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

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman

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

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4) EIA Study Area

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Mile

Sources: Cayman DOE and ESRI



Field Verification Figure 2 of 2

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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	Manglove Edgeen Man-Modified Without Trees - Pasture	0.07
18	Ponds Pools and Mangrove Lagoons	0.40
10	Ponds, Pools and Mangrove Lagoons	0.00
20	Seasonally Flooded Mangrove Forest	0.07
20	Man-Modified Without Trees	0.7
22	Man Medified Without Trees	0.2
23	Man Medified Without Trees	0.4
24	Man Medified Without Trees	0.35
20	Second Weeder Mengreye Forest and Weedland	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
14	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



Average Habitat Value (UMAM) Figure: A

Field Verification Points (2023 & 2024)



Habitat (Average UMAM Score)

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
- Lagoons 0.66 Palm Hammock - 0.7

Dry Forest and Woodland - 0.63 Ponds, Pools and Mangrove Seasonally Flooded Mangrove Forest and Woodland - 0.70

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

> 600 300 - Feet



Average Habitat Value (UMAM) Figure: B

Field Verification Points (2023 & 2024)

2023 2024

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

Ponds, Pools and Mangrove Lagoons - 0.66 Seasonally Flooded Mangrove Forest and Woodland - 0.70 Palm Hammock - 0.7

*Alignment not to scale and does not represent required area

> 600 300 - Feet





Average Habitat Value (UMAM)

Figure: C



- 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
- Palm Hammock 0.7

Ponds, Pools and Mangrove Lagoons - 0.66 Seasonally Flooded Mangrove Forest and Woodland - 0.70

*Alignment not to scale and does not represent required area

> 600 300 - Feet



Average Habitat Value (UMAM) Figure: D

Field Verification Points (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
- Palm Hammock 0.7

Dry Forest and Woodland - 0.63 Ponds, Pools and Mangrove Lagoons - 0.66 Seasonally Flooded Mangrove Forest and Woodland - 0.70

Sources: Cayman data and ESRI

*Alignment not to scale and does not represent required area

> 600 300 🗖 Feet



Average Habitat Value (UMAM) Figure: E Field Verification Points (2023 & 2024)

20232024

 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

2023 UMAM Sheets

Site/Project Name	Application Numbe	mber Assessment Area Name or Number			or Number	
					4	5
FLUCCs code	Further classifica	tion (optional)		Impact	t Туре	Assessment Area Size
1100 - Dry forest and woodlan	d					Acres
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	on (i.e.O	FW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hydr	ologic connection with	wetlands, other su	urface water, uplar	nds		
Dry forest and woodland located	north of Bodden Tow	n Rd.				
Assessment area description						
To the south there is Boddentow small pond.	n Road. East and Wes	st is residential/c	ommercial. Soutl	h side	of Boddentown Rd co	oastal shrubland with
Significant nearby features			Uniqueness (coi landscape.)	nsideri	ing the relative rarity in	relation to the regional
			None			
Functions			Mitigation for prev	vious p	permit/other historic use)
Anticipated Wildlife Utilization Base	d on Literature Review	(List of species	Anticipated Utiliza	ation b	y Listed Species (List s	pecies, their legal
be found)	sment area and reasor	lably expected to	assessment area	1, 550)	, type of use, and inte	insity of use of the
Observed Evidence of Wildlife Utiliz	ation (List species dire	ctly observed, or o	other signs such a	s track	ks, droppings, casings,	nests, etc.):
Minimal insect life observed. 1-2	species of birds, 2-3 s	species of butter	flies (one Dryas i	ulia)		
Additional relevant factors:						
Assessment conducted by:			Assessment date	(s):		
JS and MM			07/25/23			

		-		Application Number: -		Assessment Area	Name or Number: 45
npact or Mitig	gation:	Impact		Assessment Conducted by: JS and MM		Assessment Date:	07/25/23
	Scoring Guidar	ice	Optimal (10)	Moderate(7)	Mir	nimal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to ons Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
					Enter Notes	below (do NOT sco	re each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			3
			b. Invasive plant species.				5
500(6)(a) c	ocation and Lan	decane Sunnort	c. Wildlife access to and from A	A (proximity and barriers).			7
.000(0)(0) EC			d. Downstream benefits provided to fish and wildlife.			Ν	/A
			e. Adverse impacts to wildlife in a	AA from land uses outside of AA.			7
			f. Hydrologic connectivity (imp	ediments and flow restrictions).		Ν	/A
]		g. Dependency of downstream I	habitats on quantity or quality of discharges.		Ν	/A
Current		With Impact	h. Protection of wetland function	s provided by uplands (upland AAs only).			3
			Additional				
e		0	Notes:				
U		U					
			a. Appropriateness of water leve	els and flows.			
			b. Reliability of water level indic	cators.			
			c. Appropriateness of soil mois	ture.			
.500(6	(6)(b) Water Env	ironment	d. Flow rates/points of discharg	e.			
	(n/a for upland	s)	f Type of vegetation				
			a Hydrologic stress on vegetat	ion			
			b Use by animals with bydrolog	non.			
			i Plant community composition	n associated with water quality (i.e. plants tol	erant of poor WQ)		
			i. Water quality of standing wa	ter by observation (Le., discoloration, turbidit	v).		
	ו		k Water quality data for the typ	e of community	,,		
Current		With Impact	Water depth wave energy at	nd currents			
			Additional N/A				
0		0	Notes:				
U		0					
			L Appropriato/desiroble aposico				6
500(6	6)(c) Community	Structure					
.000(0		Olidelaic	II. Invasive/exotic plant species				5
	X Vor						7
	<u> </u>	Intation					
		jetation	V Snags dens cavity etc				
	Rer	ithic	V. Snags, dens, cavity, etc.				6 7
	Ber	ithic	 V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices 	S.			7 6 7 3
	Ber	ithic h	 V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug 	s. ia, channels, hummocks).			7 6 7 3 4
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Current	Ber Bot	ithic h With Impact	 V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invasi 	s. ia, channels, hummocks). score if present). (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain l	erminalia catappa), eatherleaf (Colubrin	gumbo limbo (burs a asiatica) , butterfl	7 6 7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),
Current 6	Ber Bot	ithic Mith Impact	 V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invas seashide mahoe (T 	s. ia, channels, hummocks). score if present). (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain l hespesia populnea), Australian pine (Casuarir	erminalia catappa), eatherleaf (Colubrin na equisetifolia)	gumbo limbo (burso a asiatica) , butterfl	7 6 7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),
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Current 6 Raw Scor (if u Current 0.60	Ber Bot	Vith Impact O Vith Impact Vith Impact Vith Impact Vith Impact O Vith Impact 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invas seashide mahoe (T FL NOTE: If impact is	s. ia, channels, hummocks). score if present). (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain le 'hespesia populnea), Australian pine (Casuarir Impact Acres = 0.0 Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = 0.0 proposed to be mitigated at a mitigation ban	erminalia catappa), eatherleaf (Colubrin na equisetifolia)	gumbo limbo (burse a asiatica) , butterfl	7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),
Current 6 Raw Scor (if u Current 0.60	Ber Bot Bot uplands, divide	vithic with Impact 0 with Impact 0 with Impact 0.00 D)	V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invas seashide mahoe (T FL NOTE: If impact is was assessed usin	s. ia, channels, hummocks). score if present). (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain le hespesia populnea), Australian pine (Casuarir Impact Acres = 0.0 Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = 0.0 proposed to be mitigated at a mitigation ban ng UMAM, then the credits required for mitigat	erminalia catappa), eatherleaf (Colubrin na equisetifolia)	gumbo limbo (burse a asiatica) , butterfl	7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),
Current 6 Raw Scor (if u 0.60	Ber Bot	etation ethic ethic with Impact 0 eve scores/30 ey 20) With Impact 0.00 D)	V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invas seashide mahoe (T FL NOTE: If impact is was assessed usin equal to Functiona mitigation, bank, the	S. iia, channels, hummocks). score if present). I (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain le Thespesia populnea), Australian pine (Casuaring Impact Acres = 0.0 Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = 0.0 proposed to be mitigated at a mitigation banking UMAM, then the credits required for mitigated at loss (FL). If impact mitigation is proposed at was not assessed using LIMAM, then the rest of the second stress is proposed at was not assessed using LIMAM.	erminalia catappa), eatherleaf (Colubrin na equisetifolia)	gumbo limbo (burs a asiatica) , butterfl	7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),
Current 6 Raw Scor (if u 0.60	Ber Bot	ve scores/30 by 20) With Impact 0 With Impact 0.00 D) 0.600	V. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - silver palm daphnoides). Invas seashide mahoe (T FL NOTE: If impact is was assessed usin equal to Functiona mitigation bank that cannot be used to a	s. ia, channels, hummocks). score if present). (Cocothrinax proctorii), west indian almond (T ive - tan-tan (Leucaena leucocephala), asain le 'hespesia populnea), Australian pine (Casuarir Impact Acres = 0.0 Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = 0.0 proposed to be mitigated at a mitigation ban ig UMAM, then the credits required for mitigat al Loss (FL). If impact mitigation is proposed at was not assessed using UMAM, then U assess impacts; use the assessment method of	erminalia catappa), eatherleaf (Colubrin na equisetifolia)	gumbo limbo (bursa a asiatica) , butterfl	7 3 4 N/A 4 era simaruba), wild olive (Bontia y orchid tree (Bauhinia divaricata),

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Site/Project Name		Application Numbe	Pr		Assessment Area Name or Number		
					4	6	
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size	
1100	Dry	forest and wood	lland			Acres	
Basin/Watershed Name/Number Af	fected Waterbody (Clas	ss)	Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)	
Geographic relationship to and hydro	logic connection with	wetlands, other s	I urface water, uplar	nds			
Dry forest and woodland located n	orth of Bodden Tow	ın Rd. AA is loca	ted on a slope.				
Assessment area description							
To the south there is Boddentown	Road and a beach/c	oastal shrub. To	o the east and wes	st is r	esidental, the north is	a contiguous forest.	
Significant nearby features			Uniqueness (con landscape.)	nsider	ing the relative rarity in	relation to the regional	
			None				
Functions			Mitigation for previous permit/other historic use				
Anticipated Wildlife Utilization Based that are representative of the assess be found)	on Literature Review nent area and reasor	(List of species hably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	y Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the	
Observed Evidence of Wildlife Utiliza	tion (List species dire	ctly observed, or	I other signs such a	s tracl	ks, droppings, casings,	nests, etc.):	
Insects, honeybees and pollinators	5						
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
JS and MM			07/25/23				

Site/Project Na	ame:				Application Number:			Assessment Area	Name or Number:
Impact or Mitig	ation:	-			- Assessment Conducted by:			Assessment Date	40
		Impact			JS and MM	Λ			07/25/23
Scoring Guidance			Optimal (10)		Moderate(7)		Mir	nimal (4)	Not Present (0)
The scoring of would be su su	f each indicator itable for the typ rface water asse	is based on what be of wetland or bessed	Condition is optimal a supports wetland/surfa functions	and fully ace water	Condition is less than optimal, but su maintain most wetland/surface wate	ufficient to ffunctions	Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
			L				Enter Notes	below (do NOT sco	ore each subcategory individually)
			a. Quality and quantity	of habitat	t support outside of AA.				7
.500(6)(a) Location and Landscape Support			 b. Invasive plant species c. Wildlife access to an d. Downstream benefier e. Adverse impacts to v f. Hydrologic connect 	asive plant species.7dlife access to and from AA (proximity and barriers).7wnstream benefits provided to fish and wildlife.2verse impacts to wildlife in AA from land uses outside of AA.4dralogic connectivity (impediments and flow restrictions)7			7 7 2 4 7		
Current		With Impact	g. Dependency of dow	nstream h	abitats on quantity or quality of dischar	ges.			3
5		0	Additional Notes:	Protection of wetland functions provided by uplands (upland AAs only). 3 Iditional Notes:					<u> </u>
.500(6	6)(b) Water Envi (n/a for upland	ironment s)	 a. Appropriateness of v b. Reliability of water li c. Appropriateness of s d. Flow rates/points of e. Fire frequency/seventiation. g. Hydrologic stress on h. Use by animals with i. Plant community continued in the second stress of the second stress of	vater leve evel indic soil moist f discharge erity. n vegetati n hydrolog mpositior	Is and flows. eators. ure. e. ion. ic requirements. n associated with water quality (i.e., pla	nts tolerant	of poor WQ).		
) (j. Water quality of star k Water quality data fu	nding wat	ter by observation (I.e., discoloration, ter by observation)	urbidity).			
Current		With Impact	I. Water depth, wave e	energy, an	nd currents.				
0		0	Additional N/A Notes:						
500/6		Structure	I. Appropriate/desirable	species					7
.500(0		Structure	II. Invasive/exotic plant III. Regeneration/recruit	species tment					5
	X Veg	etation	IV. Age, size distribution	ge, size distribution.			7		
	Ben	thic	V. Snags, dens, cavity VI. Plants' condition.	nags, dens, cavity, etc. 'lants' condition.				8	
			VII. Land management	t practices					4
	Both	n	VIII. Fopographic featur	res (refugi tion (onlv	a, channels, hummocks). score if present).				6 N/A
Current] [With Impact	X. Upland assessment Additional	area					6
6		0	Notes: West India caymaner (Guilandir	an almono nsis), beao na bonduc	a (Terminalia catappa), frangipani (Plun ch naupaka (Scaevola taccada), Asian I ;).	ieria obtussa atherleaf (C	a), gumbo limb olubrina asiati	oo (Bursera simarub ca), Prtia/ mahoe (1	ba), Cayman agave (Agave Thespesia populnea), grey nicker
							_		
Raw Scor (if u	e = Sum of abo uplands, divide t	ove scores/30 oy 20)			Impact Acres =	0.00			
Current		With Impact			Functional Loss (FL)				
0.55		0.00		FL	[For Impact Assessment Areas]: = ID x Impact Acres =	0.000			
	Impact Delta (I	D)	NOTE: If was asse	impact is ssed using	proposed to be mitigated at a mitigation g UMAM, then the credits required for	on bank that mitigation is			
Current -	w/Impact	0.550	equal to mitigation cannot be mitigaiton	bank that bank that bank.	at was not assessed using UMAM, fassess impacts; use the assessment m	hen UMAM of the			

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Site/Project Name	re/Project Name Application Nu				hber Assessment Area Name or Number			
					4	0		
FLUCCs code	Further classification (optio	onal)		Impact	Туре	Assessment Area Size		
1214	Coastal	Shrub				Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class)	S	Special Classification	ON (i.e.Ol	FW, AP, other local/state/federal	designation of importance)		
Coographic relationship to and hyd	rologic connection with wetlands	other sur	face water uplan	nde				
			iace water, upiar	ius				
Uplands adjacent to beach/Carib	bean Sea							
Assessment area description								
Coastal shrub between Boddon T	Fown Rd and beach.							
Significant nearby features			Uniqueness (cor andscape.)	nsideri	ng the relative rarity in	relation to the regional		
Boddon Town Road north of AA. pine to the east of AA. Residentia	stralian N	lone						
Functions		N	Mitigation for previous permit/other historic use					
Wildlife habitat, erosion stabiliza	tion, weather event buffer	N	N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (List of sp sment area and reasonably expe	ected to c	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 Utiliz	zation (List species directly obser	ved, or oth	her signs such as	s track	s, droppings, casings,	nests, etc.):		
Birds, woodpeckers, termite nest	s, pollinators, butterflies, geck	(OS.						
Additional relevant factors:								
Assessment conducted by:		A	Assessment date	(s):				
JS and MM		C	07/26/23					

Site/Project Na	ame:	-		Application Number: -		Assessment Area	Name or Number: 40		
mpact or Mitig	gation:	Impact		Assessment Conducted by: JS and MM		Assessment Date	Assessment Date: 07/26/23		
Scoring Guidance			Optimal (10)	Moderate(7)		linimal (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 functions				Condition is less than optimal, but suffic maintain most wetland/surface waterfun	ient to ctions	level of support of d/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					Enter Note	es below (do NOT sco	pre each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.			6		
			b. Invasive plant species.				4		
500(6)(2) (ocation and Lan	decana Sunnort	c. Wildlife access to and from A	A (proximity and barriers).			6		
.500(0)(a) L(ocation and Lan	uscape Support	d. Downstream benefits provide	ed to fish and wildlife.			6		
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			3		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			4		
0			g. Dependency of downstream h	habitats on quantity or quality of discharges			4		
Current		with impact	h. Protection of wetland functions	s provided by uplands (upland AAs only).			3		
			Additional Invasives on fringe,	, birds, insects able to access. Erosion stab	ilization seaward.				
5		0	Notes:						
-		-							
			a. Appropriateness of water leve	els and flows.					
			b. Reliability of water level indic	cators.					
			c. Appropriateness of soil moist	ture.					
E00/	(G)(b) Matar Epy	ironmont	d. Flow rates/points of discharg	le.					
.500((b) water Env (n/a for upland	lionment Is)	e. Fire frequency/severity.						
		- /	f. Type of vegetation.						
			g. Hydrologic stress on vegetation.						
			h. Use by animals with hydrolog	gic requirements.	talayant of poor MO	A			
			Plant community composition Water quality of standing wa	ter by observation (Le., discoloration, turb	idity)).			
	7		k Water quality of standing wa	e of community	iany).				
Current		With Impact	Water depth wave energy ar	nd currents					
			Additional N/A						
			Additional N/A Notes:						
			Additional N/A Notes:						
			Additional N/A Notes: I. Appropriate/desirable species				6		
.500(6	6)(c) Community	Structure	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species				6		
.500(6	6)(c) Community	Structure	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment				6 4 8		
.500(6	6)(c) Community XVec	Structure	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution.				6 4 8 6		
.500(6	6)(c) Community X Veç	Structure	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc.				6 4 8 6 3		
.500(6	6)(c) Community <u>X</u> Vec	Structure getation nthic	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition.				6 4 8 6 3 6 4		
.500(6	6)(c) Community <u>X</u> Vec Ber	Structure getation hthic	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug	S.			6 4 8 6 3 6 4 3		
.500(6	6)(c) Community <u>X</u> Vec Ber Bot	Structure getation hthic	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Lopographic features (refug IX. Submerged vegetation (only	s. ia, channels, hummocks). score if present).			6 4 8 6 3 6 4 3 N/A		
.500(6	6)(c) Community <u>X</u> Veç Ber Bot	Structure getation hthic	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area	s. ia, channels, hummocks). score if present).			6 4 8 6 3 6 4 3 N/A 6		
.500(6	6)(c) Community <u>X</u> Veg Ber Bot	Structure getation hthic h With Impact	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave	caymanensis), coco	nut palm (Cocos nuci	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax		
.500(6	6)(c) Community Vec Ber Bot	Structure getation hthic h With Impact	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso	caymanensis), coco balanus icaco). Inva	nut palm (Cocos nuci sive- Egyptian crowfo	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winmal invasive species. Good		
.500(6 Current	6)(c) Community <u>X</u> Vec Ber Bot	Structure getation hthic h With Impact 0	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave nbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent	caymanensis), coco balanus icaco). Inva australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo uarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax stort (Dactyloctenium aegyptium), beach winimal invasive species. Good seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5	6)(c) Community XVeg Ber Bot	Structure getation hthic h With Impact 0	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), re species. minimal topo features. Adjacent	caymanensis), coco balanus icaco). Invas australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). N ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach winimal invasive species. Good beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5	6)(c) Community X Veg Ber Bot	Structure getation hthic h With Impact 0	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent	caymanensis), coco balanus icaco). Invas australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Geagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor	6)(c) Community Veg Ber Bot	Structure getation hthic h With Impact 0	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres =	caymanensis), coco balanus icaco). Inva australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax tot (Dactyloctenium aegyptium), beach dinimal invasive species. Good seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if	6)(c) Community <u>X</u> Veg Ber Bot re = Sum of abo uplands, divide	Structure getation hthic h With Impact 0	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres =	caymanensis), coco balanus icaco). Inva australian pine (Casu land management p 0.00	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax sot (Dactyloctenium aegyptium), beach Winimal invasive species. Good seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if	6)(c) Community <u>X</u> Veg Ber Bot Bot Bot Bot Bot Bot	Structure getation hthic h With Impact 0 ove scores/30 by 20)	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres =	caymanensis), coco balanus icaco). Inva australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if	6)(c) Community Veg Ber Bot Bot re = Sum of abc uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres =	caymanensis), coco balanus icaco). Invas australian pine (Casu land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current	6)(c) Community Veg BerBotBot re = Sum of abo uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Acces]:	caymanensis), coco balanus icaco). Inva australian pine (Casu land management p	nut palm (Cocos nuci sive- Egyptian crowfo uarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax sot (Dactyloctenium aegyptium), beach winimal invasive species. Good seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current	6)(c) Community Veg BerBotBot re = Sum of abo uplands, divide	Structure getation hthic h With Impact 0 by 20) With Impact	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]:	caymanensis), coco balanus icaco). Inva australian pine (Casi land management p	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community <u>X</u> Veg Ber Bot re = Sum of abc uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres =	caymanensis), coco balanus icaco). Invas australian pine (Casi land management p 0.00	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community VegBerBot re = Sum of abc uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (caymanensis), coco balanus icaco). Invas australian pine (Casi land management p 0.00	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community Veg BerBotBot re = Sum of abc uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (caymanensis), coco balanus icaco). Inva: australian pine (Casi land management p 0.00	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 7 6 6 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach winimal invasive species. Good seagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community Veg Ber Bot re = Sum of abc uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (Notes: proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL NOTE: If impact is	S. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (proposed to be mitigated at a mitigation b or UMAM, then the gradite required for mitigation b	caymanensis), coco balanus icaco). Invas australian pine (Casi land management p 0.00	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community Veg Ber Bot Bot uplands, divide	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL NOTE: If impact is was assessed usin equal to Functiona	s. ia, channels, hummocks). score if present). Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (proposed to be mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation b ng UMAM, then the credits required for mitigated at a mitigation is proposed at a mitigation	caymanensis), coco balanus icaco). Invas australian pine (Casi land management p 0.00 0.000	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 6 4 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if 0.50	6)(c) Community <u>X</u> Veg Ber Bot re = Sum of abc uplands, divide Impact Delta (I	Structure getation hthic h With Impact 0 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL NOTE: If impact is was assessed usin equal to Functiona mitigation bank tha	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), i re species. minimal topo features. Adjacent Impact Acres = Impact Acres = (Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (proposed to be mitigated at a mitigation b ng UMAM, then the credits required for mitigat at was not assessed using UMAM, then	caymanensis), coco balanus icaco). Inva: australian pine (Casu land management p 0.000	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good Beagrape 8-10" DBH, 20-25 ft tall.		
.500(6 Current 5 Raw Scor (if Current 0.50	6)(c) Community Veg BerBot re = Sum of abo uplands, divide Impact Delta (I - w/Impact	Structure getation hthic h With Impact 0 bve scores/30 by 20) With Impact 0.00	Additional N/A Notes: I. Appropriate/desirable species II. Invasive/exotic plant species III. Regeneration/recruitment IV. Age, size distribution. V. Snags, dens, cavity, etc. VI. Plants' condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Native - seagrape (proctorii), gumbo lir naupaka (Scavola t recruitment of nativ FL NOTE: If impact is was assessed usin equal to Functiona mitigation bank the cannot be used to a mitigation bank	s. ia, channels, hummocks). score if present). (Coccoloba uvifera), cayman agave (Agave mbo (Bursera simaruba), cocoplum (Chryso taccada), grey nicker (Guilandina bonduc), a re species. minimal topo features. Adjacent Impact Acres = Functional Loss (FL) [For Impact Assessment Areas]: _ = ID x Impact Acres = (proposed to be mitigated at a mitigation b ng UMAM, then the credits required for mitigation to ng UMAM, then the credits required for mitigation to ng UMAM, then the credits required for mitigation is proposed at was not assessed using UMAM, then assess impacts; use the assessment method	caymanensis), coco balanus icaco). Inva australian pine (Casi land management p 0.00 0.000	nut palm (Cocos nuci sive- Egyptian crowfo Jarina equisetifolia). I ractices impact AA. S	6 4 8 6 3 N/A 6 fera), silver palm (Coccothrinax ot (Dactyloctenium aegyptium), beach Winimal invasive species. Good beagrape 8-10" DBH, 20-25 ft tall.		

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Site/Project Name	Application Numb	Imber Assessment Area Name or Number			
			4	12	
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size	
1214	Coastal Shrub			Acres	
Basin/Watershed Name/Number	ffected Waterbody (Class)	Special Classificati	ON (i.e.OFW, AP, other local/state/federal	designation of importance)	
Geographic relationship to and hydro	blogic connection with wetlands, other	surface water upla	nds		
Half Moon Bay south of AA					
Assessment area description					
Coastal shrub south of Boddon Te	own Road.				
Significant nearby features		Uniqueness (co landscape.)	nsidering the relative rarity in	relation to the regional	
Boddon Town Road north of AA. I Moon Bay to the south of AA.	Residential east and west of AA. Hal	^f None			
Functions		Mitigation for pre-	vious permit/other historic use)	
Anticipated Wildlife Utilization Based that are representative of the assess be found)	I on Literature Review (List of species ment area and reasonably expected to	Anticipated Utiliza classification (E, assessment area	ation by Listed Species (List s T, SSC), type of use, and inte)	species, their legal ensity of use of the	
Observed Evidence of Wildlife Utiliza	ation (List species directly observed, or	other signs such a	s tracks, droppings, casings,	nests, etc.):	
Parrot (Amazona leucocephala ca	ymanensis), butterflies, grackel, geo	kos			
Additional relevant factors:					
Assessment conducted by:		Assessment date	e(s):		
JS, RH, TS and MM		07/25/23			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
Impact or Mitig	lation:	-		-		Assessment Date	42		
		Impact		JS, RH, TS and	MM		07/25/23		
	Scoring Guidar	ice	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
The scoring of would be sui su	f each indicator itable for the typ irface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suf maintain most wetland/surface waterf	ficient to unctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					L	Enter Notes below (do NOT sco	pre each subcategory individually)		
			a. Quality and quantity of habita	at support outside of AA.			5		
			b. Invasive plant species.				5		
.500(6)(a) Lc	ocation and Lan	dscape Support	c. Wildlife access to and from A	AA (proximity and barriers).			5		
			d. Downstream benefits provide	ed to fish and wildlife.			5		
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.			5		
	1		a Dependency of downstream	habitats on quantity or quality of discharge	05		7		
Current		With Impact	b. Protection of wetland function	e provided by uplands (upland AAs only)			7		
			Additional Coastal shrub frag	rmented by road. Invasives on fringe, bird	s able to ac	cess, but road splits shrub habit	, at and surrounded by fence on northern		
6		0	Notes: boundary. Stops er	rosion into half moon bay. Invasives on fr	nge.	····, · · · · · · · · · · · · · · · · ·			
Ŭ		U							
			a. Appropriateness of water leve	els and flows.					
			b. Reliability of water level indi	cators.					
			c. Appropriateness of soil mois	ture.					
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	ge.					
	(n/a for upland	s)	f Type of vegetation						
			g. Hydrologic stress on vegetat	tion.					
			h. Use by animals with hydrolog	gic requirements.					
			i. Plant community compositio	n associated with water quality (i.e., plan	ts tolerant o	f poor WQ).			
	1		j. water quality of standing wa	ter by observation (i.e., discoloration, tu	rdidity).				
Current		With Impact	I. Water depth, wave energy, a	nd currents.					
			Additional N/A						
			Notes:						
			I. Appropriate/desirable species				6		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				5		
	V Mar		III. Regeneration/recruitment				6		
	<u> </u>	jetation	V. Snags, dens, cavity, etc.				8		
	Ber	ithic	VI. Plants' condition.				6		
-			VII. Land management practices	S.			6		
	Bot	h	VIII. Topographic features (refug	jia, channels, hummocks).			8 N/A		
]		X. Upland assessment area	อออาจาก การอธาญ.			6		
Current		With Impact	Additional						
6		0	mature with recruit	cocopium, royal poiciana, gumbo limbo li ment.	ivasives: As	sutralian pine, tan-tan. Sooty mo	id, dieback, snags. Seagrape dense and		
	I		·						
				Impact Acres =	0.00				
Raw Scor	re = Sum of abo uplands_divide	ove scores/30			0.00				
(11.0		oy 20)							
0									
Current		With Impact		Functional Loss (FL)					
				[For Impact Assessment Areas]:					
0.60		0.00	FI	L = ID x Impact Acres =	0.000				
	•								
	Impact Delta (D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation ng UMAM, then the credits required for n	bank that itigation is				
			equal to Functiona	al Loss (FL). If impact mitigation is prop	osed at a				
-			mitigation bank th	hat was not assessed using UMAM, th	en UMAM				
Current -	w/Impact	0.600	cannot be used to mitigaiton bank.	assess impacts; use the assessment me	thod of the				

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Site/Project Name	nber Assessment Area Name or Number			or Number		
					8	
FLUCCs code	Further classification (optional)		Impact Type		Assessment Area Size	
1500	Dry Shrublan	d			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificati	ON (i.e.OFW, AP, other lo	ocal/state/federal	designation of importance)	
Geographic relationship to and hydr	ologic connection with wetlands, other	surface water, upla	nds			
Assessment area description						
Dry shrubland						
Significant nearby features		Uniqueness (co landscape.)	nsidering the relat	tive rarity in	relation to the regional	
National Trust Property, lagoon, I	mangroves	None				
Functions		Mitigation for previous permit/other historic use				
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (List of species sment area and reasonably expected t	Anticipated Utiliza classification (E, assessment area	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 Utiliz	ation (List species directly observed, c	r other signs such a	as tracks, dropping	gs, casings,	nests, etc.):	
Birds, rat holes						
Additional relevant factors:						
Assessment conducted by:		Assessment date	e(s):			
JS and MM		07/26/23	07/26/23			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:
mpact or Mitia	ation.	-		Assessment Conducted by:		Assessment Date	ð :
	Janon.	Impact		JS and M	M		07/26/23
	Scoring Guidar	ice	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)
he scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but s maintain most wetland/surface wate	sufficient to erfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions	
				I	I	Enter Notes below (do NOT sc	pre each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			9
			b. Invasive plant species.				9
.500(6)(a) Lc	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			9
			d. Downstream benefits provide	d to fish and wildlife.			6
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			9
	1		f. Hydrologic connectivity (imp	ediments and flow restrictions).			6
Current		With Impact	g. Dependency of downstream h	nabitats on quantity or quality of discha	irges.		6
			h. Protection of wetland functions	s provided by uplands (upland AAs on	ly).	I	N/A
-		_	Notes:				
8		0					
			a. Appropriateness of water leve	ls and flows			
			b. Reliability of water level indic	ators.			
			c. Appropriateness of soil moist	ure.			
500//	6)(b) Water Fou	ironment	d. Flow rates/points of discharg	е.			
	(n/a for uplanc	ls)	e. Fire frequency/severity.				
			T. Type of vegetation. Hydrologic stress on vegetati	ion			
			h. Use by animals with hydrologic	ic requirements.			
			i. Plant community composition	associated with water quality (i.e., pl	ants tolerant of	poor WQ).	
	-		j. Water quality of standing wa	ter by observation (I.e., discoloration,	turbidity).		
Current		With Impact	k. Water quality data for the type	e of community.			
Carron	 •		I. Water depth, wave energy, ar	nd currents.			
-		_	Additional N/A Notes:				
U		0					
			I. Appropriate/desirable species				9
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9
			III. Regeneration/recruitment				7
	X Veg	getation	IV. Age, size distribution.				7
	-	athia	V. Snags, dens, cavity, etc.				6
	Ber	ITUIC	VI. Flants condition.	3.			<i>י</i> 7
	Bot	h	VIII. Topographic features (refug	 ia, channels, hummocks).			
			IX. Submerged vegetation (only	score if present).			N/A
Current		With Impact	X. Upland assessment area				7
Guirent		with impact	Notes: Native - silver nalm	(Cocothrinax proctorii) Logwood/bloo	dwood (Haema	toxylum campechianum). Balbi	s' airplant (Tillandsia haldhisiana)
7		0	simpson's stopper (Myrcianthes fragrans), gumbo limbo (E	Bursera simarut	ba), strangler fig (Ficus aurea).	אנשטטטומוומן,
			I				
] [humond A	0.00		
Raw Scor	re = Sum of abo	ove scores/30		Impact Acres =	0.00		
(if u	uplands, divide	by 20)			<u> </u>		
1	1		4				
Current		With Impact		Functional Loss (FL)			
			1	[For Impact Assessment Areas]:			
0.75		0.00	FL	. = ID x Impact Acres =	0.000		
					1		
	Impact Dalta /		NOTE: If impact is	proposed to be mitigated at a mitigati	on bank that		
	Impact Delta (ID)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigati g UMAM, then the credits required for	on bank that mitigation is		

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Site/Project Name	ļ	Application Numbe	r	Ass	sessment Area Name c	or Number
					ç)
FLUCCs code	Further classificati	ion (optional)		Impact Ty	/pe	Assessment Area Size
1500		Dry Shrubland		Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class	3)	Special Classification	DN (i.e.OFW,	, AP, other local/state/federal	designation of importance)
Geographic relationship to and hyd	rologic connection with w	vetlands, other si	I urface water, uplar	nds		
Assessment area description						
AA appears to be seasonally floo	oded semi-deciduous fo	prest and shrub	land			
Significant nearby features			Uniqueness (coi landscape.)	nsidering	the relative rarity in I	relation to the regional
National Trust Property, mastic t	rail		None			
Functions			Mitigation for prev	ious peri	mit/other historic use	
Anticipated Wildlife Utilization Base	ed on Literature Review (List of species	Anticipated Utiliza	ation by L	isted Species (List s	pecies, their legal
be found)		ably expected to	assessment area)	type of use, and inte	nsity of use of the
Observed Evidence of Wildlife Utiliz	zation (List species direc	tly observed, or o	other signs such a	s tracks,	droppings, casings, i	nests, etc.):
Parrots, small yellow and gray bi	irds, butterflies, rat hole	es.				
Additional relevant factors:						
East a little more shrubland. Coc	conut palms, agave cay	man.				
Assessment conducted by:			Assessment date	(s):		
JS and MM			07/25/23			

