour boat guides have been observed to "clap" their hands to encourage nesting birds to take flight, for the edification of tourists.

- *Natural predators:* birds of prey, especially wintering Peregrine falcons *Falco peregrinus*.

- *Introduced predators:* rats and cats. This area is a dumping site for unwanted kittens.

- *Historically exploitation:* harvesting of eggs continued routinely until the mid-1970s, ceasing by the early 1990s.

- *Decline in Sargassum:* shortage of this preferred nesting material may increase clutch vulnerability during incubation.

- *Displacement:* terrestrial disturbance and predator avoidance encourage nesting on lower ledges, vulnerable to inundation during high seas.

- *Commercial fisheries:* a potential source of conflict, this is not a significant issue in Cayman, as local fisheries are of a subsistence / recreational nature.

- *Maritime pollution:* Cayman Brac lies close to major shipping lanes. Birds covered in oil and bilge wash are occasionally collected from along the shore.

- *Storms:* Bluff-edge habitat is susceptible to severe weather. The carcasses of twenty-one adult birds were retrieved following Hurricane Paloma, Nov 2008.

Opportunities and Current Local Action for *Brown booby*

A *Management Plan to Conserve and sustain the Brown booby Colony and its Habitat on Cayman Brac* has been completed, (Bradley 2002).

Interpretative signage has been installed at the Lighthouse trailhead.

A *Checklist of Birds of the Cayman Islands* was published (Bradley 2006).

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands, has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

SPECIES ACTION PLAN for *Brown booby*

This Species Action Plan is based on *Management Plan to Conserve and sustain the Brown booby Colony and its Habitat on Cayman Brac* (Bradley 2002).

OBJECTIVES	TARGET
1. Restore population to 1980s level (ca. 200 breeding pairs).	2015

2. Establish a protected area on the bluff, sufficient to ensure survival and continued recovery of the established booby colony.	2010
3. Implement management measures to minimize impact of human disturbance and developmental impacts on established nest sites.	2011
4. Reduce predation by non-native species.	2011
5. Preserve the aesthetic and ecological value of this area of outstanding natural beauty.	2015
6. Improve media profile and public understanding of the Brown booby.	2009

Brown booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1-6
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	3
PL3. Protect *Sula leucogaster* under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-6
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	3,5
PL5. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	3,5
PL6. Universal enforcement of leash laws for dogs on the Sister Isles.	DoA	DoE CIG MP	2010	3,4
PL7. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	3,4
Safeguards & Management				
SM1. Establish the bluff face Crown lands and Little Cayman Brac as protected areas, and use the *Environmental Protection Fund* to establish a protected area / management agreement with land owners including, the vertical face of the bluff, lip, associated caves, and parcels 111E 220 and 111A 5,70,69.	CC	CIG MP SIDA DCB DoE NT	2009	1,2,5
SM2. Negotiate with land owners for the establishment of a bluff-top protected area extending inland 25m from the cliff edge.	CC	CIG MP SIDA DCB DoE NT	2009	1,2,5
SM3. Use the *Environmental Protection Fund* to purchase and protect the six-acre lighthouse site, as a base for conservation management and interpretation of the area.	CC	CIG MP SIDA DCB DoE NT	2009	1,2,5
SM4. Use the *Environmental Protection Fund* to establish a protected area / management agreement with land owners encompassing the 200 hectare strip along the bluff lip.	CC	CIG MP SIDA DCB DoE NT	2009	1,2,5
SM5. Employ a warden / guide on site to undertake reserves management, species monitoring, interpretation	DoE	DoT SIDA NT	2015	1-6

and assist visitors as necessary.		CIG		
SM6. Management of caving activities, including prohibition of access to the large cave (N19°44'50" W79°43'40") during breeding season.	DoE DoT SIDA		2010	3
SM7. Management of climbing activities, including code of conduct, development of new routes, bolt placement and seasonal access restrictions.	DoE DoT	SIDA	2010	3
SM8. Develop code of conduct for boat operators.	DoE DoT	SIDA	2010	3
SM9. Develop and implement long-term non-native predator control on site.	DEH DoA	DoE SIDA	2010	3,4
SM10. Promote spaying and neutering of domestic cats.	DoA	DoE	ongoing	3,4
SM11. Eradicate feral dogs and *Iguana iguana* in Cayman Brac.	DoE	DEH IntC DoA MP	2010	3,4
SM12. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1-6
SM13. Implement associated HAPs.	DoE		2015	1-6
Advisory				
A1. Recommend maintenance of an unsealed road for 500m directly west of lighthouse, with no further expansion, and no perimeter road on the eastern bluff.	DoE DCB NRA	LS, DoP AGC SIDA	2008	3,5
A2. Recommend appropriate building set-back from the bluff edge and base.	DoE DCB	SIDA MP DoP	2008	3,5
A3. Recommend appropriate restrictions on removal of vegetation from the bluff edge.	DoE DCB	SIDA MP DoP	2008	3,5
A4. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1-6

Brown booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Monitor population and breeding success every three years (minimum).	DoE	NT	2008	1,6
RM1. REPORT: Preliminary assessment of site reveals 21 dead adults in wake of Hurricane Paloma, Nov 2008.				
RM2. Investigate the potential for artificial augmentation of nesting ledges to assist in colony expansion / relocation.	DoE	NT, SIDA	2012	1,3
RM3. Monitor and eradicate *Iguana iguana* in Little Cayman and Cayman Brac.	DoE	DoA DEH MP	ongoing	4
RM4. Conduct pilot project towards eradication of feral cats in Little Cayman, and improve control of rats and feral cats on Cayman Brac.	DoE	DoA CSL	2015	4
RM5. Construct quarters for visiting scientists in Little Cayman and Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE		2012	3
Communication & Publicity				
CP1. Develop and publicize a code of conduct for visitors (inc. climbers, cavers, boaters) outlining site status and restrictions.	DoE	SIDA DoT	2012	3,6
CP2. Produce brochure guides to the area.	DoT SIDA	DoE, NT	ongoing	6
CP3. Establish of a dedicated warden / nature tour guide, responsible for site interpretation.	DoT SIDA	DoE, NT	2015	1-6
CP4. Improve interpretative facilities at key areas.	DoT SIDA	DoE, NT	2012	3,6
CP5. Raise public awareness of the Brown booby and other birds through local media (e.g. *Know Your Islands* column), public talks and schools presentations (e.g. *Do You Know Me?*), and natural history websites.	NT	DoE DE	ongoing	6
CP5. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for NT "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 2007.				
CP6. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	5,6

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TERRESTRIAL SPECIES

Cayman parrot / Cuban parrot / Rose-throated parrot *Amazona leucocephala*

INSERT IMAGE

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Psittaciformes, Family: Psittacidae
Genus: Amazona, Species: leucocephala

The Cayman parrot *Amazona leucocephala* is a restricted range neotropical species occurring in the Cayman Islands, Cuba and the Bahamas. There are five endemic races: *A. l. caymanensis* on Grand Cayman and *A. l. hesterna* on Cayman Brac; two races on Cuba, and one in the Bahamas, confined to Great Inagua and Abaco. Preliminary genetic analysis indicates *A. l hesterna* as highly divergent from the other four races, and studies are in progress to determine its status as a separate species.

On Grand Cayman, *A. l. caymanensis* suffered a major loss of breeding habitat following devastation of mature Black mangrove in the Central Mangrove Wetland during hurricane Ivan (2004). Breeding is currently restricted to central and eastern dry forest. On Cayman Brac *A. l hesterna* breeds on the bluff in mature *dry forest*. On Little Cayman, the race *A. l. hesterna* became extirpated in the 1940s. Current status on Little Cayman is problematic. Four birds recolonised from Cayman Brac in 2000. In 2006, three birds were regularly observed on the south coast (a pair and a young bird). One of the adults, however, was possibly *A. l. caymanensis*. It is currently undetermined whether this offspring is a hybrid. Only one bird remained in 2007/8.

Status

Distribution: Subspecies endemic to Grand Cayman, and Cayman Brac.
Conservation: The Cayman parrot is listed as near-threatened (IUCN Red List; Appendix 1 CITES) due to its restricted range. The last population estimates for *A. l. leucocephala* gave max. 2000 birds in 1995, and 400 birds for *A. l. hesterna.* Presently DoE is undertaking a new survey of parrot populations on Grand Cayman and Cayman Brac, with the support of USFWS. The race *hesterna* is considered at risk of extinction (Wiley *et al*. 2004).
Legal: The Cayman parrot *Amazona leucocephala* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

Natural history

The Cayman parrot is the National Bird of the Cayman Islands. It is a cavity nester, breeding only in mature habitats: *dry forest* and *mangrove* forest. There is one instance of a wild pair breeding in an artificial nestbox at the Botanic Park. The species forages throughout Grand Cayman and Cayman Brac. On Grand Cayman parrots breed in cavities in dead and live Black mangrove *Avicennia germinans* and in dry forest, in Mango *Mangifera indica*, Strangler fig *Ficus aurea*, Royal palm *Roystonea regia* and Red birch *Bursera simaruba*.

On Cayman Brac, Cedar *Cederola odorata* is the preferred cavity tree, but recruitment of Cedar is currently very low due to infestation by the Mahogany shoot-borer *Hypsipyla grandella*. The Brac Parrots are seen throughout the island, feeding in *dry shrubland* in the interior, along the littoral Seagrape *Coccoloba uvifera* and Cocoplum *Chrysobalanus icaco* of *coastal shrubland*, and in gardens and plantations. The parrot is frugivorous, but also forages on young leaves and flowers. Crop predation by parrots results in their persecution by some farmers.

Clutch size ranges from 2-5 eggs (mean 3.2). Incubation is about 28 days. Young fledge by 55-60 days, and remain with their parents, at least until the next breeding season. Natural predators include Racer snakes *Alsophis cantherigerus*, Barn Owl *Tyto alba* and Peregrine Falcon *Falco peregrinus*.

Associated Habitats and Species for the *Cayman parrot*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
9. Mangrove 11. Coastal shrubland 14. Dry shrubland 15. Dry forest 17. Farm and grassland 18. Urban and man-modified areas	Vitelline warbler *Dendroica vitellina* Banana orchid *Myrmecophila thompsoni* Silver Thatch palm *Coccothrinax proctorii* Cedar *Cedrela odorata*

Current Factors Affecting the *Cayman parrot*

- *Habitat loss: dry forest* has been a primary target for development on Grand Cayman since 1980. Wetlands in western Grand Cayman have been cleared since 1984, and no viable breeding habitat remains. Breeding habitat in the Central Mangrove Wetland, (Black mangrove *Avicennia germinans*) was significantly impacted during hurricane Ivan, 2004. Though it has since re-established somewhat, full recovery of this habitat will likely take another 20 years. Since 2000, rapid development of the bluff has impacted *dry forest* habitat on Cayman Brac.

- *Remnant habitat fragmentation:* through land clearance, urban development, agricultural clearance, rapid expansion of roads networks on both islands.

- *Introduced predators:* rats, cats. Green iguanas *Iguana iguana* may take eggs.

- *Human impact:* despite legal protection, persistent illegal hunting as a crop pest (high impact from a limited number of individuals) and illegal trapping (for the pet trade) continues, both on Grand Cayman, and to a lesser extent, on Cayman Brac. Removal of chicks often involves the permanent destruction of the nest cavity. Deliberate and incidental poisoning are largely unknown quantities.

- *Limited fecundity:* it is likely that only a fraction of the adult population is actively breeding, due in part to limited nest site availability. Nest site limitation is likely especially acute on Cayman Brac.

- *Road traffic:* collision with cars is a significant cause of mortality for this direct, low-flying species.

- *Legislation:* originally listed as a game bird under Section 69 of the Animals Law (1976), the parrot, along with several other bird species, was removed from the game bird list and given full protection under Section 2 of The Animals (Protection) Regulations (1989). Grand-fathering in of pre-existing captive pet parrots prior to introduction of the Law contributed to the Law becoming largely unenforceable in its current form, facilitating continuation of the illegal capture, pet trade, and shooting of parrots, most especially by fruit-farmers for whom the parrot represents a crop pest.

- *Contention:* of all species (with the possible exception of Weeping willow) conservation issues associated with the Cayman parrot are perhaps the most contentious. Being both a crop-pest and a National Symbol for conservation, legally protected and exploited with impunity, conservation efforts geared towards the preservation of Cayman parrots will be subject to highly polarized public opinion.

- *Shifting baselines:* a feral population of invasive Monk parakeets *Myiopsitta monachus* is becoming increasingly well-established in Grand Cayman. This crop-pest is a competitor for food with the Cayman parrot, and despite its looking remarkably different, apparently a confusion species. “Tour-guides” point out Monk parakeets to visitors, identifying them as Cayman parrots. The Yellow-naped Amazon *Amazona auropalliata* is also establishing on Grand Cayman, with approximately 20 pairs breeding in the wild, mostly in the Savannah district.

Opportunities and Current Local Action for the *Cayman parrot*

In a National Symbols campaign spearheaded by the National Trust for the Cayman Islands (1995), the Cayman parrot was voted the National Bird of the Cayman Islands. (The Silver Thatch palm was chosen as the National Tree and the Wild Banana orchid as the National Flower). An interpretative folder was produced for schools, containing information and activities centred on the National Symbols. The Trust plans to update the National Symbols campaign in 2006.

Proposed Important Bird Areas (IBAs) for the Cayman Islands (Bradley *et al*. 2006) identifies areas of habitat sufficient to sustain the Cayman parrot. Sites include the Mastic Reserve, Botanic Park and Salina, eastern forests in Grand Cayman, and the Brac Parrot Reserve and the Splits in Cayman Brac.

In 2004, the National Trust purchased additional land in the Mastic Reserve, Grand Cayman. In 2005, the National Trust, with funding from DoE CIG and USFWS NMBCA, purchased additional land in the Brac Parrot Reserve, consolidating this protected area. Also in conjunction with this grant, a series of bird lectures (*Do You Know Me?*) and bird ID cards are delivered to local schools.

A *Checklist of Birds of the Cayman Islands* published (Bradley 2006).

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands, has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

Surveys by the Bird Club, include monitoring of the parrot on Grand Cayman since hurricane Ivan. A comprehensive study is underway by DoE / USFWS, with the objective of developing an annual survey methodology incorporating Distance Sampling protocol.

SPECIES ACTION PLAN for the *Cayman parrot*

OBJECTIVES	TARGET
1. Purchase and protect essential feeding and breeding habitat in Grand Cayman and Cayman Brac, toward sustaining parrot populations in perpetuity.	2015
2. Increase cavity availability for nesting.	2010
3. Conduct annual population estimates and map distribution of nest sites .	2008
4. Maintain and improve the profile of the Cayman parrot as a flagship for local biodiversity conservation.	ongoing
5. Encourage adherence to local laws prohibiting trade and transport, illegal shooting and trapping of parrots, and active enforcement of these laws when contravened.	2006
6. Maintain wildlife corridors through protection of woodland in suburban areas, and planting mini-woodlands of local species to serve as foraging habitat.	2010
7. Reduce impacts from introduced predators.	2010

Cayman parrot PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1-7
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	5,7
PL3. Protect *Amazona leucocephala* under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-7
PL4. Secure Cayman Islands Important Birds Areas (IBAs) - once accepted by Birdlife.	DoE	CIG NT	2010	1
PL5. Implement mandatory registration of all captive breeding sources for parrots, combined with ringing / microchipping and recording of all captive bred chicks.	DoE	DoA	2009	5
PL6. Implement a six-month amnesty on captive parrots, to enable ringing/microchipping and recording of all individuals.	DoE	DoA	2009	5
PL7. Conservation Officers to commence active prosecution for infractions of protective laws, including illegal killing, collection and keeping of unregistered / unringed / un-microchipped birds.	DoE	DoA CIG	2010	5
PL8. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	1,6
PL9. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	1,6
PL10. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	1,6
PL11. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	7

Safeguards & Management				
SM1. Prioritise land acquisition options to establish sufficient breeding and foraging reserves on Grand Cayman and Cayman Brac to sustain the species, with special attention to the Mastic Reserve, Grand Cayman, and Hemmington Forest and the Brac Parrot reserve, Cayman Brac.	DoE CC	MP NT	2009	1,6
SM2. Use the *Environmental Protection Fund* to protect key IBA areas: consolidation of the Mastic Reserve, protection of eastern shrubland, and Central Mangrove Wetland, Grand Cayman, and dry forest in Cayman Brac (including Salt Water Pond Walk, Hemmington Forest and expansion of the Brac Parrot reserve).	CC	DoE MP NT	2009	1
SM3. Establish strategic woodland patches in *urban and man-modified areas*, including LPP, to act as refugia, to maintain wildlife corridors.	DoE	MP NT CIG DoP CPA DCB	2006	6
SM4. Restore damaged habitat where possible.	DoE NT	MP	2010	1,2,6
SM5. Develop and implement sustainable management strategies for parrot conservation, which reasonably mitigate local farmers for damage to their fruit crops.	DoE	DoT NT CIG MP DoA AS	2015	1,5
SM6. Reduce predation by introduced species.	DEH DoE DoA	HS	2010	7
SM7. Eradicate Monk parakeets *Myiopsitta monachus* from the Cayman Islands, towards removing this crop-pest and confusion species.	DoE	MP	2009	7
SM8. Conservation propagation of Cedar *Cedrela odorata* in Growing Stations on Cayman Brac, for restoration of depauperate natural habitat and improvement of suburban areas.	DoE	NT MP QEIIBP IntC	2010	2,6
SM9. Develop and expand artificial nest box programme to increase capacity of degraded habitats.	DoE	NT MP IntC	2010	2,6
SM10. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1-7
SM11. Implement ringing and recording programme for all captive parrots.	DoE	DoA	2009	5
SM12. Commence active enforcement of non-compliance with laws protecting parrots.	DoE	CIG	2009	5
SM13. Implement associated HAPs.	DoE		2015	1-7
Advisory				
A1. Secure amendment of gazetted road corridors in order that they no pass through (i) critical east interior habitat, Grand Cayman (ii) the Nature Trail, Little Cayman and (iii) the parrot Reserve, Cayman Brac.	DoE NRA	NT DoP CPA DCB	ongoing	1,6
A2. Establish management strategy to develop nature tourism in reserves with sustainable financial planning.	NT SIDA CITA SITA	DoE DoA	2006 ongoing	4
A3. Develop and recommend guidelines for native vegetation maintenance / landscaping, particularly for developments in littoral areas.	DoE DoP	SIDA	2009	6
A4. Promote use of native food plants in landscaping, through maintenance of existing vegetation and use of	DoP	DoE	2009	6

Recommended Planting Palette in new developments.				
A5. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1-7

Cayman parrot PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Investigate feasibility of artificial nest box installation in protected areas.	NT	DoE	2009	2,6
RM2. Determine genetic status of race *hesterna.*	DoE NT		2015	4
RM3. Develop and implement predator control in managed parrot habitats.	DoE DoA	HS NT	2007	7
RM4. Assess the ecological impact of *Iguana iguana* on *A. l. caymanensis.*	DoE	NT	2007	7
RM5. Undertake population dynamics study - improve annual population estimates and map distribution of nest sites.	DoE	NT BC	ongoing	3
RM6. Investigate feasibility of implementing *Parrot Jam Project* – a financial / PR incentive scheme to offset crop damages suffered by local fruit farmers.	DoE MP DoA AS	DoT NT CIG	2012	4,5
RM7. Construct quarters for visiting scientists in Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE		2012	3
Communication & Publicity				
CP1. Targeted awareness of this flagship species and its international importance to key sectors: tourism, business, Government, local community.	NT DoT DoE	CIG DE SITA CITA	2007	4,5
CP2. Update National Symbols campaign.	NT		2006	4,5
CP3. Raise public awareness of Parrots and other birds through local media (e.g. *Know Your Islands*), special events (e.g. *Birds* stamp issue), public talks and schools presentations (e.g. *Do You Know Me?*) and natural history websites.	NT	DoE BC DE	2006 ongoing	4,5
CP3. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for NT "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 2007.				
CP4. Development of National Trust's interpretative centre for conservation education.	NT		2007	4,5
CP5. Install interpretative signage on National Trust owned nature trails.	NT	DoE	2006	4,5
CP6. Promote island wide awareness of the illegality and undesirability of moving parrots between islands, outside of managed transfers.	DoE	CIG	2008	5
CP7. Raise awareness of the value of native landscaping for wildlife.	DoE DoP NT QEIIBP	MP CN GC OS SB LCN	2010	6
CP8. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	4

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TERRESTRIAL SPECIES

Cayman Pygmy Blue butterfly *Brephidium exilis thompsoni*

INSERT IMAGE

Taxonomy and Range

Kingdom: Animalia, Phylum: Arthropoda, Class: Insecta, Order: Lepidoptera, Family: Lycaenidae
Genus: Brephidium, Species: exilis, Subspecies: thompsoni

Status

Distribution: Subspecies endemic to the Cayman Islands.
Conservation: Data deficient.
Legal: *Brephidium exilis* currently has no legal protection. Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment would be the lead body for legal protection.

Natural history

The Cayman Pygmy Blue butterfly *Brephidium exilis thompsoni* is one of the smallest butterflies in the Western hemisphere – possibly in the world. It is highly dependent on *salt-tolerant succulents* for all stages of its life-cycle. In its larva form, the caterpillars feed on *Salicornia perennis*. Adults depend on *Sesuvium portulacastrum* for nectar.

Associated Habitats and Species for *Cayman Pygmy Blue*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
12. Salt-tolerant succulents 13. Pools, ponds and mangrove lagoons	West Indian Whistling-duck *Dendrocygna arborea*

Current Factors Affecting *Cayman Pygmy Blue*

- *Range limitation:* this tiny butterfly is endemic to the Cayman Islands.

- *Population fragmentation:* highly dependent upon *salt-tolerant succulents* for all stages of its life-cycle. *Salt-tolerant succulents* habitats are generally highly fragmented in the Cayman Islands. Habitatable areas are generally small; some constitute only a few square metres.

- *Insecticide:* susceptibly of populations to insecticide spraying is unknown.

- *Species reliance:* in its larva form, the caterpillars of the Cayman Pygmy Blue feed on *Salicornia perennis*. Adults depend on *Sesuvium portulacastrum* for nectar.

- *Capacity for protection:* given the small size of areas which appear capable of supporting populations of this butterfly, conservation should be potentially achievable.

- *Recovery potential:* given appropriate baseline conditions and management, artificially created *salt-tolerant succulents* habitat will have a tendency to rapidly accrue a natural complement of species. This makes *salt-tolerant succulents* potentially attractive candidates for artificial creation, and restoration projects. The r-selected nature of many butterfly populations should aid rapid establishment, given suitable habitat.

- *Drainage:* water regime is critical to the functioning of *salt-tolerant succulent* habitat. Elevation or reduction in water level is likely to result in a change in vegetation, and the loss of typifying species, such as *Salicornia perennis* and *Sesuvium portulacastrum*.

Opportunities and Current Local Action for *Cayman Pygmy Blue*

None.

SPECIES ACTION PLAN for *Cayman Pygmy Blue*

OBJECTIVES	TARGET
1. Survey and improve understanding of *Brephidium exilis thompsoni*, and incorporate 30% of known habitat into protected areas.	2015
2. Promote preservation of *insitu* populations of *Brephidium exilis thompsoni.*	2015
3. Promote establishment of contingency populations of *Brephidium exilis thompsoni.*	2010

Cayman Pygmy Blue PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	1,2
PL3. Protect *Brephidium exilis thompsoni* under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2
PL5. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	1,2
PL6. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	1,2
Safeguards & Management				
SM1. Use the *Environmental Protection Fund* to establish a protected area / management agreement with landowners to protect natural *salt-tolerant succulents* habitat for *Brephidium exilis thompsoni.*	CC	NT, MP DoE CIG	2012	1,2
SM2. Use the *Environmental Protection Fund* to purchase and protect *salt-tolerant succulents* areas in Barkers, and manage access on site, towards maximising visitor experience / minimising impact.	CC	DoE NT CIG	2010	1,2
SM3. Use the *Environmental Protection Fund* to extend Meagre Bay Pond Animal Sanctuary, to incorporate areas of *salt-tolerant succulents* along the eastern shore, and prevent dumping in this area.	CC	DoE NT CIG	2012	1,2
SM4. Establish experimental site for the design and testing of techniques to restore artificial *salt-tolerant succulents,* and determine the feasibility of a restoration programme.	DoE	IntC	2012	1,3
SM5. Subject to successful conclusion of SM4, embark upon a programme of restoration of *salt-tolerant succulents* habitat to suitable man-modified areas.	DoE		2015	1,3
SM6. Implement associated HAPs.	DoE		2015	1,2,3
Advisory				
A1. Work with *Department of Planning* to formalize	DoE	DoP	2012	3

restoration protocol for quarry applications, incorporate adherence to *salt-tolerant succulents* guidelines where appropriate, and promote establishment of an escrow fund to cover costs of implementation.		CPA		
A2. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1,2,3

Cayman Pygmy Blue PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Survey and map remaining populations of *Brephidium exilis thompsoni*, towards determining conservation status.	DoE	NT	2012	1,2
RM2. Identify and prioritise most significant *pools, ponds and mangrove lagoons* and *salt-tolerant succulents* areas in the Cayman Islands	DoE	NT	2012	1,2,3
RM3. Instigate the design and testing of experimental techniques to establish and restore *salt-tolerant succulents* areas and *pools, ponds and mangrove lagoons*, including seed collection, propagation and planting, and the ecology of key fauna, such as *Brephidium exilis*, to determine the feasibility and factors affecting potential restoration programmes.	DoE		2012	1,3
RM4. Investigate potential for artificial relocation and rearing / head-starting of *Brephidium exilis* larvae to facilitate population establishment in suitable areas.	DoE	IntC	2012	1,3
RM5. Establish experimental site for the design and testing of artificial restoration techniques for *salt-tolerant succulents*.	DoE	IntC	2012	1,3
RM6. Facilitate and promote research into terrestrial invertebrates in the Cayman Islands.	DoE	IntC	2010	1
RM7. Establish and develop a national invertebrates collection, with searchable online facility.	DoE		2012	1
Communication & Publicity				
CP1. Raise public awareness of the unique nature of *Brephidium exilis thompsoni* and other endemic flora and fauna.	DoE NT QEIIBP	MP CN GC OS SB LCN	2008	1,2,3
CP2. Promote establishment of "study ponds" in schools.	DoE	NT MP DE	2012	1,2,3
CP3. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	1,2,3

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TERRESTRIAL SPECIES

Grand Cayman Blue iguana *Cyclura lewisi*

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Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Sauropsida, Order: Squamata, Family: Iguanidae
Genus: Cyclura, Species: lewisi

The Grand Cayman Blue iguana, *Cyclura lewisi*, is endemic to the island of Grand Cayman. Closest relatives are *Cyclura nubila* (Cuba), and *Cyclura cychlura* (Bahamas); all three having apparently diverged from a common ancestor some three million years ago.