Site/Project Na	ame:	-		Application Number:			Assessment Area	a Name or Number: Q
mpact or Mitio	ation:	-		- Assessment Conducted by			Assessment Date	J
inpact of milig		Impact		JS and MM	1			07/25/23
	Scoring Guidar	ice	Optimal (10)	Moderate(7)		Mini	imal (4)	Not Present (0)
The scoring of would be su su	f each indicator itable for the typ irface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but su maintain most wetland/surface water	ifficient to functions	Minimal leve wetland/s fur	el of support of surface water actions	Condition is insufficient to provide wetland/surface water functions
						Enter Notes b	pelow (do NOT sc	ore each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.				9
			b. Invasive plant species.					9
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).				9
			d. Downstream benefits provide	ed to fish and wildlife.			I	N/A
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.				9
	1		f. Hydrologic connectivity (imp	ediments and flow restrictions).				9
Current		With Impact	g. Dependency of downstream h	nabitats on quantity or quality of discharge	ges.			9
		-	h. Protection of wetland functions	s provided by uplands (upland AAs only	/).			9
			Additional Notes:					
9		0						
			a. Appropriateness of water leve	els and flows.				
			b. Reliability of water level indic	cators.				
			c. Appropriateness of soil moist	cure.				
.500(6	6)(b) Water Env	ironment	e. Fire frequency/severity.	е.				
	(n/a for upland	S)	f. Type of vegetation.					
			g. Hydrologic stress on vegetat	ion.				
			h. Use by animals with hydrolog	jic requirements.				
			i. Plant community composition	associated with water quality (i.e., pla	nts tolerant o	of poor WQ).		
	1		j. Water quality of standing wa	ter by observation (I.e., discoloration, t	urbidity).			
Current		With Impact	K. water quality data for the type					
			Additional N/A	id currents.				
		0	Notes:					
		Ŭ						
			I. Appropriate/desirable species					9
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					9
			III. Regeneration/recruitment					7
	X Veg	jetation	IV. Age, size distribution.					7
			V. Snags, dens, cavity, etc.					7
	Ber	ithic	VI. Plants' condition.					8
	Det	h	VII. Land management practices	ia channels hummocko)				<u>ک</u> 7
•	DUI		IX. Submerged vegetation (only	score if present).				N/A
]		X. Upland assessment area	1 /.				7
Current		With Impact	Additional					
			Notes: Native - gumbo limb (Tabebuia beteroot	bo (Bursera simaruba), mangrove fern (/	Acrostichum	aureum), silve ve (Bontia dan)	r palm (Coccothrir	nax proctorii), pink trumpet tree
8		0			,, mia onv			
] [
Raw Scor	e = Sum of abo	ove scores/30		Impact Acres =	0.00			
(if u	uplands, divide	by 20)						
	-							
Current		With Impact						
			4	Functional Loss (FL)				
0.05		0.00		[For impact Assessment Areas]:				
0.85		0.00	FL	. = ID x Impact Acres =	0.000			
	•		·					
	Impact Delta (D)	NOTE: If impact is	proposed to be mitigated at a mitigatio	n bank that			
			was assessed usin	y own, men me credits required for l	nnuyauon is			
			equal to Functiona		poood at a			
Current	w/lmnast		mitigation bank the	at was not assessed using UMAM, t	hen UMAM			
Current -	w/Impact	0.850	mitigation bank the cannot be used to a mitigation bank.	at was not assessed using UMAM, t assess impacts; use the assessment me	hen UMAM ethod of the			

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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number
					3	8
FLUCCs code	Further classificat	tion (optional)		Impac	t Туре	Assessment Area Size
1500		Dry Shrubland				Acres
Basin/Watershed Name/Number A	ffected Waterbody (Class	s)	Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hydro	logic connection with	wetlands, other s	urface water, uplar	nds		
Assessment area description						
Dry shrubland north of Boddentov	vn Road.					
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
Boddentown Rd to the south. Resi Continious shrubland to the north	dental to the east an	d west.	None			
Functions			Mitigation for prev	vious p	permit/other historic use)
Anticipated Wildlife Utilization Based that are representative of the assess be found)	on Literature Review ment area and reason	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	by Listed Species (List s C), type of use, and inte	pecies, their legal nsity of use of the
Observed Evidence of Wildlife Utiliza	tion (List species dired	ctly observed, or o	I other signs such a	s tracl	ks, droppings, casings,	nests, etc.):
Birds Butterflies						
Additional relevant factors:						
Assessment conducted by:			Assessment date	e(s):		
JS and MM			07/26/23			

Site/Project Na	ame:	<u> </u>		Application Number:		Assessment Area	Name or Number:
mpact or Mitig	gation:	_		Assessment Conducted by:		Assessment Date	:
		Impact		JS and M	Μ		07/26/23
	Scoring Guidar	ice	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but s maintain most wetland/surface wate	ufficient to erfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions
					E	nter Notes below (do NOT sco	ore each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			4
			b. Invasive plant species.				5
500(6)(a) Lo	ocation and I an	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			5
			d. Downstream benefits provide	d to fish and wildlife.			4
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			5
	7		f. Hydrologic connectivity (imp	ediments and flow restrictions).		١	J/A
Current		With Impact	g. Dependency of downstream h	abitats on quantity or quality of discha	rges.		2
	_		h. Protection of wetland functions	s provided by uplands (upland AAs on	ly).		3
			Additional				
3		0	noles.				
			a. Appropriateness of water leve	Is and flows.			
			b. Reliability of water level indic	ators.			
			c. Appropriateness of soil moist	ure.			
.500((6)(b) Water Env	ironment	d. Flow rates/points of discharg	9.			
	(n/a for uplanc	s)	e. Fire frequency/severity.				
			a Hydrologic stress on vegetation.	on			
			h. Use by animals with hydrolog	ic requirements.			
			i. Plant community composition	associated with water quality (i.e., pla	ants tolerant of p	boor WQ).	
	7		j. Water quality of standing wa	ter by observation (I.e., discoloration,	turbidity).		
Current		With Impact	k. Water quality data for the type	e of community.			
		-	I. Water depth, wave energy, ar	id currents.			N/A
		0	Notes:				
		U					
			I. Appropriate/desirable species				6
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				6
	X Ve		III. Regeneration/recruitment				3
	<u> </u>	jetation	V. Snags, dens, cavity, etc.				
	Ber	nthic	VI. Plants' condition.				7
			VII. Land management practices				4
	Bot	h	VIII. Topographic features (refug	a, channels, hummocks).			4
	1		IX. Submerged vegetation (only X. Upland assessment area	score it present).			N/A 5
Current		With Impact	Additional				•
	1 1		Notes: Native - gumbo limb	oo (Bursera simaruba), black mastic (Te	erminalia eriosta	chya), silver palm (Coccothrin	ax protorii), wild olive (Bontia
5		0	daphnoides), foliag	e nower (Phylianthus angustifolius), Inv	vasive - tan-tan (∟eucaena ieucocephala).	
			1 [
Raw Scor	re = Sum of abo	ove scores/30		Impact Acres =	0.00		
(if	uplands, divide	by 20)					
	7						
Current		With Impact		_			
	1			Functional Loss (FL)			
0.40		0.00			0.000		
				= x impact Acres =	0.000		
			NOTE: If impact is	proposed to be mitigated at a mitigati	on bank that		
	_	-		5 0 0			
	Impact Delta (D)	was assessed usin	g UMAM, then the credits required for	mitigation is		
	Impact Delta (D)	was assessed usin equal to Functiona mitigation bank that	g UMAM, then the credits required for I Loss (FL). If impact mitigation is pr at was not assessed using UMAM.	mitigation is oposed at a then UMAM		
Current -	Impact Delta (D) 0.400	was assessed usin equal to Functiona mitigation bank that cannot be used to a	g UMAM, then the credits required for I Loss (FL). If impact mitigation is pr at was not assessed using UMAM, assess impacts; use the assessment m	mitigation is oposed at a then UMAM nethod of the		

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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number	
					4	9	
FLUCCs code	Further classifica	tion (optional)		Impac	t Type	Assessment Area Size	
2230	Ser	ni-Deciduous Fo	rest				
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)	
Geographic relationship to and hyd	rologic connection with	wetlands, other s	l urface water, uplar	nds			
Rocky wooded area north of Boc	Identon Rd. Adjacent	to construction s	site. Uplands to w	vest.			
Assessment area description							
Rocky wooded area north of Boc	Identon Rd. Adjacent	to construction s	site.				
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional	
SW- residential. Construction sit	e to east. West contin	uous forest	None				
Functions			Mitigation for prev	vious p	permit/other historic use)	
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review ssment area and reasor	(List of species hably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	by Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the	
Observed Evidence of Wildlife Utiliz	zation (List species dire	ctly observed, or	other signs such a	s tracl	ks, droppings, casings,	nests, etc.):	
birds, Cayman racer (Cubophis c	aymanus)						
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
JS and MM			07/25/23				

Site/Project Na	ame:				Application Number:			Assessment Area	Name or Number:
Impact or Mitig	ation:	-			-			Assessment Date	49
impact of willig	allon.	Impact			JS and M	ИM		Assessment Date	07/25/23
	Scoring Guidar	Ce	Optir	mal (10)	Moderate(7)		Min	imal (4)	Not Present (0)
The scoring of would be su su	f each indicator itable for the typ rface water asso	is based on what be of wetland or essed	Condition is o supports wetla fun	s optimal and fully tland/surface water unctions Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions Minimal level of support of wetland/surface water functions					
							Enter Notes	below (do NOT sco	pre each subcategory individually)
			a. Quality and	quantity of habita	t support outside of AA.				5
.500(6)(a) Lo	ocation and Lan	dscape Support	b. Invasive pla c. Wildlife acco d. Downstrean e. Adverse imp	i nt species. ess to and from A n benefits provide acts to wildlife in A	A (proximity and barriers). ed to fish and wildlife. AA from land uses outside of AA.			Ν	8 8 J/A 2
Current		With Impact	f. Hydrologic g. Dependenc	connectivity (imp y of downstream I	pediments and flow restrictions). habitats on quantity or quality of disch	arges.		N	J/A J/A
			h. Protection of Additional A Notes:	f wetland function djacent to constru	is provided by uplands (upland AAs o uction site to east and development to	nly). south. Minima	I invasives.		2
.500(6	6)(b) Water Env (n/a for upland	ironment s)	 a. Appropriater b. Reliability of c. Appropriater d. Flow rates/ e. Fire frequer f. Type of veg g. Hydrologic s h. Use by anir i. Plant communication 	ness of water level f water level indic ness of soil mois points of discharg ncy/severity. letation. stress on vegetat mals with hydrolog unity composition	els and flows. cators. ture. ge. tion. gic requirements. n associated with water quality (i.e., p	plants tolerant of	of poor WQ).		
Current		With Impact	j. Water qualit k. Water qualit	ty of standing wa	ater by observation (I.e., discoloration be of community.	n, turbidity).			
			Additional N Notes:	/A					
500/0		Chrysterre	I. Appropriate/c	desirable species					9
.500(6		Structure	II. Invasive/exo III. Regeneratio	tic plant species					9 4
	X Veg	etation	IV. Age, size di	stribution.					5
	Ber	thic	V. Snags, den VI. Plants' con	s, cavity, etc. dition.					<u> </u>
			VII. Land man	agement practices	S.				2
	Bot	n	IX. Submerged	d vegetation (only	gia, channels, hummocks).				/ N/A
Current		With Impact	X. Upland asse Additional	essment area	stic (Terminalla eriostachya), gumbo lii	mbo (Bursera s	simaruba) wild	l olive (Bontia daph	5 noides) francipani (Plumeria obtusa)
7			Notes: pi B	itch apple (Clusia albis' airplant (Till	rosea), Thomson's dwarf schomburgh andsia balbisiana), butterfly ordchid tr	kia (Mymercopl ee (Bauhinia d	hila thomsonia livaricata).	na), large-flowered	cactus (Selenicereus grandiflorus),
Raw Scor (if u	e = Sum of abo uplands, divide l	ove scores/30 oy 20)] [Impact Acres =	0.00			
Current		With Impact] г		Functional Loss (FL)				
0.60		0.00		FL	[For Impact Assessment Areas]: _ = ID x Impact Acres =	0.000			
	Impact Delta (I	D)	- L N W	OTE: If impact is as assessed usin	proposed to be mitigated at a mitigang UMAM, then the credits required for	tion bank that or mitigation is	ı		
Current -	w/Impact	0.600	er m ca m	qual to Functiona itigation bank th annot be used to itigaiton bank.	al Loss (FL). If impact mitigation is p lat was not assessed using UMAM assess impacts; use the assessment	proposed at a , then UMAM method of the			

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Site/Project Name	A	pplication Numbe	r		Assessment Area Name	or Number
					1'	11
FLUCCs code	Further classification	on (optional)		Impac	t Type	Assessment Area Size
2230	Semi	-Deciduous Fo	rest			Acres
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classificati	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hyd	rologic connection with w	etlands, other su	urface water, uplai	nds		
Seasonally flooded deciduous fo	rest. Surrounded by Ma	astic Forest and	d trail. Mangroves	s to th	ne west.	
Assessment area description						
Seasonally flooded deciduous fo	rest. Surrounded by Ma	astic Forest and	d trail. Mangroves	s to th	ne west.	
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
Mastic Forest- National Trust. Ce	ntral Mangrove Wetland	d	None			
Functions			Mitigation for prev	vious p	permit/other historic use	9
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (L sment area and reasonal	ist of species bly expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	by Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the
Observed Evidence of Wildlife Utiliz	zation (List species direct	ly observed, or o	other signs such a	s tracl	ks, droppings, casings,	nests, etc.):
Caribean dove, parrot, west india	n woodpecker, banana	quit (Coereba f	laveola)			
Additional relevant factors:						
Assessment conducted by:			Assessment date	e(s):		
JS, RH, TS and MM			07/27/23			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:	
,		-		_		111		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date		
impact of Millig	gallon.	Impost				Assessment Date		
		Impact					07727723	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessedCondition is optimal and fully supports wetland/surface water functionsCondition is less than optimal, but sufficient to maintain most wetland/surface waterfunctionsMinimal level of support of wetland/surface water functions						Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			8	
			b. Invasive plant species.				8	
			c. Wildlife access to and from A	A (proximity and barriers).			9	
.500(6)(a) L	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			4	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			2	
			f. Hydrologic connectivity (impe	ediments and flow restrictions).			1	
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	es. 4			
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).	pland AAs only). 4			
	1		Additional					
5			Notes:					
5								
			a. Appropriateness of water leve	Is and flows.				
			b. Reliability of water level indic	ators.				
			c. Appropriateness of soil moist	ure.				
5000	(6)(b) Water En	vironment	d. Flow rates/points of discharge	9.				
.000((n/a for upland	ds)	e. Fire frequency/severity.					
			f. Type of vegetation.					
			g. Hydrologic stress on vegetati	on.				
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WO)			
			i. Water guality of standing wat	er by observation (I.e., discoloration, turbidity	/).			
	1		k. Water guality data for the type	of community.	,			
Current		With Impact	I. Water depth, wave energy, an	d currents.				
			Additional N/A					
			Notes:					
			I. Appropriate/desirable species				9	
.500(6)(c) Community	v Structure	II. Invasive/exotic plant species				8	
			III. Regeneration/recruitment				6	
	X Ve	getation	IV. Age, size distribution.				9	
V. Snags, dens, cavity, etc.						6		
Benthic VI. Plants' condition.							7	
			VII. Land management practices	ctices. 8			8	
Both VIII. Topographic features (refugia, channels, hummocks). 8					8			



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Site/Project Name		Application Numbe	umber Assessment Area Name or Number			or Number	
					1	12	
FLUCCs code	Further classifica	tion (optional)	I	mpact Type		Assessment Area Size	
2230	Sen	ni-Deciduous Fo	rest			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classificatio	N (i.e.OFW, AP, o	ther local/state/federal	designation of importance)	
Geographic relationship to and hyd	I Irologic connection with	wetlands, other si	l urface water, uplan	ds			
Seasonally flooded deciduous fo	prest. Surrounded by M	lastic Forest and	d trail. Mangroves	to the west.			
Assessment area description							
Seasonally flooded deciduous fo	prest. Surrounded by N	lastic Forest and	d trail. Mangroves	to the west.			
Significant nearby features			Uniqueness (con landscape.)	sidering the I	relative rarity in	relation to the regional	
Mastic Forest- National Trust. Co	entral Mangrove Wetla	nd	None				
Functions			Mitigation for prev	ious permit/o	ther historic use	9	
Anticipated Wildlife Utilization Base that are representative of the asse be found)	ed on Literature Review ssment area and reason	(List of species ably expected to	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 Utili	zation (List species dire	ctly observed, or o	other signs such as	s tracks, drop	pings, casings,	nests, etc.):	
Birds/nests, geckos, woodpecke	er, warbler spp., thrush	ı, parrot, wasps					
Additional relevant factors:							
Assessment conducted by:			Assessment date(s):			
JS, RH, TS and MM			07/27/23				

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:
moot or Milia	ation	-		-		Accomment Data	112
mpact or milliga		Impact		JS, RH, TS and	мм	Assessment Date	07/27/23
	Scoring Guidar	1Ce	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)
The scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suf maintain most wetland/surface water	ficient to unctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions
					I	Enter Notes below (do NOT sco	pre each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			8
.500(6)(a) Lo	ocation and Lan	dscape Support	 b. Invasive plant species. c. Wildlife access to and from A d. Downstream benefits provide e. Adverse impacts to wildlife in A f. Hydrologic connectivity (impacts) 	A (proximity and barriers). ed to fish and wildlife. AA from land uses outside of AA.			9 8 6 2 2
			g. Dependency of downstream	habitats on quantity or quality of discharg	es.		2
Current		With Impact	h. Protection of wetland function	s provided by uplands (upland AAs only)			3
6			Additional Notes:				
			a. Appropriateness of water leve	els and flows.			
			b. Reliability of water level india	cators. ture.			
500/6	6)(h) Matar Env	ironment	d. Flow rates/points of discharg	je.			
.500(6	(n/a for upland	ls)	e. Fire frequency/severity.				
			 Type of vegetation. Hydrologic stress on vegetat 	tion.			
			h. Use by animals with hydrolog	gic requirements.			
			i. Plant community composition	n associated with water quality (i.e., plan	ts tolerant of	poor WQ).	
			j. Water quality of standing wa	ter by observation (I.e., discoloration, tu	rbidity).		
Current		With Impact	I. Water depth, wave energy, and	nd currents.			
			Additional N/A				
			Notes:				
			L Appropriato/degirable apogias				0
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9
			III. Regeneration/recruitment				9
-	X Veg	getation	IV. Age, size distribution.				4
	Bor	othic	V. Snags, dens, cavity, etc.				8
-	Dei		VII. Land management practices	S.			7
-	Bot	h	VIII. Topographic features (refug	jia, channels, hummocks).			6
] .		IX. Submerged vegetation (only	score if present).			N/A
Current		With Impact	Additional				U
8			Notes: Yellow mastic, pitch good condition. Yo	h apple, silver thatch, simpson's stopper, unger plant age - gumbo - 5"DBH, hieght	gumbo limbo - 27'	, orchid, smokewood. No invas	ives. Abudant recruitement and plants
			I				
Raw Score (if u	r e = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00		
Current		With Impact		Functional Lose (EL)			
0.70		0.00	1	[For Impact Assessment Areas]:			
			FL	_ = ID x Impact Acres =	0.000		
	Impact Delta (I	D)	NOTE: If impact is was assessed usin equal to Functiona	proposed to be mitigated at a mitigation og UMAM, then the credits required for n al Loss (FL). If impact mitigation is prop	bank that hitigation is bosed at a		
Current -	w/Impact	0.700	mitigation bank th cannot be used to	at was not assessed using UMAM, th assess impacts; use the assessment me	en UMAM thod of the		

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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number	
					1'	13	
FLUCCs code	Further classificat	tion (optional)		Impact	t Туре	Assessment Area Size	
2230	Sem	ni-Deciduous Fo	rest			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class	s)	Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)	
Coographic relationship to and hyd	release connection with	votlanda, othar a	urfaga watar juplai	ndo			
		weilanus, other si	ullace water, upia	nus			
Mastic Forest (Semi-deciduous fo	orest). Central Mangro	ve Wetland to w	est.				
Assessment area description							
Semi-deciduous forest							
Significant nearby features			Uniqueness (co landscape.)	nsideri	ng the relative rarity in	relation to the regional	
Mastic Forest- National Trust			None				
Functions			Mitigation for prev	vious p	permit/other historic use)	
Anticipated Wildlife Utilization Base	d on Literature Review	(List of species	Anticipated Utiliza	ation b	y Listed Species (List s	pecies, their legal	
be found)			assessment area	i)			
Observed Evidence of Wildlife Utiliz	zation (List species direc	ctly observed, or	other signs such a	is track	ks, droppings, casings,	nests, etc.):	
Rat holes, west Indian woodpeck	er, warbler, cuban fro	g					
Additional relevant factors:							
Accomment conducted by			Accordent data	v(a);			
JS. RH. TS and MM			07/27/23				

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:	
		-		-			113	
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date		
	jation.	Impact		IS PH TS and MM				
		impact					01121125	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessedCondition is optimal and fully supports wetland/surface water functionsCondition is less than optimal, but sufficient to maintain most wetland/surface waterfunctionsMinimal level of support of wetland/surface water functionsCondition is condition is wetland/surface waterfunctionsMinimal level of support of wetland/surface water functionsCondition is wetland/surfaceCondition is wetland/surfaceCondition is wetland/surfaceCondition is userfunctionsCondition is wetland/surfaceCondition is wetland/surfaceCondi						Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			8	
			b. Invasive plant species.				9	
	anotion and Lan	desers Current	c. Wildlife access to and from A	A (proximity and barriers).			9	
.ουυ(ο)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			6	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			3	
			f. Hydrologic connectivity (impe	ediments and flow restrictions).			5	
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	es. 3			
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).				
	1		Additional					
5			Notes:					
			a. Appropriateness of water leve	Is and flows.				
			b. Reliability of water level indic	ators.				
			c. Appropriateness of soil moist	ure.				
.500	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.				
	(n/a for upland	ds)	e. Fire frequency/severity.					
			f. Type of vegetation.					
			g. Hydrologic stress on vegetati	on.				
			i Plant community composition	associated with water quality (i.e. plants tole	rant of poor WQ)			
			i. Water guality of standing wat	er by observation (I.e., discoloration, turbidity	·).			
	1		k. Water quality data for the type	of community.	,			
Current		With Impact	I. Water depth, wave energy, an	d currents.				
	1		Additional N/A					
			Notes:					
		-	I. Appropriate/desirable species				9	
.500(6)(c) Community	/ Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				6	
	X Veg	getation	IV. Age, size distribution.				7	
V. Snags, dens, cavity, etc.						6		
	Bei	nthic	VI. Plants' condition.				6	
	Det	h	VII. Land management practices	a channals hummacka)			<u> </u>	
Both VIII. Topographic features (refugia, channels, hummocks). 7					/ 			



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Site/Project Name	Application N	umber	Assessment Area Name or Number		
				11	
FLUCCs code	Further classification (optiona	l)	Impact Type	Assessment Area Size	
3112	Mangrove La	agoon		Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificati	ion (i.e.OFW, AP, other local/s	tate/federal designation of importance)	
Geographic relationship to and hydr	ologic connection with wetlands, ot	her surface water, upla	nds		
Assessment area description					
mangrove lagoon					
Significant nearby features		Uniqueness (cc landscape.)	onsidering the relative	rarity in relation to the regional	
Mangroves adjacent, continuous		None			
Functions		Mitigation for pre	vious permit/other hist	toric use	
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (List of spec sment area and reasonably expecte	ies Anticipated Utiliz ed to classification (E, assessment area	ation by Listed Specie T, SSC), type of use, a)	es (List species, their legal and intensity of use of the	
Observed Evidence of Wildlife Utiliz	ation (List species directly observe	d, or other signs such a	as tracks, droppings, c	casings, nests, etc.):	
	、 · ·				
honeybees, mosquitos, butterfly,	birds, small mud crabs				
Additional relevant factors:					
Assessment conducted by:		Assessment date	e(s):		
JS and MM		07/26/23			

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:
,		-					11
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date	
	jation.	Impact		IS and MM		Assessment Date	
		impact					07720723
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)
The scoring c would be su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to ons Minimal lev wetland/s fu	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
					Enter Notes	below (do NOT sc	I ore each subcategory individually)
			a. Quality and quantity of habitat	support outside of AA.			9
			b. Invasive plant species.				9
			c. Wildlife access to and from A	A (proximity and barriers).			9
.500(6)(a) L	ocation and Lan	dscape Support	d. Downstream benefits provide	d to fish and wildlife.			N/A
			e Adverse impacts to wildlife in A	A from land uses outside of AA			9
			f Hydrologic connectivity (imp	ediments and flow restrictions)			9
	7		a Dependency of downstream h	abitate on quantity or quality of discharges			8
Current		With Impact	b. Destaction of watland functions	abilities of quality of quality of discharges.			
			n. Protection of wetland functions	s provided by uplands (upland AAS only).			N/A
9			Notes:				
			a. Appropriateness of water leve	Is and flows.			9
			b. Reliability of water level indic	ators.			9
			c. Appropriateness of soil moist	ure.			9
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			8
	(n/a for upland	ls)	e. Fire frequency/severity.				9
			f. Type of vegetation.				9
			h. Use by animals with hydrolog	ic requirements			9
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		8
]		k. Water quality data for the type	e of community.			N/A
Current		with impact	I. Water depth, wave energy, an	d currents.			8
9			Additional Deep, no currents. / Notes:	Approriate water levels and flows.			
			I. Appropriate/desirable species				9
.500(6)(c) Community	Structure	II. Invasive/exotic plant species				9
			III. Regeneration/recruitment				8
	<u> </u>	getation	IV. Age, size distribution.				7
			V. Snags, dens, cavity, etc.				6
	Ber	nthic	VI. Plants' condition.				8
	Dot	Ь	VII. Land management practices	a channals hummocks)			<u> </u>
	B01						



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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number
					3	2
FLUCCs code	Further classifica	tion (optional)		Impac	t Type	Assessment Area Size
3112	Ponds, P	ools and Mangro	ove Lagoons			Acres
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classificati	on (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hyd	rologic connection with	wetlands, other si	urface water, upla	nds		
Assessment area description						
mangrove lagoon						
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
Quarry, residential, continuous n	nangrove shrubland		None			
Functions			Mitigation for pre-	vious p	permit/other historic use	•
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review ssment area and reason	(List of species hably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS(a)	y Listed Species (List s C), type of use, and inte	pecies, their legal nsity of use of the
Observed Evidence of Wildlife Likili	-otion (List on asian dire				la dranzinza coninza	
Observed Evidence of whidhire Othin.	zation (List species dire	cily observed, or o	Surier signs such a	is traci	ks, droppings, casings,	nesis, elc.).
Insect life, birds, fish						
Additional relevant factors:						
Assessment conducted by:			Assessment date	e(s):		
JS and MM			07/26/23			

Site/Project Na	ame:	-		Application Number:			Assessment Area	Name or Number: 32
Impact or Mitig	ation:	Impact		Assessment Conducted by: JS and	MM		Assessment Date	07/26/23
	Scoring Guidar	Ce	Optimal (10)	Moderate(7)		Min	imal (4)	Not Present (0)
The scoring o would be su su	f each indicator litable for the typ	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	r Condition is less than optimal, but maintain most wetland/surface w	it sufficient to aterfunctions	Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
						Enter Notes	below (do NOT sco	ore each subcategory individually)
			a. Quality and quantity of habita	at support outside of AA.				7
			b. Invasive plant species.					6
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from <i>i</i>	AA (proximity and barriers).				7
			d. Downstream benefits provid	led to fish and wildlife.			1	N/A
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.				3
	1		f. Hydrologic connectivity (im	pediments and flow restrictions).	harraa			4
Current		With Impact	g. Dependency of downstream	nabitats on quantity or quality of disc	narges.			N/A
5			h. Protection of wetland function Additional Sourrounded by re Notes:	ns provided by uplands (upland AAs esidential, quarry and mangrove shrul	only). pland.		T	N/A
5								
			a. Appropriateness of water lev	vels and flows.				8
			b. Reliability of water level ind	icators.				8
			 Appropriateness of soil mois Flow rates/points of dischart 	sture.				7
.500(6)(b) Water Env (n/a for upland	ironment s)	e. Fire frequency/severity.	90.				9
		5)	f. Type of vegetation.					7
			g. Hydrologic stress on vegeta	ation.				8
			i. Plant community composition	ogic requirements.	plants tolerant	of poor WQ).		4
			j. Water quality of standing w	ater by observation (l.e., discoloration	on, turbidity).			6
Current		With Impact	k. Water quality data for the type	pe of community.				N/A
ourient		man impact	I. Water depth, wave energy, a	and currents.				4
7			Notes:	s, but flow observed. Fish activity				
-			I. Appropriate/desirable species	3				7
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					7
	X Ver	etation	III. Regeneration/recruitment					6
	<u> </u>	letation	V. Snags, dens, cavity, etc.					N/A
	Ber	thic	VI. Plants' condition.					7
			VII. Land management practice	es.				2
	Bot	n	IX. Submerged vegetation (only	gia, channeis, nummocks). v score if present).				4 N/A
			X. Upland assessment area	,				N/A
Current		With Impact	Additional					
6			(Thespesia populr	ngrove (Laguncularia racemosa), blac nea), Australian pine (Casuarina equis	setifolia)	vicennia germii	nans), buttonwood	(Conocarpus erectus), seaside manoe
						7		
Raw Scor (if	e = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00			
C]	\\/:4h !				-		
Current		With Impact		Functional Loss (FL) [For Impact Assessment Areas]:				
0.60		0.00	F	L = ID x Impact Acres =	0.000			
	Impact Delta (I	D)	NOTE: If impact is was assessed usi	s proposed to be mitigated at a mitig ing UMAM, then the credits required to tal Loss (EL). If impact mitigation is	ation bank that for mitigation is			
Current -	w/Impact	0.600	equal to Function mitigation bank th cannot be used to mitigaiton bank.	hat was not assessed using UMAN assess impacts; use the assessmen	noposed at a A, then UMAM t method of the	 ;		

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Site/Project Name	А	Application Numbe	r		Assessment Area Name	or Number
					5	54
FLUCCs code	Further classification	on (optional)		Impac	t Type	Assessment Area Size
5240 - semi-permanently flooded grasslands	Not grass	s. Acrostichum	wetland	-		Acres
Basin/Watershed Name/Number Aff	ected Waterbody (Class))	Special Classification	on (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hydrole	ogic connection with w	vetlands, other su	l urface water, uplar	nds		
Assessment area description						
Open, oval shaped, Acrostichum au	reum wetland. Surro	ounded by 2230	(seasonally floo	ded/ s	saturated semi-decidu	ous forest)
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
Surrounded by seasonally flooded tower to the south.	forest. Hurricane she	elter and call	None			
Functions			Mitigation for prev	vious p	permit/other historic use	9
Anticipated Wildlife Utilization Based of that are representative of the assessmed be found)	on Literature Review (L nent area and reasona	List of species bly expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	by Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the
Observed Evidence of Wildlife Utilizat	ion (List species direct	tly observed, or o	L other signs such a	s tracl	ks, droppings, casings,	nests, etc.):
3 species of lizards, abundant land	crabs, birds, butterfl	lies, expected ir	nsect life			
Additional relevant factors:						
Assessment conducted by:			Assessment date	(s):		
JS and MM			07/25/23			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:	
		_		-			54	
Impost or Mitis	ration			Accessment Conducted by:		Accomment Date		
Impact or Mittig	jation:	I				Assessment Date		
		Impact		JS and MM			07/25/23	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
				modorato(r)				
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	Condition is insufficient to provide wetland/surface water functions			
					Enter Notes	below (do NOT sc	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			9	
			b. Invasive plant species.				9	
			c. Wildlife access to and from A	A (proximity and barriers).			9	
.500(6)(a) L	ocation and Lan	dscape Support	d. Downstream benefits provide	d to fish and wildlife.			N/A	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			9	
			f. Hydrologic connectivity (impe	ediments and flow restrictions).			9	
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			N/A	
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).		N/A		
			Additional					
9		0	Notes:					
			a. Appropriateness of water leve	Is and flows.			8	
			b. Reliability of water level indic	ators.			6	
			c. Appropriateness of soil moist	ure.			N/A	
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			9	
	(n/a for upland	ls)	e. Fire frequency/seventy.				9	
			a Hydrologic stress on vegetati	00			9	
			h. Use by animals with hydrolog	ic requirements.			N/A	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8	
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		N/A	
]		k. Water quality data for the type	e of community.			N/A	
Current		With Impact	I. Water depth, wave energy, an	d currents.			N/A	
	1		Additional No standing water p	present.				
8		0	Notes:					
	I		L Appropriate/desirable species					
.500(6	6)(c) Community	Structure	II Invasive/evotic plant apocios				<u> </u>	
	c)(c) c c		III. Regeneration/recruitment				7	
	X Ver	retation	IV. Age, size distribution.				8	
		<u> </u>	V. Snags, dens. cavity. etc.				N/A	
	Ber	nthic	VI. Plants' condition.				9	
	201		VII. Land management practices				 N/A	
	Bot	h	VIII. Topographic features (refugi	a, channels, hummocks).			8	
				· · · · · · · · · · · · · · · · · · ·			N1/A	



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Site/Project Name		Application Numbe	r		Assessment Area Name of	or Number
					5	5
FLUCCs code	Further classification	ation (optional)		Impact	t Type	Assessment Area Size
5240 - semi-permanently floode grasslands	d					Acres
Basin/Watershed Name/Number	Affected Waterbody (Clas	SS)	Special Classification	0N (i.e.O	FW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hydro	ologic connection with	wetlands, other su	L urface water, uplan	nds		
Assessment area description						
Semi-permiantly flooded grasslan	ds adjacent to road.					
Significant nearby features			Uniqueness (cor landscape.)	nsideri	ing the relative rarity in	relation to the regional
Residential, roads, commercial pr northeast.	operty (mostly devel	oped, lagoon to	None			
Functions			Mitigation for prev	vious p	permit/other historic use	
Anticipated Wildlife Utilization Based that are representative of the assess be found)	d on Literature Review sment area and reasor	List of species hably expected to	Anticipated Utiliza classification (E, 1 assessment area)	ition b F, SS()	y Listed Species (List s C), type of use, and inte	pecies, their legal nsity of use of the
Observed Evidence of Wildlife Litiliz	ation () ist spacing dive	athe aboar ad ar			a drappinga againga	
Observed Evidence of Wildlife Otiliz	ation (List species dire	cuy observed, or o	other signs such as	Strack	s, aroppings, casings,	nesis, eic.).
Pollinators, birds						
Additional relevant factors:						
Assessment conducted by:			Assessment date	(s):		
JS and MM			07/26/23			

ite/Project Na	ame:			Application Number:		Assessment Area	Name or Number: 55
npact or Mitig	pation:			Assessment Conducted by:		Assessment Date	:
		Impact		JS and MM			07/26/23
	Scoring Guidar	се	Optimal (10)	Moderate(7)	M	inimal (4)	Not Present (0)
he scoring of would be su su	of each indicator litable for the typ liface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suff maintain most wetland/surface waterfu	ficient to unctions ficient to f	evel of support of d/surface water unctions	Condition is insufficient to provide wetland/surface water functions
				I	Enter Notes	s below (do NOT sco	ore each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			2
			b. Invasive plant species.				3
500(6)(2) (ocation and Lan	decana Sunnort	c. Wildlife access to and from A	A (proximity and barriers).			5
.000(0)(d) EC			d. Downstream benefits provide	ed to fish and wildlife.			1
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			3
	•		f. Hydrologic connectivity (imp	ediments and flow restrictions).			3
Current		With Impact	g. Dependency of downstream h	nabitats on quantity or quality of discharge	es.		2
Ourient		With impact	h. Protection of wetland functions	s provided by uplands (upland AAs only)			2
			Additional				
3		0	Notes:				
			a. Appropriateness of water leve	els and flows.			
			b. Reliability of water level indic	cators.			
			c. Appropriateness of soil moist	ure.			
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	е.			
	(n/a for upland	s)	e. Fire frequency/severity.				
			 Type of vegetation. Hydrologic stress on vegetation. 	ion			
			h. Use by animals with hydrolog	ic requirements			
			i. Plant community composition	associated with water quality (i.e., plan	ts tolerant of poor WQ).		
			j. Water quality of standing wa	ter by observation (I.e., discoloration, tu	rbidity).		
Current		With Impost	k. Water quality data for the type	e of community.			
Current		with impact	I. Water depth, wave energy, ar	nd currents.			
			Additional N/A				
0		0	110105.				
500/6		Structure	I. Appropriate/desirable species				5
.500(0		Siluciule	II. Invasive/exotic plant species				5
	X Vec	letation	IV. Age. size distribution.				3
			V. Snags, dens, cavity, etc.				1
	Ber	thic	VI. Plants' condition.				6
			VII. Land management practices	3.			3
	Bot	n	VIII. Topographic features (refug	ia, channels, hummocks).			1
	1		IX. Submerged vegetation (only	score if present).			N/A 2
Current		With Impact	Additional				ა
		•	Notes: Native - gumbo limb	oo (Bursera simaruba), orange geiger (Co	ordia sebestena). Invasi	ve - bristlegrass (Se	taria geniculata/ parviflora), egyptian
3		0	crowfoot (Dactlyloc	tenium aegyptium), silky sesban (Sesbiar	na sericea), tan-tan (Leu	ucaena leucocephala	a)
			1				
Raw Scor	re = Sum of abo	ove scores/30		Impact Acres =	0.00		
(if u	uplands, divide	oy 20)					
	.		ļ				
Current		With Impact					
	1 1		4	Functional Loss (FL)			
0.00		0.00		ir or impact assessment areasj:			
0.30		0.00	FL	. = ID x Impact Acres =	0.000		
			· · · · · · · · · · · · · · · · · · ·				
	Impact Delta (D)	NOTE: If impact is	proposed to be mitigated at a mitigation g UMAM, then the credits required for m	bank that		
			พลง สงงของชน นริทา	a charant, montane oregina required for m	nagation is		
			equal to Functiona	I Loss (FL). If impact mitigation is prop	oused at a		
Curront	w/Impact	0 200	equal to Functiona mitigation bank the	I Loss (FL). If impact mitigation is prop at was not assessed using UMAM, th	en UMAM		
Current -	- w/Impact	0.300	equal to Functiona mitigation bank the cannot be used to a mitigaiton bank.	I Loss (FL). If impact mitigation is prop at was not assessed using UMAM, th assess impacts; use the assessment met	en UMAM thod of the		

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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number
					10	00
FLUCCs code	Further classifica	tion (optional)		Impac	t Type	Assessment Area Size
5250	Seasonally F	Flooded Mangrov woodland	e Forest and	-		Acres
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification	on (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hyd	rologic connection with	wetlands, other so	urface water, uplar	nds		
Part of central mangrove wetlan	d. Mosquito ditches.					
Assessment area description						
Raised access road with adjace	nt mosquito ditches wi	th culverts.				
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
West - urban/ residential, N, S, E	- undevelped mangro	ve habitat.	Central mangrov	ve we	tland	
Functions			Mitigation for prev	vious p	permit/other historic use)
Avian habitat, nursery, mosquito erosion control	o control, severe weath	ner buffer,	N/A			
Anticipated Wildlife Utilization Base that are representative of the asse be found)	ed on Literature Review ssment area and reasor	(List of species hably expected to	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 re	ptile species		Grand Cayman I	Parrot	t	
Observed Evidence of Wildlife Util	zation (List species dire	ctly observed, or	ther signs such a	s tracl	ks, droppings, casings,	nests, etc.):
Moorehen, yellow warbler, dams	el fly, gecko, rats					
Additional relevant factors:						
Assessment conducted by:			Assessment date	(5).		
			07/25/22	(3).		
			UIIZJIZJ			

Site/Project Na	ame:	-		Application Number:		Asse	essment Area	Name or Number: 100
Impact or Mitiga	ation:	Impact		Assessment Conducted by: JS, RH, TS a	ind MM	Asse	essment Date	07/25/23
	Scoring Guidar	се	Optimal (10)	Moderate(7)		Minimal	(4)	Not Present (0)
The scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what e of wetland or essed	Condition is optimal and fully supports wetland/surface wate functions	r Condition is less than optimal, but maintain most wetland/surface wa	sufficient to aterfunctions	Minimal level of s wetland/surfac function	support of e water s	Condition is insufficient to provide wetland/surface water functions
						Enter Notes below	(do NOT sco	pre each subcategory individually)
			a. Quality and quantity of habit	at support outside of AA.				7
			b. Invasive plant species.					10
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from	AA (proximity and barriers).				10
			d. Downstream benefits provid	ded to fish and wildlife.				7
			f Hydrologic connectivity (im	pediments and flow restrictions)				5
			q. Dependency of downstream	habitats on quantity or quality of disch	narges.			8
Current		With Impact	h. Protection of wetland function	ns provided by uplands (upland AAs c	only).		١	J/A
			Additional Surrounded by res	sidential and development. Access roa	d - disturbed v	regetation, no invasiv	ves, good wild	dlife habitat, moderate down stream
7		0	Notes: benefits, culverts	- hydro connectivity, high dependency	of downstream	n benefits.	-	
			a. Appropriateness of water lev	els and flows.				8
			b. Reliability of water level ind	icators.				9
			c. Appropriateness of soil mois	sture.				8
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of dischar	ge.				<u> </u>
	(n/a for upland	s)	f. Type of vegetation.					9
			g. Hydrologic stress on vegeta	ation.				8
			h. Use by animals with hydrold	ogic requirements.				6
			i. Plant community compositio	on associated with water quality (i.e.,	plants tolerant	of poor WQ).		8
			k. Water quality of standing w	pe of community.	n, tarbiaity).			8
Current		With Impact	I. Water depth, wave energy, a	and currents.				5
7			Additional Seasonally floode Notes: turbid water. Wate	d. Red mangroves and wrack line pres er depth - ~3.5 ft, no currents. Salinity	sent. Soil - muc - 30ppt on nort	cky. High turbidity, st h side, 26 - ppt on s	agnant. Low outh side.	fire frequency. Dense mangroves in
E00/6		Structure	I. Appropriate/desirable species	3				9
.500(6	b)(c) Community	Structure	II. Invasive/exotic plant species					9
	X Veç	etation	IV. Age, size distribution.					7
-	`		V. Snags, dens, cavity, etc.					7
-	Ber	thic	VI. Plants' condition.					7
	Bot	2	VII. Land management practice	eia channels hummocks)				5
-	BUI	•	IX. Submerged vegetation (only	y score if present).				N/A
0		\ \ /\$41- 1	X. Upland assessment area					N/A
Current		With Impact	Additional Notes: Native - red, black mold. Ditches and	a mangroves, mangrove fern. No invas l culverts. Possible historic use/empou	ives. Low recru ndment for mo	uitment. DBH - 3-4". squitto control.	Height: 10-15	5'. One dead mangrove. Black sooty
0		U	<u> </u>					
Raw Score (if u	r e = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00]		
Current		With Impact				1		
Jurrenit				Functional Loss (FL) [For Impact Assessment Areas]:				
0.67		0.00	F	L = ID x Impact Acres =	0.000]		
	Impact Delta (I	D)	NOTE: If impact is was assessed usi	s proposed to be mitigated at a mitigated of a mitigated by the second s	ation bank that or mitigation is			
Current -	w/Impact	0.670	equal to Function mitigation bank th cannot be used to mitigation bank	hat was not assessed using UMAN assess impacts; use the assessment	hoposed at a l, then UMAM method of the			

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Site/Project Name		Application Number			Assessment Area Name or Number		
						6	
FLUCCs code	Further classificat	tion (optional)		Impact	t Type	Assessment Area Size	
5252	Seasonally F	looded Mangrov woodland	e Forest and			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class	s)	Special Classification	ON (i.e.O	DFW, AP, other local/state/federa	I designation of importance)	
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds			
Adajacent to Central mangrove v	vetland and Mastic Tra	il.					
Assessment area description							
Seasonally flooded mangrove for	rest/ very shrubby veg	etation with a fe	w taller trees.				
Significant nearby features			Uniqueness (co landscape.)	nsideri	ing the relative rarity in	relation to the regional	
Central mangrove wetland and M	lastic Trail		None				
Functions			Mitigation for prev	vious p	permit/other historic use	9	
Anticipated Wildlife Utilization Base	ed on Literature Review	(List of species	Anticipated Utiliza	ation b	y Listed Species (List s	species, their legal	
be found)			assessment area	ı)			
Observed Evidence of Wildlife Utiliz	zation (List species dired	ctly observed, or o	ther signs such a	is track	ks, droppings, casings,	nests, etc.):	
Butteflies, egret							
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
JS and MM			07/25/23				

-	ame:			Application Number:	Assessm	ent Area Name or Number:
npact or Mitig	gation:	-		Assessment Conducted by:	Assessm	ent Date:
,		Impact		JS and MM		07/25/23
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
he scoring of would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient t maintain most wetland/surface waterfunction	o s Minimal level of supp wetland/surface wa functions	ort of ater Condition is insufficient to provid wetland/surface water function
					Enter Notes below (do	NOT score each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.		9
			b. Invasive plant species.			9
500(6)(a) I (ocation and I an	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).		8
			d. Downstream benefits provide	ed to fish and wildlife.		7
			e. Adverse impacts to wildlife in /	AA from land uses outside of AA.		8
	7		f. Hydrologic connectivity (imp	ediments and flow restrictions).		8
Current		With Impact	g. Dependency of downstream h	abitats on quantity or quality of discharges.		7
Guirent		with impact	h. Protection of wetland function	s provided by uplands (upland AAs only).		N/A
	1		Additional AA surrounded by r	nangrove and woodlands. Minimal invasive spe-	cies present. Easy widlife ac	cess. Provides benefits to central mangrove
8		0	Notes: weltand.			
·		C C				
			a Appropriateness of water law	us and flows		
			a. Appropriateness of water level	as anu nows. 		<u> </u>
			c. Appropriateness of soil mois	2010 5. 		<u> </u>
			d. Flow rates/points of discharg	e.		6
.500(6	(6)(b) Water Env	ironment	e. Fire frequency/severity.	<u>-</u>		6
	(n/a for upland	15)	f. Type of vegetation.			1
			g. Hydrologic stress on vegetat	ion.		9
			h. Use by animal s with hydroloç	jic requirements.		8
			i. Plant community composition	associated with water quality (i.e., plants toler	ant of poor WQ).	4
	_		j. Water quality of standing wa	ter by observation (I.e., discoloration, turbidity)		N/A
Current		With Impact	k. Water quality data for the type	e of community.		N/A
Current		with impact	I. Water depth, wave energy, ar	nd currents.		N/A
			Additional Seasonally flooded	. Mucky soil. Desirable species.		
6			Notes:			
	-		I. Appropriate/desirable species			8
.500(€	6)(c) Community	Structure	II. Invasive/exotic plant species			8
			III. Regeneration/recruitment			4
	X Veg	getation	IV. Age, size distribution.			6
			V. Snags, dens, cavity, etc.			2
	Ber	othic	V/L Blanta' condition		· · · · · · · · · · · · · · · · · · ·	
		itilit				7
			VII. Land management practices			7 4
	Bot	h	VII. Land management practices VIII. Topographic features (refug	s. ia, channels, hummocks).		7 4 3
	Bot	h	VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only	s. ia, channels, hummocks). score if present).		7 4 3 N/A
Current	Bot	h With Impact	VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area	s. ia, channels, hummocks). score if present).		7 4 3 N/A N/A
Current	Bot	h With Impact	VII. Plants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes:	s. ia, channels, hummocks). score if present). prove (Avicennia germinans), mangrove fern (Ac	rostichum aureum), buttonw	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg
Current	Bot	h With Impact	VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius	 s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras pruby with a few tall trees. DBH - 2-3" Height: 2-6 	rostichum aureum), buttonw s (Cynodon dactylon). Desir	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features
Current 5	Bot	h With Impact 0	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black manger (Cyperus planifolius) Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras ruby with a few tall trees. DBH - 2-3" Height: 3-6	rostichum aureum), buttonw s (Cynodon dactylon). Desir 3 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5	Bot	h With Impact 0	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras ruby with a few tall trees. DBH - 2-3" Height: 3-6	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5	Bot	h With Impact 0	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres =	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor	Bot	h With Impact 0	VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A nood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor	Bot	h With Impact 0 bve scores/30 by 20)	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor	Bot	h With Impact 0 ove scores/30 by 20)	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if u	Bot	h With Impact 0 ove scores/30 by 20) With Impact	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if u	Bot	h With Impact 0 ove scores/30 by 20) With Impact	VII. Frants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL)	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if	re = Sum of abo uplands, divide	h With Impact 0 ove scores/30 by 20) With Impact	VII. Frants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]:	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if Current 0.63	re = Sum of abo uplands, divide	h With Impact 0 by 20) With Impact 0.00	VII. Flants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh FL	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A ood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if u Current 0.63	re = Sum of abo uplands, divide	h With Impact 0 by 20) With Impact 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	VII. Franks condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh FL	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A vood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if Current 0.63	re = Sum of abo uplands, divide	h With Impact 0 by 20) With Impact 0.00	VII. Flams condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh FL NOTE: If impact is was assessed using	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00 proposed to be mitigated at a mitigation bank to a LIMAM, then the credits required for mitigation	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A rood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if Current 0.63	re = Sum of abo uplands, divide	h With Impact 0 ove scores/30 by 20) With Impact 0.00	VII. Frants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh FL NOTE: If impact is was assessed usin equal to Functiona	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras iruby with a few tall trees. DBH - 2-3" Height: 3-6 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00 proposed to be mitigated at a mitigation bank fig UMAM, then the credits required for mitigation loss (FL). If impact mitigation is proposed a	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini	7 4 3 N/A N/A rood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if 0.63	re = Sum of abo uplands, divide	h With Impact 0 ove scores/30 by 20) With Impact 0.00	VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh FL NOTE: If impact is was assessed usin equal to Functiona mitigation bank tha	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras muby with a few tall trees. DBH - 2-3" Height: 3-0 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00 proposed to be mitigated at a mitigation bank of g UMAM, then the credits required for mitigation I Loss (FL). If impact mitigation is proposed a at was not assessed using UMAM, then UM	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini 0	7 3 N/A N/A rood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.
Current 5 Raw Scor (if 0.63	re = Sum of abo uplands, divide	h With Impact 0 by 20) With Impact 0.00 D) 0.630	VII. Frants condition. VII. Land management practices VIII. Topographic features (refug IX. Submerged vegetation (only X. Upland assessment area Additional Notes: Native - black mang (Cyperus planifolius Vegetation more sh Vegetation more sh FL NOTE: If impact is was assessed usin equal to Functiona mitigation bank that cannot be used to a	s. ia, channels, hummocks). score if present). grove (Avicennia germinans), mangrove fern (Ac s), pine fern (Amenia adiantifolia), bermuda gras muby with a few tall trees. DBH - 2-3" Height: 3-4 Impact Acres = 0.00 Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = 0.00 proposed to be mitigated at a mitigation bank for g UMAM, then the credits required for mitigation I Loss (FL). If impact mitigation is proposed a at was not assessed using UMAM, then UM assess impacts; use the assessment method of	rostichum aureum), buttonw s (Cynodon dactylon). Desir 5 feet. Taller trees - 20'. Mini 0	7 3 N/A N/A rood (conocarpus erectus), flat-leaf flat sedg able species, with minimal reccruitment. mal topo features.

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Site/Project Name	A	pplication Numbe	lumber Assessment Area Name or Number			r Number	
					7		
FLUCCs code	Further classification	on (optional)		Impact Type	/	Assessment Area Size	
5282	Seasonally Flo	oded Mangrov woodland	e Forest and			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.OFW, AP, other loca	l/state/federal d	designation of importance)	
	Central Mangrove	e System					
Geographic relationship to and hyd	rologic connection with we	etlands, other su	urface water, uplai	nds			
Adjacent to Mastic Trail and with	in the Mastic Reserve. L	JItimately conr	ects to the centr	al mangrove syste	m.		
Assessment area description							
Seasonally flooded mangrove fo	rest and woodland on se	outh side of ac	cess road (not p	aved).			
Significant nearby features			Uniqueness (co landscape.)	nsidering the relative	e rarity in re	elation to the regional	
National Trust Land, Mastic Trail	, Central Mangrove Syst	tem	Habitat is located within the Mastic Reserve				
Functions			Mitigation for prev	vious permit/other hi	storic use		
Wildlife Habitat, Reduce Erosion Weather Events,	, Buffer Upland Areas fro	om Extreme	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review (L ssment area and reasonal	ist of species bly expected to	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 R	eptile Species		Grand Cayman Parrot				
Observed Evidence of Wildlife Utili	zation (List species directl	ly observed, or o	L other signs such a	s tracks, droppings,	casings, n	nests, etc.):	
Insects, birds, sapsucker (red he	ad)						
Additional relevant factors:							
National Trust Land, Mastic Trail	and Mastic Reserve						
Assessment conducted by:			Assessment date	e(s):			
JS and MM			07/26/23				

Site/Project Na	ame:			Application Number:		Assessment Ar	rea Name or Number:		
Impact or Mitig	ation:	-		- Assessment Conducted by:		Assessment Da	r ate:		
		Impact		JS and MM	Π		07/26/23		
	Scoring Guidan	се	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
The scoring of would be su su	f each indicator itable for the typ rface water asse	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface wate functions	r Condition is less than optimal, but su maintain most wetland/surface water	ifficient to functions	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)		
			a. Quality and quantity of habit	at support outside of AA.			9		
.500(6)(a) Lc	ocation and Lan	dscape Support	 b. Invasive plant species. c. Wildlife access to and from A d. Downstream benefits provid e. Adverse impacts to wildlife in f. Hydrologic connectivity (im 	AA (proximity and barriers). ded to fish and wildlife. AA from land uses outside of AA. pediments and flow restrictions).			9 9 9 8 7		
Current		With Impact	g. Dependency of downstream	Dependency of downstream habitats on quantity or quality of discharges.					
8		0	n. Protection of wetland function Additional Minimal invasive s Notes:	ns provided by uplands (upland AAs only procies, appropriate species. Access to A	/). A. Habitat fr	agmented by unpaved road. C	N/A Connected to central mangrove habitat.		
			a. Appropriateness of water lev	vels and flows.			9		
			b. Reliability of water level ind	icators. sture.			8		
500/	6)/b) Matar Env	ironmont	d. Flow rates/points of dischar	ge.			2		
.500(6	(n/a for upland	s)	e. Fire frequency/severity.				9		
			f. Type of vegetation.	ation			9		
			h. Use by animals with hydrolo	ogic requirements.					
			i. Plant community composition	on associated with water quality (i.e., pla	nts tolerant	of poor WQ).	8		
	1		j. Water quality of standing w	ater by observation (I.e., discoloration, t	urbidity).		N/A		
Current		With Impact	k. Water quality data for the ty	and currents			N/A N/A		
7			Additional No standing water Notes:	r observed. Approriate soil mositure and v	egetation ty	pe. No standing water availab	le for salinty reading.		
500/6		Structure	I. Appropriate/desirable species	3			9		
.500(0		Structure	II. Invasive/exotic plant species III. Regeneration/recruitment				<u> </u>		
	X Veg	etation	IV. Age, size distribution.				8		
			V. Snags, dens, cavity, etc.				3		
	Ber	ithic	VI. Plants' condition.				9		
	Bot	n	VIII. Topographic features (refu	gia, channels, hummocks).			5		
			IX. Submerged vegetation (only	y score if present).			N/A		
Current		With Impact	Additional				IN/A		
8		0	Notes: Native - Balbis' air coriacea), black m	plant (Tillandsia balbisian), Simpson's sto nangrove (Avicennia germinans), mangrov	opper (Myrci ve fern (Acro	anthes fragrans), coconut paln ostichum aureum). DBH - 4", h	n (Cocos nucifera), lancewood (Ocotea eight - 10-20'.		
Raw Scor (if u	e = Sum of abc uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00				
Current		With Impact				l			
			Functional Loss (FL) [For Impact Assessment Areas]:						
0.77		0.00	F	L = ID x Impact Acres =	0.000				
	Impact Delta (I	D)	NOTE: If impact is was assessed usi equal to Function	s proposed to be mitigated at a mitigation ing UMAM, then the credits required for al Loss (FL). If impact mitigation is pro	n bank that mitigation is posed at a				
Current -	w/Impact	0.770 0.7700 0.7700 0.770 0.770 0.770 0.770 0.770 0.770 0.770 0.770 0.770 0.77							

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Site/Project Name	Appli	ication Numbe	umber Assessment Area Name or Number			or Number	
					3	4	
FLUCCs code	Further classification ((optional)		Impac	t Туре	Assessment Area Size	
7000	Invasive S	pecies - Cas	suarina			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.C	OFW, AP, other local/state/federal	designation of importance)	
N/A	Meagre Bay Por	nd			Invasive		
Geographic relationship to and hyd	ologic connection with wetla	ands, other s	urface water, uplar	nds			
Uplands area located on the sout	hern boundary of Meagre	Bay Pond					
Assessment area description							
Thick vegetation dominated by ir	wasive trees and shrubs.						
Significant nearby features		Uniqueness (co landscape.)	nsideri	ing the relative rarity in	relation to the regional		
South of Bodden Town Road and resdiental. North Meagre Pond	I residential. East and wes	st -	None				
Functions			Mitigation for prev	vious p	permit/other historic use)	
Barrier/protection/stabilization, V	Vildlife habitat		N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (List sment area and reasonably	of species expected to	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 Utiliz	zation (List species directly c	observed, or	other signs such a	s tracł	ks, droppings, casings,	nests, etc.):	
None							
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
JS and MM		07/25/23					

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:		
		-		-		34			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	2:		
		Impact		JS and MM			07/25/23		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring c would be su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient maintain most wetland/surface waterfunction	t to Minimal lev ons fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				2		
		desers Current	c. Wildlife access to and from A	A (proximity and barriers).			7		
.500(6)(a) L	d. Downstream benefits prov			d to fish and wildlife.		5			
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4		
			f. Hydrologic connectivity (impe	ediments and flow restrictions).		I	N/A		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			5		
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).			4		
5		0	Additional North - Meagre Bay Notes: Runoff from roadwa	Additional North - Meagre Bay Pond, East and West - Upland Habitat dominated by invasives, South - Bodden Town Road and Residential Structur Notes: Runoff from roadway and adjacent lands to the south flows north through the assessment area.					
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	2.					
	(n/a for upland	ds)	e. Fire frequency/severity.						
			n. Type of vegetation.	on					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
Guirent	4	With impact	I. Water depth, wave energy, an	d currents.					
0		0	Additional N/A Notes:						
	-		I. Appropriate/desirable species				2		
.500(.500(6)(c) Community Structure II. Invasive/exotic plant species		II. Invasive/exotic plant species				2		
	III. Regeneration/recruitment		III. Regeneration/recruitment		2				
	<u> </u>	getation	IV. Age, size distribution.	5			5		
	-	a thia	V. Snags, dens, cavity, etc.				2		
	Ber	TITTIC	VI. Plants condition.				<u> </u>		
	Rot	'n	VIII. Topographic features (refugi	s (refugia channels hummocks) 3			3		
Both VIII. Topo		IV Cubmorged vegetation (only			3				



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Site/Project Name	Application Number	Number Assessment Area Name or Number							
			10						
FLUCCs code	Further classification (optional)	In	npact Type	Assessment Area Size					
7000	Invasive species - Cas	uarina		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 hydr	ologic connection with wetlands, other s	urface water, upland	S						
Uplands. Adjacen to beach/ Carib	bean Sea								
Assessment area description									
Australian pines in an undevelop	Australian pines in an undeveloped lot, along the coast and south of Bodden Town Road.								
Significant nearby features		Uniqueness (cons landscape.)	idering the relative rarity in	relation to the regional					
Caribbean Sea		None							
Functions		Mitigation for previo	ous permit/other historic us	e					
barrier/protection, habitat									
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (List of species sment area and reasonably expected to	Anticipated Utilization by Listed Species (List species, their legal to classification (E, T, SSC), type of use, and intensity of use of the assessment area)							
Observed Evidence of Wildlife Utiliz	ation (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							

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-		1	10		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	:		
		Impact		JS and MM		07/26/23			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring c would be su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dns	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				2		
500(6)(2)	ocation and Lan	decape Support	c. Wildlife access to and from A	A (proximity and barriers).			7		
.500(0)(a) L		uscape Support	d. Downstream benefits provide	d to fish and wildlife.	2				
	e. Adverse im			A from land uses outside of AA.			4		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).		1	N/A		
	1		g. Dependency of downstream h	abitats on quantity or quality of discharges.			2		
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).			2		
3		0	Additional Surrounded by deve Notes:	development and Caribbean sea. Mostly invasive.					
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.					
	(n/a for upland	ls)	e. Fire frequency/severity.						
			1. Type of vegetation.	on					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
0]		k. Water quality data for the type	e of community.					
Current			I. Water depth, wave energy, an	d currents.					
0		0	Additional N/A Notes:						
	<u>+</u>		I. Appropriate/desirable species				2		
.500(.500(6)(c) Community Structure II. Invasive/exotic plant species		II. Invasive/exotic plant species			1			
	III. Regeneration/recruitment		III. Regeneration/recruitment			2			
	X Vegetation IV. Age, size distribution.		IV. Age, size distribution.				6		
			V. Snags, dens, cavity, etc.				3		
	Ber	nthic	VI. Plants' condition.				7		
	Dot	h	VII. Land management practices	ctices. 4			4		
	Both VIII. Top		Vin. Topographic realures (relugi	a, onanneis, nunninucksj.	<u> </u>				



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Site/Project Name		Application Numbe	mber Assessment Area Nam			or Number		
					2	26		
FLUCCs code	Further classifica	tion (optional)		Impac	t Type	Assessment Area Size		
18311	Man-	modified without	out trees Acre					
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance)					
Geographic relationship to and hydr	ologic connection with	wetlands, other su	Lurface water, uplar	nds				
Assessment area description								
Raised access road adjacent to a	Raised access road adjacent to access site.							
Significant nearby features	ignificant nearby features				ing the relative rarity in	relation to the regional		
Development to east, Bodden Toy strip to the north.	wn Road to the south	and drag racing	None					
Functions			Mitigation for prev	vious	permit/other historic use)		
barrier/protection, habitat								
Anticipated Wildlife Utilization Based that are representative of the asses be found)	d on Literature Review sment area and reasor	(List of species nably expected to	Anticipated Utilization by Listed Species (List species, their legal to classification (E, T, SSC), type of use, and intensity of use of the assessment area)					
Observed Evidence of Wildlife Utiliz	ation (List species dire	ctly observed, or o	other signs such a	s trac	ks, droppings, casings,	nests, etc.):		
Butterflies								
Additional relevant factors:								
Trash/litter - moderate								
Assessment conducted by:			Assessment date	e(s):				
JS and MM			07/25/23					

Site/Project Na	ame:			Application Number:		Assessment Area Name or Number:			
		_		-		26			
Impost or Mitia	ration			Accessment Conducted by:		Assessment Date:			
impact or witig	jation:	I				Assessment Date:			
		Impact		JS and MM			07/25/23		
	Scoring Guidar	lce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
				modorato(r)					
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev wetland/sons fur	el of support of surface water actions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes below (do NOT score each subcategory individually)				
			a. Quality and quantity of habitat	support outside of AA.			3		
			b. Invasive plant species.				3		
			c. Wildlife access to and from A	A (proximity and barriers).			8		
.500(6)(a) Lo	ocation and Lan	dscape Support	d. Downstream benefits provide	d to fish and wildlife.			1		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			5		
	f. Hydrologic connectivi			ediments and flow restrictions).			N/A		
]		g. Dependency of downstream h	tream habitats on quantity or quality of discharges. N/A			N/A		
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands (upland AAs only). N/A					
	1		Additional						
4		0	Notes:						
			a. Appropriateness of water leve	Is and flows.			N/A		
			b. Reliability of water level indic	ators.			N/A		
			c. Appropriateness of soil moist	ure.		8			
.500((6)(b) Water Env	ironment	d. Flow rates/points of discharge	2.			N/A		
	(n/a for upland	ls)	e. Fire frequency/severity.				1		
			t. Type of vegetation.	~			8		
			g. Hydrologic stress on vegetati	ic requirements			N/A		
			i Plant community composition	associated with water quality (i.e. plants tol	erant of poor WO)		8		
			i. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	v).		N/A		
]		k. Water quality data for the type	of community.	,		N/A		
Current		With Impact	I. Water depth, wave energy, an	d currents.			N/A		
	1		Additional						
6		0	Notes:						
			I. Appropriate/desirable species				8		
.500(6	.500(6)(c) Community Structure II. Invasive/exotic plant species						4		
	III. Regeneration/recruitment		III. Regeneration/recruitment			2			
	X Vegetation IV. Age, size distribution.					2			
	V. Snags, dens, cavity, etc.		V. Snags, dens, cavity, etc.				7		
	Benthic VI. Plants' condition.						7		
			VII. Land management practices	·			7		
	Bot	h	VIII. Topographic features (refugi	a, channels, hummocks).			1		
1			IV Cubmorged upgetetion (only)				N1/A		



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Site/Project Name		Application Numbe	lumber Assessment Area Name or Number			or Number		
					2	2		
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size		
18311	Man-ı	modified without	trees			Acres		
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)		
Geographic relationship to and hyd	rologic connection with	wetlands, other si	ı urface water, uplaı	nds				
Assessment area description								
Man-modified without trees.	/an-modified without trees.							
Significant nearby features		Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional			
Surrounded by developed area w	vith trees.		None					
Functions			Mitigation for previous permit/other historic use					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review ssment area and reasor	(List of species hably expected to	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 Utiliz	zation (List species dire	ctly observed, or o	other signs such a	s tracl	ks, droppings, casings,	nests, etc.):		
	、 ·	•	Ū					
Butterflies								
Additional relevant factors:								
Assessment conducted by:			Assessment date	e(s):				
JS and MM			07/25/23					

Site/Project Na	ame:	-		Application Number: -			Assessment Area	Name or Number: 22			
mpact or Mitiga	pation:	Impact		Assessment Conducted by: JS and N	М		Assessment Date	07/25/23			
	Scoring Guidan	се	Optimal (10)	Moderate(7)		Mini	mal (4)	Not Present (0)			
The scoring of would be sui sui	f each indicator iitable for the typ irface water asse	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface wate functions	r Condition is less than optimal, but maintain most wetland/surface wa	sufficient to erfunctions	Minimal leve wetland/s fun	el of support of urface water ctions	Condition is insufficient to provide wetland/surface water functions			
						Enter Notes b	elow (do NOT sco	pre each subcategory individually)			
			a. Quality and quantity of habit	at support outside of AA.				3			
.500(6)(a) Lo	ocation and Land	dscape Support	 b. Invasive plant species. c. Wildlife access to and from a d. Downstream benefits provide. e. Adverse impacts to wildlife in f. Hydrologic connectivity (impacts to be address of the second secon	AA (proximity and barriers). ded to fish and wildlife. n AA from land uses outside of AA. apediments and flow restrictions).				1 6 1 2 3			
Current		With Impact	g. Dependency of downstream	n habitats on quantity or quality of disch	arges.			0			
2		0	Additional Notes:	Additional Notes:							
	1		a. Appropriateness of water lev	vels and flows.							
			b. Reliability of water level ind	licators.							
			c. Appropriateness of soil moi	sture.							
.500(6	6)(b) Water Env	ironment	e. Fire frequency/severity.	у с .							
	(n/a for upland	5)	Type of vegetation.								
			g. Hydrologic stress on vegeta	ation.							
			 b. Use by animals with hydrological in the second se	ogic requirements. on associated with water quality (i.e., r	lants tolerant (of poor WQ)					
			j. Water quality of standing w	vater by observation (I.e., discoloration	, turbidity).	<u>. p </u>					
Current		With Impact	k. Water quality data for the ty	pe of community.							
Ourrent		With Impact	I. Water depth, wave energy, a	and currents.							
0		0	Additional N/A Notes:								
<u>I</u>	<u> </u>		I. Appropriate/desirable species	3				1			
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					1			
	X Voo	latation	III. Regeneration/recruitment					1			
-	veg	letation	V. Snags, dens, cavity, etc.					1			
	Ben	thic	VI. Plants' condition.					6			
	5.4		VII. Land management practice	es.				3			
-	Boti	n	VIII. Topographic features (refu	Igia, channels, hummocks).				1 N/A			
] [X. Upland assessment area	/ P = P = P =				2			
Current		With Impact	Additional Notes: Euphoribia sp. (Cl	hamaesyce/ Euphoribia bruntii), goose	grass (Eleusin	e indica), guine	ea grass (Panicum	maximum/ Megathyrsus maximus)			
2		0									
Raw Score (if u	r e = Sum of abo uplands, divide l	ove scores/30 oy 20)		Impact Acres =	0.00						
Current		With Impact]	Functional Loss (FL)							
0.20		0.00		[For Impact Assessment Areas]:	0.000						
				10 A IIIpaul Auto -	0.000						
	Impact Delta (I	D)	NOTE: If impact in was assessed usi	s proposed to be mitigated at a mitiga ing UMAM, then the credits required fo	ion bank that r mitigation is						
Current - w/Impact 0.200 Current - w/Impac											

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Site/Project Name		Application Numbe	mber Assessment Area Name or Nu			or Number		
					2	3		
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size		
18311	Man-ı	modified without	hout trees Acres					
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.C	PFW, AP, other local/state/federal	designation of importance)		
Geographic relationship to and hydr	ologic connection with	wetlands, other su	ı urface water, uplar	nds				
Assessment area description								
Man-modified without trees.								
Significant nearby features		Uniqueness (co landscape.)	nsideri	ing the relative rarity in	relation to the regional			
South of road. Surrounded by ag	ricultural in all direction	ons	None					
Functions			Mitigation for prev	vious p	permit/other historic use	•		
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review sment area and reason	(List of species hably expected to	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 Utiliz	ation (List species dire	ctly observed, or o	other signs such a	s track	(s. droppings, casings,	nests. etc.):		
Dragonfly, birds								
Additional relevant factors:								
Assessment conducted by:			Assessment date	e(s):				
JS and MM			07/25/23					

	Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number: 23				
impact Optimized (10) Residence (11) Residence (11)<	Impact or Mitig	ation:			Assessment Conducted by:		Assessment Date	e:				
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						Enter No	tes below (do NOT so	core each subcategory individually)				
b invation of Lower and Section of Lower and Section of Section of Section of Lower and Lower and Section of Lower and Section of Lower				a. Quality and quantity of habita	t support outside of AA.			5				
500(b) Learning and Landsage Support 				b. Invasive plant species.				6				
	.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			3				
				d. Downstream benefits provide	d to fish and wildlife.			N/A				
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Bornhick Ministration Bornhick Bornhick With Impact With	500/	6)(b) Matar Epy	ironmont	d. Flow rates/points of discharg	е.							
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i. Work brigge stress on vogetation. i. Water spatials with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Water quality of san fails with hydrogic requirements. i. Mater depth, wave energy, and currents. Additional NA Motes: i. Requestion of the type of community. View depth, wave energy, and currents. i. Requestion fails species i. Requestion of the type of community. V. Age, see distribution. V. Stange, dam, cavity, etc. genthic VI. Land constitution. VI. Inter condition. VI. Topographic features (rologis, tharmate, hummecks). Z VI. Topographic features (rologis, tharmate, hummecks). Z VI. Inter condition. V. Stand dependent precises. VI. Inter condition. V. Dipart dependent precises. V. Dipart dependent prec				f. Type of vegetation.	Type of vegetation.							
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Benthic V. Snags, dens, cavity, etc. 2 Benthic VI. Plants' condition. 7 Wit. Land management practices. 3 Both VIII. Topographic features (refugia, channels, hummocks). 2 K. Submerged vegetation (only score if present). N/A X. Upland assessment area 5 Additional 5 Mith Impact Nofes: Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Acres = 0.000 Impact Detta (ID) 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). 0.000 Impact Detta (ID) 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 assessment method of the		X Vec	etation	IV. Age, size distribution.				5				
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Current With Impact X. Upland assessment area 5 4 0 Red mombin (Spondias purpurea), Cocnut palm (Cocos nucifera), bana (Musa paradisaca), tan-tan (Leucaena leucocphala), weeping fig (Fit benjamina) Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact [For Impact Acres = 0.00 Note: Functional Loss (FL) (For Impact Acres = 0.000 Impact Delta (ID) NOTE: If impact is proposed to be mitigated at a mitigation is proposed at a mitigation is proposed at a mitigation bank that was not assessed using UMAM, then Uhe cases and using UMAM, canot bank that was not assessed using UMAM, canot bank that was not assessed using UMAM, then Uhe assessment method of the		Bot	n	VIII. I opographic teatures (refug	a, channels, hummocks).			2 Ν/Δ				
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Current - w/Impact0.400equal 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		Impact Delta (D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation g UMAM, then the credits required for m	i panк that hitigation is						
Current - w/Impact0.400mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the				equal to Functiona	I Loss (FL). If impact mitigation is prop	posed at a						
milization hant	Current -	w/Impact	0.400	mitigation bank the cannot be used to a	at was not assessed using UMAM, th assess impacts; use the assessment me	en UMAM thod of the						
mitigaiton bank.				mitigaiton bank.								