Status

Distribution: Species endemic to Grand Cayman.
Conservation: Critically endangered (IUCN Red List). In 2002 surveys indicated a wild population of 10-25 individuals. By 2005 any young being born into the unmanaged wild population were not surviving to breeding age, making the population functionally extinct. *Cyclura lewisi* is now the most endangered iguana on Earth.
Legal: The Grand Cayman Blue iguana *Cyclura lewisi* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection. The Blue Iguana Recovery Programme BIRP operates under an exemption to the Animals Law, granted to the National Trust for the Cayman Islands.

Natural history

While it is likely that the original population included many animals living in *coastal shrubland* environments, the Blue iguana now only occurs inland, in natural *dry shrubland*, and along the margins of *dry forest*. Adults are primarily terrestrial, occupying rock holes and low tree cavities. Younger individuals tend to be more arboreal. Like all *Cyclura* species the Blue iguana is primarily herbivorous, consuming leaves, flowers and fruits. This diet is very rarely supplemented with insect larvae, crabs, slugs, dead birds and fungi. Hatchlings are preyed upon by the native Racer snake *Alsophis cantherigerus*. Adults have no natural predators. The age of sexual maturity is typically three years. Natural longevity in the wild is unknown, but is presumed to be many decades. One captive individual, in the USA, lived to 67 years-of-age.

The present-day population is restricted to the eastern interior of Grand Cayman, where it was reduced to a critically low density prior to the first survey, 1938. Their range has contracted significantly over the last 25 years, with many sites once populated now showing no signs of wild iguanas.

Associated Habitats and Species for *Blue iguana*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
11. Coastal shrubland 14. Dry shrubland 17. Farm and grassland	Century plant *Agave caymanensis* Cocoplum *Chrysobalanus icaco* Broadleaf *Cordia sebestena caymanensis* Banana orchid *Myrmecophila thompsoni* Silver Thatch palm *Coccothrinax proctorii* Sister Islands Rock iguana *Cyclura nubila caymanensis*

Current Factors Affecting *Blue iguana*

- *Traditional habitat loss:* fossil records indicate that beach-ridge habitat was, historically, a favoured habitat for *C. lewisi*. This area has been a primary focus for development since the 1960s, and intersected by a busy coastal road since the 1980s.

- *Remnant habitat fragmentation:* interior habitat has been degraded through land conversion, change in agricultural practice (grazing replacing traditional fruit farming), and proliferation of the roads network.

- *Hunting:* historically, iguanas were hunted for food, and occasionally mistaken and persecuted as a crop-pest.

- *Poaching:* endangered status of *C. lewisi*. may have encouraged recent incidents of theft. In 2008, seven individuals were killed in what appeared to a deliberate act of vandalism.

- *Non-native species:* predation of youngsters by rats and cats, and adults by dogs is a growing problem, exacerbated by habitat fragmentation and increasing ingress of residential areas into remnants of natural habitat.

- *Road kill:* iguanas are attracted to roads surface for thermo-regulation, and many are killed on the roads each year.

- *Shifting baseline:* confusion with Green iguana *Iguana iguana.*

- *Legal:* DoE staff are not currently legally enabled to use firearms to effect lethal control of invasive species. This has resulted in situations in which immediate control of feral cats and dogs to preserve endangered native species has not been possible, likely resulting in the loss of individuals through reliance on less immediate control mechanisms.

Opportunities and Current Local Action for *Blue iguana*

The National Trust for the Cayman Islands established the Blue Iguana Recovery Programme. Based at the QEII Botanic Park, Grand Cayman, this incorporates a successful captive breeding / release programme.

The Recovery Programme currently employs three full-time staff (two salaried), and delivers ca. 100 hatchlings per year. Directed by Fred Burton, the programme is assisted by a consortium of local and international specialists. Management strategy is implemented through a *Species Recovery Plan*, updated on a three-yearly basis.

The restored, free-roaming QE II Botanic Park subpopulation, breeding since 2001, now numbers ca. 40 individuals (as of Dec 2007). The restored free-roaming Salina Reserve subpopulation numbered over 200 in 2008, and began breeding in 2006.

Expanding education and merchandising programme, with strong internet support through www.BlueIguana.ky. Development of a self-financing strategy to cover core programme costs, through revenue-generating nature tours of the captive breeding facility.

SPECIES ACTION PLAN for *Blue iguana*

Objectives and targets of this Species Action Plan are based on formulations of the *Species Recovery Plan for the Grand Cayman Blue iguana, Cyclura lewisi 2009-2011.*

OBJECTIVES	TARGET
1. Acquire and protect xerophytic shrubland in eastern Grand Cayman sufficient to support one thousand Blue iguanas (requirement 300 – 500 acres).	2009
2. Restore, maintain and protect free-roaming Blue iguanas in natural habitats.	ongoing
3. Provide genetically optimal animals for reintroduction through the existing on-island captive breeding and head-starting programme.	ongoing
4. Safeguard against catastrophic loss of Grand Cayman Blue iguana populations by maintaining the off-island captive breeding population.	ongoing
5. Ensure sustained support for the conservation of the Blue iguana through targeted education and awareness programmes.	ongoing
6. Secure sufficient financial, technical and human resources for the long-term sustainability of the Blue Iguana Recovery Programme.	ongoing

Grand Cayman Blue iguana PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1-6
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
PL3. Protect *Cyclura lewisi* under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-6
PL4. Implementation of Species Recovery Plan for *Cyclura lewisi.*	BIRP	DoE NT QEIIBP	ongoing - 2008	1-6
PL5. Maintain local and international volunteer support for captive facility and field work.	BIRP	NT	ongoing	6
PL6. Develop a business plan to develop revenue lines and ensure long-term financial sustainability of the Recovery Programme, including core staff salaries.	BIRP	NT DoE IRCF DWCT	2006	6
PL7. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	1,2
PL8. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	2,6
PL9. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	1,2
Safeguards & Management				
SM1. Identify land acquisition options and prioritise for the establishment of a shrubland reserve.	NT	EAC	2006	1,2
SM1. REPORT: Completed. From a half-dozen candidate sites, the two most suitable areas of shrubland were identified in the East End of Grand Cayman, 2007. Both incorporate areas of Crown land: one abutting the southern boundary of the East End quarry, the other located approximately midway between the Salina Reserve and Colliers Pond.				

SM2. Use Crown land protection and the *Environmental Protection Fund* to negotiate and purchase a shrubland reserve with Government and local landowners.	CC	DoE NT MP	2009	1,2
SM3. Request international contributions and matched Crown contributions of land / funds for reserve establishment.	DoE		2009-2010	1,2
SM4. Establish an inalienable protected shrubland area of ca. 500 acres.	DoE	NT	2010	1,2
SM5. Joint management agreement and nature tourism strategy for sustainable financing of a reserve.	DoE NT		ongoing - 2010	1,2
SM6. Suitable habitat in the Salina and Botanic Park to be stocked to capacity.	BIRP	NT	2007 - 2010	2
SM7. Optimize genetic diversity of worldwide breeding strategy and expand to 225 individuals / 20 founder lines.	BIRP	SDZ	ongoing - 2007	3,4
SM8. Acquire and protect parcel of shrubland (65A / 37) to consolidate Salina Reserve and increase its carrying capacity for Blue Iguanas.	NT	DoE	2009	1,2
SM9. Improve dietary supply, content and diversity.	BIRP	NT	2008	2
SM9. REPORT: Completed. Diet of pelleted iguana food replaced by wholly fresh diet of leaves, flowers and fruit, collected daily. Dietary change is accompanied by a significant increase in fecundity.				
SM10. Security improvements at the breeding facility.	BIRP	NT	2008-9	2
SM10. REPORT: Seven adult iguanas were killed inside the captive breeding facility in what appears to be a wilful act of vandalism, 2008. RCIP investigations have, as yet, failed to identify perpetrators. In a second incident, two free-roaming adults were killed inside the Park by feral dogs, 2008. DoE Conservation Officers were halted from shooting the dogs amid legal concerns. Some dogs were trapped, however, at least one remains at large.				
SM11. Implement associated HAPs.	DoE		2015	1-6
Advisory				
A1. Secure amendment of gazetted road corridors through the critical east interior habitat.	DoE	NT	2009	1,2
A2. Train Government officers / key personnel in identification of *Iguana iguana* and *Cyclura lewisi.*	BIRP	DoE	2006	6
A3. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1-6

Grand Cayman Blue iguana PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Identify capacity of additional areas for re-stocking (Barkers, Mastic, Wilderness Farm etc.).	BIRP	NT DoE CIG	2006	2
RM1. REPORT: Completed. Barkers and Wilderness Farm would support small populations, but pose significant ongoing management issues. The Mastic grassland pockets are now reverting to secondary growth woodland. Most suitable sites were identified as two shrubland areas in East End, 2007.				
RM2. Develop and test methods of non-native predator control for managed iguana habitats.	BIRP	DoE	2007	2,6
RM3. Assess the ecological impact of *Iguana iguana* on *Cyclura lewisi.*	BIRP	DWCT ISG DoE	2010	2,6
RM4. Quantify genetic structure of wild and captive populations.	BIRP	DWCT	2008-9	3
RM5. Publish existing data on Blue iguana diet.	BIRP		2010	2,3
RM6. Regular health screening of captive and QEIIBP wild populations.	BIRP	WCS DoA	ongoing	2
RM7. Construct quarters for visiting scientists.	BIRP	DoE	2009	6
Communication & Publicity				
CP1. Targeted awareness campaign to key sectors of Government and the local community	NT	DoE	2006 ongoing	5
CP2. Local and international media campaign.	NT	DoE BIRP	ongoing - 2006	5
CP3. Launch of educational DVD / schools packs.	BIRP	NT DE	2006-2009	5
CP4. Island wide awareness of the differences between *Iguana iguana* and *Cyclura lewisi.*	BIRP	NT IRCF DoE	ongoing - 2007	5
CP5. Construction of a *Blue iguana shrublands* interpretative centre / classroom.	BIRP	DoE CIG NT IntC	2009	5
CP6. Develop and expand merchandising lines.	BIRP	NT IRCF	ongoing	5,6
CP7. Use *Cyclura lewisi* as a flagship for *dry shrubland* preservation.	DoE NT	CIG	2008 ongoing	1-6
CP8. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	1-6

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TERRESTRIAL SPECIES

Mosquito fish *Limia caymanensis & Gambusia xanthosoma*

INSERT IMAGE

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Actinopterygii, Order: Cyprinodontiformes, Family: Poeciliidae
Genus: Limia, Species: caymanensis

Kingdom: Animalia, Phylum: Chordata, Class: Actinopterygii, Order: Cyprinodontiformes, Family: Poeciliidae
Genus: Gambusia, Species: xanthosoma

The genus *Limia* is endemic to the Greater Antilles. Some 22 species are to be found on Hispaniola, with single endemic species on Cuba, Jamaica, and Grand Cayman, Cayman Islands.

The genus *Gambusia* consists of over 40 species, with a single endemic species in Grand Cayman, Cayman Islands.

Status

Distribution: Both species are endemic to Grand Cayman.
Conservation: Both species are data deficient.
Legal: *Limia caymanensis* and *Gambusia xanthosoma* currently have no legal protection. Pending legislation, they would be protected under the National Conservation Law (Schedule II). The Department of Environment would be the lead body for legal protection.

Natural history

"Mosquito fish" is a generic term, covering many different species of fish. *Limia caymanensis* & *Gambusia xanthosoma* are live-bearing fish, the former growing to 2.8 cm SL (male/unsexed), 3.18 cm SL (female), the latter to about 3.4cm SL (male/unsexed), 3.58cm SL (female).

Limia caymanensis is associated with freshwater and brackish water, and is to be found in *pools, ponds and mangrove lagoons*, rock hollows, especially in the vicinity of *mangroves*. They are generally demersal, feeding towards the bottom of the water column, coexisting with *Gambusia affinis*.

Gambusia xanthosoma is a *mangrove* species preferring more saline water. It is restricted to the tidal Rhizophora zones close to North Sound.

Associated Habitats and Species for the *Mosquito fish*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
9. Mangrove 13. Pools, ponds and mangrove lagoons	Bats West Indian Whistling-duck *Dendrocygna arborea*

Current Factors Affecting *Mosquito fish*

- *Habitat loss: pools, ponds and mangrove lagoons* are a limited and threatened habitat in the Cayman Islands. Loss of *mangroves* fringing North Sound especially impacts *Gambusia xanthosoma*.

- *Quarrying:* modification of natural structure, including deepening, and removal of aquatic and peripheral vegetation, may render artificial pools and marl pits less suitable as habitat for Mosquito fish.

- *Non-native species:* Tilapia have been characterized as a threat to native freshwater fish in the US. Tilapia reproduce quickly, and eat the eggs and juveniles of other fish species (Fitzsimmons 2001).

- *Resilience:* with a minimum population doubling time probably less than 15 months, these small fish should be able to quickly establish, given suitable habitat conditions.

Opportunities and Current Local Action for *Mosquito fish*

None.

SPECIES ACTION PLAN for *Mosquito fish*

OBJECTIVES	TARGET
1. Improve knowledge of *Mosquito fish*, survey and determine Red List status.	2015
2. Promote preservation of *insitu* populations of *Mosquito fish.*	2015
3. Promote establishment of contingency populations of *Mosquito fish* in modified pools and environments.	2015

Mosquito fish PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	1,2
PL3. Protect *Limia caymanensis* and *Gambusia xanthosoma* under Schedule II of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2
PL5. Establish guidelines for form and function of artificial excavations and marl pits, and for restoration of flooded quarries, toward maintaining and maximizing value for biodiversity.	DoP DoE	AAC	2012	2,3
PL6. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	2,3
Safeguards & Management				
SM1. Use the *Environmental Protection Fund* to establish a protected area / management agreement with landowners to protect *Mosquito fish* populations.	CC	NT, MP DoE CIG	2010	2
SM2. Incorporate habitat requirements for *Mosquito fish* into restoration of *pools, ponds and mangrove lagoons.*	DoE	MP	2015	2
SM3. Encourage introduction of *Mosquito fish* into suitable *pools, ponds and mangrove lagoons* and other habitats.	DoE	MP	2015	3
SM4. Implement associated HAPs.	DoE		2015	1,2,3
Advisory				
A1. Provide advice for landowners on the effective management *pools, ponds and mangrove lagoons*, to conserve *Mosquito fish.*	DoE	NT MP	2012	2
A2. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1,2

Mosquito fish PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Survey and map populations of *Mosquito fish.*	DoE		2012	1
RM2. Determine local IUCN status of *Mosquito fish.*	DoE		2012	1
RM3. Identify habitat requirements and key areas of natural habitat for *Mosquito fish* .	DoE	MRCU	2012	1,2,3
RM4. Investigate potential for artificial rearing to facilitate improved survivorship, and establishment of contingency populations in suitable sites.	DoE	IntC	2012	1,3
Communication & Publicity				
CP1. Raise awareness of the unique nature of *Mosquito fish* and other endemic flora and fauna.	DoE NT QEIIBP	MP, CN GC, OS SB, LCN	2008	1,2,3
CP2. Raise awareness of *Mosquito fish* with a children's competition to think of a "common name" for each, and promotion of establishment of "study ponds" in schools.	DoE	NT MP DE	2012	1,2,3
CP3. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	1,2,3

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TERRESTRIAL SPECIES

Red-footed booby *Sula sula*

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Pelecaniformes, Family: Sulidae
Genus: Sula, Species: sula

The Red-footed booby *Sula sula* has a large range, with an estimated global breeding Extent of Occurrence of 50,000-100,000 km². The Red-footed booby is pan tropical, breeding off the Yucatan Peninsula, cays and small islands off Belize, Venezuela and Tobago. Also in the West Indies: Little Cayman, Puerto Rico, Hispaniola, the US Virgin Islands, Redonda and the Grenadines in the Lesser Antilles, and a few pairs in the Bahamas. It is one of the Cayman Islands' six species of breeding seabirds.

Status

Distribution: The Red-footed booby *Sula sula* is resident in the Cayman Islands, but breeds only on Little Cayman.
Conservation: The global population is estimated to be 600,000 individuals (M. Crosby in litt. 2003). Global population trends have not been quantified, but the species is not believed to approach the thresholds for the population decline criterion of the IUCN Red List (i.e. declining more than 30% in ten years or three generations). For these reasons, the species is evaluated as Least Concern. Local population trends, however, may be significantly different.
Legal: The Red-footed booby is protected under the Animals Law (1976). The Booby Pond and associated breeding colony came under full legal protection with the Animals (Sanctuaries) Regulations (1982) as amended by Gazette No. 24 of 1993. Management responsibility for the colony was assigned to the National Trust for the Cayman Islands in 1995. The Booby Pond Reserve has since been expanded to a total area of 135 ha. All National Trust properties fall under the protection of the National Trust for the Cayman Islands Law (1987). The reserve is also a designated Ramsar site, and is listed as an Important Bird Area (IBA) by Birdlife International. Pending legislation, the Red-footed booby would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

Natural history

The Red-footed booby *Sula sula* is named for its feet, which are distinctly red. Adults appear in two plumage colour phases: "brown phase" (predominantly brown, with distinct white hind parts and tail) and "white phase" (almost completely white). Sexes appear alike, with no seasonal variation in plumage, however, immature birds are a sooty brown colour, paler below, and may display a dark band across the breast.

Boobies forage for fish in coastal areas, and further out to sea, plunging into the water from a height. Courtship between prospective mates comprises pair flights, territorial displays, and symbolic nesting building. Red-footed boobies typically nest in colonies on remote islands. This is the only booby in the Caribbean that nests in trees. Nest areas may be tightly packed, but are strongly defended, usually through a display of ritualised head movements. Birds breed September-June, laying one egg.

The Booby Pond is a 43ha brackish to hypersaline lagoon located on the south coast of Little Cayman. Once open to the sea, it is now separated by a coastal road. The seabird rookery is located in the mangrove and shrubland along the northern edge of the pond. Covering an area of approximately 16.5 ha, the area includes a colony of up to ca. 800 Magnificent frigatebirds *Fregata magnificens*, (1997, Bradley 2000). The associated Red-footed booby colony is globally significant - one of the four largest colonies in the Caribbean (Bradley and Norton 2009).

The colony was first reported on Owen Island, a cay in the South Hole Sound, Little Cayman. In 1859 it moved to the littoral Sea grape *Coccoloba uvifera* on Little Cayman, as a result of fire, and later settled in

the *mangrove* swamp behind the coastal ridge. After the Hurricanes of 1932 and 1935, the breeding colony moved to its present site (Bradley 2000). Since 1986 it has generally expanded, moving north into the woodland. Immature birds are thought to disperse to other colonies in the region, but return to their natal colony to breed. The colony was first described in August 1975, surveyed for the first time in 1986, and subsequently, in 1997 (Burton *et al.* 1997).

The colony has seen an increase in size from the mid 1980s through the 1990s. However, a significant decline in nesting birds was noted in 2008 (Betty Anne Schreiber, 2008 *pers comm.*)

Year	Nesting Pairs	Type of Count
1986	2,600	Transect
1997	4,849	Transect
2008	670-700	Colony count

Associated Habitats and Species for *Red-footed booby*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
1. Open sea	Sister Islands Rock iguana *Cyclura nubila caymanensis*
9. Mangrove	Little Cayman Green anole *Anolis maynardi*
13. Pools, ponds and mangrove lagoons	Little Cayman snail *Cerion nanus*
14. Dry shrubland	West Indian Whistling-duck *Dendrocygna arborea*
15. Forest and woodland	Vitelline warbler *Dendroica vitellina crawfordii*

Current Factors Affecting *Red-footed booby*

- *Illegal development:* despite legal protection, the southern side of the Booby Pond has been subject to encroachment by the construction and clearance of land as recently as 2008. These issues remain currently unresolved.

- *Development:* an increase in commercial and residential construction in the vicinity of Blossom Village will likely impact the colony through increased light pollution, and ingress of invasive species, most especially rats and cats. Seepage from sewage systems is suggested to contribute to offensive odour arising from the pond, and requires investigation.

- *Airport:* a new airport, possibly one that can accommodate jets, is planned to the north of the colony. This has the potential to inflict significant disturbance on the colony through light and noise pollution. Presently collision of boobies with aircraft is infrequent, however, if the airport is relocated, sensitive pre-emptive planning will be required if potentially serious accidents are to be avoided.

- *Natural predators:* birds of prey, especially wintering Peregrine falcons *Falco peregrinus*.

- *Introduced predators:* rats and cats. Unwanted kittens are brought over to Little Cayman from Cayman Brac, and dumped.

- *Historic exploitation:*, though now much reduced, collection of eggs is reported as recently as 1987.

- *Commercial fisheries:* a potential source of conflict, this may not represent a significant issue in Cayman. Local fisheries are of a subsistence / recreational nature, non-the-less, boobies are known to range widely on individual fishing expeditions, and it would be expected that regional fisheries trends may effect local populations of the birds. Entanglement in fishing line has resulted in the death of some individuals.

- *Maritime pollution:* Little Cayman lies close to major shipping lanes. Birds oiled or covered in bilge wash are occasionally collected along the shore.

- *Storms:* Little Cayman is a small (28km^2) low-lying island. No point is more than 1.5 km from the sea. This makes Little Cayman especially vulnerable to storm surge. The nesting habitat of along the Booby Pond has suffered damage in successive hurricanes, most recently Ivan, Gustav and Paloma.

- *Climate change:* the low lying nature of Little Cayman would make it especially vulnerable to sea-level rise, and increasingly severe storms: both current predications associated with climate change.

- *Colonial nature:* the colonial nature of the boobies will mean that, if the breeding site becomes overly-disturbed, polluted, or in any other way unsuitable, the colony is likely to shift *en-mass*. If the colony remains in the Cayman Islands, it would likely re-establish in an area which is completely unprotected.

- *Tourism:* the Booby Pond Reserve is a major tourist attraction for Little Cayman.

- *Offensive odours:* since land-locking of the Booby Pond altered the natural drainage and flushing dynamics of the pond, issues associated with foul odours arising from the sediments have arisen occasionally. It is believed that the odour is related to bacterial action, and the smell appears to worsen when the sediments are exposed and drying, or when exposed sediments are rehydrated. While some bacteria and algae may be potentially harmful to the birds, the boobies do not generally enter the water in the pond, and the potential threat of this phenomenon remains undetermined. Suggested flushing of the pond by re-establishing culverts beneath the coastal road may have serious consequences for the adjacent marine environment.

Opportunities and Current Local Action for *Red-footed booby*

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands, has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

A *Checklist of Birds of the Cayman Islands* was published (Bradley 2006).

A National Trust interpretation centre on the south-west corner of the Booby Pond provides tourists with information about the site. This centre has a raised observation platform with telescopes.

Local residents take an interest in the fauna of their island, and are often pleased to talk to tourists who pause to enjoy the Booby Pond Reserve.

SPECIES ACTION PLAN for *Red-footed booby*

OBJECTIVES	TARGET
1. Ensure no reduction in Red-footed booby *Sula sula* due to anthropogenic influence, and encourage population stability and / or expansion, through appropriate conservation management.	ongoing
2. Establish a regular, long-term, minimum-disturbance monitoring programme for the booby colony.	2010
3. Reduce predation of Red-footed boobies by non-native species.	2010
4. Improve media profile and public understanding of the Red-footed booby.	2009

Red-footed booby	LEAD	PARTNERS	TARGET	MEETS

PROPOSED ACTION				OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3,4
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	1
PL3. Protect *Sula sula* under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3,4
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	1
PL5. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	1
PL6. Promote sympathetic management of current airport facilities, and appropriate siting and management of proposed airport facilities, to ensure minimal risk to aircraft passengers from birdstrike, and minimal impact on local birdlife.	DoE NT	CIG	ongoing	1
PL7. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	1,3
PL8. Commence prosecution for offences involving damage to existing Animal Sanctuaries and Ramsar sites, and associated buffer zones, and update and upgrade penalties for transgression of associated regulations.	DoE	CIG	2009	1
Safeguards & Management				
SM1. Continue protection and reserves management.	NT	DoE	ongoing	1,2,3,4
SM2. Demarcation of the northern boundary of the reserve, using DoE's GPS capability.	DoE	NT	2010	1
SM3. Subject to RM3, eradicate feral cats in Little Cayman, and spay all domestic cats.	DEH DoA DoE	SIDA HS	2012	4
SM4. Subject to RM3, develop and implement long-term non-native predator control on site.	DEH NT DoA DoE	SIDA HS	2012	4
SM5. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1,2,3,4
SM6. Update the 1995 Management Plan for the Booby Pond Nature Reserve.	NT DoE	IntC	2012	1,2,3,4
SM7. Implement associated HAPs.	DoE		2015	1,2,3,4
Advisory				
A1. Recommend replanting of old landfill site, with native species congruent with the native vegetation of the Booby Pond reserve.	NT DoE		2012	1
A2. Recommend restrictive guidelines for artificial lighting in this area.	DoE	CIG	2010	1
A3. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1,2,3,4

Red-footed booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Develop and implement regular, minimum disturbance aerial monitoring programme for the booby colony, to determine population size, incorporating occasional ground survey, to calibrate accuracy of aerial observations and determine breeding success.	NT DoE MRCU	RSPB IntC	2010	2
RM1. REPORT: DoE, with support of RSPB, purchases gyroscopic-mount camera system for high quality aerial photography, 2009.				
RM2. Construct quarters for visiting scientists in Little Cayman and Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE	IntC	2012	1,2,3,4
RM2. REPORT: Accommodation for up to four individuals on Little Cayman established by DoE, 2008.				
RM3. Conduct pilot project towards eradication of feral cats in Little Cayman.	DoE CSL	DoA	2015	1,3
RM3. REPORT: Pilot project completed by DoE and DoA, 2008. All pet cats in Little Cayman were micro-chipped. Twenty eight cats were removed through trapping, however, more remain. Trap-shy individuals will require alternative control methods.				
RM4. Monitor the rookery area, ensuring the buffer protection zone is adequate.	NT DoE		2010	1,2
Communication & Publicity				
CP1. Produce brochure guides to the area.	DoT NT SIDA	DoE	ongoing	4
CP2. Establish of a dedicated warden / nature tour guide, responsible for site maintenance.	NT	DoE DoT SIDA	2012	1,2,3,4
CP3. Improve interpretative facilities at key areas.	NT	DoE DoT SIDA	ongoing	4
CP4. Raise public awareness of the Red-footed booby and other birds through local media (e.g. *Know your Islands column*), public talks and schools presentations (e.g. *Do You Know Me?*), and natural history websites.	NT	DoE DE	ongoing	4
CP4. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for NT "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 2007.				