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Site/Project Name	/Project Name Application			umber Assessment Area Name of				
					2	2		
FLUCCs code	Further classificat	tion (optional)		Impact Typ	De	Assessment Area Size		
1831	Man-m	nodified Without	Trees	Dii	rect Impact	Acres		
Basin/Watershed Name/Number Af	fected Waterbody (Class	s)	Special Classification	ON (i.e.OFW, A	AP, other local/state/federal	designation of importance)		
N/A	N/A				N/A			
Geographic relationship to and hydro	logic connection with v	wetlands, other s	urface water, uplar	nds				
N/A								
Assessment area description								
Upland grassland that has been cle	eared and is currentl	ly used for livest	ock/cattle.					
Significant nearby features			Uniqueness (co landscape.)	nsidering t	the relative rarity in	relation to the regional		
N/A		N/A						
Functions		Mitigation for prev	ious perm	nit/other historic use				
Food source and pastureland for li	vestock		N/A					
Anticipated Wildlife Utilization Based that are representative of the assess be found)	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation by Lis T, SSC), ty)	sted Species (List s ype of use, and inte	pecies, their legal nsity of use of the			
Observed Evidence of Wildlife Utiliza	tion (List species direc	ctly observed, or o	I other signs such a	s tracks, d	droppings, casings,	nests, etc.):		
Butterfly,								
Additional relevant factors:								
Assessment conducted by:			Assessment date	(s):				
RM & TS			07/25/23					

Site/Project Na	te/Project Name:			Application Number:		Assessment Area Name or Number:				
		-		-			2			
Impost or Mitis	nation:			Accessment Conducted by:		-				
Impact of Millig	Jalion.	Impost								
		impact		RIVI&IS			07725725			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)			
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev wetland/s fur	el of support of surface water actions	Condition is insufficient to provide wetland/surface water functions			
					Enter Notes	below (do NOT sco	ore each subcategory individually)			
			a. Quality and quantity of habita t	support outside of AA.			2			
			b. Invasive plant species.				5			
500(0)())	<i></i>		c. Wildlife access to and from A	A (proximity and barriers).			2			
.500(6)(a) Lo	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			4			
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			3			
f. Hydro			f. Hydrologic connectivity (imp	ediments and flow restrictions).			1			
]		Dependency of downstream habitats on quantity or quality of discharges. 2				2			
Current		With Impact	. Protection of wetland functions provided by uplands (upland AAs only). 2				2			
	1		Additional Residential housing	and Shamrock Road adjacent to AA.						
3		0	Notes:							
			a. Appropriateness of water leve	Is and flows.						
			b. Reliability of water level indic	ability of water level indicators.						
			c. Appropriateness of soil moist	noisture.						
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge).						
	(n/a for upland	ls)	e. Fire frequency/seventy.	ncy/sevenity.						
			a. Hydrologic stress on vegetation.	QD.						
			h. Use by animals with hydrolog	ic requirements.						
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).					
	-		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).					
Current		With Impact	k. Water quality data for the type	e of community.						
Guirent		With impact	I. Water depth, wave energy, an	d currents.						
			Additional							
		0	Notes.							
	<u>I</u>		I. Appropriate/desirable species				5			
.500(6	.500(6)(c) Community Structure II. Invasive/exotic plant species		II. Invasive/exotic plant species				5			
			III. Regeneration/recruitment				5			
	X Veç	getation	IV. Age, size distribution.				4			
			V. Snags, dens, cavity, etc.				3			
	Ber	nthic	VI. Plants' condition.				5			
	D - 4	Ь	VII. Land management practices	ctices. 3			3			
	BOI	.11	IX Submorged vegetation (antw				3			



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Site/Project Name	Application Numb	lumber Assessment Area Name or Number					
				12			
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size			
3112	Ponds, Pools, Mangrov	e Lagoons	Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification	DN (i.e.OFW, AP, other local/state/federa	I designation of importance)			
N/A	N/A		N/A				
Geographic relationship to and hydr	ologic connection with wetlands, other	surface water, uplar	nds				
Located on the edge of an active	mining operation. Apart of the Centr	al Mangrove Wetla	nd				
Assessment area description							
Small open water area located on	the northwestern boundary of an a	ctive mine.					
Significant nearby features		Uniqueness (con landscape.)	nsidering the relative rarity in	relation to the regional			
Active mine located to the south		Central Mangrov	ve Wetland				
Functions		Mitigation for prev	vious permit/other historic use	e			
		N/A					
Anticipated Wildlife Utilization Based that are representative of the asses be found)	d on Literature Review (List of species sment area and reasonably expected to	Anticipated Utiliza classification (E, assessment area	ation by Listed Species (List s F, SSC), type of use, and inte)	species, their legal ensity of use of the			
Observed Evidence of Wildlife Utiliz	ation (List species directly observed, o	r other signs such a	s tracks, droppings, casings,	nests, etc.):			
Additional relevant factors:							
Assessment conducted by:		Assessment date(s):					
RM & TS		07/26/23					

Site/Project Na	ame:	-		Application Number:		ļ	Assessment Area	a Name or Number:		
mpact or Mitig	ation:	-		Assessment Conducted by			ssessment Date	۲ ۲		
inpact of white		Impact		RM & TS		,		07/26/23		
	Scoring Guidar	се	Optimal (10)	Moderate(7)		Minir	nal (4)	Not Present (0)		
The scoring of would be su su	f each indicator itable for the typ rface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but su maintain most wetland/surface water	ifficient to functions	Minimal leve wetland/su func	l of support of Irface water ctions	Condition is insufficient to provide wetland/surface water functions		
						Enter Notes be	elow (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.				3		
			b. Invasive plant species.					8		
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).				6		
			d. Downstream benefits provide	ed to fish and wildlife.				5		
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.				3		
			r. Hydrologic connectivity (imp	bediments and flow restrictions).	205			5		
Current		With Impact	b. Protection of wotland function	navitate on quantity of quality of dischar	yes. /)			1		
			Additional Active mine located	to the South, Within the Central Manor	/). ove Wetland	Buffers/protec	ts the downstrea	am Central Mangrove Wetland from		
5		0	Notes: mining activities.			. Buileis/piolee				
5		U								
			a Appropriateness of water leve	als and flows				7		
			b. Reliability of water level india	cators.				7		
			c. Appropriateness of soil mois	ture.				8		
500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	je.				5		
.000((n/a for upland	s)	e. Fire frequency/severity.					8		
			t. Type of vegetation.	tion				8		
			h. Use by animals with hydrolog	aic requirements.				7		
			i. Plant community composition	n associated with water quality (i.e., pla	nts tolerant o	of poor WQ).		7		
	-		j. Water quality of standing wa	ater by observation (I.e., discoloration, t	urbidity).			5		
Current		With Impact	k. Water quality data for the typ	e of community.				5		
			I. Water depth, wave energy, and	nd currents.				6		
6		0	Notes:							
			I. Appropriate/desirable species					7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					8		
			III. Regeneration/recruitment					5		
	<u> </u>	etation	V Spage dens cavity etc					5		
	Ber	thic	VI. Plants' condition.					3		
			VII. Land management practices	S.				3		
	Bot	h	VIII. Topographic features (refug	jia, channels, hummocks).				6		
	1		IX. Submerged vegetation (only	score if present).				0		
Current		With Impact	Additional					۷		
_			Notes: Vegetation appears	s to be stressed from nearby mining acti	vities. Mangr	ove canopy is t	hin, recruitment a	and regeneration is low. Roots and		
5		U								
Raw Scor (if u	e = Sum of abo uplands, divide	ove scores/30 by 20)		Impact Acres =	0.00					
Current]	With Impact	·							
Carront				Functional Loss (FL) [For Impact Assessment Areas]:						
0.53		0.00	FL	= ID x Impact Acres =	0.000					
	Impact Delta (I	D)	NOTE: If impact is was assessed usin equal to Eunctiona	proposed to be mitigated at a mitigation of UMAM, then the credits required for al Loss (FL). If impact mitigation is pro-	n bank that mitigation is					
Current -	w/Impact	0.530	mitigation bank th cannot be used to mitigaiton bank.	Current - w/Impact 0.530						

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Site/Project Name	Application Numbe	r	Assessment Area Name	or Number			
			1	16			
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size			
1831	Pasture		Direct Impact	Acres			
Basin/Watershed Name/Number Affect	ed Waterbody (Class)	Special Classification	ON (i.e.OFW, AP, other local/state/federa	I designation of importance)			
	N/A		N/A				
Geographic relationship to and hydrologic	c connection with wetlands, other su	urface water, uplar	nds				
Assessment area description							
Historically classified as man-modified	d with trees, area has been cleare	d and is now ma	n-modified without trees. L	anduse is primarily.			
		Liniqueness (co	nsidering the relative rarity in	relation to the regional			
Significant nearby features		landscape.)	insidening the relative ranty in	relation to the regional			
Surrounded by additional man-modifie without trees areas. Agriculture and liv	ed with trees and man-modified vestock.	N/A					
Functions		Mitigation for prev	vious permit/other historic use	9			
		N/A					
Anticipated Wildlife Utilization Based on I	Literature Review (List of species	Anticipated Utiliza	ation by Listed Species (List s	species, their legal			
be found)		assessment area)					
Observed Evidence of Wildlife Utilization	(List species directly observed, or o	other signs such a	s tracks, droppings, casings,	nests, etc.):			
lbis, Smooth Bill, Yellow Warbler, Grad	ckle, Cattle Eegret, Night Heron, I	Mocking Bird, Bla	ack neck stilt, Green heron,	, Cattle			
Additional relevant factors:							
Cattle fencing and pens present							
Assessment conducted by:		Assessment date	(s):				
RM & TS		07/28/23					

Site/Project Na	ame:			Application Number:	Assessment Area Name or Number:		
		-		-			16
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	2:
		Impact		RM & TS			07/28/23
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient maintain most wetland/surface waterfunction	t to Minimal lev wetland/s	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
					Enter Notes	below (do NOT sc	ore each subcategory individually)
			a. Quality and quantity of habitat	support outside of AA.			7
			b. Invasive plant species.				1
500(6)(2) 1	ocation and Lan	decana Sunnort	c. Wildlife access to and from A	A (proximity and barriers).			8
.500(0)(a) L	ocation and Ldn	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			5
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			3
]		Dependency of downstream habitats on quantity or quality of discharges.				4
Current		With Impact	h. Protection of wetland functions provided by uplands (upland AAs only). 5				
5		0	Additional Primary use is for a Notes:	griculture/cattle. Neighboring land is similar us	e.		
			a. Appropriateness of water leve	Is and flows.			
			b. Reliability of water level indic	ators.			
			c. Appropriateness of soil moist	ure.			
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			
	(n/a for upland	ds)	e. Fire frequency/severity.				
			 Type of vegetation. Hydrologic stress on vegetation. 	<u></u>			
			h. Use by animals with hydrolog	ic requirements			
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	/).		
•]		k. Water quality data for the type	of community.			
Current		with impact	I. Water depth, wave energy, an	d currents.			
0		0	Additional Uplands Notes:				
	•		I. Appropriate/desirable species				6
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				1
			III. Regeneration/recruitment				3
	X Ve	getation	IV. Age, size distribution.				4
	V. Snags, dens, cavity, etc.		V. Snags, dens, cavity, etc.				2
	Ber	ntnic	VI. Plants condition.	actices 3			<u> </u>
	Rot	'h	VIII Topographic features (refugi	Ces. 3			2
1	Both		Vini Topographic realities (relugi		2		



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Site/Project Name	/Project Name Application			mber Assessment Area Na				
					18	8		
FLUCCs code	Further classification	n (optional)		Impact	Туре	Assessment Area Size		
3112	Ponds, Pools	and Mangrov	e Lagoons		Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)		
N/A	N/A				N/A			
Geographic relationship to and hydr	ologic connection with wet	tlands, other su	urface water, uplar	nds				
Isolated Pond								
Assessment area description								
Small isolated pond. Likely used	as a cattle pond or borro	ow pit.						
Significant nearby features			Uniqueness (coi landscape.)	nsiderir	ng the relative rarity in	relation to the regional		
Surrounded by man-modified wit trees habitat. Used as agriculture	d without	N/A						
Functions			Mitigation for prev	vious p	ermit/other historic use)		
Water source for livestock			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (Lis sment area and reasonabl	st of species ly expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC)	/ Listed Species (List s c), type of use, and inte	pecies, their legal nsity of use of the		
Observed Evidence of Wildlife Utiliz	ation (List species directly	observed, or o	ther signs such a	s track	s, droppings, casings,	nests, etc.):		
Minnow, Grackle, Green Heron, D	ragonfly, Butterfly, Cattl	le.						
Additional relevant factors:								
Assessment conducted by:			Assessment date	e(s):				
RM & TS			07/26/23					

Instant or Mitigation: Instant Advector Mitigation: Advector Mitigation: Advector Mitigation: Market and the Statistic	Site/Project Na	ame:	-		Application Number: Assessment Area Name or Number: 18					
Scoreign functions Opposite (10) Headerson(2) Method (4) Out (4) The score of score of score of a score of sco	Impact or Mitig	ation:	Impact		Assessment Conducted by	RM & TS	Assessment I	Date: 07/26/23		
The section of description of the section o		Scoring Guidar	nce	Optimal (10)	Moderat	te(7)	Minimal (4)	Not Present (0)		
Elicit Note Lerice (xx NT score each excession in inducting	The scoring of would be su su	f each indicator itable for the typ irface water asso	is based on what be of wetland or essed	Condition is optimal an supports wetland/surfac functions	d fully e water Condition is less than opt maintain most wetland/su	timal, but sufficient to urface waterfunctions	Minimal level of support o wetland/surface water functions	f Condition is insufficient to provide wetland/surface water functions		
							Enter Notes below (do NOT	score each subcategory individually)		
5x00(b) Leasters and Leasters Support E. Invasion plant spaces. 6 5x00(b) Leasters and Leasters Support E. Welding access and for an Algorithm 2 and the Alg				a. Quality and quantity o	f habitat support outside of AA.			6		
Current Image: a constraint in the sectors in a sector in a	.500(6)(a) Lc	ocation and Lan	dscape Support	 b. Invasive plant specie c. Wildlife access to and d. Downstream benefits e. Adverse impacts to wild 	s. I from AA (proximity and barriers). Is provided to fish and wildlife. Idlife in AA from land uses outside of rity (impediments and flow rectriction	of AA.		8 8 5 6 4		
6 0 Additional Italiaed astile point or borrow pit located in an agricultural area (sate pasture. Note: Not	Current		With Impact	g. Dependency of down h. Protection of wetland t	stream habitats on quantity or quality functions provided by uplands (upla	m habitats on quantity or quality of discharges. 3 ons provided by uplands (upland AAs only).				
Appropriateness of value fevels and flows. Appropriateness of value fevels and flows. Appropriateness Approprise Appropriatenes Appropriatene	6		0	Additional Isolated cat Notes:	tle pond or borrow pit located in an a	agricultural area/cattle p	asture.			
		1		a. Appropriateness of wa b. Reliability of water le v	ter levels and flows. vel indicators.			8 8		
(rid for uplandy) I. Type of vegetation. B. Hydrologic areas on vegetation. J. Water vegetation. J.	.500(6	6)(b) Water Env	ironment	 c. Appropriateness of so d. Flow rates/points of c a. Fire frequency/sovering 	bil moisture. Jischarge.			8 7 8		
i. Hydrologis stress on vagetation. i. Use by animabe with hydrologic root/memoria. i. Water control y composition associated with water valuely (i.e., discoluration, turbidity). 7 i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Water quality data for the type of community. i. Representation/conclusion. i. Representation/conclusion. i. Representation/conclusion. i. Representation/conclusion. ii. Representation/conclusion. ii		(n/a for upland	ls)	f. Type of vegetation.	.y.			6		
 I. Use by animals with hydrologic requirements. I. Plant community composition associated with water quality (i.e., plants toterant of poor (VQ). 7 i. Water quality of standing water by observation (i.e., discoluration, turbidity). 7 0 Water quality of standing water by observation (i.e., discoluration, turbidity). 7 0 Water quality of standing water by observation (i.e., discoluration, turbidity). 7 0 Water quality of standing water by observation (i.e., discoluration, turbidity). 7 0 Water quality of standing water by observation (i.e., discoluration, turbidity). 6 0 Notes: SoD(6)(c) Community Structure I. Appropriate/destrable species I. Appropriate/destrable species I. Mage above some to many composition species I. Submerged water (chuigi, channels, hummods). I. Submerged water (chuigi, channels, hummods)				g. Hydrologic stress on	vegetation.			7		
Current With Impact / With Impact 7 // // 7 // // 7 // // // 7 // // // // // // //				h. Use by animals with i Plant community com	hydrologic requirements.	lity (i.e., plants tolerant (of poor WO	6		
Current With Impact *.Water quality data for the type of community. 6 7 0 Additional 8 7 0 Additional Minows Freeent. Salinty 8 PFT, Low Turbidity .500(6)(c) Community Structure 1. Appropriate/desitable species 7				j. Water quality of stand	ding water by observation (I.e., dis	coloration, turbidity).		7		
Current With impact Water depth, wave energy, and currents. 6 7 0 Adier depth, wave energy, and currents. 6 7 0 Adier depth, wave energy, and currents. 6 7 0 Adier depth, wave energy, and currents. 6 7 0 Adier depth, wave energy, and currents. 6 7 1 Appropriate/desirable spacies 7 8 1. Appropriate/desirable spacies 8	Current		With Impact	k. Water quality data for	the type of community.			6		
Additional Minews Present. Salinity 9 PPT, Low Turbidity Notes: I. Appropriate/desirable species 7 I. Begeneration/functurtment 6 I. Regeneration/functurtment 6 I. Regeneration/functurtment 6 I. Regeneration/functurtment 6 I. Benthic V. Sensa, dens, cavity, etc. 4 I. Benthic VII. Topographic features (refugia, channels, hummocks). 3 Both VIII. Topographic features (refugia, channels, hummocks). 5 K. Submerged vogation (only score if present). 5 G. O Impact Acres = 0.00 Current With Impact Impact Acres = 0.00 Inspect Delta (ID)	Current		with impact	I. Water depth, wave en	ergy, and currents.			6		
.500(6)(c) Community Structure 1. Appropriate/desirable species 7	7		0	Additional Minnows Pi Notes:	esent, Salinity 8 PP1, Low Turbidity					
x Vegetation 6 - V. Age, size distribution. 6 - Benthic 4 W. Plants condition. 7 VI. Land management practices. 3 Both VIII. Topographic features (refugia, channels, hummocks). 5 K. Submerged vegetation (only score if present). 5 X. Submerged vegetation (only score if present). 5 K. Submerged vegetation (only score if present). 5 Ge 0 1 Ge 0 1 Impact Acres = 0.00 Current With Impact 0.63 0.00 Impact Deta (ID) NOTE: If impact spressed using UMAM, then UKAM cannot be mitigation bank that was acassessed using UMAM, then UKAM cannot b	.500(6	6)(c) Community	Structure	I. Appropriate/desirable s	pecies			7		
X Vegetation IV. Age, size distribution. 6 With Parts: Condition. 4 Benthic VI. Land management practices. 3 Both VIII. Topographic features (refugia, channels, hummocks). 5 K. Submerged vegetation (only score if present). 5 Current With Impact 5 6 0 5 Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Acres = 0.00 Impact Delta (ID) NOTE: If impact is proposed to be miligated at a miligation bank that was assessed using UMAM, then the credits required for mitigation is equal to Functional Loss (FL). NOTE: If impact is proposed to be miligation bank that was assessed using UMAM, then the credits required for mitigation is equal to Euclide Loss (FL). Current - w/impact 0.630 NOTE: If impact is proposed to be miligated at a miligation bank that was assessed using UAM, then the credits required for mitigation is equal to Euclide Loss (FL).	,			III. Regeneration/recruitm	nent			6		
Benthic V. Snags, dens, davity, etc. 4 Benthic VI. Plants' condition. 7 WI. Land management practices. 3 Both VII. Land management practices. 3 Impact Detra (ID) X. Submerged vegetation (only score if present). 5 K. Upland assessment area 5 Additional Notes: Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Assessment Areas]: 0.00 0.63 0.00 FL = ID x Impact Acres = 0.000 Impact Detta (ID) 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 is assessed using UMAM, then UMAM, ten UMA		X Veg	getation	IV. Age, size distribution.				6		
Current With Impact 0.63 0.00 Impact Delta (ID) Current - w/Impact 0.630		Ber	othic	V. Snags, dens, cavity, e	etc.			4		
Both VIII. Topographic features (refugia, channels, hummocks). 5 IV. Submerged vegetation (only score if present).		DCI		VII. Land management p	practices.			3		
Current With Impact X. Upland assessment area 5 6 0 Additional Notes: 5 6 0 Impact Acres = 0.00 Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Acres = 0.00 0.63 0.00 FL = ID x Impact Acres = 0.000 NOTE: If impact is proposed to be mitigated at a miligation is proposed to assess impacts; use the assessment method of the mitidation bank. that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitidation bank.		Bot	h	VIII. Topographic feature	s (refugia, channels, hummocks).			5		
6 0 Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Assessment Areas]: [Impact Acres = 0.63 0.00 FL = ID x Impact Acres = 0.000 Impact Delta (ID) NOTE: If impact is proposed to be mitigated at a mitigation bank that was assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank, then the ordits required for mitigation is proposed to be mitigation bank, that was not assess impacts; use the assessment method of the mitigation bank.	Current		With Impact	IX. Submerged vegetation X. Upland assessment a	on (only score if present). rea			5		
Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) [For Impact Assessment Areas]: 0.63 0.00 FL = ID x Impact Acres = 0.000 Impact Delta (ID) 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 equal to Fu	6		0	Notes:						
Raw Score = Sum of above scores/30 (if uplands, divide by 20) Impact Acres = 0.00 Current With Impact Functional Loss (FL) 0.63 0.00 FL = ID x Impact Acres = 0.000 Impact Delta (ID) 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 mitigation bank.	•									
Current With Impact 0.63 0.00 Functional Loss (FL) [For Impact Assessment Areas]: 0.63 0.00 Impact Delta (ID) OCUrrent - w/Impact 0.630 0.630	Raw Scor (if u	re = Sum of abo uplands, divide	ove scores/30 by 20)		Impact Acres =	0.00				
0.63 0.00 Impact Assessment Areas]: Impact Delta (ID) FL = ID x Impact Acres = 0.000 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 mitigation bank.	Current		With Impact		Functional Loss (FL)	- 1				
Impact Delta (ID) 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 mitigation bank.	0.63		0.00		[⊢or impact Assessment Are FL = ID x Impact Acres =	0.000				
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 mitigation bank.		Impact Delta (D)	NOTE: If in was assess	npact is proposed to be mitigated at sed using UMAM, then the credits re	t a mitigation bank that equired for mitigation is				
	Current -	w/Impact	0.630	equal to Fi mitigation I cannot be u mitigaiton b	unctional Loss (FL). If impact mitigonal that was not assessed using used to assess impacts; use the ass ank.	ation is proposed at a g UMAM, then UMAM essment method of the				

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Site/Project Name		Application Numbe	mber Assessment Area Nam			or Number		
					1	9		
FLUCCs code	Further classification	tion (optional)		Impact	Туре	Assessment Area Size		
3112	Ponds, P	ools, Mangrove	Lagoons		Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)		
N/A	N/A		N/A					
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds				
AA within Central Mangrove Wet	land							
Assessment area description								
Mangrove lagoon located within	the Central Mangrove	Wetland						
Significant nearby features			Uniqueness (con landscape.)	nsiderii	ng the relative rarity in	relation to the regional		
Access road. Area historically us	ed for mosquitto cont	rol?	Central Mangrov	ve Wet	land			
Functions			Mitigation for prev	vious p	ermit/other historic use)		
			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review ssment area and reason	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC)	/ Listed Species (List s), type of use, and inte	pecies, their legal Insity of use of the		
Observed Evidence of Wildlife Utili	zation (List species dired	ctly observed, or	ther signs such a	s track	s, droppings, casings,	nests, etc.):		
Fish, Butterfly, Grackle, Galehen	, Little Blue Heron							
Additional relevant factors:								
Assessment conducted by:			Assessment date	e(s):				
RM & TS			07/26/23					

Site/Project Na	te/Project Name:			Application Number:		Assessment Area Name or Number:		
,		-				19		
Impact or Mitia	untion:			Assessment Conducted by:		Assessment Date:		
impact of willig	jation.	lmnaat						
		Impact		RM&IS			07726723	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
	g							
The scoring o would be su su	f each indicator itable for the typ irface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal levo ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes b	pelow (do NOT sco	pre each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			6	
			b. Invasive plant species.				9	
			c. Wildlife access to and from A	A (proximity and barriers).		7		
.500(6)(a) Lo	.500(6)(a) Location and Landscape Support		d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A		7			
			f. Hvdrologic connectivity (imp	ediments and flow restrictions).			6	
	1		a Dependency of downstream h	abitats on quantity or quality of discharges		8		
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands (upland AAs only).				
			Additional					
7		0	Notes:					
			a. Appropriateness of water leve	Is and flows.			6	
			b. Reliability of water level indic	ators.			8	
			c. Appropriateness of soil moist	ure.			7	
.500(6)(b) Water Env	vironment	d. Flow rates/points of discharge).			4	
	(n/a for upland	ls)	e. Fire frequency/seventy.				8	
			n. Hydrologic stress on vegetation.	on			8	
			h. Use by animals with hydrolog	ic requirements.			8	
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8	
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		6	
•			k. Water quality data for the type	e of community.			7	
Current		with impact	I. Water depth, wave energy, an	d currents.			7	
			Additional Salinity 22 PPT					
7		0	Notes:					
			I. Appropriate/desirable species				8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				8	
			III. Regeneration/recruitment				5	
	X Vegetation IV. Age, size distribution.			5				
			V. Snags, dens, cavity, etc.	7				
	Ber	nthic	VI. Plants' condition.				6	
	D - 4	Ь	VII. Land management practices	a channala hummacka)			5	
	Both VIII.		/III. Topographic features (refugia, channels, hummocks).				1	



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Site/Project Name	/	Application Numbe	mber Assessment Area Na			or Number		
					2	0		
FLUCCs code	Further classificati	ion (optional)		Impact	Туре	Assessment Area Size		
5250	Seasonally Fl	looded Mangrov Woodland	e Forest and		Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class	5)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)					
N/A	N/A		N/A					
Geographic relationship to and hyd	rologic connection with v	wetlands, other su	urface water, uplar	nds				
AA within Central Mangrove Wet	land							
Assessment area description								
Mangrove forest located within t	he Central Mangrove W	Vetland						
Significant nearby features			Uniqueness (coi landscape.)	nsiderii	ng the relative rarity in	relation to the regional		
Access road. Area historically us	sed for mosquitto contr	rol?	Central Mangrov	ve Wet	land			
Functions	Functions			vious p	ermit/other historic use)		
			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review (ssment area and reasona	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC)	/ Listed Species (List s), type of use, and inte	pecies, their legal ensity of use of the		
Observed Evidence of Wildlife Utili	zation (List species direc	ctly observed, or o	other signs such a	s track	s, 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					

Site/Project Na	ame:			Application Number:			Assessment Area	Name or Number:	
Impact or Mitig	ation:	-		Assessment Conducted by:			Assessment Date	20	
		Impact		RM & TS				07/26/23	
	• • •	-							
	Scoring Guidan	ce	Optimal (10)	Moderate(7)		Min	imal (4)	Not Present (0)	
The scoring of would be su su	f each indicator itable for the typ rface water asse	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but su maintain most wetland/surface water	fficient to functions	Minimal lev wetland/s fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
						Enter Notes	below (do NOT sco	re each subcategory individually)	
			a. Quality and quantity of habita	t support outside of AA.				8	
			b. Invasive plant species.					8	
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			9		
			d. Downstream benefits provide	ed to fish and wildlife.				8	
			f Hydrologic connectivity (imp	AA from land uses outside of AA.				7	
			q. Dependency of downstream h	habitats on quantity or quality of dischard	pes.			7	
Current		With Impact	h. Protection of wetland function	is provided by uplands (upland AAs only	·).				
			Additional AA within the Centr	ral Mangrove Wetland	,				
7		0	Notes:						
			a. Appropriateness of water leve	els and flows.				7	
			b. Reliability of water level indic	cators.				8	
			 c. Appropriateness of soil moist d. Elow rates/points of discharge 	ture.				8	
.500(6	6)(b) Water Env	ironment	e. Fire frequency/severity.	J C .				8	
	(n/a for upland	5)	f. Type of vegetation.					9	
			g. Hydrologic stress on vegetat	tion.		8			
			h. Use by animals with hydrolog	gic requirements. n associated with water quality (i.e., pla	nts tolerant o	of poor WO)		8	
			j. Water quality of standing wa	ater by observation (I.e., discoloration, t	urbidity).			5	
Current		With Impact	k. Water quality data for the typ	e of community.				7	
Current		with impact	I. Water depth, wave energy, an	nd currents.				5	
_		_	Additional Salinity 40 PPT (No Notes:	orth), 33 PPT (South),					
7		0							
			L Appropriate/desirable species					8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					8	
			III. Regeneration/recruitment					7	
	X Veg	etation	IV. Age, size distribution.					6	
	Don	thia	V. Snags, dens, cavity, etc.					7	
	Dei		VII. Land management practices	S.				5	
	Bot	n	VIII. Topographic features (refug	jia, channels, hummocks).				8	
	1 1		IX. Submerged vegetation (only	score if present).					
Current		With Impact	Additional						
		-	Notes: Sooty mold present	t on the maiority of mandrove leaves Ma	angroves in t	this area are n	ot as mature as of	ner areas.	
7		0			5 1 5 6 m 1				
			1						
Raw Scor	e = Sum of abo	ve scores/30		Impact Acres =	0.00				
(if u	uplands, divide l	by 20)							
]						
Current		With Impact							
		-		Functional Loss (FL) [For Impact Assessment Areas].					
0.70		0.00							
			FL FL	= ID x Impact Acres =	0.000				
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation of UMAM, then the credits required for	n bank that nitigation is				
		equal to Functiona	al Loss (FL). If impact mitigation is pro	posed at a					
equal to Functional Loss (FL). If impact mitigation is proposed at a Current - w/Impact 0.700 cannot be used to assess impacts; use the assessment method of the mitigation bank									