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TERRESTRIAL SPECIES

Vitelline warbler *Dendroica vitellina* (Cory.)

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Passeriformes, Family: Parulidae
Genus: Dendroica, Species: vitellina

The Vitelline warbler *Dendroica vitellina* is a restricted range neotropical species confined to the Cayman Islands and Swan Islands. There are three endemic races: *D. v. vitellina* on Grand Cayman, *D. v. crawfordi* on Cayman Brac and Little Cayman and *D. v. nelsoni* on the Swan Islands. It is similar to and closely related to the migrant Prairie warbler, *D.* discolour, and often considered part of a superspecies. Preliminary genetic analysis by Irby Lovatt at Cornell University indicates that the Vitelline warbler is a full species.

Status

Distribution: Subspecies endemic to each of Grand Cayman and Cayman Brac.
Conservation: The Vitelline warbler is listed as near-threatened (IUCN), with a decreasing population trend.
Legal: The Vitelline warbler *Dendroica vitellina* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

Natural history

The Vitelline warbler *Dendroica vitellina* breeds primarily in *forest and woodland* and *dry shrubland* (infrequently in xerophytic shrubland), and also in disturbed edge habitat bordering shrubland and dry forest. It will forage, but seldom breeds, in edge wetland and littoral habitats on Grand Cayman. On Cayman Brac and Little Cayman, birds forage in edge wetland habitats but seldom breed there, whilst they forage and occasionally breed in littoral habitats. Species of the genus *Dendroica sp.* have been recovered from 12,000 year-old fossil deposits (owl pellets) from caves on Cayman Brac, but have not yet been identified to the species level.

The Vitelline warbler is insectivorous, and occasionally frugivorous. No full life history study has been made of this species, but observations indicate that it exhibits similarities to that of the Prairie warbler (Nolan 1978). Vitelline warblers construct a small woven cup nest in the outer branches of trees, in the fork of a low shrub, or hidden in bromeliads. Nest elevation varies from 1-7m. Clutches of two eggs are normal, incubated for 14 days. The young are fed by both parents; fledging by 14 days. Predators include rats, snakes, Smooth-billed ani *Crotophaga ani*, Greater Antillean grackle *Quiscalus niger*, and Barn owl *Tyto alba*.

Associated Habitats and Species for *Vitelline warbler*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
14. Dry shrubland	Century plant *Agave caymanensis*
15. Dry forest	Silver Thatch palm *Coccothrinax proctorii*
18. Urban and man-modified areas	Cayman parrot *Amazona leucocephala*

Current Factors Affecting *Vitelline warbler*

- *Restricted range: D. v. vitellina* on Grand Cayman is restricted to the eastern interior. In the early 1980s, it was fairly common throughout preferred habitat on Grand Cayman but, from the mid-1980s to mid-1990s, a steady population decline related to loss of habitat began in western Grand Cayman, spreading to developed areas further east, to Bodden Town and beyond. The decline speeded up in the late-1990s and, following hurricane Ivan, resulted in only a few relictual individuals remaining in the western half of Grand Cayman, 2006. *D. v. crawfordi* is common on Cayman Brac and fairly common on Little Cayman.

- *Traditional habitat loss: dry forest, dry shrubland,* and secondary habitats have been targets for development since the 1980s, especially in the western half of Grand Cayman.

- *Remnant habitat fragmentation:* interior habitat has been degraded through land clearing for *urban and suburban* development, agricultural and expansion of the *roads* network.

- *Introduced predators:* rats, cats, and potentially Green iguana *Iguana iguana*. The parasitic Shiny cowbird *Molothrus bonariensis*, while not currently a problem, should not be allowed to establish in the Cayman Islands.

Opportunities and Current Local Action for *Vitelline warbler*

Surveys by Bradley (2000) and the Bird Club, include monitoring of all endemic land birds on Grand Cayman. Frequency has increased since hurricane Ivan.

Proposed Important Bird Areas (IBAs) for the Cayman Islands (Bradley *et al*. 2006) identifies areas of habitat sufficient to sustain the Vitelline warbler in perpetuity. In Grand Cayman, key areas are the Mastic Reserve, Botanic Park, Salina Reserve, and eastern forests. In Cayman Brac, key areas are the Brac Parrot Reserve and the Splits. In Little Cayman, the key area is the Central Forest.

In 2004, the National Trust purchased additional land in the Mastic Reserve, Grand Cayman. In 2005, the National Trust, with funding from DoE CIG and USFWS NMBCA, purchased additional land in the Brac Parrot Reserve, consolidating this protected area. Also in conjunction with this grant, a series of bird lectures (*Do You Know Me?*) and bird ID cards are delivered to local schools.

A *Checklist of Birds of the Cayman Islands* (Bradley 2006) was published this year.

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands, has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

SPECIES ACTION PLAN for *Vitelline warbler*

OBJECTIVES	TARGET
1. Purchase and protect key areas of habitat to sustain *Dendroica vitellina* in perpetuity.	2015
2. Map the distribution of *Dendroica vitellina* and continue to monitor numbers.	2006
3. Ensure sustained support for *Dendroica vitellina* and local bird conservation through targeted education.	ongoing
4. Maintain and enhance relictual populations.	2009
5. Reduce predation by non-native species.	2008

Vitelline warbler	LEAD	PARTNERS	TARGET	MEETS

PROPOSED ACTION				OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1-5
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	5
PL3. Protect *Dendroica vitellina* under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-5
PL4. Secure Cayman Islands Important Birds Areas (IBAs) - once accepted by Birdlife.	DoE	CIG NT IntC	2007	1
PL5. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	1,4
PL6. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	1,4
PL7. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	1,4
PL8. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	5
Safeguards & Management				
SM1. Prioritise potential dry forest and shrubland acquisition options, and undertake negotiations towards establishing protected areas on the three islands sufficient to sustain the species in perpetuity.	DoE NT	MP	2006 ongoing	1
SM2. Use the *Environmental Protection Fund* to protect / establish management agreements with landowners of key IBA areas, including consolidation of the Mastic Reserve, protection of eastern shrubland and Central Mangrove Wetland, Grand Cayman, and dry forest in Cayman Brac (including Salt Water Pond Walk), and the Central Forest, Little Cayman.	CC	DoE MP NT	2006	1
SM3. Continue to request local / international funds and matched contributions to establish key reserves.	DoE NT	IntC	ongoing	1
SM4. Purchase strategically important patches of woodland that act as refugia, including urban areas in West Bay and Ventnor's, East End.	NT DoE	DoE MP	2010	1,4
SM5. Establish strategic woodland patches in *urban and man-modified areas*, including LPP, to act as refugia and maintain wildlife corridors.	DoE	MP NT CIG DoP	2006	1,4
SM6. Control predation by rats, cats, *Iguana iguana*, and potential colonisation of the Shiny cowbird *Molothrus bonariensis*.	DEH DoE DoA	NT HS	2007	5
SM7. Restore damaged habitat where possible.	DoE NT MP		2010	1,4
SM8. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement	DoE		2012	1-5

conservation actions.				
SM9. Implement associated HAPs.	DoE		2015	1-5
Advisory				
A1. Secure amendment of gazetted road corridors in order that they no pass through (i) critical east interior habitat, Grand Cayman (ii) the Nature Trail, Little Cayman and (iii) the parrot Reserve, Cayman Brac.	DoE NRA	NT DoP CPA DCB	ongoing	1
A2. Establish management strategy to develop nature tourism in reserves with sustainable financial planning.	NT SIDA CITA SITA	DoE DoA	2006 ongoing	3
A3. Develop and recommend guidelines for native vegetation maintenance / landscaping, particularly for developments in littoral areas.	DoE DoP	SIDA	2009	4
A4. Promote use of native plants in landscaping, through maintenance of existing vegetation and use of *Recommended Planting Palette* in new developments.	DoP	DoE	2009	4
A5. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1-5

Vitelline warbler PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Develop and implement methods of non-native predator control for managed warbler habitats.	DoE DoA	NT HS	20010	5
RM2. Assess the ecological impact of *Iguana iguana* on the Vitelline warbler.	DoE	NT	2010	5
RM3. Continue monitoring and map distribution of the Vitelline warbler in the Cayman Islands.	DoE NT BC MP		ongoing	2
RM4. Assess population status of Vitelline warblers in the Swan Islands, towards contextualising conservation status of local populations.	DoE NT BC MP		ongoing	2
RM5. Monitor habitat for early stages of the colonisation by *Molothrus bonariensis.*	DoE NT BC MP		ongoing	5
RM6. Construct quarters for visiting scientists in Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE		2012	2,3
Communication & Publicity				
CP1. Raise public awareness of Vitelline warblers and other birds through local media (e.g. *Know Your Islands*), special events (e.g. *Birds* stamp issue), public talks and schools presentations (e.g. *Do You Know Me?*) and natural history websites.	NT	DoE BC DE	2006 ongoing	3
CP1. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for NT "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 2007.				
CP2. Development of National Trust's interpretative centre for conservation education.	NT		2007	3
CP3. Install interpretative signs on National Trust nature trails.	NT	DoE	2006	3
CP4. Raise awareness of the value of native landscaping for wildlife.	DoE DoP NT QEIIBP	MP CN GC OS SB LCN	2010	3,4
CP5. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	3

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TERRESTRIAL SPECIES

West Indian Whistling-duck (Whistler) *Dendrocygna arborea*

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Anseriformes, Family: Anatidae
Genus: Dendrocygna, Species: arborea

The West Indian Whistling-duck *Dendrocygna arborea* breeds in many countries throughout the Caribbean, locally ranging from common to very rare. This West Indian endemic species is generally of conservation concern over its range (Bradley 2000).

Status

Distribution: Resident year-round and breeding on all three Cayman Islands.
Conservation: The West Indian Whistling-duck *Dendrocygna arborea* is a species endemic to the West Indies, and is listed as vulnerable (IUCN Red List 3.1).
Legal: CITES Appendix II. CMS Appendix II. The West Indian Whistling-duck *Dendrocygna arborea* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

Natural history

The West Indian Whistling-duck *Dendrocygna arborea* is Cayman's only breeding duck. They are non-migratory. Largely crepuscular or nocturnal by nature, they are mostly inactive during the day; roosting in mangroves, reed beds, and swampy areas. At dusk they tend to move to fresh and saltwater *pools, ponds and mangrove lagoons*, and temporary wetlands to feed. These behaviours are, however, only generally applicable, and in some places ducks will be seen feeding throughout the day.

Nest site choice is variable, though is generally on or near the ground. Preferred nest sites include rough pasture, bushes, and even hollow trees. The comparative safety of isolated *ironshore* outcrops and islands within *pools, ponds and mangrove lagoons*, and *lagoons*, contribute to their being amongst favoured nesting sites. Whistling-ducks breed all year round. Clutches generally contain 5-13 eggs.

In the 1980s, numbers fell as low as 180-220 individuals on Grand Cayman and Little Cayman. Numbers subsequently recovered to 1000-1200, 1996-97, with current estimates of approximately 2000 birds between the three Islands (Bradley *pers comm.*).

Associated Habitats and Species for *West Indian Whistling-duck*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
3. Lagoons 9. Mangrove 12. Salt-tolerant succulents 13. Pools, ponds and mangrove lagoons 17. Farm and grassland 18. Urban and man-modified areas	Red-footed booby *Sula sula* Cayman parrot *Amazona leucocephala* Cayman Pygmy Blue butterfly *Brephidium exilis thompsoni*

Current Factors Affecting *West Indian Whistling-duck*

- *Hunting pressure:* historic hunting pressure contributed in large part to the decline of this species in the Cayman Islands. Lows of 180-220 individuals were recorded on Grand Cayman and Little Cayman in the 1980s.

- *Poaching:* though protected under the Animals Law, a level of background hunting has remained persistent.

- *Habitat loss:* loss of habitat, including *mangrove* roosting habitat and *salt-tolerant succulents* feeding habitat, has contributed to the decline of the natural population.

- *Supplementary feeding:* supplementary feeding initiated by Willie Ebanks, and the late Jim Ebanks, North Side, Grand Cayman, 1992, and later supported by CIG, has contributed in large part to an increase in numbers locally. Currently several feeding stations are active on both Grand Cayman and Cayman Brac. While supplemental feeding has probably been a significant factor in the recovery of the wild population, feeding sites have a tendency to attract large numbers of birds, potentially encouraging dependency, and attracting predators.

- *Introduced predators:* predators such as rats, cats, and especially packs of feral dogs, inflict a significant toll on these ground / near-ground nesting birds.

- *Flagship status:* the Whistling-duck is being established as a flagship for wetland preservation, through the work of groups such as the West Indian Whistling-duck Working Group of the Society for the Conservation and Study of Caribbean Birds, SCSCB.

- *Aesthetic appeal:* these attractive birds invite the care and support of members of the public, many of whom enjoy feeding the birds.

- *Adaptation:* in the face of loss of their natural habitat, the West Indian Whistling-duck has proven adaptable, adjusting to suitable niches maintained within the built environment, and successfully establishing in *urban and man-modified areas*.

Opportunities and Current Local Action for *West Indian Whistling-duck*

Since 1997, the West Indian Whistling-duck Working Group, SCSCB, has conducted a region-wide public education and awareness programme that provides local teachers and educators with training and educational materials; working to raise awareness and appreciation for the value of local wetlands and wetland biodiversity: www.whistlingduck.org.

The Nature Tourism Project under development in Cayman Brac and Little Cayman, 2001, incorporated trails and observation platforms, established at points of natural interest, especially in association with *pools, ponds and mangrove lagoons.*

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands, has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

A *Checklist of Birds of the Cayman Islands* was published (Bradley 2006).

The Cayman Islands Bird Club conducts an annual Bird Count in Grand Cayman, in March of each year, which incorporates an count of Whistling-duck.

SPECIES ACTION PLAN for *West Indian Whistling-duck*

OBJECTIVES	TARGET
1. Commence detailed studies of *Dendrocygna arborea* to determine status and dynamics of local populations.	2009
2. Implement planning and conservation action towards maintaining *Dendrocygna arborea*, and encouraging population stability, and recovery.	2012

West Indian Whistling-duck PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
PL3. Protect *Dendrocygna arborea* under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2
PL5. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	2
PL6. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	2
PL7. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	2
Safeguards & Management				
SM1. Use the *Environmental Protection Fund* to protect key areas of habitat for *Dendrocygna arborea.*	CC	DoE MP NT	2006	2
SM2. Transfer Little Cayman Crown Wetlands to protected area status.	CC	DoE CIG MP NT	2012	2
SM3. Subject to SM2, designate Little Cayman Crown Wetlands a Ramsar site.	DoE	CC CIG MP NT	2012	2
SM4. Control predation by rats, cats, and deter potential for predation by *Iguana iguana*.	DEH DoE DoA	NT HS	2009	2
SM5. Restore damaged nesting habitat where possible.	DoE NT MP		2010	2
SM6. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1,2
SM7. Incorporate isolated islands into development guidelines for restoration of degraded *pools, ponds and mangrove lagoons*, to facilitate roosting and nesting habitat for *Dendrocygna arborea.*	DoE	DoP CPA DCB MP	2012	1,2
SM8. Implement associated HAPs.	DoE		2015	1,2

Advisory				
A1. Develop and recommend guidelines for native vegetation maintenance / landscaping, particularly for developments in wetland areas.	DoE DoP	SIDA	2009	2
A2. Promote use of native plants in landscaping, through maintenance of existing vegetation and use of *Recommended Planting Palette* in new developments.	DoP	DoE	2009	2
A3. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1,2

West Indian Whistling-duck PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Develop and implement methods of non-native predator control in colony areas.	DoE DoA	NT HS	2007	1,2
RM2. Complete detailed mapping of nest sites to determine precise population distribution and numbers, and key areas of habitat.	DoE	NT	ongoing	1
RM3. Undertake monitoring of artificial feeding sites to determine diet and nature of interactions, and need to develop guidelines.	DoE		2010	1
RM4. Collaborate with scientists from other Caribbean islands, to encourage work on projects complimentary to the conservation of *Dendrocygna arborea.*	DoE	SCSCB IntC	2010	1
RM5. Investigate potential for artificial nest box programme to promote population sustainability.	DoE	NT	2009	2
Communication & Publicity				
CP1. Raise public awareness of *Dendrocygna arborea* and other birds through local media (e.g. *Know Your Islands*), special events (e.g. *Birds* stamp issue), public talks and schools presentations (e.g. *Do You Know Me?*) and natural history websites.	NT	DoE BC DE	2006 ongoing	2
CP1. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for NT "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 2007.				
CP2. Install interpretative signs on nature trails.	NT	DoE	2006	2
CP2. REPORT: Informational signage featuring Whistling-ducks installed by NT, adjacent highways in Grand Cayman, 2008, toward discouraging roadside feeding, and encouraging traffic to slow down.				
CP3. Use *Dendrocygna arborea* as a flagship for the protection of key areas of *mangrove* and *salt-tolerant succulents.*	DoE NT	CIG	2010	2
CP4. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	2

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TERRESTRIAL SPECIES

White Land crab *Cardisoma guanhumi*

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Arthropoda, Class: Malacostraca, Order: Decapoda, Family: Gecarcinidae
Genus: Cardisoma, Species: guanhumi

The White Land crab *Cardisoma guanhumi* is a circumequatorial species found throughout estuarine regions of the Caribbean, Central and South America including Columbia, Venezuela, the Bahamas, the Gulf of Mexico, coastal Florida and Puerto Rico. It is found in greatest numbers on low lying ground, generally within five km of the ocean. Burrow concentrations in optimum habitat may exceed 7500 per acre. The population distribution of this species is heavily influenced by water temperature. In areas where water temperatures fall below 20 °C in winter larval survival is affected.

The White Land crab is found throughout the Cayman Islands due to the relatively close proximity of the coastline, however, no comprehensive distribution studies have been undertaken. Two similar, but smaller, species of Gecarcinidae land crabs are also found in the Cayman Islands; *Gecarcinus ruricola* and *Gecarcinus lateralis*. Conservation efforts made towards the preservation of *Cardisoma guanhumi* will likely be of value to these species also.

Status

Distribution: Circumequatorial.
Conservation: There are currently no local or regional conservation initiatives and the species is not listed on CITES or the IUCN Redlist. Local conservation status is unknown.
Legal: *Cardisoma guanhumi* currently has no legal protection. Pending legislation, it would be protected under the National Conservation Law (Schedule II). The Department of Environment would be the lead body for legal protection.

Natural history

The White Land crab *Cardisoma guanhumi*, is a large burrowing crab. Its distribution on land is generally limited to within five km of the ocean. Large individuals may exceed 11cm across, and weigh over 500g. The White Land crab is slow-growing compared to most other crabs, reaching sexual maturity after approximately four years, when it attains a mass of 40g. Adults of both sexes have carapaces which range in colour from dark blue to various shades of brown, grey and white. Males have one enlarged cheliped. Juveniles generally have brown carapaces and orange legs.

The reproductive cycle of the White Land crab is closely linked to seasonal weather patterns and lunar phases. Migrations are initiated by heavy rains. For the first few weeks of the migratory period, foraging intensity is increased, and the crabs gain weight rapidly. Males actively court ripe females during this period. Fertilization is internal, and throughout July and August most females carry external egg masses. Eggs are carried for approximately two weeks prior to hatching, and must be released into salt water in order for the larvae to survive. Females typically complete spawning migrations within 1-2 days and generally spawn within 1-2 days of a full moon. Thus, though *Cardisoma* and other terrestrial crabs have been successful invaders of the land, they are still dependent on the ocean for at least part of their life cycle.

Several spawns per year may occur, with spawning season varying with location. In Florida, spawning extends June-December, peaking in October and November. In the Bahamas the season extends July-September, and in Venezuela July-November. Eggs hatch into free-swimming larvae. Thereafter, the larvae pass through five zoeal stages and one postlarval, or “megalopal” stage. Typically, development time from hatching to the first adult form is 42 days under laboratory conditions; however, this time may be much reduced in nature. Fecundity in *Cardisoma* is related to body mass. A 300g female may produce 300,000-700,000 eggs per spawning.

Adult crabs colonise various habitats, however, they are limited to areas where they can burrow to intersect the water table, and maintain a 1-2 litre pool in the bottom of the burrow. Thus they are functionally limited to areas where the water table is within approximately two metres of the surface. In south Florida, burrow densities have been found to be highest in firm, muddy substrates. *Cardisoma* tolerate salinities from freshwater to hypersaline, however, larval development has been shown to be optimal at salinities of 20-40 ppt.

Cardisoma guanhumi is mostly herbivorous, feeding on leaves, fruits, and grasses collected in the vicinity of burrows. They will also eat insects, carrion, faeces and are sometimes cannibalistic; thus, they are functional omnivores. Preferred foods include the leaves of Red and White mangrove, and Buttonwood. They feed throughout the day in shaded areas; however, if exposed to direct sunlight for prolonged periods, they prefer to feed at night. Peak activity time is at dawn and dusk, though activity tends to increase under low light levels and with reduced food availability.

Associated Habitats and Species for *White Land crab*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
1. Open sea 9. Mangrove 18. Urban and man-modified areas 19. Roads	Whelks & Soldier crab *Cittarium pica & Coenobita clypeatus* Cayman parrot *Amazona leucocephala* West Indian Whistling-duck *Dendrocygna arborea*

Current Factors Affecting *White Land crab*

- *Economic significance:* economically important in the Caribbean and Bahamas. In the Cayman Islands *Cardisoma* is generally exploited for food, though not at a commercial level.

- *Conflict situations*: damage to lawns from burrow digging has resulted in some people regarding Land crabs as garden pests.

- *Cultural significance:* a culturally important local food source within the Cayman Islands, *Cardisoma* is probably subject to significant exploitation. Harvesting pressure is not known, in part due to the subsistence nature of the collection, but is likely intensive and increasing in step with the growing population of the Islands.

- *Habitat loss:* loss of mangrove habitat due to drainage, fragmentation and filling, is likely a significant factor influencing the population of *Cardisoma*, however, no quantitative data currently exist.

- *Road kill:* bisection of migration routes by *roads* is likely the most significant cause of decline in this species. Coastal roads, and road-widening projects, would be expected to have a disproportionate impact on populations returning to the sea to spawn.

- *Insecticide:* impacts associated with landscaping control, and the Mosquito Research and Control Unit's aerial and land-based spraying regime remain undetermined.

Opportunities and Current Local Action for *White Land crab*

There is currently no legal protection specific for this species, however National Trust for the Cayman Islands Law (1987) Section 19(a) makes it an offence to take any form of wildlife from a Trust Property.

The requirement of migratory movement to and from the sea limits the effectiveness of single site protection for all land crabs.

There is no local action geared towards preservation of this species.

SPECIES ACTION PLAN for *White Land crab*

OBJECTIVES	TARGET
1. Ensure that local populations are protected from extirpation, and maintain the long-term stability of stock for sustainable harvest.	2015
2. Determine status of, and threats to, local populations.	2009
3. Ensure sustained support for the conservation of Land crabs through targeted education and awareness programmes.	2008

White Land crab PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
PL3. Protect *Cardisoma guanhumi* under Schedule II of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2,3
PL5. Develop, maintain and enforce regulations appropriate to maintenance of the long-term sustainable harvesting of *Cardisoma guanhumi*.	DoE MCB	CIG	2010	1
PL6. Strengthen the *Development Plan* on Grand Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP CPA	CIG MP DoE	ongoing	1,2
PL7. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	1,2
Safeguards & Management				
SM1. Establish a closed season and bag limits for collectors, incorporating minimum carapace size limit for collection (possibly to allow ca. 6-7 years worth of reproduction), as necessary to maintain population stability.	DoE	IntC	2012	1
SM2. Utilise key habitat and migratory route data to establish a system of protected areas, from which collection is either regulated or banned, as necessary to maintain population stability of *Cardisoma guanhumi* and other migrating land crabs.	CC DoE	IntC	2012	1,2
SM3. Investigate potential for under road conduit / animal corridors at key road crossing sites.	DoE	DoP NRA CPA DCB	2012	1,2
SM4. Consider ban on collection of berried females, and, subject to RM4, possibly all females as necessary to maintain population stability.	DoE		2012	1,2

SM5. Implement associated HAPs.	DoE		2015	1,2,3
Advisory				
None.				

White Land crab PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Map potential *Cardisoma guanhumi* habitat on all three islands.	DoE		2008	2
RM2. Survey existing population to determine baseline, immediate threats, and establish monitoring program.	DoE	MRCU	2010	1,2
RM3. Monitor biological aspects of catch through catchery sampling.	DoE		2010	1,2
RM4. Identification of local crab catchers, and potential crab processing and outlets.	DoE	MP	2011	1,2
RM5. Hold discussions with crab collectors to enlist their participation in the collection of catch information.	DoE	IntC MP	2011	1,2,3
RM6. Develop and conduct questionnaires, and field data-sheets for crab catchers to identify catch areas, quantities of catch, indicative effort, frequency of collection, timing and methods of collection, market price, destination of crab, processing etc.	DoE	IntC MP	2011	1,2
RM7. Determine peak spawning season and seasonal reproductive patterns.	DoE	IntC	2010	1,2
RM8. Determine critical migration routes, and influencing factors, towards implementing modification of road design to reduce mortality to *Cardisoma guanhumi* and other migrating Land crabs.	DoE	IntC	2012	1,2
RM9. Collaborate with international researchers to examine designs for under road conduits and animal corridors at key crossing sites along migratory routes for *Cardisoma guanhumi* and other migrating Land crabs.	DoE	IntC NRA MRCU	2012	1,2
Communication & Publicity				
CP1. Targeted awareness campaign to key sectors of local community to inform groups that are prone to non-sustainable Land crab harvesting practices.	DoE	MP	2010	3
CP2. Targeted awareness campaign to key sectors of Government to assist in adopting management and legislation recommendations.	DoE	CIG	2015	3
CP3. Produce educational fact sheet detailing ecology and biology of Land crabs for schools and local public.	DoE	DE	2009	3
CP4. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	3

REFERENCES and FURTHER READING for *White Land crab*

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www.sms.si.edu

"Sustainable Management of the Black Land Crab *Gecarcinus ruricola*, Colombia (162/11/015)"
http://darwin.defra.gov.uk/documents/11015/4212/11-015%20AR1%20-%20edited.pdf

TERRESTRIAL SPECIES

White-tailed tropicbird (Boatswain bird) *Phaethon lepturus*

INSERT IMAGES

Taxonomy and Range

Kingdom: Animalia, Phylum: Chordata, Class: Aves, Order: Pelecaniformes, Family: Phaethontidae
Genus: Phaethon, Species: lepturus

The White-tailed tropicbird (Boatswain bird) *Phaeton lepturus* is widely dispersed throughout tropical and subtropical oceans. A summer breeding visitor to the Cayman Islands, they are known from a small colony (ca. 10 pairs – possibly now abandoned), nesting in holes on the coastal bluff from Bats Cave east of Bodden Town, Grand Cayman, and a larger colony (ca. 40 individuals), in caves and holes in the cliffs along the north and south coast of the eastern end of the Bluff, Cayman Brac (Bradley 2000). The tropicbird is one of the Cayman Islands' six breeding seabirds.

Status

Distribution: In the West Indies, the White-tailed tropicbird *Phaethon lepturus* breeds from the Bahamas, south to St. Vincent. It has a large range, with an estimated global breeding Extent of Occurrence of 50,000-100,000 km² (IUCN). In the Cayman Islands, breeding sites are confined to two areas of Bluff cliff, one each on Grand Cayman and Cayman Brac.
Conservation: The White-tailed tropicbird *Phaethon lepturus* has a large global population, estimated to be ca. 50,000 individuals. As a result, it is listed as least concern globally (IUCN), however, the Cayman Island's birds have undergone a population collapse during the past 30 years. Once an abundant breeder in the Islands, with ca. 800 individuals reported in the 1980s, Brac residents reported 1990s numbers to be the lowest in living memory, with just 28 pairs individuals observed in 1996 (Bradley 2000), with numbers increasing slightly 1999-2003, to about 50 pairs (Bradley *pers com*).
Legal: The White-tailed tropicbird *Phaethon lepturus* is protected under the Animals Law (1976). Pending legislation, it would be protected under the National Conservation Law (Schedule I). The Department of Environment is the lead body for legal protection.

Natural history

The most distinguishing feature of the White-tailed tropicbird *Phaethon lepturus* is its extraordinarily long central tail-feathers, or "streamers", which equal the length of its entire body. These are displayed to best effect by the tropicbird's characteristically aerobatic flight.

White-tailed tropicbirds disperse widely across the oceans when not breeding. These slender seabirds feed on fish and squid, diving from the air in a similar fashion to a booby. They breed late January–July, laying a single egg, in rock crevices and caves (Bradley 2000).

Associated Habitats and Species for *White-tailed tropicbirds*

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
1. Open sea 7. Maritime cliffs and Ironshore 16. Caves	*Verbesina caymanensis* Brown booby *Sula leucogaster* Cayman parrot *Amazona leucocephala*

Current Factors Affecting *White-tailed tropicbirds*

- *El Niño Southern Oscillation* (ENSO): commonly referred to as simply "El Niño", ENSO is a global ocean-atmosphere phenomenon. The precipitous decline of the White-tailed tropicbird in the Cayman Islands is largely linked to the effects of El Niño, reducing the accessibility of fish stocks to foraging birds.

- *Disease:* the carcass of a White-tailed tropicbird infected with avian pox was recovered from Cayman Brac, 2008.

- *Introduced predators:* predators such as rats and cats probably inflict a significant toll on these ground-nesting birds.

- *Maritime pollution:* Cayman Brac lies close to major shipping lanes.

- *Aesthetic:* the White-tailed tropicbird is one of our most attractive seabirds. If successful, conservation efforts would effectively preserve one of the most spectacular species in the natural complement of the Cayman Islands.

- *Natural predators:* birds of prey, especially wintering Peregrine falcons *Falco peregrinus*.

Opportunities and Current Local Action for *White-tailed tropicbirds*

Training of nature guides in bird identification on Cayman Brac and Little Cayman as part of the Nature Tourism Initiative on the Sister Islands has been completed, however a structured monitoring and reporting programme for the islands' birdlife is not in place.

A *Checklist of Birds of the Cayman Islands* was published (Bradley 2006).

SPECIES ACTION PLAN for *White-tailed tropicbirds*

OBJECTIVES	TARGET
1. Commence detailed studies of *Phaethon lepturus* to determine status of local populations, and the nature of their decline.	2009
2. Implement conservation action towards halting the decline of *Phaethon lepturus*, and encouraging a population recovery.	2012
3. Increase nesting population of *Phaethon lepturus* by 100%.	2015

White-tailed tropicbirds PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3
PL2. Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
PL3. Protect *Phaethon lepturus* under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
PL4. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal developments and provide a responsive and effective enforcement mechanism.	DoP	DoE CIG	2010	2
PL5. Strengthen the *Development Plan* on Grand	DoP	CIG MP	ongoing	2

Cayman, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	CPA	DoE		
PL6. Promote establishment of a *Development Plan* for the Sister Islands, incorporating a long-term vision for the environmental, social, and economic development of the Islands.	DoP DCB	CIG MP DoE	ongoing	2
PL7. Enable DoE Conservation Officers to implement legal eradication of invasive species, as necessary to ensure the survival of endangered native species.	DoE	CIG	2008	2,3
Safeguards & Management				
SM1. Establish the bluff face Crown lands as protected areas, and use the *Environmental Protection Fund* to protect key areas of the lip of the Bluff edge, to provide a buffer from disturbance for breeding colonies.	CC	DoE MP NT	2009	2,3
SM2. Control predation by rats, cats, and deter potential for predation by *Iguana iguana*.	DEH DoE HS DoA	NT	2009	2,3
SM3. Restore damaged nesting habitat where possible, and utilise artificial cavities as appropriate, towards recovering 1980s population levels.	DoE NT MP		2012	2,3
SM4. Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1,2,3
SM5. Implement associated HAPs.	DoE		2015	2
Advisory				
A1. Develop and recommend guidelines for native vegetation maintenance / landscaping, particularly for developments in littoral areas.	DoE DoP	SIDA	2009	2
A2. Promote use of native plants in landscaping, through maintenance of existing vegetation and use of *Recommended Planting Palette* in new developments.	DoP	DoE	2009	2
A3. Targeted awareness of the need for the National Conservation Law and the Endangered Species (Trade & Transport) Law.	DoE	CIG NT	2006	1,2,3

White-tailed tropicbirds PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
RM1. Develop and implement methods of non-native predator control in colony areas.	DoE DoA	NT HS IntC	2009	1,2,3
RM2. Complete detailed mapping of nest sites to determine precise colony distribution and numbers.	DoE	NT IntC	2012	1
RM3. Undertake nest site monitoring, to determine feeding regimes, diet selection and breeding success, towards elucidating factors influencing fecundity.	DoE	IntC	2012	1
RM4. Assess population for possible effects of pollution and/or disease.	DoE	DoA MP IntC	2012	1
RM5. Collaborate with scientists from other Caribbean islands, with previous experience of artificial nesting cavity construction for *Phaethon lepturus*.	DoE	IntC	2012	1
RM6. Construct quarters for visiting scientists in Cayman Brac, and support research initiatives complimentary to the objectives of the NBAP.	DoE		2012	1,2,3
Communication & Publicity				
CP1. Raise public awareness of *Phaethon lepturus* and other birds through local media (e.g. *Know Your Islands*), special events (e.g. *Birds* stamp issue), public talks and schools presentations (e.g. *Do You Know Me?*) and natural history websites.	NT	DoE BC DE	2006 ongoing	2
CP1. REPORT: DoE and NMBCA jointly fund development of Bird ID cards for National Trust's "Do You Know Me?" programme, and Virtual Bird Guide for the Cayman Islands launched through CaymanBiodiversity.com, 2007.				
CP2. Install interpretative signs on nature trails and areas of interest.	NT DoE		2006	2
CP3. Use *Phaethon lepturus* as a flagship for the protection of key areas of *Marine cliffs and Ironshore* as areas of outstanding natural beauty.	DoE NT	CIG	2009	2
CP4. Utilise native flora and fauna, and associated preservation efforts, in the international promotion of the Cayman Islands.	CIG	DoE DoT NT MP QEIIBP	2010	2

REFERENCES and FURTHER READING for *White-tailed tropicbirds*

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Appendix K.4 - Proposed Project Habitats and Land Uses Map

East-West Arterial Extension,
Environmental Impact Assessment

Habitats and Land Uses

Figure: A

Man-modified Land Uses
- Commercial
- Man-made Pond
- Man-modified with Trees
- Man-modified without Trees
- Pasture
- Residential
- Roads

Upland Habitats
- Invasive Species - Casuarina
- Palm Hammock

Wetland_Habitats
- Ponds, Pools and Mangrove Lagoons
- Seasonally Flooded / Saturated Semi-deciduous Forest
- Seasonally Flooded Mangrove Forest and Woodland

Sources: Cayman DOE and ESRI

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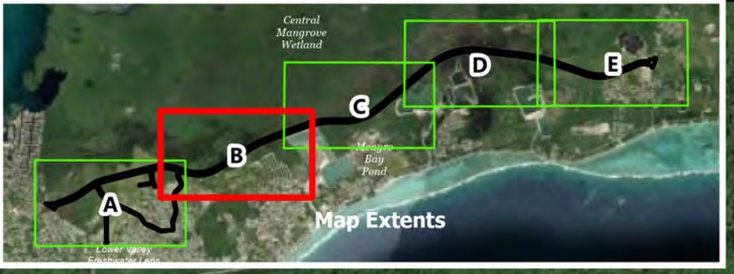

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East-West Arterial Extension,
Environmental Impact Assessment

Habitats and Land Uses

Figure: B

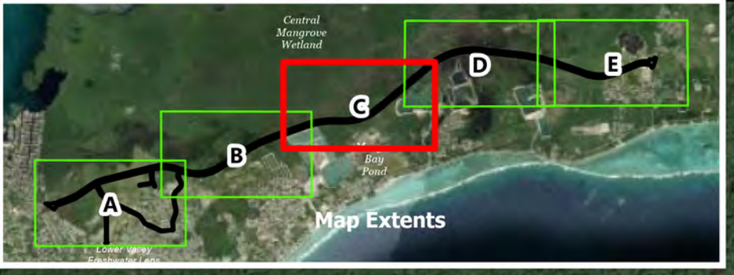
Man-modified Land Uses
- Man-modified with Trees
- Man-modified without Trees
- Residential

Upland Habitats
- Palm Hammock

Wetland_Habitats
- Ponds, Pools and Mangrove Lagoons
- Seasonally Flooded Mangrove Forest and Woodland

Sources: Cayman DOE and ESRI

0 300 600 Feet



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East-West Arterial Extension,
Environmental Impact Assessment

Habitats and Land Uses

Figure: C

Man-modified Land Uses

- Man-modified with Trees
- Man-modified without Trees

Wetland_Habitats

- Seasonally Flooded Mangrove Forest and Woodland

Sources: Cayman DOE and ESRI

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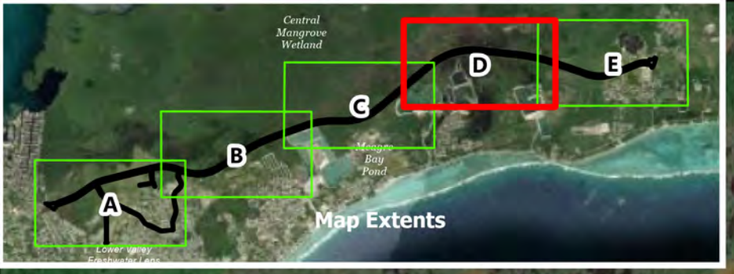

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East-West Arterial Extension,
Environmental Impact Assessment

Habitats and Land Uses

Figure: D

Man-modified Land Uses

Man-modified with Trees

Upland Habitats

Dry Forest and Woodland

Wetland_Habitats

Seasonally Flooded Mangrove Forest and Woodland

Sources: Cayman DOE and ESRI

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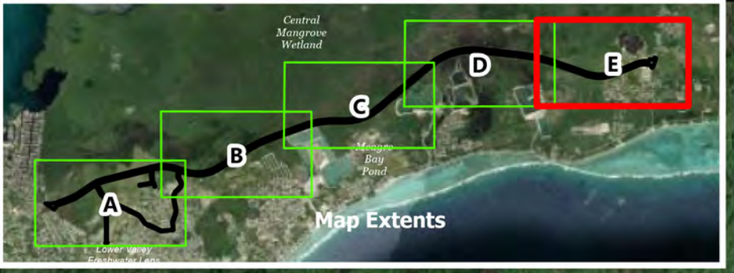

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East-West Arterial Extension,
Environmental Impact Assessment

Habitats and Land Uses

Figure: E

Man-modified Land Uses
- Commercial
- Institutional
- Man-modified with Trees
- Man-modified without Trees
- Residential
- Roads

Upland Habitats
- Dry Forest and Woodland

Wetland_Habitats
- Seasonally Flooded Mangrove Forest and Woodland

Sources: Cayman DOE and ESRI

0 300 600 Feet

Appendix K.5 - 2020 Cayman Islands Ecosystem Accounting

Cayman Islands Ecosystem Accounting

2020 Ecosystem Account

February 2022

Funded by UK Government

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Disclaimer

Document evolution

Final report	01/2022	Reviewed by Jake Kuyer

This report is based on eftec's Version 2 – January 2020 report template.

2020 Ecosystem Account

At 264 square kilometres with a population of 65,786 in 2020 (Economics and Statistics Office, 2021), the Cayman Islands is dependent on its wealth of environmental assets, in fact the environment contributes at least an estimated **CI$ 62 million** in value to the Cayman Islands in 2020 (Table 2). These environmental assets provide an abundance of benefit to the people across the Cayman Islands including the: value added to the tourism industry (CI$21 million per year); carbon sequestered by coastal and forest habitats (CI$12 million per year); amenity value due to mangroves (CI$1.3 billion); and other more difficult to measure values such as local recreation and the biodiversity that makes life richer to both local inhabitants and visitors. The economic prosperity and wellbeing of the people of the Cayman Islands are fundamentally linked to effective management of the environment, and an understanding of the value that it provides.

Ecosystem accounts provide economic evidence that supports the delivery of sustainable value from environmental assets[1]. Effective management of the environment must consider the extent and underlying condition of ecosystems over time, as well as the range of benefits they provide and the economic value of those benefits to different stakeholder groups. Specifically, the data in ecosystem accounts can help address several fundamental questions for policy and planning:

- What environmental assets are present and what state are they in? How does this change over time?
- What benefits does the environment provide? How are these received by beneficiaries?
- What is the economic value of these benefits? How is this value distributed across the population?

The environmental and socioeconomic data produced within Ecosystem Accounts provide a basis for answering these questions. Their importance is reflected in the development of the System of Environmental Economic Accounting – Ecosystem Accounts (SEEA-EA)[2], by the United Nations (UN). Officially adopted by the UN as a Statistics standard in March 2021, the SEEA-EA supports the implementation of ecosystem accounting as a part of National Accounts by National Statistics Offices around the world (see Box 1).

Development of ecosystem accounts provide indicators that compliment national economic and social indicators (such as GDP and demographic trends), and this evidence can support policy development and decision making, such as:

- Effective decision-making which impacts on the environment and the benefits it provides;
- Action on climate change, including mitigation, adaptation and resilience to impact;
- Delivery of international initiatives, such as the UN Sustainable Development Goals (SDGs)3; and
- A green post-COVID economic recovery, and in particular a sustainable tourism sector.

For ecosystem accounts to be a valuable addition to government and organisational policy and planning strategy, they should be embedded into the decision-making process, and updated on an annual basis both

[1] See Box 1 for more detail.

[2] See: https://seea.un.org/ecosystem-accounting

[3] More information is available at: https://sdgs.un.org/goals

to provide current data and to monitor trends over time. A partnership of eftec, the UK Joint Nature Conservation Committee (JNCC), the New Economics Foundation, and the Cayman Islands Department of Environment (DoE), with funding from the UK Government via the Darwin Initiative, have continued developing the ecosystem accounting process in the Cayman Islands. The aim is to embed the consistent production of national environmental statistic through ecosystem accounting within the Cayman Islands Government.

Physical flow and monetary flow

A range of benefits have been assessed within the Ecosystem Account, with estimated annual physical flow and monetary values given a confidence rating, as described in Table 1. The confidence rating is based on the robustness of the evidence and assumptions used. The Ecosystem Service Flow and Asset Accounts are presented in Table 2. The supplementary information is presented in Table 3. Note that the evidence presented in the summary table should be interpreted as a partial valuation of the total contribution of the environment to the Cayman Islands. The Cayman Islands environment provides additional benefits, such beach erosion protection and local recreation, which cannot be accurately quantified or valued at this time due to data limitations. Future iterations of the accounts should seek to address these gaps to provide a fuller valuation (see Appendix A of the Technical Report).

Table 1: Description of confidence

Confidence	Symbol	Description
Low	●	Evidence is partial and significant assumptions are made so that the data provides only order of magnitude estimates of value to inform decisions and spending choices.
Medium	●	Science-based assumptions and published data are used but there is some uncertainty in combining them, resulting in reasonable confidence in using the data to guide decisions and spending choices.
High	●	Evidence is peer reviewed or based on published guidance so there is good confidence in using the data to support specific decisions and spending choices.
No colour	●	Not assessed

Table 2: Ecosystem Service Flow and Asset Accounts

Produced at: January, 2022	**Ecosystem Service Flow Accounts**						**Ecosystem Asset Account (PV* CI$m)**
	Physical flow (unit/yr.)			**Monetary value (CI$m/yr.)**			
	Reporting	**Confidence**	**Physical indicator**	**Reporting**	**Confidence**	**Valuation metric**	
Fisheries	702,000	●	Volume of reef fish caught in the Cayman Islands (lbs/yr.)	3	●	Net benefit value of recreation, subsistence and small-scale commercial fishing on coral reefs	51
Agriculture	5,061	●	Total livestock production (no./yr.)	2	●	Total value of livestock production	25
	-	●	Total arable production (t/yr.)	18	●	Total value of arable production	272
Carbon sequestration	68,500	●	Total tonnes of CO_2e sequestered by coastal ecosystems (tCO_2e/yr.)	11	●	Total value of CO_2e sequestered by coastal ecosystems	272
	9,393	●	Total tonnes of CO_2e sequestered by forest ecosystems (tCO_2e/yr.)	1	●	Total value of CO_2e sequestered by forest ecosystems	37
Coastal protection	-	●	Area of coral reef (km^2)	7	●	Coastal protection value by coral reefs	112
Tourism	598,263	●	Total visitor arrivals (stay-over and cruise ships) (visitors/yr.)	21	●	Total tourism added value attributed to marine ecosystems	943
Amenity value	26,197	●	Number of houses (no.)	-	●	Amenity value of mangroves	1,306
			Total value	**62**	●	**Mix of values**	**3,020**

* The present value (PV) is the sum over 25-years. It is the total monetary value of a stream of benefits profiled over time, accounting for greater worth being placed on nearer term values than those further in the future.

Table 3: Supplementary information

Produced at: January, 2022	Ecosystem Service Flow Accounts						Ecosystem Asset Account (PV* CI$m)
	Physical flow (unit/yr.)			Monetary value (CI$m/yr.)			
	Reporting	Confidence	Physical indicator	Reporting	Confidence	Valuation metric	
Other exchange values							
Tourism	598,263	●	Total visitor arrivals (stay-over and cruise ships) (visitors/yr.)	59	●	Remaining tourism expenditure not attributed to ecosystems	2,706
Welfare values							
Tourism	598,263	●	Total visitor arrivals (stay-over and cruise ships) (visitors/yr.)	35	●	Total WTP to prevent decline in quality of coral reefs from medium to low levels	1,873
Non-monetised benefits							
Water supply		●			●		
Renewable energy		●			●		
Beach erosion protection		●			●		
Local recreation	378	●	Total number of diving spots (no.).		●		

* The present value (PV) is the sum over 25-years. It is the total monetary value of a stream of benefits profiled over time, accounting for greater worth being placed on nearer term values than those further in the future.

Ecosystem Extent and Condition Accounts

Spatial analysis was conducted to assess the ecosystems present within the Cayman Islands. The quantity (i.e., extent) and quality (i.e., condition) of the present ecosystems are recorded in the Ecosystem Extent Account (**Table 4**) and Ecosystem Condition Account (**Table 5**), respectively. Beyond the extent and condition of ecosystems, other indicators for spatial configuration and other forms of capital are also included in the assessment (**Table 6**). The accounts can be used to monitor changes in the environmental assets over time. The terrestrial and marine ecosystem of the Cayman Islands are mapped in **Figure 1, Figure 2** and **Figure 3.**

Table 4: Ecosystem Extent Account

IUCN Code	Ecosystem	Grand Cayman	Cayman Brac	Little Cayman	Cayman Islands
Terrestrial					
Total area (km^2)		**200**	**38**	**29**	**267**
F2.7	Permanent salt and soda lakes	-	0.1	-	0.1
MFT1.2	Intertidal forests and shrublands	62	0.1	2	64
MT1	Shorelines biome	-	0.9	0.6	2
MT2.1	Coastal shrublands and grasslands	1	1	1	4
T1.2	Tropical-subtropical dry forests and scrubs	15	12	1	29
T3.1	Seasonally dry tropical shrublands	25	7	16	47
T5.3	Sclerophyll hot deserts and semi-deserts	0.9	-	-	0.9
T7.4	Urban and industrial ecosystems	10	1	0.4	11
T7.5	Derived semi-natural pastures and old fields	17	-	-	17
TF1.1	Tropical flooded forests and peat forests	13	0.4	4	19
TF1.2	Subtropical/temperate forested wetlands	0.8	-	-	0.8
TF1.3	Permanent marshes	0.2	-	0.04	0.3
TF1.4	Seasonal floodplain marshes	0.4	0.01	0.1	0.5
Marine (benthic and lagoon shelf)					
Total area (km2)		**658**	**21**	**209**	**893**
M1.1	Seagrass meadows	80	0.2	3.2	83
M1.3	Photic coral reefs	282	13	111	406
M1.6	Subtidal rocky reefs	269	8	95	373
M1.7	Subtidal sand beds	18	0.1	0.5	21
M1.8	Subtidal mud plains	10	-	-	10

Source: See Appendix A.1 for input data sources.
Table Notes: See Appendix C for DoE and IUCN ecosystem typology comparison.

Table 5: Ecosystem Condition Account

Category	Sub-category	Grand Cayman	Cayman Brac	Little Cayman	Cayman Islands
Ecological communities and species					
Area of dry forest above 20 feet elevation (km^2)		38	-	-	38
Area of protected land (km^2)		14	1	2	17
Area of proposed protected land (km^2)		44	10	15	69
Marine protected area (km^2)		88	7	15	110
Carbon stock in habitats (MgC)	Inside MPAs	446,100	100	12,600	458,800
	Outside MPAs	2,616,800	8,200	192,000	2,817,000
Total area of species-specific habitat (km^2)		5	15	2	22

Category	Sub-category	Grand Cayman	Cayman Brac	Little Cayman	Cayman Islands
Species points by type (#)	Aegiphilia caymanensis	2	-	-	2
	Pisonia margaratae	119	-	-	119
	Sister Islands Rock Iguana Cyclura nubila caymanensis - nest locations	-	-	238	238
Land					
Total land area owned by the Crown (km^2)		162	29	84	275
Total land area owned by the National Trust (km^2)		123	15	19	157

Source: See Appendix A.2 for input data sources.

Table 6: Other indicators

Category	Sub-category	Grand Cayman	Cayman Brac	Little Cayman	Cayman Islands
Spatial configuration					
Number of caves (#)		31	25	2	58
Area of sinkholes (km^2)					0.04
Other forms of capital					
Number of public moorings (#)	Inside MPAs	88	20	40	148
	Outside MPAs	155	48	26	229

Source: See Appendix A.3 for input data sources.