E:\Cayman Islands Field Data\UMAM\20
Site/Project Name		Application Number		er As		Assessment Area Name or Number	
					2	7	
FLUCCs code	Further classifica	ation (optional)	Impact Type			Assessment Area Size	
	Salt	Tollerent Succu	lents	D	Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification	ON (i.e.OFW	/, AP, other local/state/federal	designation of importance)	
N/A	N/A		N/A				
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds			
Located in the upland area adjac	ent to mangrove, pon	ds, pools, and la	goons habitats.				
Assessment area description							
Low lying land, appears to be pe	riodically flooded. Spa	arse Canopy.					
Significant nearby features			Uniqueness (co landscape.)	nsidering	the relative rarity in	relation to the regional	
Mine access road borders the Ea	ast side.		N/A				
Functions		Mitigation for prev	vious per	mit/other historic use)		
			N/A				
Anticipated Wildlife Utilization Base that are representative of the asse be found)	ed on Literature Review ssment area and reasor	(List of species nably expected to	Anticipated Utiliza classification (E, assessment area	ation by L T, SSC),)	isted Species (List s type of use, and inte	pecies, their legal nsity of use of the	
Observed Evidence of Wildlife Utili	zation (List species dire	ectly observed, or	other signs such a	s tracks,	droppings, casings,	nests, etc.):	
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
RM & TS			07/26/23				

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:		
		-		-			27		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date	2		
	J	Impact		RM & TS			07/26/23		
		impaor					01120120		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring c would be su su	e scoring of each indicator is based on what ould be suitable for the type of wetland or surface water assessed Sector Se			Condition is less than optimal, but sufficient maintain most wetland/surface waterfunctio	to Minimal lev wetland/s	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				8		
500(6)(2)	ocation and Lan	decano Support	c. Wildlife access to and from A	A (proximity and barriers).			6		
.500(0)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			2		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			6		
			f. Hydrologic connectivity (impo	ediments and flow restrictions).			2		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			2		
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands (upland AAs only).			4		
4		0	Additional Mine access road lo Notes:	cated to the East. Mangroves, ponds, pools, a	and lagoons habitat	located to the Sou	ith, West and North.		
	<u>.</u>		a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	2.					
	(n/a for upland	ds)	e. Fire frequency/severity.						
			 Type of vegetation. Hydrologic stress on vegetation. 	<u></u>					
			h. Use by animals with hydrolog	ic requirements					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	/).				
•]		k. Water quality data for the type	of community.					
Current		with impact	I. Water depth, wave energy, an	d currents.					
0		0	Additional Notes:						
	•	-	I. Appropriate/desirable species				8		
.500(6)(c) Community	v Structure	II. Invasive/exotic plant species				8		
			III. Regeneration/recruitment				6		
	X Veg	getation	IV. Age, size distribution.				7		
	_		V. Snags, dens, cavity, etc.				2		
	Ber	nthic	VI. Plants' condition.				8		
	Dot	h	VII. Land management practices	a channels hummocks)			<u> </u>		
	B00		IX Submarged vegetation (only	a, onalineis, numinous).			U		

	1		X Unland assessment area	7
Current		With Impact	Additional	
			Notes:	
6		0		
Raw Scor	e = Sum of abo	ove scores/30	Impact Acres = 0.00	
	apianus, uivide	by 20)		
Current		With Impact	Eunctional Loss (EL)	
			[For Impact Assessment Areas]:	
0.50		0.00	FL = ID x Impact Acres = 0.000	
	-	-		
	Impact Delta (ID)		
Current -	w/Impact	0.500	mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank	

Site/Project Name		Application Numbe	r		Assessment Area Name	or Number
					2	29
FLUCCs code	Further classificat	ion (optional)		Impact	t Type	Assessment Area Size
5250	Seasonally F	looded Mangrov Woodland	e Forest and		Direct Impact	Acres
Basin/Watershed Name/Number	Affected Waterbody (Class	s)	Special Classification	0N (i.e.O	FW, AP, other local/state/federal	designation of importance)
N/A	N/A				N/A	
Geographic relationship to and hyd	rologic connection with v	wetlands, other su	urface water, uplar	nds		
AA located on the North side of	Bodden Town Road,					
Assessment area description						
Significant nearby features			Uniqueness (con landscape.)	nsideri	ing the relative rarity in	relation to the regional
Single-family residences, Bodde Active mine access road.	en Town Road, Meagre	Bay Pond,	Central Mangrov	ve Wet	tland	
Functions			Mitigation for prev	vious p	permit/other historic use	9
			N/A			
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review (ssment area and reasona	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS()	y Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the
Observed Evidence of Wildlife Utili	zation (List species direc	ctly observed, or o	other signs such a	s track	ks, droppings, casings,	nests, etc.):
Butterfly, Grackle						
Additional relevant factors:						
Assessment conducted by:			Assessment date	e(s):		
RM & TS			07/25/23			
			l			

ite/Project Na	ime:	-		Application Number:		Assessment Area	Name or Number: 29
npact or Mitiga	ation:	Impact		Assessment Conducted by: RM & TS		Assessment Date	07/25/23
	Scoring Guidan	ice	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)
he scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suffic maintain most wetland/surface waterful	cient to Minima nctions wetla	I level of support of and/surface water functions	Condition is insufficient to provide wetland/surface water functions
					Enter No	tes below (do NOT sco	ore each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.			5
			b. Invasive plant species.				6
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			7
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			3
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5
			g. Dependency of downstream h	nabitats on quantity or quality of discharges	5.		7
Current		With Impact	h. Protection of wetland functions	s provided by uplands (upland AAs only).			
			Additional Bodden Town Road	d located to the South, Small dumping area	a located to the Nort	th of AA. Moderate amo	ount of trash located within the AA.
5		0	Notes:				
							-
			a. Appropriateness of water level	eis and tiows.			5
			c. Appropriateness of soil moist	ture.			6
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	е.			4
	(n/a for upland	s)	e. Fire frequency/severity.				8
			a. Hydrologic stress on vegetat	ion.			7
			h. Use by animals with hydrolog	gic requirements.			1
			i. Plant community composition	n associated with water quality (i.e., plants	tolerant of poor W0	Q).	6
]			j. Water quality of standing wa	ter by observation (I.e., discoloration, turk	pidity).		
Current		With Impact	K. Water quality data for the type	e of community.			
			Additional No water present w	vithin the AA at the time of survey.			
5		0	Notes:				
Į			I. Appropriate/desirable species				6
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				6
	X Vec	letation	III. Regeneration/recruitment				6 5
-		Jetation	V. Snags, dens, cavity, etc.				3
_	Ber	ithic	VI. Plants' condition.				7
	Dat		VII. Land management practices	S.			3
-	B00	n	IX. Submerged vegetation (only	score if present).			5
			X. Upland assessment area	. ,			
Current		With Impact	Additional Notes:			_	
5		0					
			ı 1 r	1			
Raw Scor	e = Sum of abo	ove scores/30		Impact Acres =	0.00		
,	upianus, uiviue l	~, _~,					
Current		With Impact		Functional Loss (FL)			
0.50		0.00		[For Impact Assessment Areas]:			
0.00		0.00	FL	= ID x Impact Acres =	0.000		
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation I g UMAM, then the credits required for mit	pank that igation is		
			equal to Functiona mitigation bank the	I Loss (FL). If impact mitigation is propo	sed at a		
Current -	w/Impact	0.500	cannot be used to a	ar was not assessed using UMAM, the assess impacts: use the assessment meth	od of the		

Site/Project Name		Application Numbe	ber Assessment Area Name or Numb			or Number
					3	0
FLUCCs code	Further classificat	tion (optional)		Impact	Туре	Assessment Area Size
3112	Ponds, P	ools, Mangrove	Lagoons		Direct Impact	Acres
Basin/Watershed Name/Number	Affected Waterbody (Class	s)	Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)
Meagre Bay Pond	N/A				Protected Area	
Geographic relationship to and hyd	rologic connection with v	wetlands, other s	urface water, uplar	nds		
AA Within the Central Mangrove	Wetland					
Assessment area description						
Southern shoreline of Meagre Ba	y Pond					
Significant nearby features			Uniqueness (con landscape)	nsiderii	ng the relative rarity in	relation to the regional
Residential Area and Bodden To mining operations located to the	wn Rd located to the S East and West.	outh. Active	Unique			
Functions		Mitigation for prev	vious p	ermit/other historic use)	
			N/A			
Anticipated Wildlife Utilization Base that are representative of the asses be found)	d on Literature Review (sment area and reason	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC)	y Listed Species (List s c), type of use, and inte	pecies, their legal ensity of use of the
Observed Evidence of Wildlife Utiliz	zation (List species direc	ctly observed, or	L other signs such a	s track	s, droppings, casings,	nests, etc.):
Wood Pecker, Grackle, Fish, Frig	ate Bird, Smooth-bille	d Ani, Turn, Fisł	1			
Additional relevant factors:						
Has an established protected are	a management plan fr	om the Cayman	Islands Governm	nent.		
Assessment conducted by:			Assessment date	e(s):		
RM & TS			07/25/23			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:	
		-		-			30	
Impact or Mitic	nation.			Assessment Conducted by:		Assessment Date	*	
	jation	Imnact		RM & TS			07/25/23	
		impact					01125125	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sc	ore each subcategory individually)	
			a. Quality and quantity of habita t	s support outside of AA.			8	
			b. Invasive plant species.				6	
			c. Wildlife access to and from A	A (proximity and barriers).			6	
.ουυ(b)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			9	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5	
	1		g. Dependency of downstream h	abitats on quantity or quality of discharges.			9	
Current		With Impact	h. Protection of wetland functions	pendency of downstream nabitats of quantity of quality of discharges.			-	
6		0	Additional Bodden Town Rd lo Notes: enters Meagre Bay	cated to the south and two active mines are loop of the south and two active mines are loop of the stands of Australian Pine are loop of the stands of Australian Pine are loop of the stands of the s	ocated to the east an aed along the south	nd west. Stormwat ern shoreline.	er runoff from Bodden Town Rd driectly	
		•	a. Appropriateness of water leve	Is and flows.			7	
			b. Reliability of water level indic	ators.			8	
			c. Appropriateness of soil moist	ure.			8	
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	е.			8	
	(n/a for upland	ds)	e. Fire frequency/seventy.				<u> </u>	
			n. Type of vegetation.	on			8	
			h. Use by animals with hydrolog	ic requirements.			8	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8	
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		7	
Current]		k. Water quality data for the type	e of community.			6	
Current		with impact	I. Water depth, wave energy, an	d currents.			6	
7		0	Additional Salinity - 18 PPT Notes:					
			I. Appropriate/desirable species				7	
.500(6)(c) Community	Structure	II. Invasive/exotic plant species				6	
			III. Regeneration/recruitment				6	
	X Veç	getation	IV. Age, size distribution.				7	
	-	- 11- 1 -	V. Snags, dens, cavity, etc.				5	
	Ber	ntnic	VI. Plants condition.				<u> </u>	
	Rot	'h	VIII Topographic features (refugi	a channels hummocks)			6	
	B01		IV Submargad vagatation (anly					



Site/Project Name		Application Number		Assessment Area Name or Number			
					3	3	
FLUCCs code	Further classificat	tion (optional)	Impact Type Asses			Assessment Area Size	
3112	Ponds, P	ools, Mangrove	Lagoons	Dir	ect Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class	s)	Special Classification	ON (i.e.OFW, A	P, other local/state/federal	designation of importance)	
N/A	N/A		N/A				
Geographic relationship to and hyd	Irologic connection with v	wetlands, other si	urface water, uplar	nds			
Pease Bay Pond							
Assessment area description							
Medium Sized Pond/Lagoon. Sa	nd and Rocky bottom. I	Mangroves on s	horeline.				
Significant nearby features			Uniqueness (con landscape.)	nsidering th	ne relative rarity in	relation to the regional	
Surrounded by additional man-n without trees areas. Agriculture	nodified with trees and and livestock.	man-modified	N/A				
Functions		Mitigation for prev	vious permi	it/other historic use	•		
			N/A				
Anticipated Wildlife Utilization Base that are representative of the asse be found)	ed on Literature Review (ssment area and reasona	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation by Lis T, SSC), ty)	ted Species (List s pe of use, and inte	pecies, their legal nsity of use of the	
Observed Evidence of Wildlife Util	zation (List species direc	ctly observed, or o	ther signs such a	s tracks, dr	roppings, casings,	nests, etc.):	
Additional relevant factors:							
Residential and Industrial locate	d to the West and Sout	h. Solar located	to the North. Act	tive mining	g located to the N	orth and East.	
Assessment conducted by:			Assessment date	e(s):			
RM & TS			07/26/23				

Site/Project Na	ame:	-		Application Number:	-	Assessment Ar	ea Name or Number: 33	
Impact or Mitig	ation:			Assessment Conducted by:		Assessment Da	ate:	
		Impact		RM	& TS		07/26/23	
	Scoring Guidan	<u>6</u>	Ontimal (10)	Moderate/7	1	Minimal (4)	Not Present (0)	
The scoring of would be su su	f each indicator itable for the typ rface water asso	is based on what be of wetland or bessed	Condition is optimal and f supports wetland/surface v functions	ully vater Condition is less than optima maintain most wetland/surfa	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions Minimal level of support of wetland/surface water functions functions			
						Enter Notes below (do NOT s	score each subcategory individually)	
			a. Quality and quantity of h	abitat support outside of AA.		, , , , , , , , , , , , , , , , , , ,	6	
			b. Invasive plant species.	••			9	
500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and fr	om AA (proximity and barriers).			6	
			d. Downstream benefits pr	rovided to fish and wildlife.			6	
			e. Adverse impacts to wildlin	fe in AA from land uses outside of A	۹.		7	
			f. Hydrologic connectivity	(impediments and flow restrictions).			3	
Current		With Impact	g. Dependency of downstre	eam habitats on quantity or quality of	discharges.		4	
			h. Protection of wetland fun	ictions provided by uplands (upland a	As only).	to the North Active mining log	cated to the North and East. Some areas	
6		0	Notes: of the shorelin	he have been hardened with rip rap a	ong the mine acces	s road.	Lated to the North and East. Some aleas	
			a. Appropriateness of water	r levels and flows.			8	
			c. Appropriateness of soil	moisture.			o 8	
500/	6)(b) Water Env	ironmont	d. Flow rates/points of disc	charge.			7	
.500((n/a for upland	s)	e. Fire frequency/severity.				8	
			f. Type of vegetation.	actation			8	
			h. Use by animals with hyd	drologic requirements.			8	
			i. Plant community compo	sition associated with water quality	(i.e., plants tolerant	of poor WQ).	7	
			j. Water quality of standin	g water by observation (I.e., discolu	ration, turbidity).		6	
Current		With Impact	k. Water quality data for th	e type of community.			6	
		•	I. Water depth, wave energy	gy, and currents. ⊤			7	
7		0	Notes:					
			I. Appropriate/desirable spe	cies			8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant spec	cies			9	
			III. Regeneration/recruitmer	nt			5	
	<u> </u>	etation	V. Snags, dens, cavity, etc				4	
	Ber	thic	VI. Plants' condition.	·			7	
			VII. Land management pra	ctices.			6	
	Bot	ו	VIII. Topographic features (retugia, channels, hummocks).			7	
			X. Upland assessment area				5	
Current		With Impact	Additional Notes:					
6		0						
Raw Scor (if	e = Sum of abc uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00			
						_		
Current		With Impact		Functional Loss (FL) [For Impact Assessment Areas]				
0.63		0.00		FL = ID x Impact Acres =	0.000			
	Impact Delta (I	D)	NOTE: If impa was assessed	act is proposed to be mitigated at a I using UMAM, then the credits reau	nitigation bank that red for mitigation is			
Current -	w/Impact	0.630	equal to Fund mitigation bar cannot be use mitigation ban	ctional Loss (FL). If impact mitigation that was not assessed using L to assess impacts; use the assess k.	n is proposed at a MAM, then UMAM ment method of the			

Site/Project Name	Applic	Application Number		A	Assessment Area Name or Number		
					3	6	
FLUCCs code	Further classification (o	ptional)		Impact Type Assessment Are			
1500	Dry	Shrubland			Direct Impact	Acres	
Basin/Watershed Name/Number Af	fected Waterbody (Class)		Special Classification	ON (i.e.OF	W, AP, other local/state/federal	designation of importance)	
N/A	N/A	A N/A					
Geographic relationship to and hydrol	ogic connection with wetlar	nds, other su	urface water, uplar	nds			
Upland area located adjacent to sea	aonally flooded mangrove	e shrubland	1.				
Assessment area description							
Upland shrubland area dominated	by small Ironwood shubs	. Downwar	d slopping south	east to	owards wetland mang	grove shurbland.	
Significant nearby features			Uniqueness (co landscape.)	nsiderir	ng the relative rarity in	relation to the regional	
Single-family residences			N/A				
Functions			Mitigation for prev	vious pe	ermit/other historic use)	
			N/A				
Anticipated Wildlife Utilization Based that are representative of the assessr be found)	on Literature Review (List on ent area and reasonably e	of species expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC I)	Listed Species (List s), type of use, and inte	pecies, their legal insity of use of the	
Observed Evidence of Wildlife Utilizat	ion (List species directly ob	oserved, or o	t other signs such a	s tracks	s, droppings, casings,	nests, etc.):	
Butterfly, Grackle, Mocking Bird							
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
RM & TS			07/25/23				

Site/Project Na	ime:			Application Number:			Assessment Area	Name or Number: 36
Impact or Mitia	ation:			Assessment Conducted by:			Assessment Date	
		Impact		RM & TS				07/25/23
		-					<u> </u>	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)		Min	imal (4)	Not Present (0)
The scoring of would be sui sui	f each indicator itable for the typ rface water ass	is based on what be of wetland or essed	Condition is optimal and fu supports wetland/surface wa functions	r Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions Minimal level of support of wetland/surface water functions functions				Condition is insufficient to provide wetland/surface water functions
						Enter Notes	below (do NOT sco	pre each subcategory individually)
			a. Quality and quantity of ha	bitat support outside of AA.				5
			b. Invasive plant species.					5
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and fro	m AA (proximity and barriers).				6
			d. Downstream benefits pro	vided to fish and wildlife.				5
			e. Adverse impacts to wildlife	e in AA from land uses outside of AA.				6
			a Dependency of downstrea	impediments and now restrictions).	raes			5 6
Current		With Impact	h. Protection of wetland func	ns provided by unlands (unland AAs only)			7	
			Additional Major amounts	of trash present within the AA.	<i>, , , ,</i>			
6		0	Notes:					
Ţ		÷						
			a. Appropriateness of water	levels and flows.				
			b. Reliability of water level i	ndicators.				
			c. Appropriateness of soil m	oisture.				
.500(6	6)(b) Water Env	rironment	e. Fire frequency/severity.	ເຊເງບ.				
	(n/a for upland	15)	f. Type of vegetation.					
			g. Hydrologic stress on veg	etation.				
			n. Use by animals with hydr i. Plant community compose	ologic requirements. ition associated with water quality (i.e., pla	ants tolerant	of poor WO)		
			j. Water quality of standing	water by observation (I.e., discoloration,	turbidity).			
Current		With Impact	k. Water quality data for the	type of community.				
Gurrent			I. Water depth, wave energy	y, and currents.				
		_	Additional Notes:					
		U						
			I. Appropriate/desirable spec	ies				5
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant speci	es				4
			III. Regeneration/recruitment					5
	X Veg	getation	IV. Age, size distribution.					5
	Ber	nthic	VI. Plants' condition.					ა 5
	251		VII. Land management pract	tices.				3
	Bot	h	VIII. Topographic features (re	efugia, channels, hummocks).				5
			IX. Submerged vegetation (c	only score if present).				5
Current		With Impact	Additional					~
		_	Notes:					
4		0						
			, <u> </u>		Γ	1		
Raw Score	e = Sum of abo	ove scores/30		Impact Acres =	0.00			
(if u	uplands, divide	by 20)				J		
			ļ					
Current		With Impact				1		
				Functional Loss (FL)				
0.50		0.00				4		
0.00		5.00		FL = ID x Impact Acres =	0.000			
J			· ·		1	4		
	Impact Delta /	חו	NOTE: If impac	t is proposed to be mitigated at a mitigati	on bank that	:		
	impact Delta (was assessed equal to Funct	using UMAM, then the credits required for ional Loss (FL). If impact mitigation is pr	mitigation is	i L		
Current -	w/Impact	0.500	mitigation bank cannot be used	that was not assessed using UMAM, to assess impacts; use the assessment n	then UMAM thethod of the	1		
			mitigaiton bank					

FLUCCs code Further classification (optional) Impact Type Assessment Area S 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						
FLUCCs code Further classification (optional) Impact Type Assessment Area S 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 N/A Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands And the surface water, uplands						
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						
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						
N/A N/A Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands						
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands						
As located on the North side of Bodden Town Road. Assessment area description						
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						

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
,		-		<u>-</u>		37			
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date:			
	jation.	Impact				Assessment Date			
		impact					01123123		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficient maintain most wetland/surface waterfunctio	to Minimal lev ns wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				5		
500(6)(2)	500(6)(a) Location and Landscape Support			A (proximity and barriers).			5		
d. Downstrea e. Adverse im			d. Downstream benefits provide	d to fish and wildlife.			4		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			3		
f. Hydrologic connectivity				ediments and flow restrictions).			4		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.		3			
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).			6		
4		0	Additional Rockwall Present, Bodden Town Road located to the South, Moderate amount of trash located alond the edge of the AA. Notes:						
			a. Appropriateness of water leve	is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	Appropriateness of soil moisture.					
.500((6)(b) Water Env	vironment	Flow rates/points of discharge.						
	(n/a for upland	ds)	e. Fire trequency/severity.						
			Type of vegetation. Hydrologic stress on vegetation						
			h. Use by animals with hydrolog	nydrologic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	rant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	·).				
Ourseast			k. Water quality data for the type	of community.					
Current			I. Water depth, wave energy, an	d currents.					
		0	Additional Notes:						
			I. Appropriate/desirable species				4		
.500(6)(c) Community	/ Structure	II. Invasive/exotic plant species				5		
			III. Regeneration/recruitment				5		
	X Ve	getation	IV. Age, size distribution.				6		
	-	athia	V. Snags, dens, cavity, etc.				5		
	Bei	IUNIC	VI. Flams condition.	6					
	Bot	'n	VIII. Topographic features (refugi	a. channels. hummocks)			7		
			IV Submorged vegetation (only	200ro if propont)			•		

			. Upland assessment area	5	
Current		With Impact	dditional lotes:		
5		0			
Raw Score = Sum of above scores/30 (if uplands, divide by 20)		ove scores/30 by 20)	Impact Acres = 0.00		
Current		With Impact	Functional Loss (FL)		
		0.00	[For Impact Assessment Areas]:		
0.45			FL = ID x Impact Acres = 0.000		
Impact Delta (ID)			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		
Current - w/Impact 0.450		0.450	mitigation bank that was not assessed using UMAM, then UMAM cannot be used to assess impacts; use the assessment method of the mitigation bank		

Site/Project Name	Α	Application Number		/	Assessment Area Name or Number				
					39				
FLUCCs code	Further classification	Further classification (optional)		Impact	Туре	Assessment Area Size			
1500		Dry Shrubland			Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class))	Special Classification	ON (i.e.Of	FW, AP, other local/state/federal	designation of importance)			
N/A N/A					N/A				
Geographic relationship to and hyd	rologic connection with w	vetlands, other su	urface water, uplar	nds					
Upland area located adjacent to s	Upland area located adjacent to seaonally flooded mangrove shrubland.								
Assessment area description									
Shrubland area with large black I	imestone features.								
Significant nearby features		Uniqueness (coi landscape.)	nsiderii	ng the relative rarity in	relation to the regional				
Parkers Raceway, Bodden Town	Road		N/A						
Functions			Mitigation for prev	vious p	ermit/other historic use)			
			N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found)	List of species ably expected to	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 Utiliz	zation (List species direct	tly observed, or o	ther signs such a	s track	s, droppings, casings,	nests, etc.):			
Additional relevant factors:									
Assessment conducted by:			Assessment date	(s):					
RM & TS			07/25/23						

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
,		-				39			
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date:			
Impact of Millig		Impact				Assessment Date	07/25/23		
		impact					01125/25		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				6		
500(0)())	.500(6)(a) Location and Landscape Support d. Downstream benefits provide			A (proximity and barriers).			7		
.500(6)(a) L				d to fish and wildlife.			5		
e. Adv			e. Adverse impacts to wildlife in AA from land uses outside of AA.				6		
			f. Hydrologic connectivity (impo	ediments and flow restrictions).		4			
			g. Dependency of downstream h	abitats on quantity or quality of discharges.		5			
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).			6		
			Additional Significant amounts	of trash located to the West just outside the	4A.				
6		0	Notes:	Notes:					
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500(6)(b) Water Env	vironment	d. Flow rates/points of discharge	rates/points or discharge.					
	(n/a for upland	ls)	f Type of vegetation	etation.					
			g. Hydrologic stress on vegetation.	ration.					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Curront		With Impact	k. Water quality data for the type of community.						
Guilent		with impact	I. Water depth, wave energy, an	Nater depth, wave energy, and currents.					
		0	Additional Notes:						
	-		I. Appropriate/desirable species				7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment				9		
	<u> </u>	getation	IV. Age, size distribution.	7					
		4 h i o	V. Snags, dens, cavity, etc.	8					
	Ber	IUTIC	VI. Plants condition.	7			7		
	Bot	'n	VIII. Topographic features (refugi	a. channels. hummocks).			10		
			IV Submorgod vegetation (only						



Site/Project Name	Application Numbe	hber Assessment Area Name or Number						
				44				
FLUCCs code	Further classification (optional)	1	mpact Type	Assessment Area Size				
7000	Invasive Species Case	uarina	Direct Impact	Acres				
Basin/Watershed Name/Number Affect	ted Waterbody (Class)	Special Classificatio	n (i.e.OFW, AP, other local/state/federa	l designation of importance)				
N/A	N/A		N/A					
Geographic relationship to and hydrologi	ic connection with wetlands, other so	urface water, uplan	ds					
AA located along Bodden Town Road. Located on the coast for the Atlantic Ocean.								
Assessment area description								
Monoculture of invasive species Casu	iarina.							
Significant nearby features		Uniqueness (con landscape.)	sidering the relative rarity in	relation to the regional				
Single-family residences, plots of lan monocultures, Atlantic Ocean, Meagre	d with Australian Pine e Bay Pond	Ν/Α						
Functions		Mitigation for previ	ious permit/other historic use	e				
		N/A						
Anticipated Wildlife Utilization Based on that are representative of the assessmer be found)	Literature Review (List of species nt area and reasonably expected to	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	n (List species directly observed, or o	ther signs such as	tracks, droppings, casings,	nests, etc.):				
Additional relevant factors:								
Recently Burned								
Assessment conducted by:		Assessment date(s):					
RM & TS		07/25/23						

Site/Project Na	Site/Project Name:		Application Number:		Assessment Area Name or Number:				
		-		-		44			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		RM & TS		07/25/23			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring c would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to ons Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habita t	t support outside of AA.			5		
			b. Invasive plant species.				1		
E00(C)(a)	c. Wildlife access to and from			A (proximity and barriers).			4		
.500(6)(a) Location and Landscape Support d. Downstream bene e. Adverse impacts to			d. Downstream benefits provide	d to fish and wildlife.			5		
			e. Adverse impacts to wildlife in AA from land uses outside of AA.				4		
f. Hydrologic connectivity (im			f. Hydrologic connectivity (imp	ediments and flow restrictions).			3		
	g. Dependency of downstream			abitats on quantity or quality of discharges.	6				
Current		With Impact	h. Protection of wetland functions	s provided by uplands (upland AAs only).			6		
4		0	Additional Notes:						
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			. Appropriateness of soil moisture .						
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge.						
	(n/a for upland	ds)	e. Fire trequency/severity.						
			g. Hydrologic stress on vegetation.						
			h. Use by animals with hydrolog	logic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).				
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
ourrent		With impact	I. Water depth, wave energy, an	d currents.					
		0	Additional Notes:						
			I. Appropriate/desirable species				1		
.500(6)(c) Community	Structure	II. Invasive/exotic plant species				1		
			III. Regeneration/recruitment				5		
	<u> </u>	getation	IV. Age, size distribution.				5		
	-	- 4 h : -	V. Snags, dens, cavity, etc.				5		
	Ber	ntnic	VI. Plants' condition.	5					
	Rot	'n	VIII Topographic features (refugi	a channels hummocks)			5		
	00		IV Submargad vagatation (anly	cooro if procont)			5		



Site/Project Name		Application Numbe	Assessment Area Name or Number			or Number	
					47		
FLUCCs code	Further classifica	tion (optional)		Impact	Туре	Assessment Area Size	
1100	Dry I	Forest and Wood	lland		Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with	wetlands, other su	urface water, uplar	nds			
AA located on the North side of E	3odden Town Road.						
Assessment area description							
Significant nearby features		Uniqueness (co landscape.)	nsiderii	ng the relative rarity in	relation to the regional		
Single-family residences, Bodde	n Town Road		N/A				
Functions			Mitigation for prev	vious p	ermit/other historic use)	
			N/A				
Anticipated Wildlife Utilization Base that are representative of the asses	d on Literature Review	(List of species ably expected to	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the				
be found)		2	assessment area)				
Observed Evidence of Wildlife Utiliz	zation (List species dire	ctly observed, or o	other signs such a	s track	s, droppings, casings,	nests, etc.):	
Grackle, Grand Cayman Parrot, E	Butterflys						
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
RM & TS		07/25/23					

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
		-		-			47		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		RM & TS			07/25/23		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficient maintain most wetland/surface waterfunction	t to Minimal lev wetland/s	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				6		
500(6)(2)	c. Wildlife access to and from the second se			A (proximity and barriers).			5		
d. Do			d. Downstream benefits provide	d to fish and wildlife.			3		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			5		
f. Hydrologic connectivity (in				ediments and flow restrictions).			4		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.		4			
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).			6		
5		0	Additional Bodden Town Road located to the South, Single-family residences located to the North. Moderate amount of trash located within the A Notes:						
			a. Appropriateness of water leve	is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500((6)(b) Water Env	vironment	. Flow rates/points of discharge.						
	(n/a for upland	ds)	e. Fire trequency/severity.						
			Hydrologic stress on vegetation						
			h. Use by animals with hydrolog	paic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	y).				
Current		With Impost	k. Water quality data for the type	e of community.					
Current			I. Water depth, wave energy, an	Vater depth, wave energy, and currents.					
		0	Additional Notes:						
	-		I. Appropriate/desirable species				6		
.500(6	6)(c) Community	/ Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment				4		
	X Ve	getation	IV. Age, size distribution.				7		
	D -	athia	V. Snags, dens, cavity, etc.			6			
	Bei	IUNIC	VI. Flants condition.				5		
	Bot	'n	VIII. Topographic features (refugi	a. channels. hummocks).			6		
			IV Submorgod vegetation (only	pooro if propont)			-		

Current		With Impact	X. Upland assessment area 5 Additional				
6		0					
Raw Score = Sum of above scores/30 (if uplands, divide by 20)		ove scores/30 by 20)	Impact Acres = 0.00				
Current		With Impact	Functional Loss (FL)				
0.55		0.00	[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 mitigation bank.				