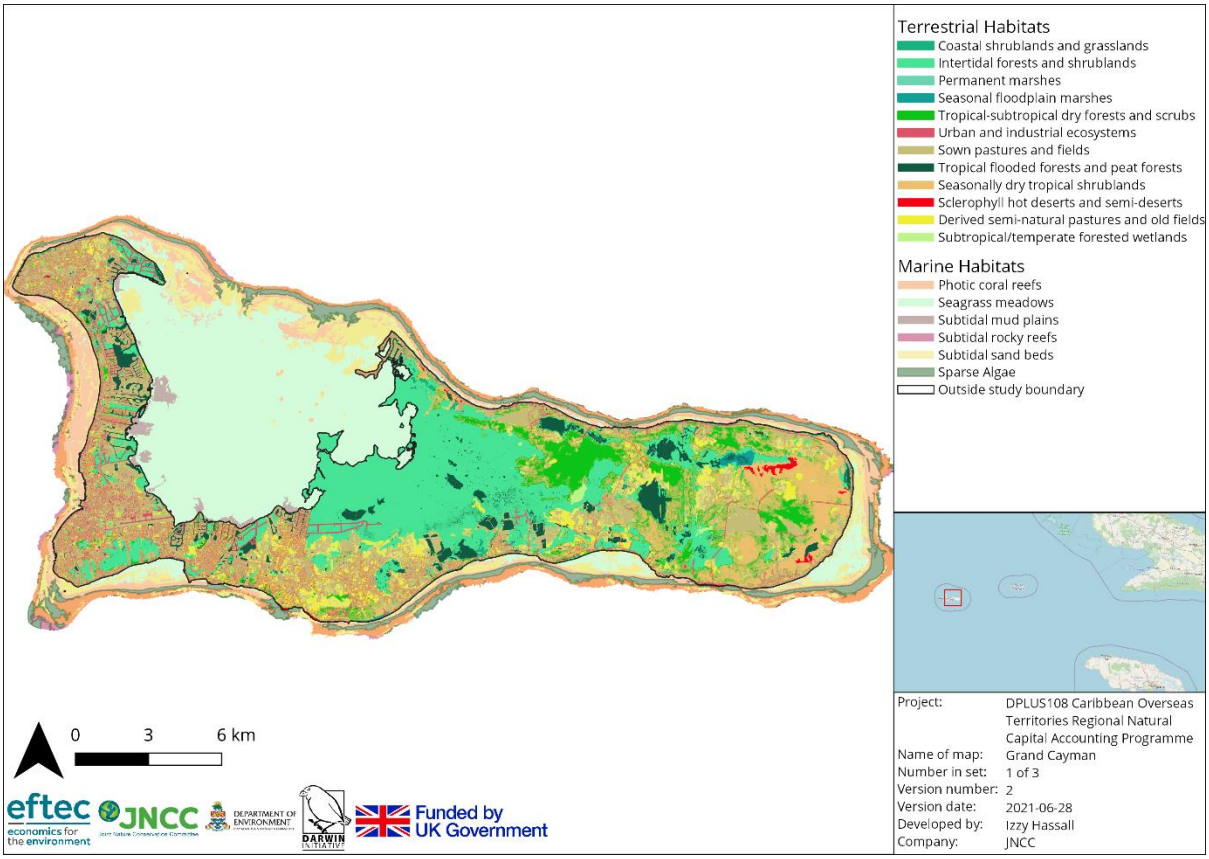

Figure 1: Grand Cayman terrestrial and marine ecosystems

Source: JNCC GIS analysis of Landcover 2013, Benthic Shelf 2008 and Lagoon Shelf (2008) from Cayman Islands DoE

Figure 2: Cayman Brac terrestrial and marine ecosystems

Source: JNCC GIS analysis of Landcover 2013, Benthic Shelf 2008 and Lagoon Shelf (2008) from Cayman Islands DoE

Figure 3: Little Cayman terrestrial and marine ecosystems

Source: JNCC GIS analysis of Landcover 2013, Benthic Shelf 2008 and Lagoon Shelf (2008) from Cayman Islands DoE

Box 1: Ecosystem accounts

The ecosystem accounting approach helps frame the interconnection between humans and the environment in economic terms. The environment can be viewed as an asset, or natural capital, that provides a revenue of ecosystem goods and services, which benefit people. This includes provisioning services, such as agricultural produce or fisheries, regulating services, such as protection from natural hazards and carbon sequestration, and cultural services, such as tourism and local recreation. These benefits can be measured and valued in a consistent and structured manner, and compiled into an accounting framework, called ecosystem accounts. Ecosystem accounts produce environmental statistics which provide an evidence base on the benefits provided by the environment.

An ecosystem account is structured as a set of component accounts, each of which require data to be consistently collected and collated in a systematic way. The main components of an ecosystem account are:

- **Ecosystem Extent and Condition Accounts** - an inventory that holds details on the state of all the ecosystem assets that are present, including their extent and condition (quality and other relevant factors). For example, the spatial area of a reef system, and its health in terms of suitable indicators.
- **Ecosystem Services Flow Account (physical terms)** – contains the flow of goods and services which are dependent on the ecosystem assets that are identified in the extent and condition accounts. This includes benefits related to the provisioning, regulating and cultural goods and services provided by ecosystems.
- **Ecosystem Services Flow Account (monetary terms)** – calculates the annual value of the estimated flow of benefits that are captured in the Ecosystem Services Flow Account (physical terms).
- **Ecosystem Asset Account** – records the net present value approach to obtain values in monetary terms for ecosystem assets based on the monetary valuation of ecosystem services.

This set of accounts therefore monitor the presence and state of different habitats, the benefits these provide, and the value that humans receive from them. When updated year on year they provide a useful means to monitor and evaluate growth or decline in any of these contributing elements, while also helping to understand the relationship between the environment, the services it provides, and how humans use and value them.

The data collection and analysis for the Cayman Islands 2020 Ecosystem Account occurred in parallel to the development and publication of the SEEA-EA standard. As such while the Cayman Islands 2020 Ecosystem Account is generally aligned with the direction and intention of the SEEA-EA standard, full compatibility should be worked towards as the implementation of the SEEA standard continues to evolve globally over time.

Contents

1.Introduction

eftec, with project partner Joint Nature Conservation Committee (JNCC) and funding from the UK Government, have initiated *natural capital accounting* with the environment and statistics departments of the local governments of five UK Overseas Territories (OTs)[4]. The purpose is to build initial *ecosystem accounts* and to provide a foundation for data collection and processing to produce national environmental statistics in support of better decision making.

As far as possible, the ecosystem accounting work is aligned to producing UN SEEA-EA compatible accounts. The UN adopted the SEEA-EA as an internationally recognised statistical standard in March 2021. This is an important step supporting the development and integration of ecosystem accounts into national accounts, and thereby forming a basis of environmental economic evidence for policy makers. The SEEA-EA standard is new, much work is yet to be done on practical implementation. It will take time before a comprehensive and broadly applicable guidance is developed and consistently put into practice. Therefore, the accounts can be expected to evolve over time, becoming more robust and complete through subsequent iterations. The current project establishes the groundwork from which this can occur.

Ecosystem accounts are a structured way to measure and monitor the benefits provided by the natural environment. They can be produced alongside other national accounts as a basis for understanding human dependence and impact on the environment, and to inform policy and planning decisions. They should be updated annually to build up the available evidence base, to demonstrate change over time, and to improve on the methods applied.

This report gives an overview of the concepts, process and structure of ecosystem accounts, and current progress on their implementation. It provides additional context for the Ecosystem Account summarised above. The remaining sections are structured as follows:

- **Section 1:** Introduction
- **Section 2:** Background on natural capital and ecosystem accounts
- **Section 3:** Implementation of ecosystem accounting
- **Section 4:** Conclusion

[4] The OTs included in this project are: Anguilla, British Virgin Islands, Cayman Island, Montserrat and Turks and Caicos Islands.

2. Natural Capital and Ecosystem Accounts

This section presents the background and concepts of natural capital and ecosystem services, also describing the process which produces ecosystem accounts and the structure of the accounts. As the SEEA-EA is recently published, the relationship with natural capital accounting is still evolving. As applied in this report, the SEEA-EA standard for ecosystem accounting can be thought of as a subset of the broader process of natural capital accounting. They generally apply the same concepts and methods. SEEA-EA does so in a more specific way to align with the System of National Accounts (which is the internationally agreed standard set of recommendations on how to compile measures of economic activity, such as GDP).

2.1 Concepts

Natural capital is defined by the UK Natural Capital Committee as: "the elements of nature that directly and indirectly produce value or benefits to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions". Natural capital, or ecosystem assets, provide benefits to people, through ecosystem services. The focus of ecosystem accounting is to measure and value the benefits from ecosystem services and the underlying ecosystem assets, and to present this evidence in a structured format called ecosystem accounts.

In the Common International Classification of Ecosystem Services (CICES), ecosystem services are defined as 'the contributions that ecosystems make to human well-being'. They are seen as arising from the interaction of biotic and abiotic processes and refer specifically to the 'final' outputs or products from ecological systems, specifically the things directly consumed or used by people. Ecosystem services are therefore the flows of benefits which people gain from natural ecosystems, and natural capital is the stock of ecosystems from which these benefits flow (**Figure 2.1**). Ecosystem services can be subdivided into provisioning, regulating, cultural and supporting services (**Box 2.1**).

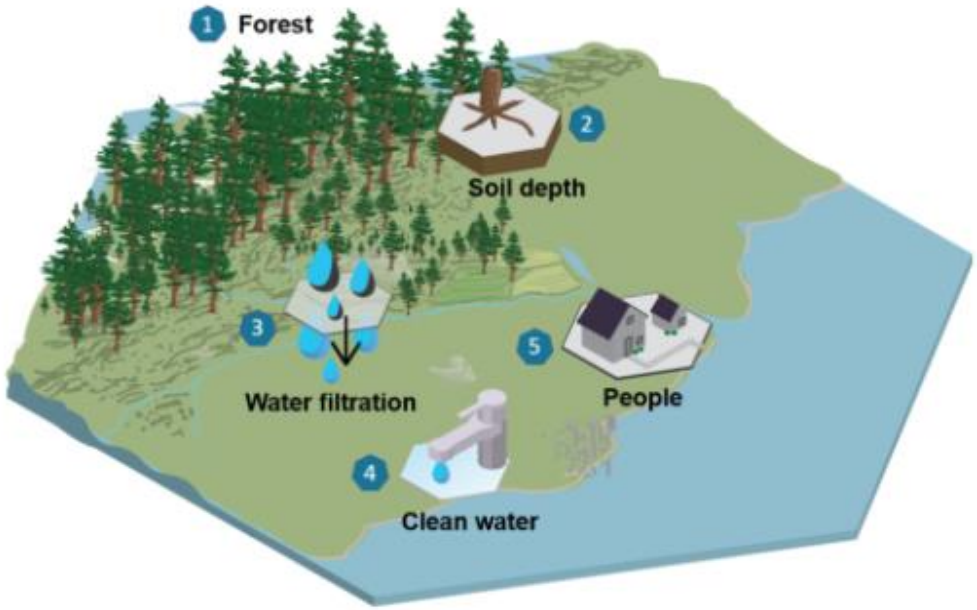

Figure 2.1: How ecosystem assets generate ecosystem services to beneficiaries in a spatial relationship
Source: UN (2021)

Viewing the environment through the lens of natural capital is an effective means to consider its value in the language of economics. Using the concept of capital and expressing the value of ecosystem services in monetary terms helps to integrate the natural environment into decision-making, in which it can otherwise be invisible.

Box 2.1: Types of ecosystem services

The most widely used definition of ecosystem services is from the Millennium Ecosystem Assessment: "the benefits people obtain from ecosystems". It further categorised ecosystem services into four types:

- **Provisioning services**: material outputs from nature (e.g., seafood, water, fibre, genetic material).
- **Regulating services:** indirect benefits from nature generated through regulation of ecosystem processes (e.g., mitigation of climate change through carbon sequestration, water filtration by wetlands, erosion control and protection from storm surges by vegetation, crop pollination by insects).
- **Cultural services:** non-material benefits from nature (e.g., spiritual, aesthetic, recreational, and others)
- Provisioning, regulating and cultural services are referred to as final ecosystem services and are underpinned by **Supporting services**. These are the fundamental ecological processes that support the delivery of other ecosystem services (e.g., nutrient cycling, primary production, soil formation).
- Analysis of benefits from natural capital also includes **abiotic services**, the benefits arising from fundamental geological processes (e.g., the supply of minerals, metals, oil and gas, geothermal heat, wind, tides, and the annual seasons).

2.2 The ecosystem accounting process

Ecosystem accounting is a process of compiling and linking data on the quantity and quality of ecosystem assets and physical and monetary data on the benefits they provide. The data are presented in a consistent framework, which should as far as possible align with the SEEA-EA standards for producing ecosystem accounts. These accounts present evidence to measure and monitor benefits from ecosystems consistently over time to inform policy and planning decisions. In the same way that the structured recording of other national statistics in conventional national accounts informs and improves a country's economic and social decisions, ecosystem accounts can inform better management of a country's ecosystem assets.

Ecosystem accounts are structured as a set of interrelated component accounts that record the value that is provided by a country's ecosystem assets. The aim of these accounts is to answer the following key questions:

- What ecosystem assets do we have? -> An Ecosystem Extent and Condition Account (together sometimes referred to as an *asset register)* is an inventory that holds details of the stocks of ecosystem assets that are present within the geographical boundary of the country. For example, a coral reef may contain a variety of species and the quality of this diversity may be measured by the number of species recorded on the site for a few selected taxa (e.g., fish, coral). The asset

register helps track trends in the quantity and quality of ecosystems.

- What benefits do these assets provide? -> An Ecosystem Services Flow Accounts (physical terms) contains the flow of goods and services which are dependent on the ecosystems that are identified in the extent and condition accounts. This account provides information on the benefits provided by ecosystems, with the flows measured in different physical units (e.g., number of recreational visits or visitors, weight of produce).
- What is the value of these benefits? -> An Ecosystem Services Flow Accounts (monetary terms) calculates the annual value of the estimated flow of goods and services that are captured in the Ecosystem Services Flow Accounts (physical terms). The Ecosystem Asset Account measures the aggregate value of flows of goods and services into the future.

2.2.1 Data collection

Some relevant data will already exist, such as economic data for natural resources, the tourism sector, and utilities and infrastructure data. Additional data can be collected through social research including surveying, economic and econometric analysis, and monitoring of environmental outputs and levels of usage. Geo-referenced socio-economic data along with infrastructure maps can be compared with habitat maps to help identify and measure location specific use.

In practice, secondary data in a readily useable format may be limited, especially with regards to regulating services. Resource and time constraints can further limit primary data collection. This may require an innovative approach with what is available, clearly caveated with assumptions and further inferences to fill remaining gaps and making use of modelling where possible. In such cases, it is important to prioritise the most material benefits in the given context and to focus on where the most value is being provided.

2.3 Structure of ecosystem accounts

This section provides more detail on the component accounts which together make up the ecosystem account. **Figure 2.2** presents the links between the components of ecosystem accounts.

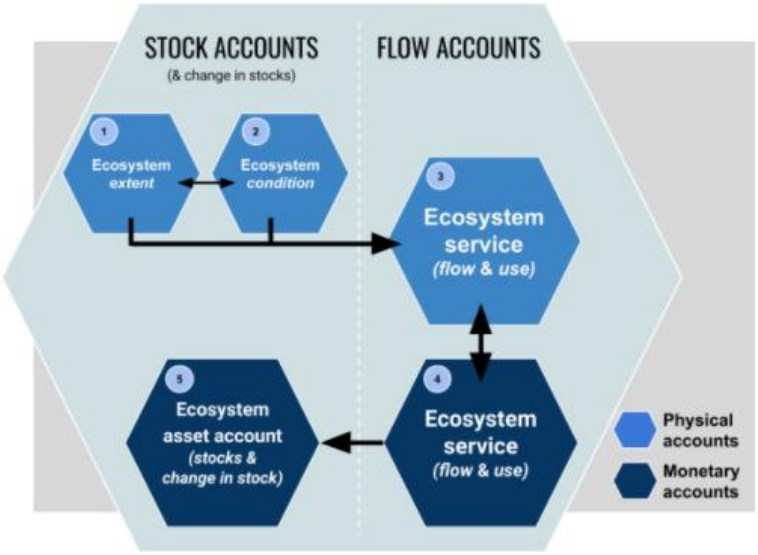

Figure 2.2: Ecosystem accounts and how they relate to each other
Source: UN (2021)

2.3.1 Ecosystem Extent and Condition Accounts

The extent and condition accounts (or asset register) record the quantity and quality of all of the ecosystem assets in a given area. The asset register therefore acts as an inventory that holds details of the stocks of ecosystem assets that are relevant to the accounts, along with information on their quality, functionality, and other relevant factors.

The foundation for an asset register is the distribution and condition of ecosystems which are present within the accounting area. Ecosystem extent can be determined and mapped by desk-based analysis, such as with data available from existing surveys and obtained through existing remote sensing techniques such as Earth Observation (EO) and processed using Geographic Information Systems (GIS). The combination of remote sensing and on-the-ground techniques provides a strong evidence base from which to build the spatial basis for an asset register.

2.3.2 Ecosystem Service Flow Accounts - Physical Terms

The Ecosystem Service Flow Accounts - Physical Terms account records the flow of goods and services from ecosystems in the asset register. They provide a physical measure of the quantity of benefits provided on an annual basis and include information on the variety of ways that the environment provides value to people. These benefits include the provisioning, regulating and cultural services provided by ecosystems, such as fisheries, sea surge protection and locations for tourism.

Not all physical flows from ecosystems will be significant or material for evaluating. The most relevant flows of benefits should be identified and prioritised for inclusion in an account. Once the prioritised benefits that are possible to quantify are identified, the annual flows should be measured. The approach to measuring the benefits provided within the OTs will vary between territories by type of ecosystem service and benefit.

2.3.3 Ecosystem Service Flow Accounts – Monetary Terms and Ecosystem Asset Accounts

The Ecosystem Service Flow Accounts - Monetary Terms measures the monetary value of the flows of benefits that are captured in the Ecosystem Service Flow Accounts - Physical Terms. It aims to measure the exchange value of both market and non-market ecosystem services through different economic valuation techniques. This applies to both the annual value of ecosystem services and the ecosystem asset value, measured as the aggregate value of the expected annual stream of benefits over the defined assessment period (set out in the Ecosystem Asset Account).

As the monetary accounts measures value in a common metric, money, it allows for comparison between different benefits within the accounts, and between different accounts. Importantly, it also allows for comparison across many other factors which may act as inputs to decision making, such as: national economic accounts; the financial cost of an intervention; replacement costs for critical infrastructure; the price paid for public provision of alternative services; and income revenue streams from traditional capital assets. Monetary values help assess trade-offs across these factors, and to justify allocation of resources to environmental management and protection.

2.3.4 Account summary

Physical flows and monetary flows should be recorded separately, and then reported together. This creates added value by showing the links between ecosystems, ecosystem services and the value of benefits to people. Where monetary valuations are uncertain, but suggest certain benefits are important, physical flow indicators might be the best measure. In the context of the OTs, it may be likely in some cases that producing Ecosystem Service Flow Accounts - Physical Terms is more feasible than monetary valuations, but even so the aim should be to build monetary accounts to guide the collection of the most important data for the Ecosystem Service Flow Accounts - Physical Terms. Results should always be expressed with appropriate caveats to ensure that the monetary units applied reflect the value as accurately as possible. A traffic light system can be used to indicate uncertainties in data or methods applied in the Ecosystem Account (see **Table 1**).

Table 1: Presenting uncertainty in the physical and monetary terms of ecosystem services

Level of confidence	Symbol	Description of confidence
High	●	Evidence is peer reviewed or based on published guidance so there is good confidence in using the data to support specific decisions.
Medium	●	Science-based assumptions and published data are used but there is some uncertainty in combining them, reasonable confidence in using the data to guide decision.
Low	●	Evidence is partial and significant expert judgement-based assumptions are made so that the data provides only order of magnitude estimates of physical quantity or monetary value.

3.Implementation of ecosystem accounting

This section outlines the implementation of the ecosystem accounts, covering progress and next steps of the current ecosystem accounting activities, and areas to explore for applying the ecosystem accounts to policy and planning.

3.1 Current progress and next steps

The current project has initiated and developed ecosystem accounts in the five Caribbean UK OTs. Further embedding them involves engagement with government departments and other stakeholders to gain an understanding of key issues, discuss the concepts and uses of the accounts, and identify and collect available data.

Ideally, the process should be embedded in national statistics outputs through annual updates of the accounts, building more reliable data systems and methodologies with each iteration. Data collection and management systems will need to be developed further to ensure the quality of outputs is of an appropriate level to inform policy and planning. This may involve the use of standardised protocols and knowledge about data handling and processing; however, adoption of these broader protocols must also be applicable to the specific local context. These data collation processes should be led by the statistics departments of each OT, who have expertise in generating accurate and consistent data sets, and can align to the SEEA-EA statistics guidance.

While progress needs to be made, it does not necessarily have to be resource intensive once accounting systems are set up, which can then evolve over time rather than requiring significant investment in any one time period. Updates can be streamlined so that as new data is generated, it is fed into the ecosystem accounting system as a matter of routine. While the accounts should be produced on an annual basis, it is not necessary to update every element of them every year – so long as it is transparent what is updated and what is not.

The frequency of updates needs to take into account how sensitive different variables are to change, and aspects of the accounts which would not be expected to change much year on year, or for which resource intensive primary research is needed, may be updated less regularly. However, a significant benefit of the accounts is their ability to monitor trends and provide up to date information to decision makers, and as such they should be reproduced regularly. Any progress or improvement, even if incomplete, will add value to the overall process, and its ability to effectively feed into decision making. As the accounts become increasingly complete records of the value that ecosystems provide, they should become further embedded in the OTs policy and planning systems and a vital component of government statistics and public record.

In the context of sustained pressure to develop, and focus on economic growth in the OTs, it is especially critical to understand what impacts development has on the environment and its ability to provide ecosystem services which benefit people. By initiating and building on the Ecosystem Accounts in the OTs, it is hoped that additional information will be generated that will directly contribute to this understanding and improved management of the economy and environment for the sustainable prosperity and well-being of the people of the OTs.

3.2 Use of ecosystem accounts

The ultimate purpose of ecosystem accounts is to facilitate improved management of the economy and environment. Better evidence leads to better informed decisions, but those decisions are reliant on understanding and interpretation of the evidence. A considerable advancement of ecosystem accounts is their ability to compile ecological, biophysical, socioeconomic, economic, and other diverse data and produce evidence in a readily useable format. The structure of ecosystem accounts provides a consistent means to present this evidence, but it can also be adapted to specific uses, producing indicators and other information fit for purpose.

There are many areas that the evidence from ecosystem accounts can contribute to, such as:

- Link to progress on the SDGs
- Link to progress on domestic policy
- Inform on land use planning
- Monitor progress (growth) / deterioration (decline) over time
- Engage with the private sector
- Understand distribution of benefits (sectoral, individuals)
- Understand proportion of economy dependent / at risk
- Understand scale of potential economic impact in from specific decisions
- Identify priority areas for value provision and maintenance
- Identify targets for investment and enhancement
- Information for public awareness campaigns
- Inform industrial and economic strategy
- Understand tax base effects
- Understand resident use and benefit of environment
- Investigate future impact and sustainability
- Conduct economic planning through scenario analysis
- Consider potential climate change impacts
- Target spending for a green economic recovery
- Create indicators to track success management / highlight areas for improvement
- Improve data management and flow across departments and sectors creating efficiencies
- *Many other specific uses are possible

Future work should aim to link the ecosystem accounts to relevant policy aims and initiatives. The next phase of the current project will begin to explore this by working with the local government departments to establish priority areas for further development.

4. Conclusion

The 2020 ecosystem accounts represent progress towards establishing an evidence base on the value that the environment provides. However, it should not be considered a one-off assessment, but rather a part of an ongoing process of data collection, methodological improvement and policy and planning implementation that should occur annually. As the SEEA-EA becomes more widely adopted, ecosystem accounts will increasingly inform government policy and planning internationally. The OTs are at the forefront of this process with the current set of accounts but will need to commit to their ongoing development and uptake to maintain this position as the practice evolves.

Specifically, future effort to further develop ecosystem accounting can focus on:

- **Stakeholder engagement** – presenting the approach and results to a wide range of stakeholders to build awareness and support.
- **Capacity building** – support for the continued development of the technical skills required to compile and update Ecosystem Accounts.
- **National Statistics Offices** – working with government statisticians to embed the SEEA-EA in National Accounts.
- **Policy and planning implementation** – develop and promote the use of Ecosystem Accounts to support policy and planning aims and objectives.
- **Draw on regional ecosystem accounting practitioners** – share knowledge and experiences across the OTs, including data, methodologies and applications of Ecosystem Accounts.
- **Link with regional and international organisations and initiatives** – make connections with Caribbean regional and international organisations with an environmental, national statistics, or ecosystem accounting focus.
- **Continued alignment with evolving SEEA guidance** – update the accounts alongside the recommendations of SEEA on methodological development and emerging good practice.

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Appendix A - Methodology

This annex sets out the input data and methods used to develop the Cayman Islands 2020 Ecosystem Account (Cayman-Island-EA-2020-January2022.xls) and provides guidance on how to update each component of the account.

For each component, a description of the input data, its source and a workbook reference for where it is applied are provided, along with how often the data should be updated (definitions for frequency are described in Table A.1).

Table A.1: Definitions of frequency of input data updates

Frequency	Definition
Annually	The underlying source should be updated on an annual basis
As source is updated	The underlying source is expected to be updated in the future (i.e., sources that are not updated annually). The accounts should be updated when new data from the same source is available.
As new evidence becomes available	The underlying source is not expected to be updated; a new source would be required to update this input

The remainder of this section is structured as follows:

- Ecosystem Extent Account (Section A.1)
- Ecosystem Condition Account (Section A.2)
- Ecosystem Service Flow and Asset Accounts and Supplementary Information (Section A.3); and
- Input tabs (Section A.4).