Site/Project Name		Application Numbe	ber Assessment Area Name			or Number
					50	
FLUCCs code	Further classifica	Further classification (optional)		Impact	t Type	Assessment Area Size
2230	Seasonally Floo	oded / Saturated Forest	Semi-Deciduous	·	Direct Impact	Acres
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification	on (i.e.O	FW, AP, other local/state/federal	designation of importance)
N/A	N/A N/A				N/A	
Geographic relationship to and hyd	trologic connection with	wetlands, other su	urface water, uplar	nds		
AA is apart of a depressional are	ea which transports st	orwater towards	the Central Mang	jrove '	Wetland.	
Assessment area description						
Seasonally flooded areas. Lots agriculture/livestock.	of depressional pocke	ts which pool an	d retain water th	rough	out. Currently used fo	or
Significant nearby features			Uniqueness (coi landscape.)	nsideri	ing the relative rarity in	relation to the regional
Central Mangrove Wetland			N/A			
Functions			Mitigation for prev	/ious p	permit/other historic use)
			N/A			
Anticipated Wildlife Utilization Base that are representative of the asse be found)	ed on Literature Review ssment area and reasor	(List of species hably expected to	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 Util	ization (List species dire	ectly observed, or o	l other signs such a	s track	ks, droppings, casings,	nests, etc.):
Green Iguana						
Additional relevant factors:						
Livestock/cattle currently on site	Э.					
Assessment conducted by:			Assessment date	(s):		
RM & TS			07/25/23			

Site/Project Na	ame:		Application Number:			Assessment Area	Assessment Area Name or Number: 50		
mpact or Mitio	ation:			Assessment Conducted by:			:		
		Impact		RM & TS			07/25/23		
	Scoring Guidan	ce	Optimal (10)	Moderate(7)	I	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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suffici maintain most wetland/surface waterfun	ent to Minimal ctions	level of support of nd/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					Enter Not	es below (do NOT sco	pre each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.			6		
			b. Invasive plant species.				6		
.500(6)(a) Lo	ocation and Lan	dscape Support	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		
	1 1		f. Hydrologic connectivity (imp	pediments and flow restrictions).			6		
Current		With Impact	g. Dependency of downstream	habitats on quantity or quality of discharges			7		
			h. Protection of wetland function	s provided by uplands (upland AAs only).					
			Additional Livestock/cattle use	е.					
6		0	NOTES:						
			a. Appropriateness of water leve	els and flows.			8		
			b. Reliability of water level indic	cators.			8		
			c. Appropriateness of soil mois	ture.			8		
.500(6	6)(b) Water Env	ronment	d. Flow rates/points of discharg	ge.			8		
	(n/a for upland	s)	e. Fire frequency/severity.	Fire frequency/seventy. 8					
			1. Type of vegetation.	tion			<u> </u>		
			h. Use by animals with hydrolog	gic requirements			3		
			i. Plant community composition	n associated with water quality (i.e., plants	olerant of poor WQ)).	7		
			j. Water quality of standing wa	ater by observation (I.e., discoloration, turbi	dity).	,	3		
k. Water quality data for				e of community.			3		
Current		with impact	I. Water depth, wave energy, and currents. 5						
			Additional Rain event during s	survey.					
6		0	Notes:						
			I. Appropriate/desirable species				6		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment	ration/recruitment			6		
-	X Veg	etation	IV. Age, size distribution.	je, size distribution.					
	Ber	thic	VI Plants' condition				5		
-			VII. Land management practices	and management practices.			2		
	Bot	ı	VIII. Topographic features (refug	Topographic features (refugia, channels, hummocks).					
			IX. Submerged vegetation (only	score if present).					
Current		\A/:46 lune = = 1	X. Upland assessment area						
Current			Additional Notes:						
5		0	1						
~		~							
D 0				Impact Acres =	0.00				
Kaw Score (if i	e = Sum of abo uplands. divide I	ove scores/30 by 20)							
(11 0		-,,							
			1						
Current		With Impact		Functional Loss (FL)					
			1	[For Impact Assessment Areas]:					
0.57		0.00	FL	_ = ID x Impact Acres =	0.000				
			۰ ل <u>ــــــــــــــــــــــــــــــــــــ</u>						
	Impact Delta (I	D)	NOTE: If impact is	proposed to be mitigated at a mitigation b	ank that				
Impact Delta (ID)		was assessed usin	ig University, then the creats required for mitig	jaliun is					
			equal to Functiona	al Loss (FL). If impact mitigation is propos	ed at a				

Site/Project Name	Appli	ication Number	ber Assessment Area Name or Number			or Number		
					53			
FLUCCs code	Further classification (Further classification (optional)		Impact Ty	уре	Assessment Area Size		
5252	Seasonally Flood	ded Mangrov	e Shrubland	D	Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.OFW	/, AP, other local/state/federal	designation of importance)		
N/A	N/A				N/A			
Geographic relationship to and hyd	rologic connection with wetla	ands, other su	irface water, uplai	nds				
AA located on the North side of I	3odden Town Road.							
Assessment area description								
Jagged black limestone wetland	area.							
Significant nearby features			Uniqueness (co landscape.)	nsidering	the relative rarity in	relation to the regional		
Single-family residences, Bodde	n Town Road		N/A					
Functions			Mitigation for prev	vious per	rmit/other historic use			
			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found)	ed on Literature Review (List esment area and reasonably	of species expected to	Anticipated Utiliza classification (E, assessment area	ation by L T, SSC),)	isted Species (List s type of use, and inte	pecies, their legal nsity of use of the		
Observed Evidence of Wildlife Utili	zation (List species directly o	observed, or c	other signs such a	s tracks,	droppings, casings,	nests, etc.):		
Butterfly, Grand Cayman Parrot, Purple Galluiine, Green Iguana								
Additional relevant factors:								
Assessment conducted by:			Assessment date	e(s):				
RM & TS			07/25/23					

Site/Project Na	me:			Application Number:			Assessment Area Name or Number: 53		
mpact or Mitigs	ation:	-		Assessment Conducted by:		Assessment Date			
mpaor or millige		Impact		RM & TS			07/25/23		
	Scoring Guidan	ICE	Optimal (10)	Moderate(7)	M	linimal (4)	Not Present (0)		
The scoring of would be sui sur	f each indicator itable for the typ rface water asse	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient maintain most wetland/surface waterfunct	ent to Minimal le wetland	evel of support of d/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					Enter Note	s below (do NOT sco	pre each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.			4		
			b. Invasive plant species.				6		
500(6)(a) Lo	ocation and I and	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			5		
			d. Downstream benefits provide	ed to fish and wildlife.			7		
			e. Adverse impacts to wildlife in a	erse impacts to wildlife in AA from land uses outside of AA.			3		
	1		f. Hydrologic connectivity (imp	pediments and flow restrictions).			7		
Current		With Impact	g. Dependency of downstream h	habitats on quantity or quality of discharges.			7		
			h. Protection of wetland function	s provided by uplands (upland AAs only).					
			Additional Minor amount of tra	ash on the edge of the weltand.					
6		0	NOTES:						
			a. Appropriateness of water leve	els and flows.			6		
			b. Reliability of water level indic	cators.			6		
			c. Appropriateness of soil mois	ture.			6		
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	e.			5		
	(n/a for upland	s)	e. Fire frequency/severity.				8		
			1. Type of vegetation.	ion			5		
			h. Use by animals with hydrolog	nic requirements.			6		
i. Plant community composition associated with water quality (i.e., plants tolerant of poor WQ)						 J.	7		
j. Water quality of standing water by observation (I.e., discoloration, turbidity).							6		
Current		\\/i4h !	k. Water quality data for the typ		6				
Gurrent			I. Water depth, wave energy, and currents. 5						
			Additional Salinity - 25 PPT						
6		0							
		_	I. Appropriate/desirable species				5		
.500(6)	5)(c) Community	Structure	II. Invasive/exotic plant species		6				
	V V.	intation	III. Regeneration/recruitment			6			
-	X_Veg	jetation	IV. Age, SIZE distribution.			<u> </u>			
	Ren	thic	VI. Plants' condition.				7		
-			VII. Land management practices	nanagement practices.			5		
	Bot	h	/III. Topographic features (refugia, channels, hummocks). 8				8		
			IX. Submerged vegetation (only	score if present).					
Current		With Impact	X. Upland assessment area						
			Notes:						
6		0							
		-							
				Impact Acres =	0.00				
Raw Score	e = Sum of abo	ove scores/30							
(11 U	upiarius, uiviūė i	uy 20)		· · · · ·					
]	[4						
Current		With Impact		Functional Loss (FL)					
			1	[For Impact Assessment Areas]:					
0.60		0.00			000				
					.000				
	Impost Dalta //	ח	NOTE: If impact is	proposed to be mitigated at a mitigation ba	ank that				
		171		The second se	untion in				
	impact Delta (i	-/	was assessed usin	Ig UMAM, then the credits required for mitig	ad at a				

Site/Project Name	,	Application Number			Assessment Area Name or Number					
					1	01				
FLUCCs code	Further classificat	ion (optional)		Impact	t Туре	Assessment Area Size				
3112	Ponds, Po	ools, Mangrove	Lagoons		Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Class	5)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)							
N/A	N/A				N/A					
Geographic relationship to and hyd	rologic connection with v	vetlands, other su	urface water, uplar	nds						
AA located on the North side of I	3odden Town Road,									
Assessment area description										
Monoculture of invasive species Casuarina.										
Significant nearby features			Uniqueness (coi landscape.)	nsideri	ng the relative rarity in	relation to the regional				
Single-family residences, Bodde Active mine access road.	Central Mangrove Wetland									
Functions		Mitigation for prev	vious p	permit/other historic use	9					
			N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found)	List of species ably expected to	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 Utiliz	zation (List species direc	ctly observed, or o	ther signs such a	s track	ks, droppings, casings,	nests, etc.):				
Butterfly, Grackle										
Additional relevant factors:										
Assessment conducted by:			Assessment date	e(s):						
RM & TS		07/25/23								

Site/Project Na	me:	<u> </u>		Application Number:	Assessment Area	Assessment Area Name or Number: 101			
npact or Mitiga	ation:	Impact		Assessment Conducted by: RM & TS		Assessment Date	07/25/23		
	Scoring Guidar	се	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
The scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what be of wetland or bessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suffic maintain most wetland/surface waterfur	cient to Minimal nctions wetlan	level of support of nd/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					Enter Note	es below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.			5		
			b. Invasive plant species.	A (proximity and barriers)			<u>8</u> 5		
.500(6)(a) Lo	ocation and Lan	dscape Support	d. Downstream benefits provide	ed to fish and wildlife.			7		
			e. Adverse impacts to wildlife in a	AA from land uses outside of AA.			4		
			f. Hydrologic connectivity (imp	pediments and flow restrictions).			7		
Current		With Impact	g. Dependency of downstream I	habitats on quantity or quality of discharges	5.		8		
			h. Protection of wetland function	s provided by uplands (upland AAs only).	located to the West	t of AA			
6		0	Notes:						
Ũ		v							
			a. Appropriateness of water leve	els and flows.			7		
			b. Reliability of water level indic	cators.			8		
			 Appropriateness of soil mois Flow rates/points of discharg 	ture. 18.			5		
.500(6	6)(b) Water Env (n/a for upland	ironment s)	e. Fire frequency/severity.	·			8		
	, I	,	f. Type of vegetation.	tia m			8		
			h. Use by animals with hydrolog	gic requirements.			7		
			i. Plant community composition	n associated with water quality (i.e., plants	tolerant of poor WQ).	8		
			j. Water quality of standing wa	iter by observation (I.e., discoloration, turb	idity).		6		
Current		With Impact	N. Water depth, wave energy, and currents.						
			Additional Salinity - 15 PPT				5		
7		0	Notes:						
Į			I. Appropriate/desirable species				8		
.500(6	i)(c) Community	Structure	II. Invasive/exotic plant species			8			
	X Vec	etation	IV. Age, size distribution.		<u> </u>				
-			V. Snags, dens, cavity, etc.				4		
-	Ber	thic	VI. Plants' condition.	-			8		
	Bot	n	VIII. Topographic features (refug	efugia, channels, hummocks).			6		
			IX. Submerged vegetation (only	score if present).					
Current		With Impact	X. Upland assessment area						
		• •	Notes:						
7		0							
		(00		Impact Acres =	0.00				
אמש Scor (if נ	e = Sum of abo uplands, divide l	ove scores/30 oy 20)							
0									
Current		with impact		Functional Loss (FL) [For Impact Assessment Areas]:					
0.67		0.00	FL	= ID x Impact Acres =	0.000				
	Impact Delta (I		NOTE: If impact is	proposed to be mitigated at a mitigation b	pank that				
			equal to Functiona	al Loss (FL). If impact mitigation is propo	sed at a				
Current -	w/Impact	0.670	mitigation bank th cannot be used to mitigaiton bank.	at was not assessed using UMAM, then assess impacts; use the assessment meth	n UMAM od of the				

Site/Project Name		Application Numbe	r	,	Assessment Area Name	or Number			
					10	02			
FLUCCs code	Further classificat	tion (optional)		Impact	Туре	Assessment Area Size			
1831	Man-n	nodified Without	Trees		Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.Ol	FW, AP, other local/state/federal	designation of importance)			
N/A	N/A				N/A				
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds					
AA located along Bodden Town	Road. Located on the	coast for the Atl	antic Ocean.						
Assessment area description									
Recently cleared land upland coastal area.									
Significant nearby features			Uniqueness (co landscape.)	nsideri	ng the relative rarity in	relation to the regional			
Single-family residences, plots of monocultures, Atlantic Ocean, M	of land with Australian eagre Bay Pond	Pine	N/A						
Functions			Mitigation for prev	vious p	ermit/other historic use	9			
			N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found)	(List of species ably expected to	Anticipated Utilization by Listed Species (List species, their legal o classification (E, T, SSC), type of use, and intensity of use of the assessment area)							
Observed Evidence of Wildlife Utiliz	zation (List species dire	ctly observed, or	L other signs such a	s track	s, droppings, casings,	nests, etc.):			
Additional relevant factors:									
Recently Cleared									
Assessment conducted by:			Assessment date	e(s):					
RM & TS			07/25/23						

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
		-		-			102		
Impact or Mitic	gation:			Assessment Conducted by:		Assessment Date):		
		Impact		RM & TS		07/25/23			
		•				1			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			3		
			b. Invasive plant species.				6		
500(6)(a) L	.500(6)(a) Location and Landscape Support d. Downstream benefits provide			A (proximity and barriers).			3		
.500(0)(a) L				d to fish and wildlife.			4		
e.			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			5		
			f. Hydrologic connectivity (impo	ediments and flow restrictions).			3		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.		7			
Current		With Impact	h. Protection of wetland functions	7					
5		0	Additional Notes:						
			a. Appropriateness of water leve	is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ture.					
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	ð.					
	(n/a for upland	ds)	e. Fire frequency/severity.						
			n. Hype of vegetation.	nc					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	of community.					
Current			I. Water depth, wave energy, an	d currents.					
		0	Additional Notes:						
			I. Appropriate/desirable species				3		
.500(6	6)(c) Community	/ Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment				5		
	X Ve	getation	IV. Age, size distribution.	1					
	D	athia	V. Snags, dens, cavity, etc.				1		
	Bei	ITTIC	VI. Flams condition.				0 1		
	Bot	th	VIII. Topographic features (refugi	a. channels. hummocks).			3		
Both VIII. I opographic features (refugi				pooro if propont)			-		



Site/Project Name		Application Number		Assessment Area Name or Number		or Number				
					10	03				
FLUCCs code	Further classifica	tion (optional)		Impact	t Type	Assessment Area Size				
5250	Seasonally F	Flooded Mangrov Woodland	e Forest and		Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	on (i.e.O	FW, AP, other local/state/federal	designation of importance)				
N/A	N/A		N/A							
Geographic relationship to and hyd	rologic connection with	wetlands, other su	urface water, uplar	nds						
AA within Central Mangrove Wet	land									
Assessment area description										
Mangrove forest, fragmented by accecss roads.										
Significant nearby features			Uniqueness (co landscape.)	nsideri	ing the relative rarity in	relation to the regional				
Access road. Area historically us	ed for mosquitto cont	trol?	Central Mangrove Wetland							
Functions			Mitigation for prev	vious p	permit/other historic use	9				
			N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found)	(List of species hably expected to	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 Utiliz	zation (List species dire	ctly observed, or o	other signs such a	s track	ks, droppings, casings,	nests, etc.):				
Butterfly, Grackle, Green Heron, Yellow Warbler, Flicker										
Additional relevant factors:										
Assessment conducted by:			Assessment date	e(s):						
RM & TS			07/26/23							

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-			103		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date	Assessment Date:		
	<u>j</u>	Impact		RM & TS			07/26/23		
		impaor					••••=•		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	al (4) Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	Condition is less than optimal, but sufficient to naintain most wetland/surface waterfunctions functions				
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			7		
			b. Invasive plant species.				8		
	.500(6)(a) Location and Landscape Support d. Downstream benefits provide			A (proximity and barriers).			8		
.500(6)(a) L				d to fish and wildlife.			8		
e. Adverse imp			e. Adverse impacts to wildlife in A	A from land uses outside of AA.		4			
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5		
	1		g. Dependency of downstream h	abitats on quantity or quality of discharges.			7		
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).					
	1		Additional						
7		0	Notes:						
			a. Appropriateness of water leve	Is and flows.			6		
			b. Reliability of water level indic	ators.		7			
			c. Appropriateness of soil moist	ure.		7			
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.		3			
	(n/a for upland	ls)	e. Fire frequency/seventy.				8		
			a Hydrologic stress on vegetation.	on			9		
			h. Use by animals with hydrolog	ic requirements.			6		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		5		
Current		With Impost	k. Water quality data for the type	e of community.			5		
Current			I. Water depth, wave energy, an	d currents.			5		
6		0	Additional Milky white substan Notes:	ce floating ontop of the water, Salinity - 25 PF	PT (North) & 24 PPT	(South).			
			I. Appropriate/desirable species				7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species			8			
			III. Regeneration/recruitment		3				
	X Veg	getation	IV. Age, size distribution.	4					
			V. Snags, dens, cavity, etc.	6					
	Ber	nthic	VI. Plants' condition.	5					
	D - 4	Ь	VII. Land management practices	a channala hummaaka)		5			
	Bot	.11	vin. Topographic reatures (refugi			6			



Site/Project Name		Application Number			Assessment Area Name or Number				
					10	04			
FLUCCs code	Further classifica	tion (optional)		Impact	Туре	Assessment Area Size			
	Salt	Salt Tollerent Succulents			Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance)						
N/A	N/A				N/A				
Geographic relationship to and hyd	rologic connection with	wetlands, other se	er surface water, uplands						
Upland area located on the South	nwestern edge of the (Central Mangrov	e Wetland						
Assessment area description									
Open upland area with karst formations dominated by succulents.									
Significant nearby features			Uniqueness (coi landscape.)	nsideri	ng the relative rarity in	relation to the regional			
Cenetral Mangrove Wetland to th agriculture located to the South.	e and	N/A							
Functions			Mitigation for prev	vious p	ermit/other historic use	9			
			N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found)	(List of species hably expected to	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 Utiliz	zation (List species dire	ctly observed, or	other signs such a	s track	s, droppings, casings,	nests, etc.):			
Grand Cayman Parrot, Grackle, E	Butterfly								
Additional relevant factors:									
Derelict vehicles located in AA	Derelict vehicles located in AA								
Assessment conducted by:			Assessment date	e(s):					
RM & TS		07/26/23							

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:		
		_		_		104			
Impost or Mitis	ration			Accessment Conducted by:		Accomment Date			
impact or witig	jation:								
		Impact		RM& IS		07/26/23			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
	g e a a a								
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev wetland/s ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes I	below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			7		
			b. Invasive plant species.				7		
500(0)())	.500(6)(a) Location and Landscape Support d. Downstream benefits provide			A (proximity and barriers).			7		
.500(6)(a) Lo				d to fish and wildlife.			5		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			5		
	f. Hydrologic connectivity (im			ediments and flow restrictions).			3		
]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			5		
Current		With Impact	h. Protection of wetland functions	provided by uplands (upland AAs only).		5			
	1		Additional Property fencing an	d derelict vehicles within AA.					
6		0	Notes:	Notes:					
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500((6)(b) Water Env	vironment	d. Flow rates/points of discharge	le.					
	(n/a for upland	ls)	e. Fire frequency/seventy.						
			a Hydrologic stress on vegetation.	on					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Current		With Impost	k. Water quality data for the type	e of community.					
Current			I. Water depth, wave energy, an	d currents.					
			Additional						
		0	Notes:						
	<u> </u>		L Approprioto/dociroble crees'				7		
500/4	6)(c) Community	Structure	I. Appropriate/desirable species				7		
			III. Invasive/exotic plant species				7		
	X Ve	petation	IV. Age, size distribution.				6		
		<u> </u>	V. Snags, dens, cavity, etc.	2			2		
	Ber	nthic	VI. Plants' condition.	7			7		
			VII. Land management practices	ztices. 3					
	Bot	h	VIII. Topographic features (refugi	a, channels, hummocks).			5		
4			IIX Submorged vegetation (only	pooro if propont)					



Site/Project Name		Application Number			Assessment Area Name or Number						
					10	05					
FLUCCs code	Further classifica	ition (optional)		Impact	туре	Assessment Area Size					
18311	Man	-modified With T	n Trees Direct Impact			Acres					
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification	on (i.e.O	FW, AP, other local/state/federal	designation of importance)					
N/A	N/A				N/A						
Geographic relationship to and hyd	rologic connection with	wetlands, other se	urface water, uplar	nds							
Upland area located on the Sout	Upland area located on the Southwestern edge of the Central Mangrove Wetland										
Assessment area description											
Sparsly forested upland area use	Sparsly forested upland area used for agriculture and livestock.										
Significant nearby features			Uniqueness (co landscape.)	nsideri	ng the relative rarity in	relation to the regional					
N/A			N/A								
Functions			Mitigation for prev	vious p	permit/other historic use)					
			N/A								
Anticipated Wildlife Utilization Base that are representative of the asses be found)	(List of species hably expected to	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 Utili	zation (List species dire	ctly observed, or	l other signs such a	s track	s, droppings, casings,	nests, etc.):					
Butterfly, Grackle, Grand Cayma	n Parrot, Cattle Eegre	t									
Additional relevant factors:											
Cattle fencing											
Assessment conducted by:			Assessment date	e(s):							
RM & TS			07/26/23								