A.1 Ecosystem Extent Account

The Ecosystem Extent Account records information on the area of terrestrial and marine ecosystems within the ecosystem accounting area, i.e., the Cayman Islands' terrestrial and marine boundary. Table A.2 sets out the data sources used to estimate the terrestrial and marine ecosystem extent, which have been applied by GIS specialists at JNCC using GIS modelling software QGIS. The Ecosystem Extent Account should be updated when the source GIS layers are updated. The Ecosystem Extent Account is within the tab: **'A1. Asset Register'** of the ecosystem accounting workbook.

Table A.2: Input data for the Ecosystem Extent Account

Description	Source	Frequency	Workbook reference
Terrestrial habitat map	Landcover 2013 (DoE, 2013).	As source is updated	A1. Asset register tab
Shelf benthic habitat map	Shelf Benthic classification 2008 (DoE, 2008)	As source is updated	A1. Asset register tab
Lagoon benthic habitat map	Lagoon Benthic classification 2008 (DoE, 2008)	As source is updated	A1. Asset register tab

A.2 Ecosystem Condition Account

The Ecosystem Condition Account records information on the quality of ecosystems within the ecosystem accounting area. Condition indicators can be associated with ecological communities and species, freshwater, land or soil elements of ecosystems. Table A.3 provides an overview of the data used within the Ecosystem Condition Account of the Cayman Islands. The Ecosystem Condition Account is set within the tab: '**A1. Asset Register**'.

Table A.3: Input data for the Ecosystem Condition Account

Description	Source	Frequency	Workbook reference
Ecological communities and species			
Area of dry forest above 20ft elevation	Derived from GC Dry Forest Above 20ft Elevation_WGS84UTM.shp	As source is updated	A1. Asset register tab
Area of protected land	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Area of proposed protected land	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Area of Marine Protected Areas (MPAs)	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Total carbon stock (in and outside MPAs)	Guzman et al. (2017)	As new evidence becomes available	A1. Asset register tab
Area of species habitats by type	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Species points	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Land			
Land area owned by The Crown	Combination of sources listed in workbook	As source is updated	A1. Asset register tab
Land area owned by the National Trust	Combination of sources listed in workbook	As source is updated	A1. Asset register tab

A.1.1 Other indicators

Beyond extent and condition of ecosystems, other details on environmental assets have been included in the Cayman Islands 2020 account. These reflect details of spatial configuration which could reflect sinkholes and caves, as well as other forms of capital such as renewable energy generation sites, areas of accessible greenspace as well as public moorings. Table A.4 provides an overview of the data sources used to generate these other indicators for the Cayman Islands, which are set within the tab: **'A1. Asset Register'**.

Table A.4: Input data for other indicators

Description	Source	Frequency	Workbook reference
Spatial configuration			
Number of caves		As source is updated	A1. Asset register tab
Area of sinkholes		As source is updated	A1. Asset register tab
Other forms of capital			
Number of public moorings (inside and outside MPAs)		As source is updated	A1. Asset register tab

A.3 Ecosystem Service Flow and Asset Accounts

This section covers the ten benefits included in the 2020 Ecosystem Account. For quantified and monetised benefits, it outlines the methods used to value each benefit and the input data that needs to be updated for future accounts. For unquantified or non-monetised benefits, a summary of the existing data, sources and next steps are outlined.

A scope and materiality[5] assessment was conducted to show which benefits are likely to be provided by these ecosystems, and which have been possible to include in this account and which not. The scope and materiality assessment should be updated as new benefit are added or when new ecosystems are included in the Ecosystem Account. This assessment is set within the tab: **'Scope & materiality assessment.'**

Within the accompanying Excel workbook (Cayman-Island-NCA-2020-January2022.xls), each benefit has a separate calculation tab, with all estimates of annual flows summarised within the Ecosystem Service Flow Account – Physical Terms (tab **'A2. Physical terms'**) and the Ecosystem Service Flow Account – Monetary Terms (tab **'A3. Monetary terms'**). The monetary account tab also presents an estimate of the monetary ecosystem asset value[6] (Ecosystem Asset Account) expressed as a present value of the estimated flow of benefits over the accounting period (25 years).

This section starts with an overview of the physical flow and monetary valuation metrics and the profiling assumptions applied for each benefit.

A.1.2 Overview

An overview of the physical flow and monetary valuation metrics and methods are provided in Table A.5. The benefits are split into the following sections:

- **Ecosystem Service Flow Account and Asset Accounts –**approach to monetary valuation aligns with the System of Environmental Economic Accounting- Ecosystem Accounting (SEEA-EA) standard which applies exchange values[7] to be comparable to other national accounts (e.g., as applied in the System of National Accounts (SNA)).

  Monetary values based on data from previous years have been inflated to 2020 prices (Economics and Statistics Office, 2021; U.S. BEA, 2021; HM Treasury, 2022). The monetary values of benefits are calculated per year and summed and discounted over time to estimate present value of benefits using a declining discount rate (starting at 3.5%) (HM Treasury, 2020) and a 25-year study period. **Table A.6** describes the assumptions used to estimate the future flows of benefits over this assessment period. These assumptions should be revisited as new evidence becomes available.

- **Supplementary information** – The SEEA-EA guidance recognises that exchange values do not capture all information useful for decision makers. This section includes additional information outside the scope of the Ecosystem Account, under the following categories:

  - **Other exchange values –** Additional monetary benefits based on exchange values but are outside the scope of the Ecosystem account, e.g., remaining visitor expenditure attributed to

[5] An impact or dependency on natural capital is material if considering it, as part of the set of information used for decision making, has the potential to alter that decision.

[6] One of the five core accounts in SEEA EA, this account records information on stocks and changes in stocks (additions and reductions) of ecosystem assets, as well as accounting for ecosystem degradation and enhancement (UN, 2021).

[7] Exchange values are equivalent to the price as set by a market (i.e., the price at which supply equals demand) or the price at which an exchange would occur in a hypothetical market. Notably this differs from welfare values which include the surplus value created in addition to the exchange value (i.e., the consumer surplus).

ecosystems. This includes economic values which is dependent on ecosystems, but which might not be entirely attributable to ecosystems within the SEEA-EA framework. For example, expenditure on some activities may not be feasible without the support of ecosystem assets, but only a subset of this expenditure would be attributable to ecosystems within SEEA-EA, as labour and other capitals might also contribute to the production of the good or service

- **Welfare values –** Monetary benefits that are based on welfare value metrics such as willingness to pay values. Note that this value includes the consumer surplus that is additional to the exchange value as adopted in the SEEA-EA framework, which also makes it an extension of the value reported with the SNA.
- **Non-monetised benefit –** There are two types of non-monetised benefits. Firstly, where data for quantifying the physical flow is available and is useful to monitor over time, but there is currently insufficient data nor an appropriate methodological approach to conduct monetary valuation. Secondly, where material benefits exist that are not feasible or not desirable to monetise (e.g., biodiversity, spiritual value, iconic species).

Table A.5: Overview of benefits

Benefit	Physical indicator	Monetary valuation metric and method
Ecosystem Service Flow and Asset Accounts		
Fisheries	Volume of output	Market prices
Agriculture	Volume of output	Value added by production
Carbon sequestration	Tonnes of CO_2e sequestered	Non-traded central carbon value BEIS (2019), £/tCO_2e
Coastal protection	-	Coastal protection value by coral reefs
Local recreation	Recreational visits	Recreational expenditure
Tourism	Tourist visits	Tourist expenditure (value added to tourism industry attributed to ecosystems)
Amenity value	Number of houses	Property uplift value attributed to mangroves
Supplementary information		
Other exchange values		
Tourism	Tourist visits	Remaining visitor expenditure attributed to ecosystems
Welfare values		
Tourism	Tourist visits	Willingness to pay to prevent decline in quality of coral reefs
Non-monetised benefits		
Water supply	-	-
Renewable energy	-	-
Beach erosion	-	-
Local recreation	Number of diving spots	-

Table A.6: Benefit profile assumptions over time

Benefit	Physical terms	Monetary terms
Ecosystem Service Flow and Asset Accounts		
Fisheries	No change in volume of fish caught compared to the baseline year.	Assumed constant economic value of benefit over time.
Agriculture	Average number of goats, cattle, pigs and poultry (2015-2020).	Average detailed value added by livestock production (2015-2019)[1].
	-	Average detailed value added by arable production (2015-2019).

Benefit	Physical terms	Monetary terms
Carbon sequestration	No change in sequestration rates over time.	Value of carbon emissions increase over time in line with BEIS (2019).
Coastal protection	-	Assumed constant economic value of benefit over time.
Tourism	Average number of tourists (2016-2020).	Average expenditure per person per night (2016-2020).
Amenity value	No change in number of houses compared to the baseline year.	Assumed constant economic value of benefit over time.
Supplementary information		
Other exchange values		
Tourism	Average number of tourists (2016-2020).	Assumed constant economic value of benefit over time.
Welfare values		
Tourism	Average number of tourists (2016-2020).	Assumed constant economic value of benefit over time.
Non-monetised benefits		
Water supply	-	-
Renewable energy	-	-
Beach erosion	-	-
Local recreation	-	-

Table notes:

[1] Updated figure not available. Will be available as part of SNA update.

A.1.3 Fisheries

The marine ecosystems surrounding the Cayman Islands provide habitat for a variety of species of fish and other sea life. This in turn supports commercial, subsistence and recreational fishing activities across the Cayman Islands. It should be noted that within the context of the Cayman Islands commercial fishing is small-scale[8]. The inclusion of fisheries in the accounts helps to track the annual value that marine natural capital contributes through this benefit.

Method overview

Guzman et al. (2017) produce estimates of the economic value of reef fish, as this is attributed to local marine ecosystems. Catch of pelagic species was beyond the scope of the study, as these species "rely on foreign ecosystems for most of their lives" (p.18). The study estimates that in 2016, the number of reef fish caught was 390,000. To produce an estimate of weight (lbs), this is multiplied by the assumed average weight of reef fish of 1.8 lbs/fish (Williams and Ma, 2013) to generate an estimated annual volume of reef fish landings. Recent records of fish landings are not available for the Cayman Islands, therefore the 2016 estimated in Guzman et al. (2017) is assumed to be representative of current and future years.

The study estimates the value of artisanal fishing for recreation, subsistence and small-scale commercial purposes using a net factor income approach[9]. As such, the value of reef fish is treated as a production factor, and Guzman et al. (2017) also include labor costs in the total value as they are a benefit to the Cayman Islands economy.

[8] This is based on evidence from Meier et al. (2011) and Henshall (2009) cited in the Guzman et al., 2017).

[9] Market-based valuation method that estimates the net benefit of fishing by taking into account costs of other production factors and revenue generated.

Following the approach set out in Guzman et al. (2017), total annual revenue from the relevant fishing activities is estimated by multiplying the estimated volume of reef fish caught by the average price, CI$7.5/lbs. Resulting in an estimate of total annual revenue of recreation, subsistence and small-scale commercial fishing equal to CI$5.3 million, in 2020 prices. Total annual costs are estimated as 44%[10] of total revenue which is CI$2.3 million. The annual net benefit is estimated as the difference between total revenue and total cost, just below CI$3 million in 2020 prices. After 2020, it is assumed that revenues and costs remain constant therefore the 2020 value is representative of future years. Note that this is an estimate for the Cayman Islands and has not been disaggregated to the three Islands.

How to update the account

The benefits are estimated in the tab: **'S1. Fisheries'**. Table A.7 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.7: Input data for the fisheries benefits

Description	Source	Frequency	Workbook reference
Physical terms			
Estimated number of reef fish caught in the Cayman Islands	Guzman et al. (2017)	As new evidence becomes available	1.1a
Average weight of reef fish, lbs/fish	Williams and Ma (2013)	As new evidence becomes available	1.1b
Monetary terms			
Average price of reef fish species in the Cayman Islands, US$/lbs	Guzman et al. (2017)	As new evidence becomes available	1.2a
Estimated total annual value of recreational, subsistence and small-scale commercial fishing on coral reefs	Guzman et al. (2017)	As new evidence becomes available	1.2b
US GDP deflator	US BEA (2021)	Annually	1.2c
Exchange rate: US$ to CI$	Economics and Statistics Office (2021)	As source is updated	1.2d
Fishing costs as proportion of total annual revenue	Schep et al. (2012) in Guzman et al. (2017)	As new evidence becomes available	1.2e

The method applied in the 2020 account can be refined using up to date data on the quantity of landings across the three Islands, as an understanding of the breakdown of catch by purpose (i.e., recreational vs commercial vs subsistence). This would help identify beneficiaries more clearly within the account. In addition to the catch, updated evidence on average price as well as costs would allow for monitoring of changes in the fishing industry in the Cayman Islands. Finally, accurate data and approaches to estimation of the contribution of other factors of production (e.g., physical capital and labour) to the overall economic value would allow for a more refined estimation of the contribution that is directly attributable to ecosystems.

[10] Based on evidence in Schep et al. (2012) looking at artisanal fishing in Caribbean coral reef ecosystems.

A.1.4 Agriculture

Agricultural activities in the Cayman Islands include livestock (goats, pigs, cattle and poultry) and non-livestock production. A break down of non-livestock production is not reflected in the 2020 account, as this data was not available.

Method overview

For each livestock type, the Department of Agriculture records total count for various age groups (e.g., kids <2months, calf 6-12 months). The number of goats, pigs, cattle and poultry are included in the Statistics Compendium (Economics and Statistics Office, 2021). For each livestock type, annual production is set equal to the 2020 figures in these evidence bases. Future production levels for goats, pigs, cattle and poultry are estimated as a five-year average (2015-2020). Note that poultry production is an estimate for the Cayman Islands and has not been disaggregated to the three Islands, whilst remaining livestock production can be disaggregated to Grand Cayman and Cayman Brac.

Farm gate prices for agricultural outputs were not readily available to be included in the 2020 account. As an alternative measure, the detailed value added for 'growing of agricultural crops' and 'farming of animals' in the Cayman Islands latest National Accounts (Economics and Statistics Office, 2020) has been used. For each category, the accounting year is set equal to the 2019 detailed value inflated to 2020 prices, with the future monetary value estimated as a five-year average (2015-2020) (Economics and Statistics Office, 2020). Once the detailed value for 2020 is available it can be added to the Ecosystem Account.

How to update the account

The benefits are estimated in the tab: **'S2. Agriculture'**. Table A.8 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.8: Input data for agricultural benefits

Description	Source	Frequency	Workbook reference
Physical terms			
Grand Cayman total number of goats	Economics and Statistics Office (2021)	As source is updated	2.1a
Grand Cayman total number of pigs	Economics and Statistics Office (2021)	As source is updated	2.1b
Grand Cayman total number of cattle	Economics and Statistics Office (2021)	As source is updated	2.1c
Cayman Brac total number of goats	Economics and Statistics Office (2021)	As source is updated	2.1e
Cayman Brac total number of pigs	Economics and Statistics Office (2021)	As source is updated	2.1f
Cayman Brac total number of cattle	Economics and Statistics Office (2021)	As source is updated	2.1g
Sister Islands total poultry	Department of Environment (2020)	Source has been superseded by updated source	2.1h
Cayman Islands total poultry production	Economics and Statistics Office (2021)	As source is updated	2.1i
Monetary terms			
Detailed value added by industry - Agriculture	Economics and Statistics Office (2020)	As source is updated	2.2a

The Cayman Islands GHG inventory (Department of Environment, 2020) does indicate that there is non-livestock farming. Production (e.g., tonnes of crops) and the value (e.g., farmgate price) should be included in the next iteration of the account. The monetary value of non-livestock or arable production is currently captured within the detailed value added of the industry for growing of agricultural crops (Economics and Statistics Office, 2020). A better understanding of data collected through agricultural surveys that feed into the Cayman Islands annual national accounts is necessary.

Future iterations of the account could estimate the contribution of other factors of production (e.g., physical capital and labour) to the overall economic value to allow for a more refined estimation of the contribution that is directly attributable to ecosystems.

A.1.5 Water supply

Based on Cayman Islands 2010 census, the main source of water supply to households in the Cayman Islands (approx. 88%) is from mains (city water or desalinated water), this is followed by cistern, rain or trucks (7%) and wells (5%) (Economics and Statistics Office, 2021). Production of potable water is from desalination and groundwater abstractions, with non-potable water being distributed through trucks and pipelines. It is therefore dependent on natural capital stocks.

Method overview

Water Authority Cayman and Cayman Water Company have provided statistics on production in Grand Cayman, supply in Cayman Brac as well as desalinated water consumption by consumer group over time (Economics and Statistics Office, 2021). A monetary value has not been identified, which is a data gap in the 2020 account.

How to update the account

The benefits are estimated in the tab: **'S3. Water supply'**. Table A.9 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.9: Input data for water supply

Description	Source	Frequency	Workbook reference
Physical terms			
Water production in Grand Cayman, 2015-2020	Economics and Statistics Office (2021)	As source is updated	3.1a
Water supply in Cayman Brac, 2015-2020	Economics and Statistics Office (2021)	As source is updated	3.1b
Desalinated water consumption by consumer group, 2015-2020	Economics and Statistics Office (2021)	As source is updated	3.1d
Main source of water supply	Economics and Statistics Office (2021)	As source is updated	3.1e

The 2020 account does not provide a quantified estimate for water supply. Further research is required to determine available data on the Cayman Islands to develop an appropriate valuation approach. For example, on the difference in costs associated with desalination and purification of groundwater could be as an estimate of the value of water supply dependent on the water filtration provision of the ecosystem

service.

A.1.6 Renewable energy

With increasing pressure to move towards a low carbon society, renewable energy is an ever-growing sector. On the Cayman Islands, the Caribbean Utilities Company ltd launched the Consumer Owned Renewable Energy (CORE) programme in 2009 (Department of Environment, 2020). The programme allows consumers in Grand Cayman to connect private solar systems or wind turbines to the national grid system. In doing so, consumers generate their own electricity whilst also reducing their own energy bills.

Method overview

The CUC CORE programme is divided into two sub-groups: Feed-in-Tariffs (FIT) structure and the distributed energy resources (DER) programme. The number of customers and kilowatt rated capacity is reported in the Cayman Islands Greenhouse Gas Inventory data (Department of Environment, 2020). The GHG inventory data does include the CUC's CORE Programme tier rate systems as CI$/kW for residential and commercial instalments.

The Cayman Islands GHG inventory (Department of Environment, 2020) does also provide a count of the number of approved applications and number of planning permit applications for the instalment of solar panels or solar farms. Further disaggregation of this data would be useful to include in the account, in order to establish how many approved applications for solar farms there are across the Cayman Islands. Solar panels on buildings would not be included in the Ecosystem Account.

How to update the account

The benefits are estimated in the tab: **'S4. Renewable energy'**. Table A.10 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.10: Input data for renewable energy

Description	Source	Frequency	Workbook reference
Physical terms			
Summary of CUC CORE FIT programme	Department of Environment (2020)	As source is updated	4.1a
Summary of CUC DER programme	Department of Environment (2020)	As source is updated	4.1b
Solar panel or solar farms applications	Department of Environment (2020)	As source is updated	4.1c
Monetary terms			
CUC's Core programme rate tier	Department of Environment (2020)	As source is updated	4.2a

The data presented within the 2020 account provides a starting point for the next iteration of the account, where energy generated from these renewable energy sources can be valued using the CUC's core programme rate tier system. This would require additional data on distinguishing residential and commercial generation, as well as the correct application of the tier system rates.

A.1.7 Carbon sequestration

Carbon sequestration refers to the ability of the natural environment (both terrestrial and marine) to remove carbon from the atmosphere. This benefit contributes towards global climate regulation. It is estimated using the sequestration rates for each habitat (tonnes CO_2 equivalent per hectare), the extent of each habitat, and the non-traded price of carbon.

Method overview

Guzman et al. (2017) estimated carbon sequestration (Megagram carbon per year) potential in seagrass and mangroves in the Cayman Islands as part of the economic analysis for the expansion of marine protected areas (MPAs). These estimates have been converted to tonnes of carbon dioxide equivalent using a tC[11] to tCO_2e conversion factor of 3.67 (IPCC, 2018). These estimates of coastal ecosystem carbon sequestration are used in the 2020 account. For mangroves, an average rate of approximately 10.2 tCO2 per hectare has been used in Guzman et al. (2017), which is slightly higher than the estimated midpoint rate applied in the other Caribbean overseas territories (6.3 tCO2e/ha/yr) as shown in Table A.11.

Table A.11 shows the global average per hectare carbon sequestration rates for terrestrial and marine habitats. Two main sources are used as the basis of the carbon sequestration rate estimates – Murray et al. (2011); as cited in IUCN (2017) and Alongi (2014). The midpoint sequestration rates between the two sources are used in the analysis.

Table A.11: Carbon sequestration rates by habitat type (tCO_2e/ha/yr)

Habitat	Murray et al. (2011); IUCN (2017)	Alongi (2014)[1]	Midpoint
Terrestrial			
Mature tropical forest	2.3	-	2.3
Marine			
Seagrass	4.4	2.0	3.2
Saltmarsh	8.0	5.5	6.8
Mangroves	6.3	6.4	6.3
Estuaries	-	1.7	1.7
Shelves	-	0.6	0.6

Table notes:

[1] The values reported were converted from $gC/m^2/yr$ to tCO_2e/ha/yr using the IPCC (2018) tC to tCO2e conversion factor of 3.67, gram to tonne and m2 to ha conversion factors.

The total amount of CO_2 equivalent sequestered is estimated by multiplying these per hectare rates with the total hectare area of the respective habitat type, as recorded in the Ecosystem Extent Account. For the Cayman Islands, the tCO_2e sequestered by forest ecosystems is considered additional to the figures produced by Guzman et al. (2017). Table A.12 summarises the assumed carbon sequestration rate for each ecosystem type.

Table A.12: Assumed carbon sequestration rate for each ecosystem type

Ecosystems in the Ecosystem Extent Account	Applied sequestration rate
Seagrass beds	Seagrass
Seasonally flooded mangrove shrubland	Mangroves
Seasonally flooded mangrove forest and woodland	Mangroves

[11] 1 MgC = 1 tC

Tidally flooded mangrove forest and woodland	Mangroves
Tidally flooded mangrove and shrubland	Mangroves
Ponds, pools and mangrove lagoons	Mangroves
Seasonally flooded/saturated semi-deciduous forest	Forest
Xeromorphic semi-deciduous forest	Forest
Dry forest and woodland	Forest
Invasive species – casuarina	Forest
Coastal mahogany forest	Forest

The amount of CO_2e sequestered by coastal and forest ecosystems is then valued following the BEIS (2019) guidance. The economic value of carbon sequestration is estimated using the non-traded central price, £75 per tonne of CO_2e in 2020. The UK carbon prices were multiplied by the relative GDP per capita in the Cayman Islands as compared to the UK (Economics and Statistics Office, 2021; ONS, 2021) and then converted to Cayman Island dollars (HMRC, 2021). The carbon price is then multiplied by the estimated tonnes of CO_2e sequestered by coastal and forest ecosystems.

How to update the account

The benefits are estimated in the tab: **'S5. Carbon sequestration'**. Table A.13 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.13: Input data for carbon sequestration benefits

Description	Source	Frequency	Workbook reference
Physical terms			
Ecosystem extent	Asset register tab (A1)	As new evidence becomes available	5.1a
Carbon sequestration potential in coastal ecosystems in the Cayman Islands	Guzman et al. (2017)	As new evidence becomes available	5.1b
Terrestrial and marine carbon sequestration rates	Murray et al. (2011), as cited in IUCN (2017); Alongi (2014)	As new evidence becomes available	5.1d, 5.1e
Monetary terms			
Cayman Islands GDP per capita at current basic prices	Economics and Statistics Office (2021)	As source is updated	5.2c
UK GDP per capita at current market prices	ONS (2021)	Annually	5.2d
UK Carbon prices	BEIS (2019)	As source is updated	5.2e; UK Carbon prices full tab
GBP to CI$ exchange rate	HMRC (2020)	Annually	5.2i;
UK GDP deflator	HM Treasury (2021)	Annually	UK GDP deflators tab

Data inputs for the physical flow can be updated as science and understanding of carbon sequestration rates of ecosystems improves. The 2020 Ecosystem Account for the Cayman Islands applies UK carbon values as per BEIS (2018). The UK carbon values were updated in September 2021 to reflect the UK's net zero policy commitment. Future iterations of the account could be aligned to the updated UK values and/or to voluntary carbon market exchange values. The values used should reflect Cayman Islands climate policy, abatement technologies and other context from the accounting year.

A.1.8 Coastal protection

The natural capital of the Cayman Islands marine coastal habitats provides protection to the Cayman Islands from damage and flooding due to sea surge from storms and other adverse weather events. Reefs, sand bars, mangrove stands, dunes and even seagrass beds all help to absorb energy and mitigate the impact of waves and rising waters. This can have the significant effect of defending vulnerable built infrastructure on the Cayman Islands.

Method overview

Guzman et al. (2017) estimated the coastal protection value of coral reefs in the marine protected areas of the Cayman Islands using an avoided damage approach. GIS is used to determine the flood damages that occur during a 1-in-25-year return time storm event[12], as well as modelling the proportion[13] of these damages that are prevented by nearby coral reefs. Coastal protection value can be assessed both through direct effects (e.g., property damage) and indirect effects (e.g., infrastructure damage, business interruption). The indirect avoided damages are not included in this analysis.

Based on the values estimated by Guzman et al. (2017), the total annual coastal protection value by coral reefs in the Cayman Islands of approximately CI$6.6 million, in 2020 prices. This was attributed across the Cayman Islands based on proportions in Guzman et al. (2017)[14]. As the estimates only reflect the direct avoided damages to properties it is a "lower-bound estimate of the actual economic value of this service" (Guzman et al., 2017, p,24).

How to update the account

The benefits are estimated in the tab: **'S6. Coastal protection'**. Table A.14 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.14: Input data for coastal protection benefits

Description	Source	Frequency	Workbook reference
Monetary terms			
Estimated annual coastal protection value by coral reefs in the Cayman Islands	Guzman et al. (2017)	As new evidence becomes available	6.2a
Estimated attribution of coastal protection value to coral reefs by island	Guzman et al. (2017)	As new evidence becomes available	6.2b
US GDP deflator	US BEA (2021)	Annually	6.2c
Exchange rate: US$ to CI$	Economics and Statistics Office (2021)	Annually	6.2d
Relative reef contribution	Guzman et al. (2017)	As new evidence becomes available	6.2e

The approach requires GIS analysis and the specified data inputs with which to model the impact. The

[12] The characteristics of this event are based on data from Hurricane Ivan (Category 4) in 2004. This was provided by the Cayman Island DoE.

[13] This represents the relative reef contribution (RRC) that mitigates damage and is calculated for each coastal transect. See Burke et al. (2008) for more detail on this method.

[14] Should be noted that the estimated attribution proportions do not sum to 100%. This needs to be investigated further to refine the calculation.

modelling can be updated with the most up-to-date infrastructure and habitat maps as they are produced. Doing so on a regular basis will track changes in development and vegetative cover which can help monitor the change in the risk of damage from sea surge due to changing land use, as well as to identify high risk flooding areas for future development planning. Property value and damage cost estimates should also be updated as available.

A.1.9 Beach erosion prevention

Coastal vegetation, such as seagrass, coral reefs, mangroves and other shoreline habitats, prevents sand loss as a result of wave backwash both during storm events and high-water levels. Some beach movement is normal over time, however in the absence of the existing coastal habitats dunes. Coastal erosion poses a significant threat to beaches in the Cayman Islands, particularly the important tourist hotspot Seven Mile Beach, Grand Cayman.

The prevention of erosion contributes to benefits in marine ecosystems and maintaining the aesthetic quality of coastal habitats that attract tourists and recreational users. However, the tourism aspects of this service are captured in the assessment of the tourism benefit (see Section A.1.11). The focus here would be more specifically on the avoidance of beach erosion as a benefit to infrastructure protection.

How to update the account

The quantification and monetisation of avoided beach erosion attributed to coastal ecosystems across the Cayman Islands requires an understanding of the current rate of erosion. The Cayman Islands DoE have access to satellite imagery that could be used to generate an average rate of beach area loss. As well as the rate of erosion in the absence of ecosystems, such as reefs and mangroves, that provide protection to beach erosion (akin to modelling coastal protection or surface flooding).

Beach erosion risk depends on many factors, including sea level rise, wave energy, coastal slope, beach width and height among others. Understanding wave dynamics is key to identifying vulnerable areas and potential mitigation strategies. Evidence will be available in the future to align with ongoing work by Wood Group UK Limited generating storm surge risk estimates by using the same model to produce beach erosion risk outputs. The SWAN model is a third-generation wave model developed by Delft University of Technology that simulates wave parameters in coastal areas. SWAN accounts for many physical processes such as wave generation, propagation, dissipation, whitecapping, and bottom friction.

The proposed beach erosion modelling will use outputs from the SWAN model, such as wave height and wave force, to estimate beach erosion risk. A baseline model will be compared to different bottom roughness and depth scenarios to predict the impact of historical coral reefs and potential areas of coral restoration on beach erosion risk, with a focus on Seven Mile Beach.

Further research is required to identify an appropriate monetary unit value, as there is a risk of double-counting with other benefits such as tourism and local recreation which rely on the beach as an ecosystem to support use. As such, avoiding beach erosion can be viewed as an intermediary regulating service, which is 'capitalised' as a benefit to people in other benefits.

A.1.10 Local recreation

'Local recreation' is a relatively broad term and encompasses a wide variety of cultural activities that natural capital provides to local residents. This can include opportunities for physical interaction with the natural environment such as recreation. However, while evidence exists on tourist use of the environment, local recreational use of the environment is less well understood.

Method overview

The natural environmental is important for recreational use by residents on the Caymans Islands. Existing evidence on recreational activities undertaken by locals has been assessed as part of Schutter et al. (2014) which through a survey identified the types of activities undertaken by residents (born on the Cayman Islands and born elsewhere). In addition, there are approximately 378 diving spots across the Cayman Islands (Guzman et al., 2017) utilised by both residents and tourists[15], although the number of divers has not been identified. The total number of diving spots is reported as a non-monetised benefit.

How to update the account

The benefits are estimated in the tab: **'S9. Local recreation'**. Table A.15 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.15: Input data for local recreation benefits

Description	Source	Frequency	Workbook reference
Physical terms			
Recreational activities undertaken by local residents	Schutter et al. (2014)	As new evidence becomes available	8.1a
Number of dives spots per area	Guzman et al. (2017)	As new evidence becomes available	8.1b

Further research into and the collection of more data, such as via surveys, on local recreation use (e.g., number of divers) and expenditure patterns is required to assess the value of this benefit across the Cayman Islands.

A.1.11 Tourism

Tourism is a major contributor to the economic prosperity of the Cayman Islands. Popular attractions include the pristine beaches across the Cayman Islands, sting rays, caving, and diving tours amongst other elements of the marine and coastal environment of the Cayman Islands. The tourism value of the Cayman Islands was one of the ecosystem services assessed as part of the Guzman et al. (2017) analysis. For the purposes of this study, the same general approach[16] has been applied, but using updated figures for visitor numbers and expenditure.

Method overview

The Caymans Islands Immigration Department and the Department of Tourism record visitor arrivals (stay-over and cruise ship) to the Cayman Islands, with annual figures by mode of travel (air or sea) reported in

[15] Diving activities by tourists is captured under the Tourism in tab S9 (see A.1.11).

[16] Note that Guzman et al. (2017) estimated consumer and producer surplus to generate a net benefit of tourism activities. In this study, consumer and producer surplus are kept separate, where consumer surplus is reported as supplementary information and the producer surplus is included in the ecosystem account.

the Cayman Islands' Compendium of Statistics (Economics and Statistics Office, 2021). Visitor arrivals are adjusted to exclude air arrivals visiting the Cayman Islands for business, this is done by multiplying the proportion of air arrivals visiting for business (7% in 2020) by the current year's recorded air arrivals, with the product subtracted from the 2020 total stay-over arrivals (Economics and Statistics Office, 2021). Cruise ship visitors are set equal to the latest total figures of number of landed visitors (Economics and Statistics Office, 2021). Landed cruise ship in 2020 is currently not available, therefore has been estimated using the ratio between actual cruise ship arrivals to landed visitors multiplied by the 2020 actual arrivals (Economics and Statistics Office, 2021). Note when this information is available it can be used to update the 2020 account. Future number of arrivals are estimated as a five-year average (2016-2020) for each visitor type (Economics and Statistics Office, 2021).

Guzman et al. (2017) further sub-divided visitors into divers and non-divers using the estimated proportion of stay-over tourists that are divers (13%) from 2016 data provided by the Cayman Islands Department of Tourism. This proportion is assumed to remain constant over time and visitor type and is therefore applied to the annual number of tourist arrivals (stay-over and cruise ship) and the five-year average.

The value of arrivals in the account is estimated using the reported average expenditure per visitor per night (i.e., no distinction between visitor types) (Economics and Statistics Office, 2021), multiplied by the estimated proportion of expenditure across 11 categories[17] for each visitor type (stay-over or cruise ship) and diver/non-diver (Guzman et al., 2017). For each visitor type and spend category, total annual tourism expenditure is estimated using average daily tourist spend, the assumed average length of stay[18] and the annual estimated number of visitors. Following the approach set out in Guzman et al. (2017), total annual tourism expenditure in each category for each visitor is multiplied by the assumed proportion (100% for donations and 25% for all other categories) of total spend that corresponds to added value of the tourism industry (Schep et al., 2012). The value added is then multiplied by an assumed factor of ecosystem dependence for each expenditure category (Guzman et al., 2017). This produces the total annual tourism added value attributed to marine ecosystems. For the future monetary flow, the five-year average (2016-2020) total tourism expenditure is estimated (Economics and Statistics Department, 2021), and the same approach is followed where the proportions applied remain constant and the five-year average length of stay of stay-over tourist is estimated (Economics and Statistics Office, 2021).

The remaining annual and five-year visitor expenditure by visitor type (i.e., remaining 75% of total expenditure) is adjusted for ecosystem dependence as well (Guzman et al., 2017). These values are reported as supplementary information to the Ecosystem Account.

The benefit of tourism activities can also be captured in welfare value terms. Guzman et al. (2017) estimate consumer surplus of local ecosystems in the Cayman Islands based on the willingness to pay (WTP) of tourists to prevent the decline in quality of coral reefs from medium to low levels. This uses a value transfer of average WTP per tourist per day of CI$30, in 2020 prices, derived through a choice experiment (Van Beukering et al., 2014). This was applied to the number of stay-over and cruise ship visitors in 2020. In future years, the average WTP to prevent reef quality decline remains constant with the value varying in line with future visitor assumptions (i.e., estimated four-year average). As the ecosystem accounting

[17] Expenditure categories identified by Guzman et al. (2017) include: airfare, accommodation, local transportation, diving, snorkelling, fishing, other water-based activities, land-based activities, food and beverage, shopping and donations.

[18] Stay-over visitors' average length of stay is reported as number of nights in the Cayman Islands' Compendium of Statistics (Economics and Statistics Office, 2020a), whilst cruise ship visitors are assumed to not stay beyond one day (Guzman et al., 2017).

framework prefers the use of exchange values, this welfare value is included as a supplementary indicator.

How to update the account

The benefits are estimated in the tab: **'S9. Tourism'**. Table A.16 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.16: Input data for tourism benefits

Description	Source	Frequency	Workbook reference
Physical terms			
Visitor arrivals in the Cayman Islands	Economics and Statistics Office (2021)	Annually	9.1a
Cruise ship visitor arrivals	Economics and Statistics Office (2021)	Annually	9.1b
Visitor air arrivals by purpose of visit	Economics and Statistics Office (2021)	Annually	9.1c
Visitor air arrivals by accommodation type	Economics and Statistics Office (2021)	Annually	9.1d
Tourist accommodation	Economics and Statistics Office (2021)	Annually	9.1e
% of stay-over tourists that are divers	Guzman et al. (2017)	As new evidence becomes available	9.1f
Monetary terms			
Stay over visitor expenditure	Economics and Statistics Office (2021)	Annually	9.2a
Cruise ship visitor expenditure	Economics and Statistics Office (2021)	Annually	9.2b
Average willingness-to-pay per tourist per day to prevent decline in quality of coral reefs from medium to low levels	Van Beukering et al. (2014)	As new evidence becomes available	9.2c
Proportion of expenditure on each category	Guzman et al. (2017)	As new evidence becomes available	9.2d
Factors of ecosystem dependence by expenditure category	Guzman et al. (2017)	As new evidence becomes available	9.2e
Net ecosystem benefits in the tourism industry	Guzman et al. (2017)	As new evidence becomes available	9.2f
Total annual value of local ecosystems for tourism in the Cayman Islands	Guzman et al. (2017)	As new evidence becomes available	9.2g
US GDP deflators	US BEA (2021)	Annually	9.2h
Exchange rate: US$ to CI$	Economics and Statistics Office (2021)	Annually	9.2i
Average length of stay of cruise ship visitors (days)	Guzman et al. (2017)	As new evidence becomes available	9.2j
% of total spend that corresponds to added value of tourism industry	Guzman et al. (2017)	As new evidence becomes available	9.2k

Tourism data should be updated annually in regard to tourist numbers for each type of visit, while average

expenditure data should be updated when relevant survey data is published in order to capture trends, and no more than every five years to capture changing patterns of use and perceived value. Other data inputs should be updated as new evidence becomes available (e.g., dependence factors).

A.1.12 Amenity value

Accessibility and proximity to green and blue space can be capitalised into real estate prices (see Nafilyan and Lorenzi (2019) for UK example). In the context of the Cayman Islands this could refer to the value that ecosystems such as coral reefs and mangroves potentially add to real estate prices.

Method overview

Guzman et al. (2017) undertook a hedonic pricing analysis to assess the effect that proximity to coral reefs and mangroves, in comparison to other attributes of residential properties, has on real estate prices. This was only applied to houses on Grand Cayman, as usable observations from the CIREBA database were only available for Grand Cayman. The study[19] found that marine ecosystems contribute to higher property values and provides a framework for extrapolating the mean amenity value per house in the study sample to the total number of residential buildings in Grand Cayman.

Average amenity value per house is estimated by dividing the modelled amenity value of mangroves (US$26 million, in 2016 prices) by the number of usable observations in the CIREBA dataset (686). The unit amenity value is inflated to 2020 prices and converted to Cayman Island dollars, as it is assumed that property prices in 2016 (and therefore the monetary unit value) are representative of the current year. As an approximation of the overall value, the average amenity value per house is extrapolated to Grand Cayman by multiplying by the total number of residential properties on the Island, approximately 26,200 on Grand Cayman in 2020 (Economics and Statistics Office, 2021). The estimated amenity value of mangroves represents a stock value and is therefore not recorded as an annual flow.

How to update the account

The benefits are estimated in the tab: **'S10. Amenity value'**. Table A.17 provides an overview of the input data for the benefit, including the frequency data should be updated and the workbook reference in the account.

Table A.17: Input data for amenity value

Description	Source	Frequency	Workbook reference
Physical terms			
Number of households on the Cayman Islands	Economics and Statistics Office (2021)	As source is updated	10.1a
Monetary terms			
Modelled amenity value of mangroves for houses in the dataset following the hedonic pricing function	Guzman et al. (2017)	As new evidence becomes available	10.2a
CIREBA dataset sample	Guzman et al. (2017)	As new evidence becomes available	10.2b
US GDP Deflator	US BEA (2021)	Annually	10.2c; US GDP deflators tab

[19] For more details on the hedonic pricing analysis used please see Guzman et al. (2017).

US$ to CI$ exchange rate	Economics and Statistics Office (2021)	As source is updated	10.2d

A.4 Input data tabs

There are several input tabs that are linked throughout the workbook as background information (e.g., ecosystem classification) and as inputs to calculations (e.g., CPI index, discount factors) across multiple benefits. Table A.18 provides an overview of these input tabs and the frequency that these data sources should be updated.

Table A.18: Input data tabs

Tab name	Description	Source	Frequency
Cayman Islands ecosystem classification	Ecosystem classification alignment between Cayman Islands extent layers and IUCN Global Ecosystem typology	Ecosystem Extent Account data (Table A.2); IUCN GET (v1.01)	As account is updated
UK Discount Factors	UK discount factors used throughout the workbook.	HM Treasury (2020)	As source is updated
Cayman Islands CPI	Cayman Islands annual CPI used throughout workbook	Economics and Statistics Office (2021)	Annually
US GDP deflators	US GDP deflators used throughout the workbook.	US BEA (2021)	Annually
UK GDP deflators	UK GDP deflators used throughout the workbook.	HM Treasury (2021)	As source is updated[1]
UK Carbon prices full	BEIS modelled carbon prices (£) used throughout the workbook.	BEIS (2019)	As source is updated[2]
Cayman Islands population statistics	Cayman Islands population statistics (people, households, average household size) used throughout the workbook.	Economics and Statistics Office (2021)	Annually

Table notes:

[1] The HM Treasury released updated UK GDP deflators every quarter as well as part of the Spring or Autumn budget.

[2] The UK carbon values were updated in September 2021 to reflect the UK's net zero policy commitment. Future iterations of the account could be aligned to the updated UK values and/or to voluntary carbon market exchange values. The values used should reflect Cayman Islands climate policy, abatement technologies and other context from the accounting year.

Appendix B - Changes in account values

Table B.1 and Table B.2 sets out the value estimated in the previous Cayman Islands Ecosystem Accounts and notes key reasons for the changes in values. All monetary values are presented in the reporting year price year, e.g., 2020/21 account values are reported in 2020. Sources GDP deflators in the Cayman Islands and the UK have been updated, which impacts the monetary value across all benefits.

Table B.1: Changes in Ecosystem Service Flow and Asset Account values

Produced at: January 2022	**2019/20**			**2020/21**			**Notes on changes**
	Ecosystem Service Flow Account		**Ecosystem Asset Account (PV25 CI$m)**	**Ecosystem Service Flow Account**		**Ecosystem Asset Account (PV25 CI$m)**	
	Physical terms	**Monetary terms (CI$m)**		**Physical terms**	**Monetary terms (CI$m)**		
Fisheries	702,000	3	50	702,000	3	51	Data inputs have remained the same, with monetary unit value inflated to current price year.
Agriculture	26,204	2	22	5,061	2	25	Monetary unit value inflated to current price year. **Input data change:** Poultry production (physical flow) reported for Cayman Islands within the latest Statistics Compendium (2021). However, similar figures are not available disaggregated.
	-	16	244	-	18	275	Data inputs have remained the same, with monetary unit value inflated to current price year.
Carbon sequestration	68,500	11	257	68,500	11	272	Data inputs have remained the same, with monetary unit value inflated to current price year.
	9,393	1	35	9,393	1	37	
Coastal hazard protection	-	6	111	-	7	112	Data inputs have remained the same, with monetary unit value inflated to current price year.
Tourism	2,119,533	71	1,089	598,263	21	943	Data inputs have remained the same, with monetary unit value inflated to current price

Produced at: January 2022	2019/20			2020/21			Notes on changes
	Ecosystem Service Flow Account		Ecosystem Asset Account (PV25 CI$m)	Ecosystem Service Flow Account		Ecosystem Asset Account (PV25 CI$m)	
	Physical terms	Monetary terms (CI$m)		Physical terms	Monetary terms (CI$m)		
							year. Note 2020 expenditure data is currently not available.
Amenity value	27,667	-	1,362	26,197	-	1,306	Data inputs have remained the same, with monetary unit value inflated to current price year.
	Total	**110**	**3,170**	**Total**	**62**	**3,020**	

Table B.2: Changes in Supplementary Information

Produced at: January 2022	2019/20			2020/21			Notes on changes
	Physical terms	Monetary terms (CI$m)	Ecosystem Asset Account (PV25 CI$m	Physical terms	Monetary terms (CI$m)	Ecosystem Asset Account (PV25 CI$m	
Other monetary values							
Tourism	2,119,533	206	3,140	598,263	59	2,706	Data inputs have remained the same, with monetary unit value inflated to current price year. Note 2020 expenditure data is currently not available.
Welfare values							
Tourism	2,119,533	134	127	598,263	35	1,873	Data inputs have remained the same, with monetary unit value inflated to current price year.
Non-monetised benefits							
Water supply	-	-	-	-	-	-	
Renewable energy	-	-	-	-	-	-	
Beach erosion	-	-	-	-	-	-	
Local recreation	378	-	-	378	-	-	Data inputs have remained the same.

Appendix C - Ecosystem service classification comparison

The Common International Classification of Ecosystem Services (CICES) was chosen as a reference point for ecosystem service typology to enable comparison of ecosystem services between accounts (EEA, 2018). CICES is a globally recognised classification of ecosystem services and referenced within the SEEA EA guidance (UN, 2021). The typology structure consists of four levels – section, division, group and class. See EEA (2018) for more guidance on using CICES.

Table C.1 compares the benefit typology used in this account with the CICES class.

Table C.1: Ecosystem services typology comparison

Shorthand	CICES Class
Fisheries	Animals reared by in-situ aquaculture for nutritional purposes
Agriculture	Animals reared for nutritional purposes; Cultivated terrestrial plants (including fungi, algae) grown for nutritional purposes
Water supply	Surface water for drinking
Renewable energy	Wind energy, Solar energy; Geothermal energy
Carbon sequestration	Regulation of temperature and humidity, including ventilation and transpiration
Coastal protection	Hydrological cycle and water flow regulation (Including flood control, and coastal protection)
Beach erosion protection	Control of erosion rates
Local recreation	Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions
Tourism	Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions
Amenity value	Characteristics of living systems that enable aesthetic experiences
Water quality	Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals

Appendix D - Ecosystem classification comparison

To allow the national accounts to be aggregated with other Overseas Territory accounts and compared between countries, the International Union for Conservation of Nature (IUCN) Global Ecosystem Typology (GET) Ecosystem Functional Groups (EFG) was cross-referenced with the terrestrial and marine ecosystem typology used within the Department of Environment (DoE). The IUCN GET is a global typological framework that applies an ecosystem process-based approach to ecosystem classification for all ecosystems around the world. The typology structure consists of six levels. The top three levels – realm, biome and ecosystem functional group - are aligned with the System of Environmental Economic Accounting (SEEA) Ecosystem Type reference (UN, 2021, s*ee Section 3.4 – Classifying ecosystem assets for more guidance*).

Table D.1 sets out the alignment between the habitat classifications completed by eftec and JNCC. Note that all lagoon benthic habitats have been classified as marine shelf biome habitats, as there are no intertidal equivalents, and while the lagoon will have a brackish influence, the areas neighbour the marine shelf.

Table D.1: Ecosystem classification comparison

Terrestrial/ benthic	Cayman Islands classifications	IUCN GET			Notes on alignment
		Realm	Biome	Ecosystem functional group	
Terrestrial	Xeromorphic semi-deciduous forest	Terrestrial	T1 Tropical–subtropical forests	T1.2 Tropical-subtropical dry forests and scrubs	
Terrestrial	Coastal shrubland	Marine-Terrestrial	MT2 Supralittoral coastal systems	MT2.1 Coastal shrublands and grasslands	
Terrestrial	Seasonally flooded mangrove shrubland	Terrestrial-Freshwater	TF1 Palustrine wetlands	TF1.1 Tropical flooded forests and peat forests	Deep peat is characteristic of these communities. They are not intertidal; however, despite being dominated by mangroves.
Terrestrial	Dry shrubland	Terrestrial	T3 Shrublands & shrubby woodlands	T3.1 Seasonally dry tropical shrublands	This is at 0.5-5m height.
Terrestrial	Dwarf vegetation and vines	Marine-Terrestrial	MT2 Supralittoral coastal systems	MT2.1 Coastal shrublands and grasslands	
Terrestrial	Seasonally flooded grasslands V.A.1.N.g	Terrestrial-Freshwater	TF1 Palustrine wetlands	TF1.4 Seasonal floodplain marshes	Not intertidal and not near coast.
Terrestrial	Semi-permanently flooded grasslands V.A.1.N.h	Terrestrial-Freshwater	TF1 Palustrine wetlands	TF1.3 Permanent marshes	Refers to standing water near urban areas (not coastal or intertidal)

Terrestrial/ benthic	Cayman Islands classifications	IUCN GET			Notes on alignment
		Realm	Biome	Ecosystem functional group	
Terrestrial	Ponds, pools, and mangrove lagoons	Terrestrial-Freshwater	TF1 Palustrine wetlands	TF1.1 Tropical flooded forests and peat forests	Note mangrove lagoons have highly organic (peat rich) sediments and probably store and sequester carbon. Area-wise they probably dominate this class, so perhaps we should lump them in TF1.1?
Terrestrial	Urban	Terrestrial	T7 Intensive land-use	T7.4 Urban and industrial ecosystems	
Terrestrial	Dry lakebed	Freshwater	F2 Lakes	F2.7 Permanent salt and soda lakes	This is rarely dry Only on Cayman Brac - looks to be (possibly seasonally) dry part of mangrove lagoon
Terrestrial	Shoreline	Marine-Terrestrial	MT1 Shorelines biome	n/a	Classified as Biome rather than Group as Cayman Islands classification relates to all shoreline.
Terrestrial	Man-modified	Terrestrial	T7 Intensive land-use	T7.2 Sown pastures and fields	
Terrestrial	Seasonally flooded mangrove forest and woodland	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal	MFT1.2 Intertidal forests and shrublands	Not on the coast, buffered by tidally flooded mangroves. Classified these areas as "MFT1.2 Intertidal forests and shrublands" after confirming mangrove cover roughly matched Global Mangrove Watch.
Terrestrial	Man-modified with trees	Terrestrial	T7 Intensive land-use	T7.5 Derived semi-natural pastures and old fields	
Terrestrial	Tidally flooded mangrove forest and woodland	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal	MFT1.2 Intertidal forests and shrublands	
Terrestrial	Dry forest and woodland	Terrestrial	T1 Tropical–subtropical forests	T1.2 Tropical-subtropical dry forests and scrubs	
Terrestrial	Seasonally flooded / saturated semi-deciduous forest	Terrestrial-Freshwater	TF1 Palustrine wetlands	TF1.2 Subtropical/temperate forested wetlands	Not intertidal, but directly next to mangroves not mangrove vegetation. This is under the 'Forest and Woodland' section of habitat classes.
Terrestrial	Invasive species - casuarina	Terrestrial	T1 Tropical–subtropical forests	T1.2 Tropical-subtropical dry forests and scrubs	In carbon terms it is a forest, even though invasive. Casuarina is an evergreen tree.
Terrestrial	Tidally flooded mangrove shrubland	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal	MFT1.2 Intertidal forests and shrublands	
Terrestrial	Salt tolerant succulents	Marine-Terrestrial	MT2 Supralittoral coastal systems	MT2.1 Coastal shrublands and grasslands	Succulent forb veg, coastal/tidal areas, edges of wetlands/mangroves
Terrestrial	Sparsely vegetated rock	Terrestrial	T5 Deserts and semi-deserts	T5.3 Sclerophyll hot deserts and semi-deserts	
Terrestrial	Black candlewood	Terrestrial	T3 Shrublands & shrubby woodlands	T3.1 Seasonally dry tropical shrublands	This is a flowering evergreen, drought and salt tolerant