Site/Project Na	ame:			Application Number: Assessment Area Name or Number: - 105						
Impact or Mitig	ation:	-		- Assessment Conducted by:		Assessment Date				
		Impact		RM & TS			07/26/23			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	1	Minimal (4)	Not Present (0)			
The scoring of would be su su	f each indicator itable for the typ rface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suff maintain most wetland/surface waterfu	cient to Minimal wetlar	level of support of nd/surface water functions	Condition is insufficient to provide wetland/surface water functions			
					Enter Note	es below (do NOT sco	ore each subcategory individually)			
			a. Quality and quantity of habita	at support outside of AA.			7			
			Invasive plant species. 7							
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	AA (proximity and barriers).			7			
			d. Downstream benefits provide	ed to fish and wildlife.			3			
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.			2			
			g. Dependency of downstream	habitats on quantity or quality of discharge	S.		4			
Current		With Impact	h. Protection of wetland function	ns provided by uplands (upland AAs only).			3			
			Additional Cattle fencing							
5		0	NOTES:							
			a Appropriateness of water love	els and flows						
			b. Reliability of water level indi	cators.						
			c. Appropriateness of soil mois	sture.						
.500(6	6)(b) Water Env	rironment	d. Flow rates/points of discharg	ge.						
	(n/a for upland	ls)	e. Fire frequency/severity.	Fire frequency/severity.						
			g. Hydrologic stress on vegetat	tion.						
			h. Use by animals with hydrolog	gic requirements.						
			i. Plant community compositio	n associated with water quality (i.e., plant	s 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.								
Current		With Impact	Water depth, wave energy, and currents.							
			Additional							
		0	Notes:							
			I. Appropriate/desirable species				5			
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				7			
	X Mar		III. Regeneration/recruitment			5				
	<u> </u>	Jetation	V. Snags, dens, cavity. etc.			<u> </u>				
	Ber	nthic	VI. Plants' condition.	ts' condition.			6			
			II. Land management practices.			2				
	Bot	n	VIII. I opographic teatures (refug	gia, cnannels, hummocks).			4			
			X. Upland assessment area				5			
Current		With Impact	Additional							
5		0								
Raw Scor (if u	e = Sum of abo uplands, divide	ove scores/30 by 20)		Impact Acres =	0.00					
`````										
Current		With Impact		Functional Loss (FL)						
			1 1	[For Impact Assessment Areas]:						
0.50		0.00	FI	L = ID x Impact Acres =	0.000					
	Impact Delta (		NOTE: If impact is	proposed to be mitigated at a mitigation	bank that					
		,	was assessed usin equal to Functiona	al Loss (FL). If impact mitigation is prop	ugation is osed at a					
Current -	w/Impact	0.500	mitigation bank th cannot be used to mitigaiton bank.	ank that was not assessed using UMAM, then UMAM sed to assess impacts; use the assessment method of the ank.						
			- -							

Site/Project Name	/	Application Number		As	Assessment Area Name or Number					
					10	06				
FLUCCs code	Further classificati	ion (optional)		Impact T	Гуре	Assessment Area Size				
		Palm Hammock		I	Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Class	5)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)							
N/A	N/A		N/A							
Geographic relationship to and hyd	rologic connection with v	vetlands, other su	urface water, uplar	nds						
Upland area located on the Sout	hwestern edge of the C	Central Mangrov	e Wetland							
Assessment area description										
Mature palm hammock										
Significant nearby features		Uniqueness (coi landscape.)	nsiderinę	g the relative rarity in	relation to the regional					
Central Mangrove Wetland locate	ed to the North		Not previously c	atalogu	ied habitat					
Functions		Mitigation for prev	vious pe	rmit/other historic use	1					
Upland buffer for Central Mangro	ove Wetland		N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	List of species ably expected to	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 Utili	zation (List species direc	ctly observed, or o	L other signs such a	s tracks	, droppings, casings,	nests, etc.):				
Green Iguana, Flicker, Termite M	ounds, Wasps									
Additional relevant factors:										
Assessment conducted by:			Assessment date	e(s):						
RM & TS		07/26/23								

Site/Project Na	ime:		Application Number:			Assessment Area	Assessment Area Name or Number:		
- Impact or Mitigation:				- Assessment Conducted by:		Assessment Date			
		Impact		RM & 1	'S		07/26/23		
	Scoring Guidar	nce	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 f supports wetland/surface v functions	fully water Condition is less than optimal, bu maintain most wetland/surface wa	sufficient to aterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions		
					E	Enter Notes below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity <b>of h</b>	abitat support outside of AA.			7		
			b. Invasive plant species.				8		
.500(6)(a) Lo	ocation and Lan	dscape Support	d. Downstream benefits provided to fish and wildlife.				6		
			e. Adverse impacts to wildli	fe in AA from <b>land uses</b> outside of AA.			6		
	1		f. Hydrologic connectivity (impediments and flow restrictions).				3		
Current With Impact			g. Dependency of downstream habitats on quantity or quality of discharges.       4				4		
			h. Protection of wetland functions provided by uplands ( <b>upland</b> AAs only). 6						
6		0	Notes:						
			a. Appropriateness of <b>wate</b>	r levels and flows.					
			b. Reliability of water level indicators.						
500/6	6)(b) Water Env	ironment	c. Appropriateness of soil moisture. d. Flow rates/points of discharge.						
.000(0	(n/a for upland	ls)	e. Fire frequency/severity.						
			<ul> <li>I ype or vegetation.</li> <li>g. Hydrologic stress on vegetation.</li> </ul>						
			h. Use by animals with hydrologic requirements.						
			i. Plant community composition associated with water quality (i.e., plants tolerant of poor WQ). i. Water quality of standing water by observation (i.e., discoloration, turbidity)						
Current		With Impost	k. Water quality data for the type of community.						
Current		with impact	I. Water depth, wave energy	Water depth, wave energy, and currents.					
		0	Additional Notes:						
			I Appropriate/desirable.spc				8		
.500(6	S)(c) Community	Structure	II. Invasive/exotic plant spec	cies			8		
			III. Regeneration/recruitment   9						
	X Veç	getation	IV. Age, size distribution. V. Snags, dens, cavity, etc	2			9		
	Ber	nthic	VI. Plants' condition.	·		8			
Dath			VII. Land management practices.				4		
	BOI		IX. Submerged vegetation	(only score if present).			, 		
Current		With Impact	X. Upland assessment area	a			8		
		-	Notes:						
8		0							
				Impact Acros -	0.00				
Raw Scor (if u	e = Sum of abo uplands. divide	ove scores/30 by 20)		וווייידער אכובא =	0.00				
( (	, , , , , , , , , , , , , , , , , , , ,	<i>↓</i> - <i>I</i>							
Current		With Impact	]	_					
			1 1	Functional Loss (FL) [For Impact Assessment Areas]:					
0.70		0.00		<b>FL</b> = ID x Impact Acres =	0.000				
Impact Delta (ID)			NOTE: If impa	act is proposed to be mitigated at a mitig	ation bank that				
			equal to Fund mitigation bar	equal to Functional Loss (FL). If impact mitigation is proposed at a mitigation bank that was not assessed using UMAM, then UMAM					
Current -	w/Impact	0.700	cannot be use mitigaiton ban	ed to assess impacts; use the assessment k.	method of the				

Site/Project Name		Application Number		Assessment Area Nam		or Number		
					10	08		
FLUCCs code	Further classifica	Further classification (optional)		Impact Type		Assessment Area Size		
	Palustrine	Palustrine Emergent Marsh			Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Clas	ed Waterbody (Class)		0N (i.e.O	FW, AP, other local/state/federal	designation of importance)		
N/A	N/A	N/A		N/A				
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds				
AA is an isolated, low lying area,	whithin an area predo	ominantly used b	oy cattle.					
Assessment area description								
Seasonally flooded herbaceous a	area.							
Significant nearby features			Uniqueness (considering the relative rarity in relation to the regional landscape.)					
Central Mangrove Wetland			N/A					
Functions			Mitigation for prev	vious p	permit/other historic use	)		
			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found )	(List of species hably expected to	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 Utiliz	zation (List species dire	ctly observed, or	other signs such a	s track	ks, 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					

ite/Project Na	me:		Application Number:			As	Assessment Area Name or Number:		
- mpact or Mitigation:				- Assessment Conducted by:		As	sessment Date:		
Impact				RM & TS	RM & TS		07/25/23		
	Scoring Guidar		Optimal (10)	Moderate(7)		Minim	al (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	
					E	Enter Notes bel	ow (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habita	t support outside of AA.				6	
			b. Invasive plant species.				7		
.500(6)(a) Location and Landscape Support			c. Wildlife access to and from AA (proximity and barriers).			9			
			d. Downstream benefits provide	ed to fish and wildlife.				4	
			e. Adverse impacts to wildlife in /	AA from <b>land uses</b> outside of AA.				5	
			a. Dependency of downstream h	nabitats on quantity or quality of discharg	es.	<u> </u>			
Current		With Impact	h. Protection of wetland functions provided by uplands (upland AAs only).					-	
			Additional Livestock/cattle use	Э.					
6		0	Notes:						
			a Appropriateness of water leve	els and flows				8	
			b. Reliability of water level indic	cators.				8	
			c. Appropriateness of soil moist	ture.				8	
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	e.				7	
	(n/a for upland	s)	e. Fire frequency/severity.					8	
			g. Hydrologic stress on vegetat	ion.				7	
			h. Use by animals with hydrolog	gic requirements.				2	
			i. Plant community composition	n associated with water quality (i.e., plan	ts tolerant of	poor WQ).		7	
			j. Water quality of standing wa	e of community	rbidity).			5	
Current		With Impact	I. Water depth, wave energy, ar	nd currents.				6	
			Additional Rain event during s	survey.					
6		0	Notes:						
<u>_</u>			I. Appropriate/desirable species					7	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					7	
	X Vec	etation	IV. Age. size distribution.					7	
-		jotation	V. Snags, dens, cavity, etc. 4					4	
	Ber	nthic	VI. Plants' condition.				5		
	Pot	h	VII. Land management practices.       2         VIII. Topographic features (refugia, chappels, hummocks)       4					2	
-	Bot		IX. Submerged vegetation (only	score if present).				*	
			X. Upland assessment area	· · ·					
Current		With Impact	Additional Notes:						
6		0							
Raw Scor	<b>e</b> = Sum of abo	ove scores/30		Impact Acres =	0.00				
(11 U	apiarius, uiviue l	∪y ∠∪j							
Current		With Impact							
		• •		Functional Loss (FL) [For Impact Assessment Areas]:					
0.60		0.00	FL	= ID x Impact Acres =	0.000				
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation g UMAM, then the credits required for m	bank that itigation is				
			equal to Functiona	I Loss (FL). If impact mitigation is prop	osed at a				
Current -	w/Impact	0.600	mitigation bank the cannot be used to a mitigaiton bank.	at was not assessed using UMAM, th assess impacts; use the assessment me	en UMAM thod of the				
Site/Project Name	ite/Project Name		Application Number		Assessment Area Name or Number				
---------------------------------------------------------------------------------------------	---------------------------------------------------	---------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------	--------------------------------	--------------------------	--	--	
					10	09			
FLUCCs code	Further classifica	ation (optional)		Impac	t Туре	Assessment Area Size			
	Palustrine	Emergent Marsh	n/Wetland		Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)						
N/A	N/A				N/A				
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds					
AA is an isolated, low lying area,	whithin an area predo	ominantly used <b>k</b>	by cattle.						
Assessment area description									
Seasonally flooded herbaceous area.									
Significant nearby features			Uniqueness (con landscape.)	nsideri	ing the relative rarity in	relation to the regional			
Central Mangrove Wetland			N/A						
Functions			Mitigation for prev	vious p	permit/other historic use	)			
			N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ssment area and reasor	(List of species hably expected to	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 Utili	zation (List species dire	ectly observed, or	other signs such a	s tracł	ks, droppings, casings,	nests, etc.):			
Dense population of Green Iguar	ia								
Additional relevant factors:									
Livestock/cattle currently on site									
Assessment conducted by:			Assessment date	e(s):					
RM & TS			07/25/23						

npact or Mitiga	tion:	-				-			109
	-				Assessment Conducted by:			Assessment Date	:
		Impact			RM	& TS			07/25/23
5	Scoring Guidan	ce	Optin	nal (10)	Moderate(7)		Min	imal (4)	Not Present (0)
۲he scoring of e would be suita surf	each indicator i able for the typ face water asse	s based on what e of wetland or ssed	Condition is o supports wetla fund	ptimal and fully nd/surface water ctions	Condition is less than optimal maintain most wetland/surfac	, but sufficient to e waterfunctions	Minimal lev wetland/s fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions
							Enter Notes b	pelow (do NOT sco	pre each subcategory individually)
			a. Quality and c	quantity of habitat	t support outside of AA.				6
			b. <b>Invasive pla</b>	nt species.					7
500(6)(a) Loc	cation and I and	Iscape Support	c. Wildlife acce	ess to and from A	A (proximity and barriers).				9
1000(0)(0) 200			d. <b>Downstream</b>	<b>benefits</b> provide	ed to fish and wildlife.				5
				acts to wildlife in A	AA from land uses outside of AA	۱.			5
			f. Hydrologic o	jic connectivity (impediments and flow restrictions).				4	
Current		With Impact	g. <b>Dependency</b>	of downstream h	nabitats on quantity or quality of	discharges.			5
			h. Protection of	wetland functions	s provided by uplands ( <b>upland</b> A	As only).			
			Additional Liv	vestock/cattle use	).				
6		0	Notes:						
I			a. Appropriaten	ess of water leve	Is and flows.				8
			b. Reliability of	water level indic	ators.				8
			c. Appropriater	ness of <b>soil moist</b>	ure.				8
.500(6)	)(b) Water Envi	ronment	d. Flow rates/p	points of discharge	е.				7
	(n/a for upland	5)	e. Fire frequen	<b>cy</b> /severity.					8
			t. Type of veg	etation.	ion				8
			h Use by anin	nals with hydrolog	iic requirements				0
			i. Plant commu	inity composition	associated with water quality (	i.e., plants tolerant	t of poor WQ).		8
			j. Water qualit	y of standing wat	ter by observation (l.e., discolor	ration, turbidity).	· ,		3
Our	[		k. Water quality	y data for the type	e of community.				5
Current		with impact	I. Water depth, wave energy, and currents. 6				6		
	]		Additional Ra	ain event during s	urvey.				
7		0							
			I. Appropriate/d	esirable species					7
.500(6)(	(c) Community	Structure	II. Invasive/exot	ic plant species					7
			III. Regeneratio	n/recruitment					8
-	X Veg	etation	IV. Aye, SIZE dis	subulion.					ι Δ
	Ren	thic	VI. Plants' cond	tens, cavity, etc. 4			7		
-		-	VII. Land mana	agement practices	ð.				2
	Both	1	VIII. Topograph	ic features (refugi	ia, channels, hummocks).				5
			IX. Submerged	vegetation (only	score if present).				
Current		With Impact	X. Upland asse	ssment area					
			Notes:						
6		0							
L			·			T			
David	0				Impact Acres =	0.00			
Kaw Score (if ur	e = Sum of abo plands, divide h	ve scores/30 v 20)			-				
(" up		,,							
	٦								
Current		With Impact	[		Functional Loss (FL)				
	1				[For Impact Assessment Areas]:				
0.63		0.00		FL	. = ID x Impact Acres =	0.000	1		
L						<u> </u>	4		
ŀ	mpact Delta (I	)	N	OTE: If impact is	proposed to be mitigated at a n	nitigation bank tha	at		
		-1	Wa er	as assessed using ual to Functiona	g UMAM, then the credits requir I Loss (FL). If impact mitigation	ed for mitigation is proposed at a	s a		
Current - v	w/Impact	0.630	m	itigation bank that innot be used to a	at was not assessed using UI assess impacts; use the assess	MAM, then UMAM nent method of the	M e		

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Site/Project Name	Ар	oplication Numbe	r	Assessment A	Area Name o	or Number		
					1	15		
FLUCCs code	Further classification	n (optional)		Impact Type		Assessment Area Size		
1831	Man-moo	dified Without	Trees	Direct Imp	act	Acres		
Basin/Watershed Name/Number Aff	ected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)					
N/A	N/A			N/.	4			
Geographic relationship to and hydrolo	ogic connection with we	etlands, other su	urface water, uplar	nds				
N/A								
Assessment area description								
Upland grassland that has been cle	ared and is currently (	used for livest	ock/cattle.					
Significant nearby features			Uniqueness (con landscape.)	nsidering the relation	ve rarity in	relation to the regional		
N/A			N/A					
Functions			Mitigation for prev	vious permit/other l	nistoric use	)		
Food source for livestock			N/A					
Anticipated Wildlife Utilization Based of that are representative of the assessm be found )	on Literature Review (Lis nent area and reasonab	ist of species oly expected to	Anticipated Utilization by Listed Species (List species, their legal o classification (E, T, SSC), type of use, and intensity of use of the assessment area)					
Observed Evidence of Wildlife Utilizat	on (List species directly	y observed, or o	other signs such a	s tracks, droppings	s, casings,	nests, etc.):		
Butterfly								
Additional relevant factors:	Additional relevant factors:							
Assessment conducted by:			Assessment date	(s):				
RM & TS			07/25/23					

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-			115		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date	:		
	Jacon	Imnact		RM & TS			07/25/23		
		impaor				01120/20			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring c would be su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions functions			Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				5		
		deserve Oversent	c. Wildlife access to and from A	A (proximity and barriers).		8			
.500(6)(a) L	d. <b>Downstream bei</b> e. Adverse impacts		d. <b>Downstream benefits</b> provide	d to fish and wildlife.	2				
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			7		
			f. Hydrologic connectivity (impo	ediments and flow restrictions).			2		
	]		g. <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges.			3		
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			3		
4		0	Additional Notes:						
			a. Appropriateness of <b>water leve</b>	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of <b>soil moist</b>	sture.					
.500(	(6)(b) Water Env	rironment	d. Flow rates/points of discharge	je.					
	(n/a for upland	ls)	e. Fire frequency/severity.						
			a. Hydrologic stress on vegetation	on.					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
	-		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
			I. Water depth, wave energy, an	d currents.					
		0	Additional Notes:						
			I. Appropriate/desirable species				6		
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				5		
			III. Regeneration/recruitment				5		
	X Vegetation IV. Age, size distribution.			6					
	V. Snags, dens, cavity, etc.			3					
	Ber	IUNIC	VI. Flants condition.				2		
	Rot	h	VIII. Topographic features (refugi	a. channels, hummocks)			3		
	Both VIII. I opographic features (refug		a, chambolo, hummookoj.			5			



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Site/Project Name		Application Numbe	r		Assessment Area Name	or Number		
					1'	14		
FLUCCs code	Further classifica	tion (optional)		Impact	Туре	Assessment Area Size		
2230	Se	mi-deciduous fo	rest		Direct Impact	Acres		
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)		
N/A	N/A		N/A					
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds				
Mastic Forest (Semi-deciduous fo	orest), Central Mangro	ove Wetland (We	st)					
Assessment area description								
Semi-deciduous forest								
Significant nearby features			Uniqueness (con landscape.)	nsideri	ng the relative rarity in	relation to the regional		
Central Mangrove Wetland		Mastic Forest, Mastic Trail						
Functions			Mitigation for prev	vious p	ermit/other historic use	9		
			N/A					
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review sment area and reason	(List of species hably expected to	Anticipated Utiliza classification (E, assessment area	ation by T, SSC )	y Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the		
Observed Evidence of Wildlife Utiliz	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	e(s):				
RM & TS			07/25/23					

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		_		_			11/		
		-		-			114		
Impact or Mitig	jation:	<b>.</b> .		Assessment Conducted by:		Assessment Date			
		Impact		RM & TS		07/25/23			
	Scoring Guidar	lice	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions			
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				4		
			c. Wildlife access to and from A	A (proximity and barriers).		9			
.500(6)(a) Lo	.500(6)(a) Location and Landscape Support d. <b>Downstream benefits</b> prov		d. Downstream benefits provide	d to fish and wildlife.		5			
		e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA				6			
			f. Hvdrologic connectivity (impe	ediments and flow restrictions).			4		
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges			3		
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			5		
	1		Additional Mastic Trail, Mastic	Forest, Younger portion of the forest. Young c	growth, appears to n	navbe have been o	cleared within the last 10 years.		
5		0	Notes:		5 7 11	,			
			a. Appropriateness of <b>water leve</b>	Is and flows.					
			b. Reliability of water level indic	cators.					
			c. Appropriateness of <b>soil moist</b>						
.500(	6)(b) Water Env	ironment	d. Flow rates/points of discharge	je.					
	(n/a for upland	ls)	f Type of vegetation						
			g. Hydrologic stress on vegetation	ion					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
ourrent			I. Water depth, wave energy, an	d currents.					
			Additional						
		0	110165.						
			I. Appropriate/desirable species				7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				4		
Ì	III. Regeneration/recruitment						5		
	X Vegetation IV. Age, size distribution.						4		
			V. Snags, dens, cavity, etc.	5					
	Ber	nthic	VI. Plants' condition.				6		
			VII. Land management practices				4		
Both VIII. Topographic features (refu		a, channels, hummocks).			7				



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Site/Project Name	Application Nu	umber	Assessment Area Name	or Number			
				3			
FLUCCs code	Further classification (optional	)	Impact Type	Assessment Area Size			
1831	Man-modified wit	hout trees		Acres			
Basin/Watershed Name/Number A	ffected Waterbody (Class)	Special Classificat	ion (i.e.OFW, AP, other local/state/federa	al designation of importance)			
Geographic relationship to and hydro	logic connection with wetlands, oth	er surface water, upla	nds				
Assessment area description							
Man-modified without trees.							
Significant nearby features	Uniqueness (co	onsidering the relative rarity in	relation to the regional				
Surrounded by residential, roads,	agricultural	None					
Functions		Mitigation for pre	vious permit/other historic us	e			
Anticipated Wildlife Utilization Based that are representative of the assess be found )	on Literature Review (List of speci ment area and reasonably expecte	es Anticipated Utiliz d to classification (E, assessment area	Anticipated Utilization by Listed Species (List species, their legal o classification (E, T, SSC), type of use, and intensity of use of the assessment area)				
Observed Evidence of Wildlife Utiliza	tion (List species directly observed	, or other signs such a	as tracks, droppings, casings,	nests, etc.):			
Insects, birds							
Additional relevant factors:							
Trash/litter - moderate							
Assessment conducted by:		Assessment date	e(s):				
JS and MM		07/25/23					

			UNIFORM WETLAND MIT Form 62-345.900(2	IGATION ASSESSMENT WORK ), F.A.C. (See Sections 62-345.5	SHEET - 00 and .	PART II - IMPACT 600, F.A.C.)		
Site/Project Na	ame:	_		Application Number:		Assessment Are	a Name or Number: <b>3</b>	
npact or Mitig	gation:	Impact		Assessment Conducted by: JS and MM		Assessment Da	e: 07/25/23	
	Scoring Guida	nce	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)	
he scoring of would be sui sur	f each indicator itable for the typ rface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suff maintain most wetland/surface waterfu	icient to Inctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions	
			1			Enter Notes below (do NOT so	ore each subcategory individually)	
			a. Quality and quantity of habita	t support outside of AA.			4	
			b. Invasive plant species.				3	
.500(6)(a) Location and Landscape Support				A (proximity and barriers).			7	
			d. Downstream benefits provid	led 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				N/A	
Current		With Impact	g. Dependency of downstream	habitats on quantity or quality of discharg	es.		N/A	
Current		with impact	h. Protection of wetland function	s provided by uplands (upland AAs only	).		2	
4		0	Additional Notes:	Additional Notes:				
.500(6	6)(b) Water Env (n/a for upland	vironment ds)	<ul> <li>Appropriateness of soil mois</li> <li>Flow rates/points of discharge</li> <li>Fire frequency/severity.</li> <li>Type of vegetation.</li> <li>Hydrologic stress on vegeta</li> <li>Use by animals with hydrologi.</li> <li>Plant community compositit</li> </ul>	tture. ge. tion. gic requirements. n associated with water quality (i.e., pla	nts tolerar	it of poor WQ).		
	_		j. Water quality of standing w	ater by observation (I.e., discoloration,	urbidity).	. ,		
Current		With Impact	k. Water quality data for the typ	e of community.				
		-	I. Water depth, wave energy, a	nd currents.				
0		0	Notes:					
			I. Appropriate/desirable species				4	
.500(6	6)(c) Community	/ Structure	II. Invasive/exotic plant species				4	
	Y Va		III. Regeneration/recruitment				3	
	<u> </u>	getation	V Snags dens cavity etc				0	
	Bei	nthic	VI. Plants' condition.				6	
			VII. Land management practice	5.			4	
	Bot	th	VIII. Topographic features (refug	ia, channels, hummocks).			1	
	n		IX. Submerged vegetation (only	score if present).			N/A	
Current		With Impact	Additional				3	
3		0	Notes: Tecoma stans, Leu	caena leucocephala, Haematoxylum car	npechianu	m, Bourreria venosa, Setaria g	eniculata/ parviflora (bristle grass)	
						1		
Raw Scor (if u	re = Sum of about the second s	ove scores/30 by 20)		Impact Acres =	0.00			
Current		With Impact		Functional Loss (FL)				
0.35		0.00	FL	= ID x Impact Acres =	0.000			
	Impact Delta (	ID)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation	bank that mitigation			
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           Current - w/Impact         0.350           cannot be used to assess impacts; use the assessment method of the mitigation bank								

Site/Project Name	Арр	lication Number	Assessment Area Name	or Number			
				24			
FLUCCs code	Further classification	(optional)	Impact Type	Assessment Area Size			
18311	Man-mod	ified without trees	Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classific	ation (i.e.OFW, AP, other local/state/federa	al designation of importance)			
Geographic relationship to and hyd	rologic connection with wetl	ands, other surface water, up	ands				
Assessment area description							
Man-modified without trees.							
Significant nearby features		Uniqueness (o	considering the relative rarity in	relation to the regional			
Sourrounded west and south by	roads. Surrounded by agr	iculture. None					
Functions		Mitigation for p	evious permit/other historic us	e			
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (Lisi ssment area and reasonably	t of species Anticipated Util expected to classification (E assessment are	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 Utili:	zation (List species directly	observed, or other signs such	as tracks, droppings, casings,	nests, etc.):			
Lizards, butterflies, smooth bille	d anil (birds)						
Additional relevant factors:							
Assessment conducted by:		Assassment da	te(s):				
JS and MM		07/25/23					

			UNIFORM WETLAND MIT Form 62-345.900(2	IGATION ASSESSMENT WORK: ), F.A.C. (See Sections 62-345.5	SHEET - 00 and .	PART II - IMPACT 600, F.A.C.)			
Site/Project Na	ame:	-		Application Number:		Assessment Ar	ea Name or Number: <b>24</b>		
npact or Mitig	gation:	Impact		Assessment Conducted by: JS and MM		Assessment Da	te: 07/25/23		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
he scoring of would be su	f each indicator itable for the ty rface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suff maintain most wetland/surface waterfu	icient to Inctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions		
			4			Enter Notes below (do NOT s	core each subcategory individually)		
			a. Quality and quantity of habita	at support outside of AA.			6		
			b. Invasive plant species.				7		
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			4		
			d. Downstream benefits provid	led to fish and wildlife.			N/A		
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.			4		
			f. Hydrologic connectivity (im	pediments and flow restrictions).			2		
0		Mith Immedia	g. Dependency of downstream	habitats on quantity or quality of discharg	es.		0		
Current		with impact	h. Protection of wetland function	s provided by uplands (upland AAs only	).		0		
3		0	Additional Notes:						
.500(6	6)(b) Water Env (n/a for upland	vironment ds)	<ul> <li>c. Appropriateness of soil mois</li> <li>d. Flow rates/points of discharge</li> <li>e. Fire frequency/severity.</li> <li>f. Type of vegetation.</li> <li>g. Hydrologic stress on vegeta</li> <li>h. Use by animals with hydrolo</li> <li>i. Plant community composition</li> </ul>	tion. gic requirements. n associated with water quality (i.e., pla	nts tolerar	it of poor WQ).			
	I		j. Water quality of standing w	ater by observation (I.e., discoloration,	turbidity).				
Current		With Impact	I. Water depth, wave energy, a	nd currents.					
0		0	Additional N/A Notes:						
500/0			I. Appropriate/desirable species				6		
.500(6	(c) Community	/ Structure	II. Invasive/exotic plant species				6		
	X Va	notation	III. Regeneration/recruitment				4		
	<u> </u>	getation	V. Snags, dens, cavity, etc.				1		
	Bei	nthic	VI. Plants' condition.				7		
			VII. Land management practice	S.			4		
	Bot	th	VIII. Topographic features (refug	jia, channels, hummocks).			1		
	n		IX. Submerged vegetation (only	score if present).			N/A		
Current		With Impact	Additional				Ø		
4		0	Notes: Alamo vine (Merrei leucocephala), red	nia dissecta, coconut palm (cocos nucife mombin (Spondias purpurea), guinea gra	ra), logwo ass (panic	od/bloodwood (Haematoxylum um maximum/megathyrsus ma	campechianum), tan-tan (Leucaena ximus)		
Raw Scor (if u	r <b>e</b> = Sum of ab uplands, divide	ove scores/30 by 20)		Impact Acres =	0.00				
Current		With Impact		Functional Loss (FL)					
0.35		0.00	FL	= ID x Impact Acres =	0.000				
	Impact Delta (	ID)	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									

Site/Project Name	Applic	ation Number	Number Assessment Area Name or Number				
			4	1			
FLUCCs code	Further classification (o	ptional)	Impact Type	Assessment Area Size			
1214	Coas	stal Shrub		Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification	ON (i.e.OFW, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hyp	rologic connection with wetlan	ds other surface water uplar	nds				
Caribean sea south of AA. Uplan	ds						
Assessment area description							
Coastal shrub south of Boddon	Γown Road.						
Significant nearby features		Uniqueness (co landscape.)	nsidering the relative rarity in	relation to the regional			
Residential, road		None	None				
Functions		Mitigation for prev	vious permit/other historic use	2			
Anticipated Wildlife Utilization Base that are representative of the asse be found )	ed on Literature Review (List o ssment area and reasonably e	f species Anticipated Utiliza expected to classification (E, assessment area	ation by Listed Species (List s T, SSC), type of use, and inte )	pecies, their legal nsity of use of the			
Observed Evidence of Wildlife Utili	zation (List species directly ob	served, or other signs such a	s 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 MIT Form 62-345.900(2	IGATION ASSESSMENT WORK ), F.A.C. (See Sections 62-345.5	SHEET - 00 and .0	PART II - IMF 600, F.A.C.)	PACT	
Site/Project Na	ame:	-		Application Number:		As	sessment Area	a Name or Number: <b>41</b>
mpact or Mitig	gation:	Impact		Assessment Conducted by: JS and MM		As	sessment Date	e: 07/26/23
	Scoring Guidar	nce	Optimal (10)	Moderate(7)		Minima	al (4)	Not Present (0)
The scoring of would be su su	f each indicator itable for the ty rface water ass	is based on what pe of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufi maintain most wetland/surface waterfi	ficient to unctions	Minimal level o wetland/surl functi	of support of ace water ons	Condition is insufficient to provide wetland/surface water functions
						Enter Notes belo	ow (do NOT sc	ore each subcategory individually)
			a. Quality and quantity of habita	at support outside of AA.				4
			b. Invasive plant species.					8
500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).				2
			d. Downstream benefits provid	led to fish and wildlife.				2
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.				3
			f. Hydrologic connectivity (im	pediments and flow restrictions).				1
0		Mith Immed	g. Dependency of downstream	habitats on quantity or quality of discharg	ges.			1
Current		with impact	h. Protection of wetland function	s provided by uplands (upland AAs only	').			3
3		0	Additional Fragmented by ro Notes:	Additional Fragmented by road. Invsavies on fringe. Birds access. Stops erosion into Half Moon Bay. Notes:				
			a. Appropriateness of water lev	els and flows.				
			b. Reliability of water level ind	cators.				
			c. Appropriateness of soil mois	sture.				
500(6	6)(b) Water Env	vironment	d. Flow rates/points of dischar	ge.				
.000(	(n/a for upland	ds)	e. Fire frequency/severity.					
			f. Type of vegetation.					
			g. Hydrologic stress on vegeta	tion.				
			<ul> <li>Use by animals with hydroid</li> <li>Plant community composition</li> </ul>	gic requirements.	onts tolerar	at of poor WO)		
			i. Water quality of standing w	ater by observation (I.e. discoloration	turbidity)			
	]		k. Water quality data for the type	be of community.	(arbialdy):			
Current		With Impact	. Water depth, wave energy, a	nd currents.				
			Additional N/A					
			Notes:					
			I. Appropriate/desirable species					8
.500(6	6)(c) Community	y Structure	II. Invasive/exotic plant species					8
			III. Regeneration/recruitment					4
	X Ve	getation	IV. Age, size distribution.					4
	Bo	othic	VI Plants' condition					6
			VII. Land management practice	S.				2
	Bot	th	VIII. Topographic features (refug	jia, channels, hummocks).				8
			IX. Submerged vegetation (only	score if present).				N/A
	]		X. Upland assessment area					5
Current		With Impact	Additional					
4		0	Native - seagrape	(Coccoloba uvifera), bourreria (Bourreria	venosa)			
Raw Scor (if u	re = Sum of about states with the second states with the second states and states are states as the second states as the second states are states are states as the second states are states as the second states are states are states as the second states are sta	ove scores/30 by 20)		Impact Acres =	0.00			
	ı	r						
Current		With Impact		Functional Loss (FL) For Impact Assessment Areasl:				
0.35		0.00	FL	= ID x Impact Acres =	0.000			
	Impact Delta (	(ID)	NOTE: If impact is	proposed to be mitigated at a mitigation	bank that			
Impact Delta (ID)         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 current - w/Impact         0.350								
			the mitigaiton bank					

# 2024 UMAM Sheets

Site/Project Name	Ap	oplication Numbe	er Assessment Area Name or Number				
					А	1	
FLUCCs code	Further classification	n (optional)		Impact Ty	уре	Assessment Area Size	
3112	Seasonal	lly Flooded Ma	ingrove	D	Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.OFW	, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with we	etlands, other su	urface water, uplar	nds			
North sound located to the north	of the AA. Urban reside	ntial developm	nent located to th	e west.			
Assessment area description							
Mangrove forest within mosquitt	o control area.						
Significant nearby features			Uniqueness (coi landscape.)	nsidering	the relative rarity in	relation to the regional	
Residential development nearby	to the west		Central Mangrov	ve Wetlar	nd		
Functions			Mitigation for prev	vious peri	mit/other historic use	•	
Stormwater runoff storage and tr	eatment, Wildlife habitat	t	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (Li ssment area and reasonab	ist of species bly expected to	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 speci	es.						
Observed Evidence of Wildlife Utiliz	zation (List species directly	y observed, or o	other signs such a	s tracks,	droppings, casings,	nests, etc.):	
Yellow warbler, Loggerhead flyca	atcher, Land Crab, Smoo	oth-billed Ani, '	White-winged do	ve, Butte	erfly		
Additional relevant factors:							
Mangroves are impounded for m	osquitto control use. Ver	g from tidal fluct	uations.				
Assessment conducted by:			Assessment date	e(s):			
RM & TS			05/14/24				

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-			A1		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	:		
		Impact		RM & TS			05/14/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient maintain most wetland/surface waterfunction	t to Minimal lev wetland/sons fur	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	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 <b>land uses</b> outside of AA.						7		
			f. Hydrologic connectivity (imp	connectivity (impediments and flow restrictions)					
	1		g <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges			8		
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			<u> </u>		
	1		Additional Access roads for me	osquito control fragments habitat and hydrolog	gic conectivity.				
7		0	Notes:						
	<b>I</b>	<u> </u>	a. Appropriateness of <b>water leve</b>	Is and flows.			5		
			b. Reliability of water level indic	ators.			8		
			c. Appropriateness of <b>soil moist</b>	ure.			8		
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			5		
	(n/a for upland	ls)	e. Fire frequency/severity.				6		
			n. Type of vegetation.	on			9		
			h. Use by animals with hydrolog	ic requirements.			6		
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		9		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity	/).		4		
Ourrent	]		k. Water quality data for the type	e of community.			6		
Current		with impact	I. Water depth, wave energy, an	d currents.			5		
7		0	Additional Salinity: N @ 21PP Notes:	Г, S @ 19PPT. Depth: N @ 17in, S @ 16". Gr	een film substance	observed on the w	aters surface.		
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				9		
	<u> </u>	getation	IV. Age, size distribution.				7		
	-	- 41- ' -	V. Snags, dens, cavity, etc.				8		
Benthic VI. Flahts contaition.							/ 5		
	Rot	'n	VIII. Topographic features (refugi	a. channels, hummocks)			9		
	00		IV Submargad vagatation (ank)				~		



Site/Project Name	ŀ	Application Numbe	r		Assessment Area Name or Number		
					Д	.2	
FLUCCs code	Further classificati	ion (optional)		Impact	Туре	Assessment Area Size	
3112	Seasona	ally Flooded Ma	ingrove	Direct Impact Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class	5)	Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with w	wetlands, other su	urface water, uplar	nds			
North sound located to the north	west of the AA.						
Assessment area description							
Mangrove forest within mosquitt	o control area.						
Significant nearby features			Uniqueness (con	nsideri	ng the relative rarity in	relation to the regional	
			Central Mangrov	/e Wet	land		
Functions			Mitigation for prev	vious p	ermit/other historic use	)	
Stormwater runoff storage and the	reatment, Wildlife habit	tat	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ( ssment area and reasona	List of species ably expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utili	zation (List species direc	ctly observed, or o	other signs such a	s track	s, droppings, casings,	nests, etc.):	
Common gallinule, butterflys, Sn	nooth-billed Ani, Grack	de, Tri-colored h	ieron.				
Additional relevant factors:							
Mangroves are impounded for m from tidal fluctuations.	osquitto control use or	n the south side	. No impoundme	nt evic	dence on the northerr	side. Some flushing	
Assessment conducted by:			Assessment date	(s):			
RM & TS			05/14/24				

Site/Project Na	ame:	-		Application Number:		A	ssessment Area	Name or Number: A2
Impact or Mitig	ation:			Assessment Conducted by:		A	ssessment Date	:
		Impact		RM & TS				05/14/24
	Scoring Guidar		Optimal (10)	Moderate(7)		Minim	al (4)	Not Present (0)
The scoring o would be su su	f each indicator itable for the typ irface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but s maintain most wetland/surface wate	ufficient to rfunctions	Minimal level wetland/su	of support of face water tions	Condition is insufficient to provide wetland/surface water functions
					1	Enter Notes be	low (do NOT sco	ore each subcategory individually)
			a. Quality and quantity of habita	t support outside of AA.				9
			b. Invasive plant species.					9
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).				8
			d. Downstream benefits provide	ed to fish and wildlife.				9
			e. Adverse impacts to wildlife in A	AA from <b>land uses</b> outside of AA.				7
	1		f. Hydrologic connectivity (imp	bediments and flow restrictions).				5
Current		With Impact	g. Dependency of downstream r	nabitats on quantity or quality of discha	rges.			9
			h. Protection of wetland function	s provided by uplands ( <b>upland</b> AAs onl	y).			
•		0	Notes:			gic conectivity.		
8		U						
			a Appropriatopage of water lave	ole and flows				7
			a. Appropriateness of water level b. Reliability of water level indic	cators.				<i>i</i> <u>9</u>
			c. Appropriateness of soil moist	ture.				8
E00//	C)(b) Matar Env	ironmont	d. Flow rates/points of discharg	je.				5
.500(0	(n/a for upland	s)	e. Fire frequency/severity.					7
			f. Type of vegetation.					9
			g. Hydrologic stress on vegetat	tion.				9
			i. Plant community composition	n associated with water quality (i.e., pla	ants tolerant of	f poor WQ).		9
			j. Water quality of standing wa	ter by observation (I.e., discoloration,	turbidity).	1		3
Oursent			k. Water quality data for the typ	e of community.				9
Current		with impact	I. Water depth, wave energy, an	nd currents.				5
7		0	Additional Salinity: N @ 22.8F Notes:	PPT, S @ 21.2PPT. Depth: N @ 16in, S	5 @ 20". Greer	n film substance	e observed on th	e waters surface, high turbidity.
			I. Appropriate/desirable species					9
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species					9
			III. Regeneration/recruitment					6
	X Veg	jetation	IV. Age, size distribution.					7
	Ber	othic	V. Shags, dens, cavity, etc.					<u> </u>
	Dei		VII. Land management practices	S.				5
	Bot	h	VIII. Topographic features (refug	ia, channels, hummocks).				9
			IX. Submerged vegetation (only	score if present).				
Current		With Impact	X. Upland assessment area					
R		0	Notes: 60% Black Mangro stressed due to pos	ve, 35% Red Mangrove, 5% Buttonwoo ssible overinundation.	d. 10-30FT he	eight, Crown de	nsity: Good/Full	overall, however Buttonwood looks
÷		Ŭ	1					
Raw Scor (if	<b>e</b> = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00			
Current		With Impact			]			
0 77		0.00		[For Impact Assessment Areas]:				
0.77		0.00	FL	= ID x Impact Acres =	0.000			
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigating UMAM, then the credits required for	on bank that mitigation is			
Current -	w/Impact	0.770	equal to Functiona mitigation bank th cannot be used to	al Loss (FL). If impact mitigation is pr at was not assessed using UMAM, assess impacts; use the assessment m	oposed at a then UMAM ethod of the			

Site/Project Name	Арр	plication Numbe	Imber Assessment Area Name or Number				
					Δ	\3	
FLUCCs code	Further classification	(optional)		Impact	Туре	Assessment Area Size	
3112	Seasonally	y Flooded Ma	ngrove		Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.Of	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with wet	lands, other su	urface water, uplar	nds			
North sound located to the north	west of the AA.						
Assessment area description							
Mangrove forest within mosquitt	o control area.						
Significant nearby features			Uniqueness (cor	nsiderii	ng the relative rarity in	relation to the regional	
			Central Mangrov	ve Wet	land		
Functions			Mitigation for prev	vious p	ermit/other historic use	)	
Stormwater runoff storage and t	reatment, Wildlife habitat		N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (Lis ssment area and reasonably	st of species y expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utili	zation (List species directly	observed, or o	other signs such a	s track	s, droppings, casings,	nests, etc.):	