Terrestrial/ benthic	Cayman Islands classifications	IUCN GET			Notes on alignment
		Realm	Biome	Ecosystem functional group	
Terrestrial	Man-modified without trees	Terrestrial	T7 Intensive land-use	T7.2 Sown pastures and fields	
Terrestrial	Coastal mohagany forest	Terrestrial	T1 Tropical–subtropical forests	T1.2 Tropical-subtropical dry forests and scrubs	Only on Little Cayman, not intertidal
Terrestrial	Tidal tropical or subtropical annual forb vegetation	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal	MFT1.2 Intertidal forests and shrublands	Succulent forb veg, coastal/tidal areas, edges of wetlands/mangroves
Shelf benthic	Aggregated patch reef	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	
Shelf benthic	Uncolonised hardbottom	Marine	M1 Marine Shelfs	M1.6 Subtidal rocky reefs	Pavement, dominated by algae with coral/sponge cover <10%
Shelf benthic	Spur and groove	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	Hard coral cover (dead and alive), grooves - sand/hardbottom
Shelf benthic	Sand	Marine	M1 Marine Shelfs	M1.7 Subtidal sand beds	Uncolonised sand
Shelf benthic	Rubble	Marine	M1 Marine Shelfs	M1.6 Subtidal rocky reefs	Dead unstable coral rubble and rocks, colonised often by algae
Shelf benthic	Reef crest	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	
Shelf benthic	Individual patch reef	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	
Shelf benthic	Colonised hardbottom	Marine	M1 Marine Shelfs	M1.6 Subtidal rocky reefs	Pavement coral cover 10-70%, rock colonised by algae/soft corals
Shelf benthic	Beach rock	Marine	M1 Marine Shelfs	M1.7 Subtidal sand beds	Cemented sand, flat rock-like substrate *Unsure what else to classify as, but could be M1 Marine shelf biome if wanted wider
Shelf benthic	Aggregate reef	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	
Lagoon benthic	Beach rock	Marine	M1 Marine Shelfs	M1.7 Subtidal sand beds	This refers to cemented sand, flat rock-like substrate. Closest match to the IUCN habitat classification is M1.7 Subtidal sand beds.
Lagoon benthic	Backreef	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	Dead unstable coral rubble/rocks landward of reef crest, colonised by algae
Lagoon benthic	Vegetated sand	Marine	M1 Marine Shelfs	M1.1 Seagrass meadows	Vegetated sediment - assigned if algae is dominant over seagrass beds - however "seagrass meadows" does include algae in description
Lagoon benthic	Hardbottom	Marine	M1 Marine Shelfs	M1.6 Subtidal rocky reefs	Low relief pavement/rubble, colonised by algae
Lagoon benthic	Seagrass beds	Marine	M1 Marine Shelfs	M1.1 Seagrass meadows	
Lagoon benthic	Sediment	Marine	M1 Marine Shelfs	M1.7 Subtidal sand beds	Unvegetated sand

Terrestrial/ benthic	Cayman Islands classifications	IUCN GET			Notes on alignment
		Realm	Biome	Ecosystem functional group	
Lagoon benthic	Lagoonal coral	Marine	M1 Marine Shelfs	M1.3 Photic coral reefs	
Lagoon benthic	Vegetated peat	Marine	M1 Marine Shelfs	M1.8 Subtidal mud plains	Vegetated sediment
Lagoon benthic	Silt	Marine	M1 Marine Shelfs	M1.8 Subtidal mud plains	Bare or sparsely vegetated sediment

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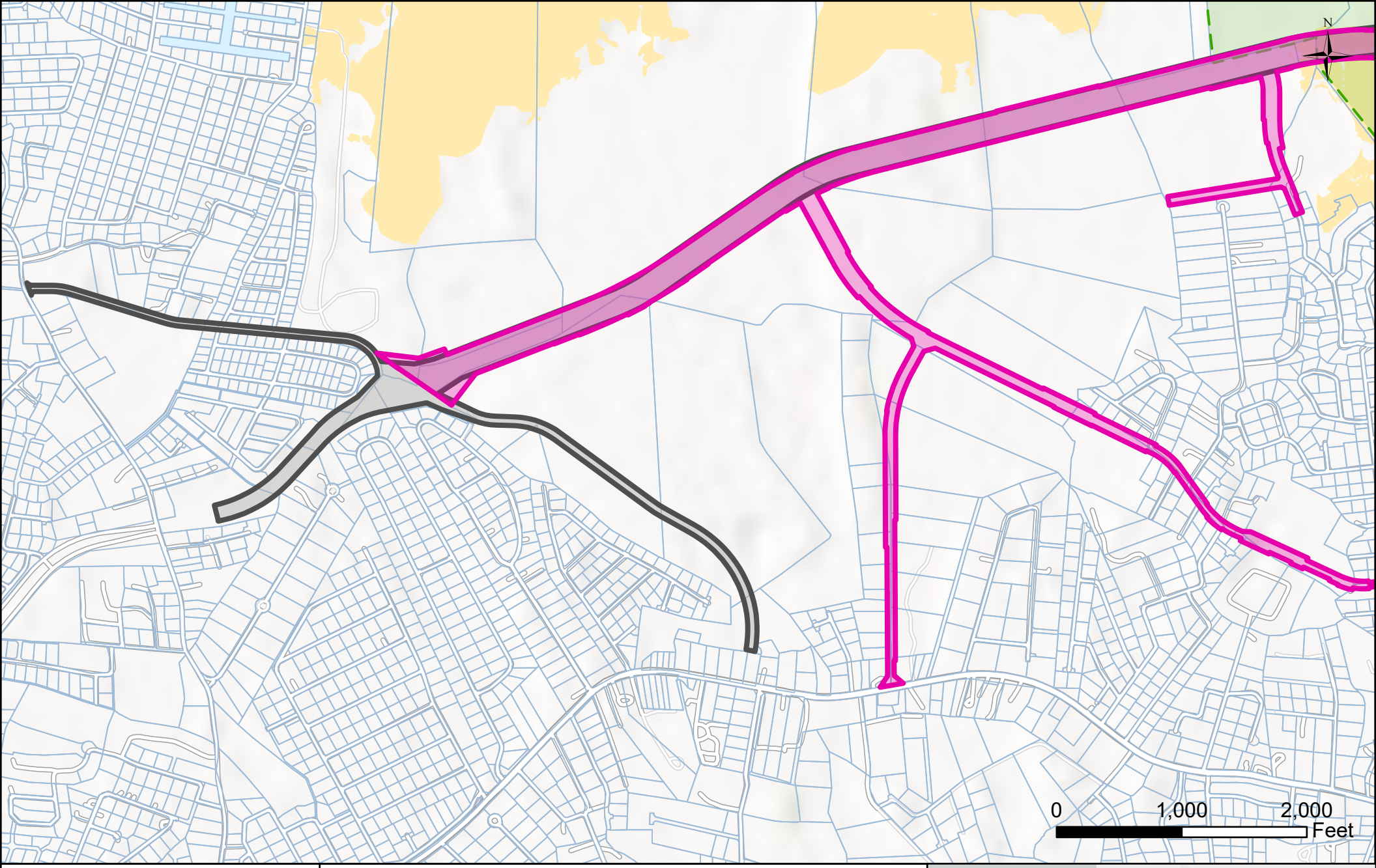
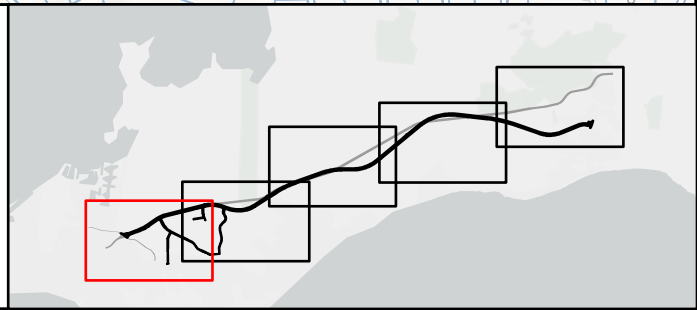
Appendix K.6 - Proposed Project and Gazetted Corridor Mapping

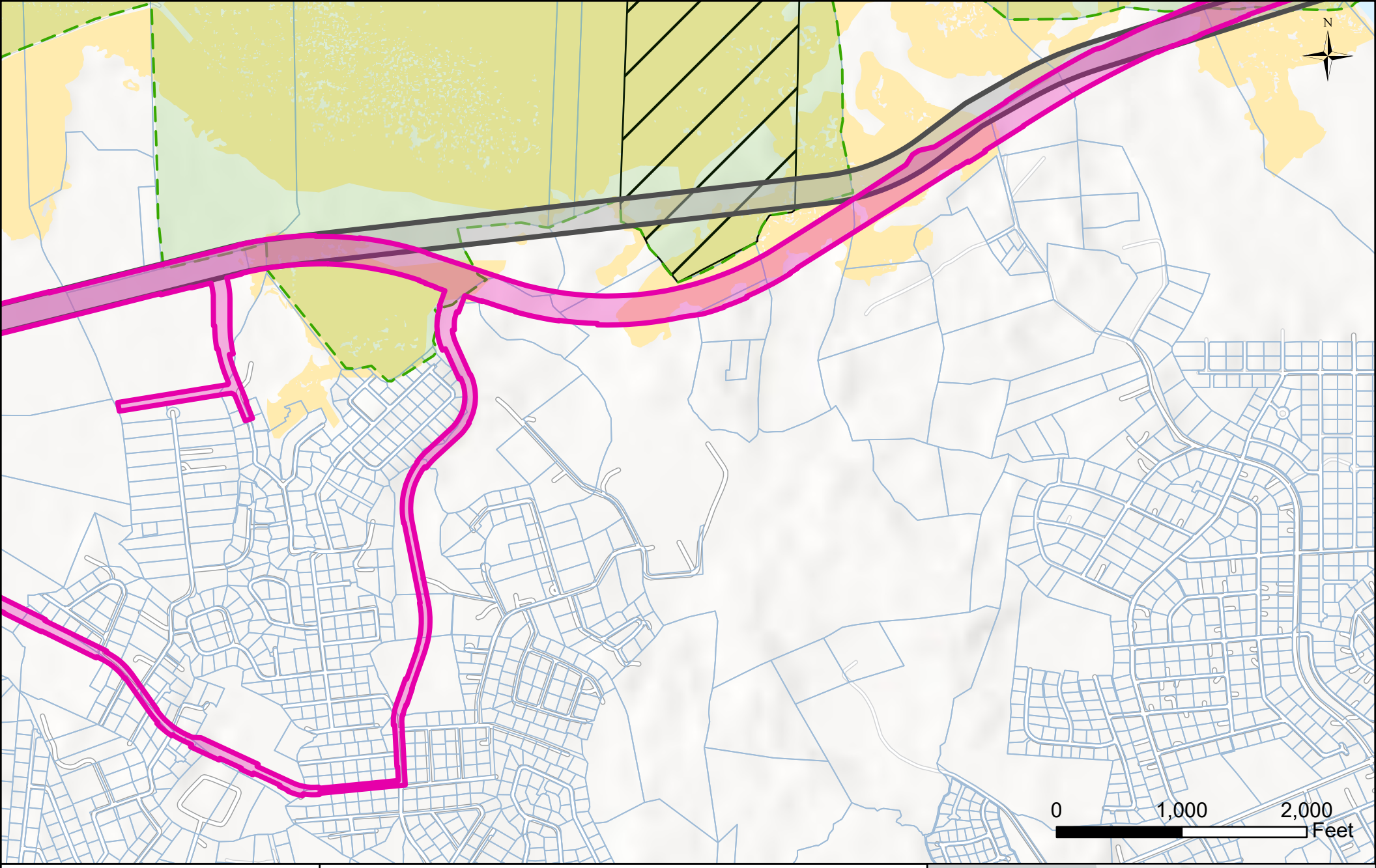


East-West Arterial Extension,
Environmental Impact Assessment

Gazetted Corridor and Proposed Project
Map 1 of 5

- Proposed Project
- Original Gazetted Corridor
- Central Mangrove Wetland
- Mastic Reserve
- Mastic Trail
- National Trust Land
- Parrot Nesting Habitat
- Parcels

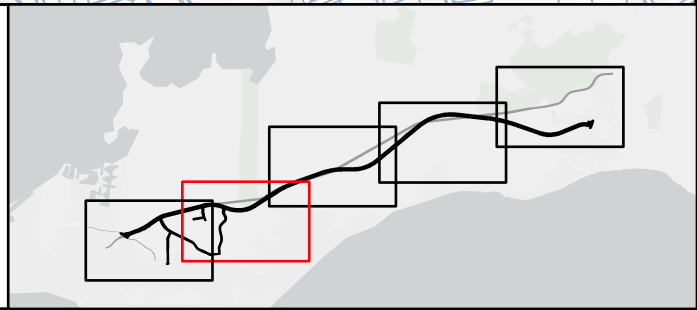


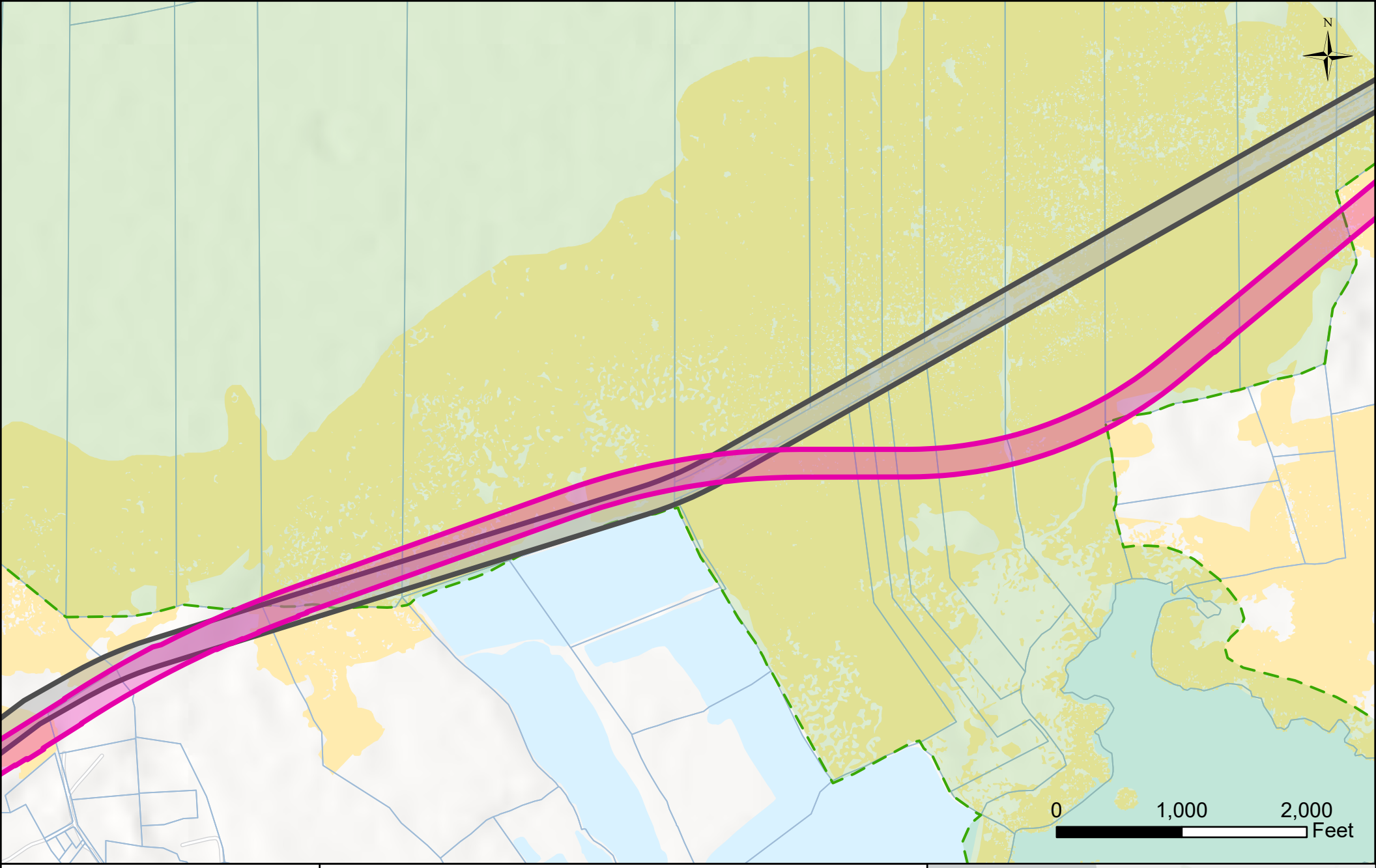


East-West Arterial Extension,
Environmental Impact Assessment

Gazetted Corridor and Proposed Project
Map 2 of 5

- Proposed Project
- Original Gazetted Corridor
- Central Mangrove Wetland
- Mastic Reserve
- Mastic Trail
- National Trust Land
- Parrot Nesting Habitat
- Parcels

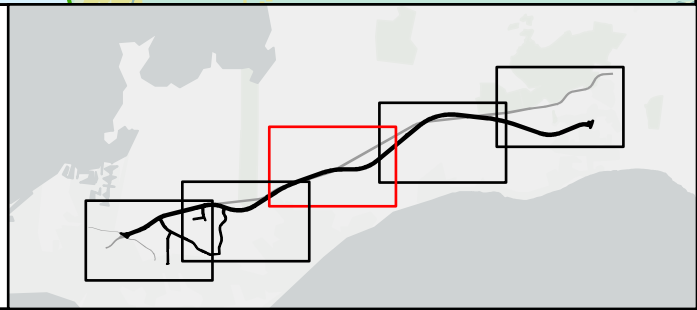


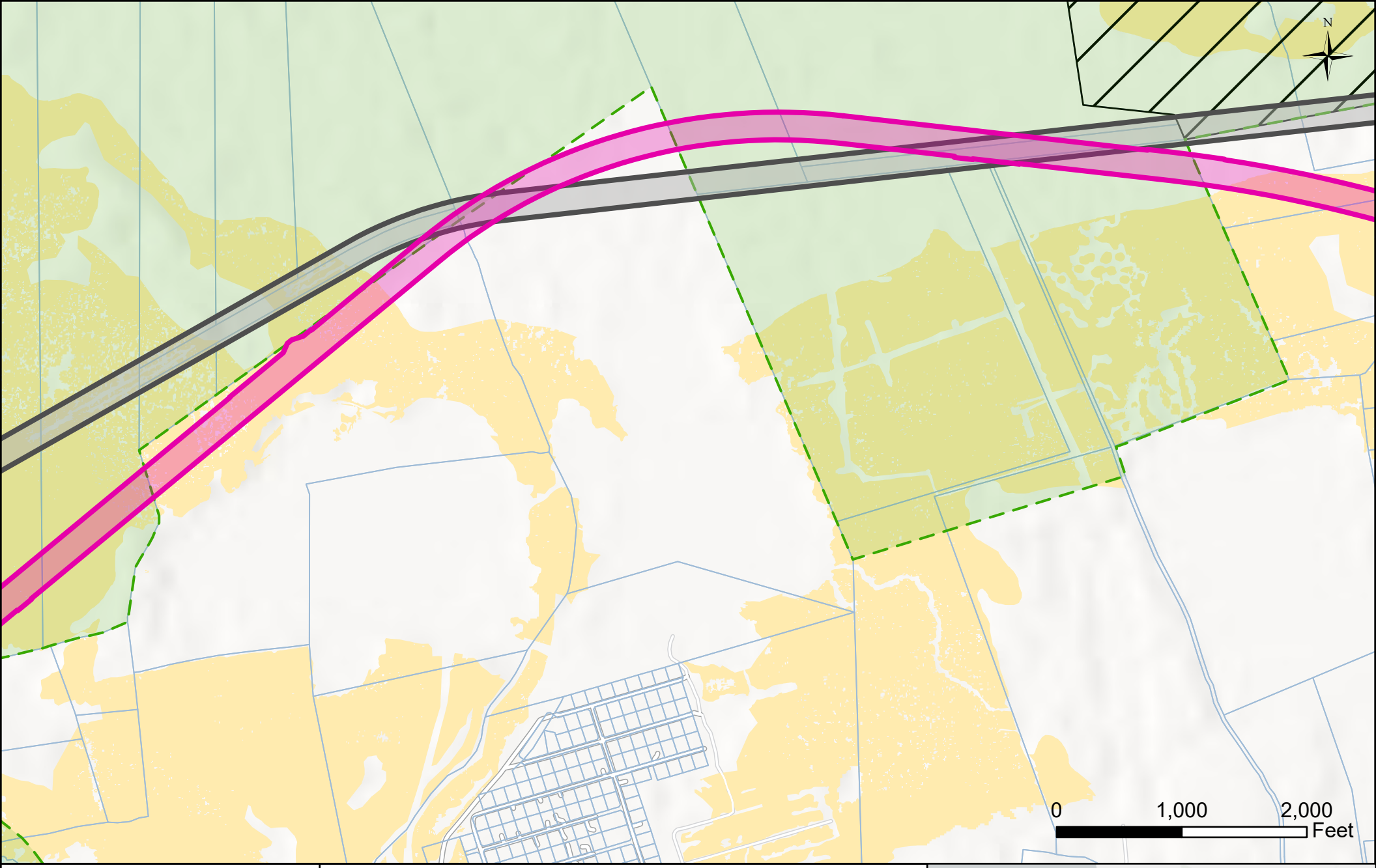


East-West Arterial Extension,
Environmental Impact Assessment

Gazetted Corridor and Proposed Project
Map 3 of 5

- Proposed Project
- Original Gazetted Corridor
- Central Mangrove Wetland
- Mastic Reserve
- Mastic Trail
- National Trust Land
- Parrot Nesting Habitat
- Parcels

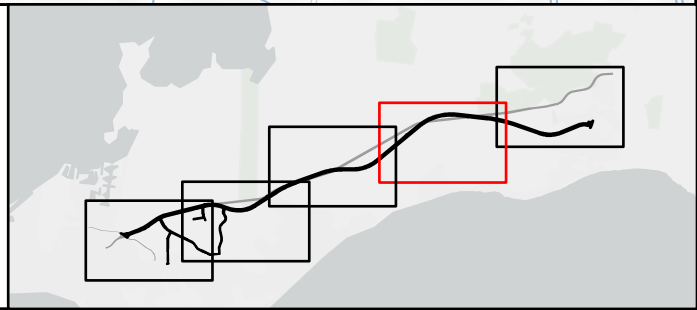


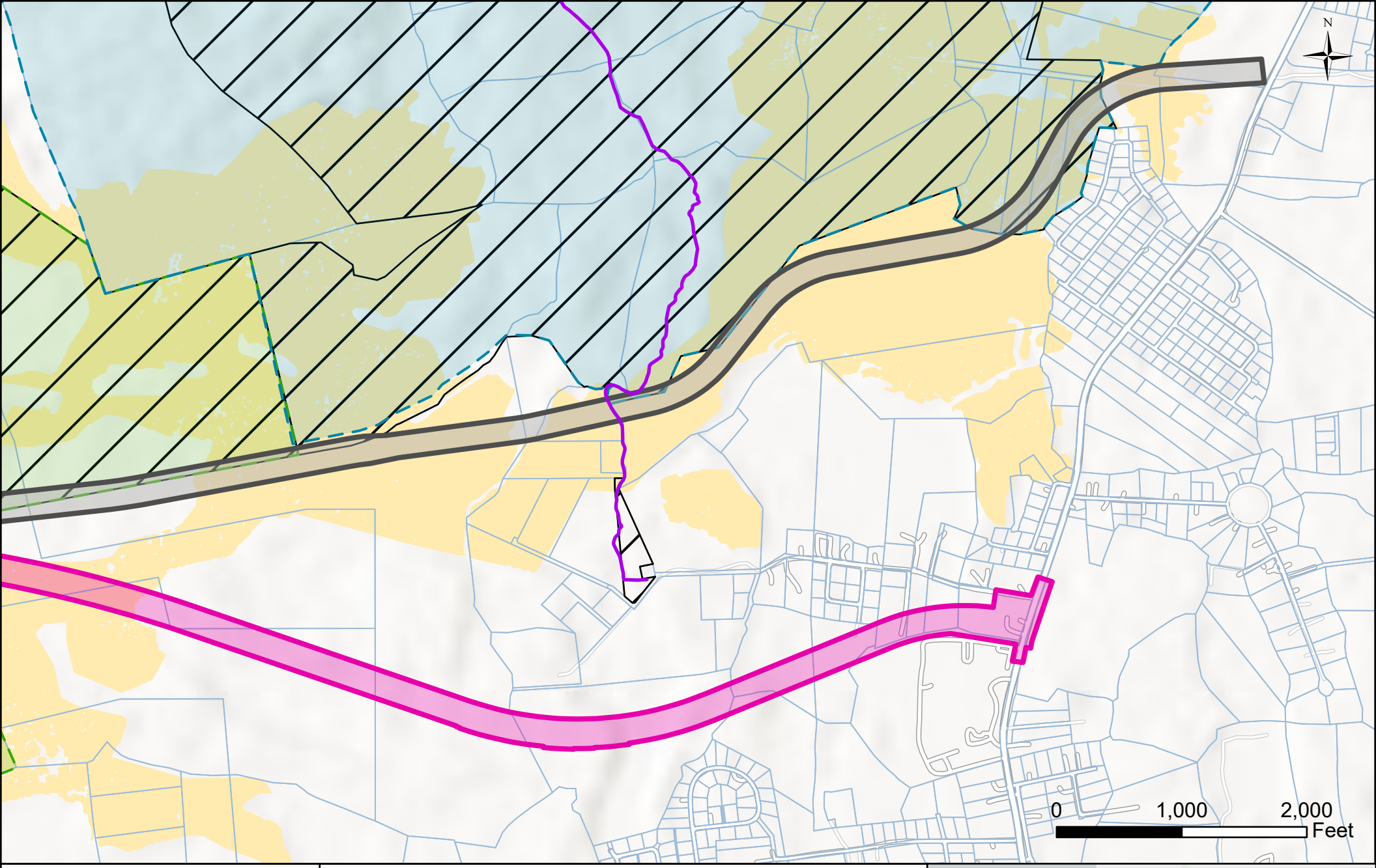


East-West Arterial Extension,
Environmental Impact Assessment

Gazetted Corridor and Proposed Project
Map 4 of 5

- Proposed Project
- Original Gazetted Corridor
- Central Mangrove Wetland
- Mastic Reserve
- Mastic Trail
- National Trust Land
- Parrot Nesting Habitat
- Parcels





East-West Arterial Extension,
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Gazetted Corridor and Proposed Project
Map 5 of 5

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