Butterflys, Tri-colored heron, Gr	ackle						
Additional relevant factors:							
Mangroves are impounded for m from tidal fluctuations.	osquitto control use on th	he south side	. No impoundme	nt evid	lence on the northern	n side. Some flushing	
Assessment conducted by:			Assessment date	e(s):			
RM & TS			05/14/24				

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:
mpact or Mitig	ation:	-		Assessment Conducted by:		Assessment Date	
	Jan 6	Impact		RM & TS			05/14/24
			-				
	Scoring Guidar	ice	Optimal (10)	Moderate(7)	N	1inimal (4)	Not Present (0)
The scoring o would be su su	of each indicator uitable for the typ urface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	r Condition is less than optimal, but suffi maintain most wetland/surface waterfu	cient to Minimal I nctions	evel of support of d/surface water functions	Condition is insufficient to provide wetland/surface water functions
					Enter Note	es below (do NOT sco	pre each subcategory individually)
			a. Quality and quantity of habita	at support outside of AA.			9
			b. Invasive plant species.				9
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from /	AA (proximity and barriers).			7
			d. Downstream benefits provid	ded to fish and wildlife.			10
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.			/ 5
	1		a <b>Dependency</b> of downstream	babitats on quantity or quality of discharge	s		9 9
Current		With Impact	b. Protection of wetland function	ns provided by uplands ( <b>upland</b> AAs only)			<u> </u>
			Additional Access roads for r	mosquitto control fragments habitat and sor	ne hydrologic conectiv	/ity.	
8		0	Notes:		, ,		
Ū		Ū					
	I		a. Appropriateness of water lev	vels and flows.			7
			b. Reliability of water level ind	icators.			9
			c. Appropriateness of <b>soil mois</b>	sture.			9
.500(	(6)(b) Water Env	ironment	d. Flow rates/points of discharge	ge.			5
	(n/a for upland	s)	f. Type of vegetation.				9
			g. Hydrologic stress on vegeta	ation.			8
			h. Use by animals with hydrolo	ogic requirements.			4
			i. Plant community compositio	on associated with water quality (i.e., plants	s tolerant of poor WQ)	).	9
	1 1		k Water quality data for the tv	pe of community	Julty).		9
Current		With Impact	I. Water depth, wave energy, a	and currents.			5
	1		Additional Salinity: N @ 33PI	PT, S @ 30PPT. Depth: N @ 14in, S @ 19'	. Green film substand	e observed on the wa	aters surface, high turbidity.
7		0	Notes:				
500/6	6)(c) Community	Structuro	I. Appropriate/desirable species	3			9
.500(0		Structure	II. Invasive/exotic plant species				9
	X Veg	jetation	IV. Age, size distribution.				7
			V. Snags, dens, cavity, etc.				8
	Ber	ithic	VI. Plants' condition.				8
	Bot	h	VII. Land management practice	es. gia channels hummocks)			9
			IX. Submerged vegetation (only	y score if present).			
Current		With Increase	X. Upland assessment area				
Current		with impact	Additional Notes: 45% Black Manard	ove. 40% Red Manarove 5% White Manaro	ove. 10% Buttonwood	. 10-30FT height Cro	wn density: Good/Full overall_bowev
8	]	0	Buttonwood looks	stressed due to possible overinundation.			
-		-	1				
				Impact Acres =	0.00		
Raw Scor	re = Sum of abo	ove scores/30					
Raw Scor (if u	<b>re</b> = Sum of abo uplands, divide l	ove scores/30 by 20)					
Raw Scor (if	re = Sum of abo uplands, divide l	ove scores/30 by 20)					
Raw Scor (if t	r <b>e</b> = Sum of abo uplands, divide l	ove scores/30 by 20) With Impact		Functional Loss (FL)			
Raw Scor (if t	re = Sum of abo uplands, divide	ove scores/30 by 20) With Impact		Functional Loss (FL) [For Impact Assessment Areas]:			
Raw Scor (if t Current 0.77	re = Sum of abo uplands, divide	With Impact 0.00		<b>Functional Loss (FL)</b> [For Impact Assessment Areas]: <b>L</b> = ID x Impact Acres =	0.000		
Raw Scor (if ) Current 0.77	re = Sum of abo uplands, divide	With Impact 0.00	F	<b>Functional Loss (FL)</b> [For Impact Assessment Areas]: <b>:L</b> = ID x Impact Acres =	0.000		
Raw Scor (if ) Current 0.77	re = Sum of abo uplands, divide l	With Impact 0.00	F NOTE: If impact is	Functional Loss (FL) [For Impact Assessment Areas]: <b>L</b> = ID x Impact Acres =	0.000 bank that		
Raw Scor (if the current 0.77	re = Sum of abo uplands, divide	With Impact 0.00 D)	F NOTE: If impact is was assessed using equal to Function	Functional Loss (FL) [For Impact Assessment Areas]: = ID x Impact Acres = s proposed to be mitigated at a mitigation ng UMAM, then the credits required for mitigation is propo-	0.000 bank that igation is ised at a		

Site/Project Name	Ар	oplication Numbe	r		Assessment Area Name	or Number	
					A	<b>\</b> 4	
FLUCCs code	Further classification	n (optional)		Impact	Туре	Assessment Area Size	
3112	Seasonal	lly Flooded Ma	ngrove		Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with we	etlands, other su	urface water, uplar	nds			
North sound located to the north	west of the AA.						
Assessment area description							
Mangrove forest within mosquitt	o control area.						
Significant nearby features			Uniqueness (cor	nsideri	ng the relative rarity in	relation to the regional	
			Central Mangrov	/e Wet	land		
Functions			Mitigation for prev	vious p	ermit/other historic use	9	
Stormwater runoff storage and tr	reatment, Wildlife habitat	t	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (Li ssment area and reasonab	ist of species bly expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utiliz	zation (List species directly	y observed, or o	other signs such a	s track	s, droppings, casings,	nests, etc.):	
Butterflys, Fish, Grackle, Lizard							
Additional relevant factors:							
Mangroves are impounded for m from tidal fluctuations.	osquitto control use on t	the west side.	No impoundmen	t evide	ence on the eastern s	ide. Some flushing	
Assessment conducted by:			Assessment date	(s):			
RM & TS			05/14/24				

Site/Project Na	ame:				Application Number:		Assess	ment Area N	Name or Number:
moot or Mitia	etion	-			-			mont Data:	A4
npact of Milliga	jalion.	Imnact			RM & T	2	A55655	ment Date.	05/14/24
		impact				0			03/17/27
	Scoring Guidan	се	Ор	timal (10)	Moderate(7)		Minimal (4)		Not Present (0)
The scoring of would be su su	of each indicator uitable for the typ urface water asse	is based on what e of wetland or essed	Condition is supports we fi	s optimal and fully tland/surface water unctions	Condition is less than optimal, but maintain most wetland/surface wa	sufficient to aterfunctions	Minimal level of su wetland/surface functions	oport of water	Condition is insufficient to provide wetland/surface water functions
							Enter Notes below (c	lo NOT score	e each subcategory individually)
			a. Quality an	d quantity <b>of habita</b>	t support outside of AA.			9	
			b. Invasive p	plant species.				9	)
500(6)(a) I (	ocation and Lan	decane Support	c. Wildlife ad	ccess to and from A	A (proximity and barriers).			7	
.000(0)(0) 20			d. <b>Downstre</b>	<b>am benefits</b> provide	ed to fish and wildlife.			9	
			e. Adverse in	npacts to wildlife in	AA from land uses outside of AA.			7	,
	ז ר		f. Hydrologi	c connectivity (imp	pediments and flow restrictions).			5	
Current		With Impact	g. <b>Depende</b> r	ncy of downstream l	habitats on quantity or quality of disch	harges.		9	)
			h. Protection	of wetland function	s provided by uplands ( <b>upland</b> AAs o	only).			
		_	Additional Notes:	Access roads for m	nosquitto control fragments habitat an	d some hydrold	ogic conectivity.		
8		0							
					ala and flame				~
			a. Appropriat	eness of water level	els and flows.				7 o
			c. Appropria	teness of soil moist	ture.				o 8
500/			d. Flow rate	s/points of discharg	le.				5
.500(6	(b) Water Env (n/a for upland	ironment s)	e. Fire frequ	ency/severity.					7
		-,	f. Type of ve	egetation.					9
			g. Hydrologi	c stress on vegetat	ion.				8
			h. Use by ai	nimals with hydrolog	gic requirements.	alante talarant	of poor WO		6
			i. Plant com	lity of standing wa	ter by observation (I.e., discoloration				3
	] [		k. Water qua	lity data for the typ	e of community.	i, tarbiaity).			9
Current		With Impact	I. Water dep	th, wave energy, ar	nd currents.				5
	1		Additional	Salinity: W @ 25PF	PT, E @ 29PPT. Depth: W @ 36in, E	@ 18". Green	film substance observ	ed on the wa	aters surface, high turbidity.
7		0	Notes:						
			I. Appropriate	e/desirable species					9
.500(6	6)(c) Community	Structure	II. Invasive/e	xotic plant species					9
			III. Regenera	tion/recruitment					4
	X Veg	etation	IV. Age, size	distribution.					7
	D	d. 1.	V. Snags, de	ens, cavity, etc.					8
	Ben	Inic	VII Land ma	anagement practices	s				5
	Botl	า	VIII. Topogra	phic features (refug	ia, channels, hummocks).				8
•			IX. Submerg	jed vegetation (only	score if present).				
Current		\\/i4h lue=====	X. Upland as	sessment area					
Current		with impact	Additional Notes:	50% Black Manaro	ve 40% Red Manarove 5% White M	androve 5% P	uttonwood 10-30FT h	eight Crowr	) density: All manarova are showing
7	]	0		lower than usuall ci	rown density. Black sooty mold prese	nt on leaves ar	nd limbs.	Signi, Ciuwi	sonory. An mangrove are snowing
			1				1		
Raw Scor	re = Sum of abo	IVE SCORES/30			Impact Acres =	0.00			
(if r	uplands, divide l	by 20)					l		
	] [	With Impact	]				1		
Current			4		Functional Loss (FL)				
Current	1 1				[For impact Assessment Areas]:				
Current									
Current		0.00		FL	= ID x Impact Acres =	0.000			
0.73		0.00	]		= ID x Impact Acres =	0.000			
Current 0.73	Impact Delta (I	0.00 D)	]	FL NOTE: If impact is was assessed usin	= ID x Impact Acres = proposed to be mitigated at a mitigated at a mitigated at a mitigated for the credits required for	0.000 ation bank that or mitigation is			
0.73	Impact Delta (I	0.00 D)		FL NOTE: If impact is was assessed usin equal to Functiona	= ID x Impact Acres = proposed to be mitigated at a mitiga g UMAM, then the credits required for al Loss (FL). If impact mitigation is p	0.000 ation bank that or mitigation is proposed at a			

Site/Project Name	Aţ	pplication Numbe	hber Assessment Area Name or Number			or Number	
					Δ	.5	
FLUCCs code	Further classificatio	on (optional)		Impact	Туре	Assessment Area Size	
3112	Seasonal	Ily Flooded Ma	ngrove		Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with we	etlands, other su	urface water, uplar	nds			
North sound located to the north	west of the AA.						
Assessment area description							
Mangrove forest within mosquitt	o control area.						
Significant nearby features			Uniqueness (cor	nsiderir	ng the relative rarity in	relation to the regional	
			Central Mangrov	/e Wetl	land		
Functions			Mitigation for prev	vious pe	ermit/other historic use	9	
Stormwater runoff storage and t	reatment, Wildlife habita	ıt	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (Li ssment area and reasonab	ist of species oly expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utili	zation (List species directl	ly observed, or o	other signs such a	s tracks	s, droppings, casings,	nests, etc.):	
Butterflys, yellow warbler							
Additional relevant factors:							
Mangroves are impounded for m from tidal fluctuations.	osquitto control use on	the south side	. No impoundme	nt evid	lence on the nothern	side. Some flushing	
Assessment conducted by:			Assessment date	e(s):			
RM & TS			05/14/24				

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-			A5		
Impact or Mitio	pation:			Assessment Conducted by:		Assessment Date	:		
	<u>j</u>	Imnact		RM & TS			05/14/24		
		impuot					00/14/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons vetland/s	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			9		
			b. Invasive plant species.				9		
		decene Current	c. Wildlife access to and from A	A (proximity and barriers).			7		
.ουυ(ο)(a) L(	ocation and Lan	изсаре Зирроп	d. Downstream benefits provide	d to fish and wildlife.			9		
	e. Adverse impacts to wildlife in AA from land uses outside of AA. 6						6		
			f. Hydrologic connectivity (impediments and flow restrictions).						
	1		g. Dependency of downstream h	ency of downstream habitats on quantity of discharges.					
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).					
8		0	Additional Access roads for mo Notes:	osquitto control fragments habitat and some h	ydrologic conectivity	/.			
		<u>.</u>	a. Appropriateness of water leve	Is and flows.			7		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.			8		
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			5		
	(n/a for upland	ls)	e. Fire frequency/severity.				/ 		
			a. Hydrologic stress on vegetation	on.			9		
			h. Use by animals with hydrolog	ic requirements.			7		
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		4		
Current		With Impact	k. Water quality data for the type	e of community.			5		
Current		With impact	I. Water depth, wave energy, an	d currents.			5		
7		0	Additional Salinity: N @ 27PP Notes:	Г, S @ 26PPT. Depth: N @ 6in, S @ 30". Gre	en film substance o	bserved on the wa	ters surface.		
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				5		
	X Veg	getation	IV. Age, size distribution.				7		
	-	- 41- ' -	V. Snags, dens, cavity, etc.				8		
Benthic VI. Plants condition.							/ 5		
	Rot	'n	VIII. Topographic features (refugi	a. channels, hummocks)			8		
	000		IV Submargad vagatation (anly						



A6       FLUCCs code     Further classification (optional)     Impact Type     Assessment Area Size       Basin/Watershed Name/Number     Affected Waterbody (Class)     Special Classification (a.a.UV. AP, error total despecter or reportions)     Acres       Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands     N/A     N/A       Adjacent to the central mangrove wetland     Assessment area description     Uniqueness (consident)     N/A       Man-modified habitat, stock piles of aggregate and overburden scattered throughout, haul equipment stagging area.     Uniqueness (consident)     Image: Special Classification (be relative rarity in relation to the regional landscape.)       Significant nearby features     Uniqueness (consident)     Mitigation for previous permit/other historic use       Lawdown and operations yard for the time rock mine     V/A     N/A       Anticipated Wildiffe Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to classification (E, T, SSC), type of use, and intensity of use of the assessment area and reasonably expected to 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	Site/Project Name		Application Numbe	umber Assessment Area Name or Number			or Number		
FullCCs code       Further classification (optional)       Impact Type       Assessment Area Size         1831       Acres       Acres       Acres         BasinWatershed NameNumber N/A       Affected Waterbody (Class)       Special Classification (sOW, AP, one localutate/future) (Acres       Acres         Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands       N/A       N/A       N/A         Adjacent to the cantral mangrove wetland       Access and overburden scattered throughout, haul equipment stagging area.       Significant nearby features       Uniqueness (considering the relative rainty in relation to the regional landscape.)         Significant nearby features       Uniqueness (considering the relative rainty in relation to the regional landscape.)       Central Mangrove Wetland         Functions       Mitigation for previous permit/other historic use       N/A         Anticipated Wildlife Utilization Based on Literature Review (List of species to be found.)       Actiopated Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area and reasonably expected to be found.)         Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):         Butterflys, Loggerhead kingbird       Assessment date(s):         Additional relevant factors:       Some evidence of soil staining present within the AA         Assessmen						Д	6		
1831     Man-modified with trees     Direct Impact     Acress       Basin/Watershed Name/Number N/A     Affected Waterbody (Class) N/A     Special Classification (a. GVW, AP, other local-tasset desequation of importance) N/A       Geographic relationship to and hydrocers     Importance (a. GVW, AP, other local-tasset desequation of importance) N/A       Adjacent to the central mangrow-wetland     Importance (a. GVW, AP, other local-tasset description)       Man-modified habitat, stock piles or aggregate and overburden scatter of throughout, haut equipment stagging area.     Importance (a. GVW, AP, other local-tasset description)       Significant nearby features     Uniqueness (conscience)     Uniqueness (conscience)     Importance (a. GVW, AP, other local-tasset description)       Functions     Uniqueness (acceps.)     Central Mangrow-Wetland     Importance (a. GVW, AP, other legistric train) to the regional factors:       Landown and operations yard for the line rock mine     Mis     NA     Importance (a. GVW, AP, other legistric train) for species (action (b, T, SSC), type of use, and intensity of use of the be found.)     NA       Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):     Importance (a. GVW, AP, other legistric tracks)       Butterflys, Loggerhead kingbirg     Species (list species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):       Additional relevant factors:     Species (action (B, T, SSC), type of use, and intensity of use of the assessment areal-s	FLUCCs code	Further classifica	tion (optional)		Impact	Туре	Assessment Area Size		
BasinWatershed NameNumber N/A     Affected Waterbody (Class) N/A     Special Classification (is.o. OV, AP, other Icoardisate/deal/selipation of Importance)       Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands     N/A     N/A       Adjacent to the central mangrove wetland     Adjacent to the central mangrove wetland     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.)       Line Rock Mine     Central Mangrove Wetland       Functions     Mitigation for previous permit/other historic use       Laydown and operations yard for the line 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 classification (E, T, SSC), type of use, and intensity of use of the assessment area and reasonably expected to classification (E, T, SSC), type of use, and intensity of use of the assessment area and reasonably expected to classification (E, T, SSC), type of use, and intensity of use of the assessment area and reasonably expected to 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       Asseessment conducte	1831	Mar	n-modified with t	h trees Direct Impact Acr					
N/A       N/A       N/A         Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands       Image: Constant and Comparison of	Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	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         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.)         Line Rock Mine       Central Mangrove Wetland         Functions       Mitigation for previous permit/vather historic use         Laydown and operations yard for the line rock mine       NA         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:         RM & TS       Assessment date(s):	N/A	N/A				N/A			
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.)         Line Rock Mine       Central Mangrove Wetland         Functions       Mitigation for previous permit/other historic use         Laydown and operations yard for the line rock mine       NA         Anticipated Wildlife Utilization Based on Literature Review (List of species) their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)       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 date(s):         RM & TS       O5/14/24	Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds				
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 classification (E, T, SC), 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	Adjacent to the central mangrov	e wetland							
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.)         Line Rock Mine       Central Mangrove Wetland         Functions       Mitigation for previous permit/other historic use         Laydown and operations yard for the line 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:         RM & TS       O5/14/24	Assessment area description								
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       NA         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:         RM & TS       Assessment date(s):         RM & TS       D5/14/24	Man-modified habitat, stock piles	s of aggregate and ove	erburden scatter	ed throughout, ha	aul equ	uipment stagging are	a.		
Line Rock Mine       Central Mangrove Wetland         Functions       Mitigation for previous permit/other historic use         Laydown and operations yard for the line 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 Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )       Anticipated Wildlife 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       O5/14/24	Significant nearby features			Uniqueness (co landscape.)	nsiderii	ng the relative rarity in	relation to the regional		
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 Wildlife 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       O5/14/24	Lime Rock Mine			Central Mangrov	ve Wet	land			
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       Assessment date(s):	Functions			Mitigation for prev	vious p	ermit/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.):         Butterflys, Loggerhead kingbird         Additional relevant factors:         Some evidence of soil staining present within the AA         Assessment conducted by:       Assessment date(s):         RM & TS       O5/14/24	Laydown and operations yard fo	r the lime rock mine		N/A					
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:         RM & TS	Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ssment area and reason	(List of species hably expected to	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)					
Butterflys, Loggerhead kingbird   Additional relevant factors:   Some evidence of soil staining present within the AA   Assessment conducted by:   RM & TS     O5/14/24	Observed Evidence of Wildlife Utili	zation (List species dire	ctly observed, or	t other signs such a	s track	s, droppings, casings,	nests, etc.):		
Additional relevant factors:         Some evidence of soil staining present within the AA         Assessment conducted by:       Assessment date(s):         RM & TS       05/14/24	Butterflys, Loggerhead kingbird								
Some evidence of soil staining present within the AA         Assessment conducted by:       Assessment date(s):         RM & TS       05/14/24	Additional relevant factors:								
Assessment conducted by: Assessment date(s):          RM & TS       05/14/24	Some evidence of soil staining	present within the AA							
RM & TS 05/14/24	Assessment conducted by:			Assessment date	(s):				
	RM & TS			05/14/24					

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:		
		-		-			A6		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date			
	jation	Impact		RM & TS			05/14/24		
		impact					00/14/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Mir	nimal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what pe of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dns Minimal lev wetland/ fu	vel of support of /surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	s support outside of AA.			4		
b. Invasive plant species.							4		
500(6)(a) L	agation and Lan	dagang Support	c. Wildlife access to and from A	A (proximity and barriers).			4		
.500(0)(a) L	ucation and Lan	uscape support	d. Downstream benefits provide	d to fish and wildlife.			5		
	e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.					1			
			f. Hydrologic connectivity (imp	connectivity (impediments and flow restrictions). 5					
	]		g. <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges.			6		
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).			3		
	1		Additional Active lime rock min	le.					
4		0	Notes:						
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.					
	(n/a for upland	ds)	e. Fire frequency/severity.						
			a Hydrologic stress on vegetation.	on					
			h. Use by animals with hydrolog	ic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidit	y).				
Current		With Impost	k. Water quality data for the type	e of community.					
Current			I. Water depth, wave energy, an	d currents.					
	]		Additional						
0		0	Notes:						
			I. Appropriate/desirable species				6		
.500(	6)(c) Community	v Structure	II. Invasive/exotic plant species				5		
			III. Regeneration/recruitment				2		
	X Ve	getation	IV. Age, size distribution.				3		
			V. Snags, dens, cavity, etc.				4		
Benthic VI. Plants condition.							2		
	Dot	ъ	VII. Land management practices	a channals hummocks)			1 /		
1	00	.11	IX Submorged vegetation (only	a, channels, hummours).			4		



Site/Project Name		Application Numbe	ber Assessment Area Name or Number			or Number	
					A	7	
FLUCCs code	Further classificat	tion (optional)		Impact	Туре	Assessment Area Size	
	Seasonally F	Flooded Mangrov	e Shrubland		Direct Impact	Acres	
Basin/Watershed Name/Number A	ffected Waterbody (Clas	s)	Special Classification	ON (i.e.OF	W, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hydro	ologic connection with	wetlands, other su	urface water, uplar	nds			
Buffer to the central mangrove wetland							
Assessment area description							
Mangrove shrubland adjacent to a deposits throughout the AA.	ctive lime rock mine,	, no standing wa	ter present, signi	ificant	amounts of waste, de	ebris and limerock	
Significant nearby features			Uniqueness (co landscape.)	nsiderir	ng the relative rarity in	relation to the regional	
Active lime rock mine, Adjacent to	Central Mangrove W	/etland					
Functions			Mitigation for prev	vious pe	ermit/other historic use	•	
Stormwater runoff storage and tre	atment, Wildlife habi	tat	N/A				
Anticipated Wildlife Utilization Based that are representative of the assess be found )	on Literature Review ment area and reason	(List of species ably expected to	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 Utiliza	ation (List species dired	ctly observed, or o	other signs such a	s tracks	s, droppings, casings,	nests, etc.):	
Yellow warbler, Anhinga							
Additional relevant factors:							
Soul staining and dispossed 55 ga	n the assessme	nt area.					
Assessment conducted by:			Assessment date	e(s):			
RM & TS		05/14/24					

,,	Site/Project Name: Application Number: Assessment Area Name or Number:						a Name or Number:		
Impact or Mitia	ation:	-		-		Accessment Dat	Ar Assessment Date:		
impact of willig	allon.	Imnact		RM & TS		Assessment Dat	e. 05/14/24		
		impact					00/17/27		
	Scoring Guidan	ice	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
The scoring of would be sui su	f each indicator itable for the typ rface water asse	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but su maintain most wetland/surface water	fficient to functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions		
						Enter Notes below (do NOT so	core each subcategory individually)		
			a. Quality and quantity <b>of habita</b>	t support outside of AA.			3		
			b. Invasive plant species.				8		
500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from AA (proximity and barriers).				4		
.000(0)(0) 20			d. Downstream benefits provided to fish and wildlife.				5		
			e. Adverse impacts to wildlife in a	AA from land uses outside of AA.			3		
	1 1		f. Hydrologic connectivity (imp	bediments and flow restrictions).			3		
Current		With Impact	g. Dependency of downstream h	nabitats on quantity or quality of dischar	ges.		6		
			h. Protection of wetland function	s provided by uplands ( <b>upland</b> AAs only	).				
E		•	Notes:						
5		U							
			a Appropriatories of water love	als and flows			7		
			b. Reliability of water level indic	cators.			6		
			c. Appropriateness of <b>soil mois</b>	ture.			6		
.500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	e.			7		
	(n/a for upland	s)	e. Fire frequency/severity.				6		
			a. Hydrologic stress on vegetat	tation 6			<u> </u>		
			h. Use by animals with hydrolog	gic requirements.			2		
			i. Plant community composition	<b>n</b> associated with water quality (i.e., pla	nts tolerant of	f poor WQ).	7		
	1 1		j. Water quality of standing wa	tter by observation (I.e., discoloration, t	urbidity).		5		
Current		With Impact	k. Water quality data for the typ	e of community.			6		
			I. water depth, wave energy, an Additional Dry season - no sta	na currents. anding water present			6		
6		0	Notes:						
			I. Appropriate/desirable species				8		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species	/exotic plant species			8		
			III. Regeneration/recruitment	4			4		
	<u> </u>	jetation	V. Snags, dens, cavity, etc.				5		
	Ber	ithic	VI. Plants' condition.				4		
			VII. Land management practices	S.			1		
	Bot	h	VIII. Topographic features (refug	ia, channels, hummocks).			3		
	]		X. Upland assessment area	ระบาย แ ทเสรยแป.					
Current		With Impact	Additional						
5		0	Notes: 10% Black Mangro Black sooty mold p	ve, 55% White Mangrove, 35% Buttonw resent on leaves and limbs.	ood. ~10FT h	eight, Crown density: All mang	rove are showing low crown density.		
			· · · · · · · · · · · · · · · · · · ·						
Raw Scor (if u	r <b>e</b> = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00				
Current		With Impact		Functional Loss (FL)					
0.53		0.00	[For Impact Assessment Areas]: <b>FL</b> = ID x Impact Acres = 0.000						
			J <u>L</u>						
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation g UMAM, then the credits required for u	n bank that nitigation is				
Current - w/Impact     0.530     was assessed used			equal to Functiona mitigation bank the cannot be used to a mitigation bank	al Loss (FL). If impact mitigation is pro at was not assessed using UMAM, t assess impacts; use the assessment me	posed at a hen UMAM ethod of the				

Site/Project Name	Application Numbe	mber Assessment Area Name or Number				
				A8		
FLUCCs code	Further classification (optional)	I	mpact Type	Assessment Area Size		
3112	Seasonally Flooded Ma	ingrove	ove Direct Impact Acr			
Basin/Watershed Name/Number Affect	ted Waterbody (Class)	Special Classificatio	n (i.e.OFW, AP, other local/state/federa	al designation of importance)		
N/A	N/A		N/A			
Geographic relationship to and hydrologi	c connection with wetlands, other su	urface water, uplan	ds			
Adjacent to mine pits and upland area	is used in an active lime rock min	e operation.				
Assessment area description						
Seasonally flooded mangrove forest.	Depression and shallow pooling (	common throught	the habitat.			
Significant nearby features		Uniqueness (con landscape.)	sidering the relative rarity in	relation to the regional		
Active lime rock mine						
Functions		Mitigation for previous permit/other historic use				
Stormwater runoff storage and treatm	ent, Wildlife habitat	N/A				
Anticipated Wildlife Utilization Based on that are representative of the assessmer be found )	Literature Review (List of species at area and reasonably expected to	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 sp	pecies.					
Observed Evidence of Wildlife Utilization	(List species directly observed, or o	l other signs such as	s 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				

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A8		
Impact or Mitio	nation:			Assessment Conducted by:		Assessment Date:		
	<u>j</u>	Impact		RM & TS		05/14/24		
		impuot					00/11/21	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Mir	nimal (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 functions				Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	nt to ons Minimal lev wetland/ fu	to ns Minimal level of support of wetland/surface water functions Condition is insufficient to wetland/surface water fu		
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habita</b> t	t support outside of AA.			3	
			b. Invasive plant species.				8	
500(6)(a) L	agation and Lan	dagang Support	c. Wildlife access to and from A	A (proximity and barriers).			6	
.500(0)(a) L(	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			6	
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			4	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5	
	1		g. <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges.			7	
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).				
6		0	Additional Notes:					
			a. Appropriateness of water leve	Is and flows.			8	
			b. Reliability of water level indic	ators.	8			
			c. Appropriateness of <b>soil moist</b>	ure.	8			
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			7	
	(n/a for upland	ls)	f Type of vegetation				8	
			a. Hydrologic stress on vegetation.	on.			7	
			h. Use by animals with hydrolog	ic requirements.			6	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		7	
			j. Water quality of standing wa	ter by observation (I.e., discoloration, turbidity).			7	
Current		With Impact	k. Water quality data for the type	e of community.			7	
ourient		With impact	I. Water depth, wave energy, an	d currents.			7	
7		0	Additional Salinity: 30PPT. Dr Notes:	/ season, very little standing water present, no	o flow, some algae g	growing on the surf	ace of depressional pools.	
			I. Appropriate/desirable species				9	
.500(6	.500(6)(c) Community Structure II. Invasive/exotic plant species						8	
			III. Regeneration/recruitment				7	
	X Veg	getation	IV. Age, size distribution.				8	
	-	- 41- ' -	V. Snags, dens, cavity, etc.	7			/	
	Ber	IUTIC	VI. Flants condition.				<i>'</i>	
	Bot	'n	VIII. Topographic features (refuci	a. channels, hummocks).			8	
			IV Submorged vegetation (only				~	



Site/Project Name Application N			nber Assessment Area Name or Number			or Number	
					A	\9	
FLUCCs code	Further classification	(optional)		Impact	Туре	Assessment Area Size	
3112	Seasonally	y Flooded Ma	ngrove	grove Direct Impact Acre			
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.Ol	FW, AP, other local/state/federal	designation of importance)	
N/A N/A					N/A		
Geographic relationship to and hyd	rologic connection with wet	lands, other su	urface water, uplar	nds			
Buffer mangroves for the Centra	I Mangrove Wetland and t	the active lime	e rock mine.				
Assessment area description							
Seasonally flooded mangrove fo	rest.						
Significant nearby features			Uniqueness (coi landscape.)	nsideri	ng the relative rarity in	relation to the regional	
Active lime rock mine, Central M	angrove Wetland						
Functions			Mitigation for previous permit/other historic use				
Stormwater runoff storage and t	reatment, Wildlife habitat		N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (Lis ssment area and reasonably	t of species y expected to	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 terrst	ial species.						
Observed Evidence of Wildlife Utili	zation (List species directly	observed, or o	other signs such a	s track	s, 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				

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A9		
Impact or Mitio	ation:			Assessment Conducted by:		Assessment Date	:	
	,	Impact		RM & TS			05/14/24	
		impuot				00/14/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Mir	nimal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	dition is less than optimal, but sufficient to Itain most wetland/surface waterfunctions functions			
					Enter Notes	below (do NOT sco	pre each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	t <b>support</b> outside of AA.			4	
			b. Invasive plant species.				8	
	a action and Lan	decene Current	c. Wildlife access to and from A	A (proximity and barriers).			5	
.ουυ(ο)(a) L	ocation and Lan	изсаре Зирроп	d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A	AA from <b>land uses</b> outside of AA.			3	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5	
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			8	
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).				
	1		Additional					
6		0	Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			8	
			b. Reliability of water level indic	ators.			8	
			c. Appropriateness of <b>soil moist</b>	ure.			8	
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	е.			7	
	(n/a for upland	ls)	e. Fire frequency/severity.				<u>م</u>	
			a Hydrologic stress on vegetation.	on			8	
			h. Use by animals with hydrolog	ic requirements.			8	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8	
			j. Water quality of standing wat	ater by observation (I.e., discoloration, turbidity).			7	
Current		With Impost	k. Water quality data for the type	e of community.			8	
Current		with impact	I. Water depth, wave energy, an	nd currents.			7	
8		0	Additional Salinity: 25PPT. Dry Notes:	y season. Sedimentation present on mangrove	es adjacent to minin	g operation.		
			I. Appropriate/desirable species				9	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				7	
	X Veg	getation	IV. Age, size distribution.				8	
	-	- 41- ' -	V. Snags, dens, cavity, etc.				7	
	Ber	IUTIC	VI. Flants condition.	8			<u> </u>	
	Bot	'n	VIII. Topographic features (refugi	a. channels, hummocks)			8	
			IV Submorgod vegetation (only				-	



Site/Project Name	plication Numbe	ber Assessment Area Name or Number					
					Α	10	
FLUCCs code	Further classification	(optional)		Impact	Туре	Assessment Area Size	
3112	Seasonally	y Flooded Ma	ingrove		Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)	
N/A N/A					N/A		
Geographic relationship to and hyd	rologic connection with wet	lands, other su	urface water, uplar	nds			
Buffer mangroves for the Centra	I Mangrove Wetland and t	the active lime	e rock mine.				
Assessment area description							
Seasonally flooded mangrove fo	rest.						
Significant nearby features		Uniqueness (coi landscape.)	nsideri	ng the relative rarity in	relation to the regional		
Active lime rock mine, Central M	angrove Wetland						
Functions			Mitigation for previous permit/other historic use				
Stormwater runoff storage and the	reatment, Wildlife habitat		N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (Lis ssment area and reasonably	st of species y expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utili	zation (List species directly	observed, or o	L other signs such a	s track	s, 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						

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A10		
Impact or Mitio	ation:			Assessment Conducted by:		Assessment Date:		
impuot or mitig		Impact		RM & TS			05/14/24	
		impact					03/14/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Mir	nimal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	nt to Minimal lev ons wetland/ fu	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			4	
			b. Invasive plant species.				8	
500(6)(a) L	agatian and Lan	dagang Support	c. Wildlife access to and from A	A (proximity and barriers).			5	
.500(0)(a) L(	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			6	
	]		g. <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges.			8	
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).				
6		0	Additional Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			8	
			b. Reliability of water level indic	dicators. 8				
			c. Appropriateness of <b>soil moist</b>	ure.			8	
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	<u>je.</u> 7				
	(n/a for upland	ls)	f Type of vegetation				/ 9	
			a. Hydrologic stress on vegetation.	ion 8			8	
			h. Use by animals with hydrolog	ic requirements.			7	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8	
	_		j. Water quality of standing wat	vater by observation (I.e., discoloration, turbidity). 7			7	
Current		With Impact	k. Water quality data for the type	e of community.			7	
Current		with impact	I. Water depth, wave energy, an	d currents.			8	
8		0	Additional Salinity: 27PPT. Dry Notes:	v season. Tannic water				
			I. Appropriate/desirable species				8	
.500(6	.500(6)(c) Community Structure II. Invasive/exotic plant species						8	
			III. Regeneration/recruitment				8	
	X Ve	getation	IV. Age, size distribution.				8	
	-	- 41- ' -	V. Snags, dens, cavity, etc.	7			<u> </u>	
	Bei	IUTIC	VI. Flants condition.	8			<u> </u>	
	Bot	'n	VIII. Topographic features (refugi	a. channels, hummocks).			8	
			IV Submorgod vegetation (only				-	



Site/Project Name	Application Nur	hber Assessment Area Name or Number					
			<u>م</u>	\11			
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size			
3112	Seasonally Flooded	Mangrove	angrove Direct Impact				
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificati	ON (i.e.OFW, AP, other local/state/federa	I designation of importance)			
N/A		N/A					
Geographic relationship to and hyd	rologic connection with wetlands, othe	r surface water, upla	nds				
Buffer mangroves for the Centra	Mangrove Wetland and the active	ime rock mine.					
Assessment area description							
Low density Seasonally flooded	mangrove forest.						
Significant nearby features		Uniqueness (co landscape.)	nsidering the relative rarity in	relation to the regional			
Active lime rock mine, Central Ma	angrove Wetland						
Functions		Mitigation for pre	Mitigation for previous permit/other historic use				
Stormwater runoff storage and t	eatment, Wildlife habitat	N/A	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of species sment area and reasonably expected	Anticipated Utilizato classification (E, assessment area	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 terrstr	ial species.						
Observed Evidence of Wildlife Utili	zation (List species directly observed,	or other signs such a	is tracks, droppings, casings,	nests, etc.):			
Kingbird							
Additional relevant factors:							
Active lime rock mine nearby.							
Assessment conducted by:		Assessment date	e(s):				
RM & TS	05/14/24						

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A11		
Impact or Mitig	ation:			Assessment Conducted by:		Assessment Date	:	
1 0	,	Impact		RM & TS			05/14/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions functions			
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			4	
			b. Invasive plant species.				9	
			c. Wildlife access to and from A	A (proximity and barriers).			5	
.500(6)(a) Lo	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4	
			f. Hydrologic connectivity (impe	ediments and flow restrictions).			6	
			g. Dependency of downstream h	abitats on quantity or quality of discharges.			8	
Current		With Impact	h. Protection of wetland functions					
6		0	Additional Notes:	Additional Notes:				
			a. Appropriateness of water leve	Is and flows.			7	
			b. Reliability of water level indic	ators.			8	
			c. Appropriateness of soil moist	ure.			8	
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	e			7	
	(n/a for upland	ls)	f Type of vegetation				8	
			a. Hydrologic stress on vegetati	on.			6	
			h. Use by animals with hydrolog	ic requirements.			4	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8	
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity).			5	
Current		With Impact	k. Water quality data for the type	e of community.			7	
Guilent		With impact	I. Water depth, wave energy, an	d currents.			7	
7		0	Additional Dry season. No poo Notes:	Is or water present within the AA.				
			I. Appropriate/desirable species				8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				6	
	X Veg	getation	IV. Age, size distribution.	6			6	
			V. Snags, dens, cavity, etc.	7			7	
	Ber	nthic	VI. Plants' condition.	3			3	
	Det	Ь	VII. Land management practices	a channols hummocks)			5	
Both VIII. Topographic features (refugi							1	



Site/Project Name	Application Num	ber Assessment Area Name or Number							
			A	12					
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size					
3112	Seasonally Flooded	Mangrove	ngrove Direct Impact A						
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificati	ON (i.e.OFW, AP, other local/state/federa	I designation of importance)					
N/A		N/A							
Geographic relationship to and hyd	rologic connection with wetlands, other	surface water, upla	nds						
Buffer mangroves for the Central	Mangrove Wetland and the active I	me rock mine.							
Assessment area description									
High density Seasonally flooded	mangrove forest.								
Significant nearby features		Uniqueness (co landscape.)	nsidering the relative rarity in	relation to the regional					
Active lime rock mine, Central Ma	angrove Wetland								
Functions		Mitigation for pre-	Mitigation for previous permit/other historic use						
Stormwater runoff storage and tr	eatment, Wildlife habitat	N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of species sment area and reasonably expected	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 terrstr	ial species.								
Observed Evidence of Wildlife Utiliz	zation (List species directly observed, o	or other signs such a	s tracks, droppings, casings,	nests, etc.):					
Grackle									
Additional relevant factors:									
Active lime rock mine nearby.									
Assessment conducted by:		Assessment date	e(s):						
RM & TS	05/14/24								
Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
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		-		-		A12			
Impact or Mitig	ation:			Assessment Conducted by:		Assessment Date	:		
		Impact		RM & TS			05/14/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dns Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			4		
			b. Invasive plant species.				9		
	c. Wildlife access to and from A			A (proximity and barriers).			5		
.ουυ(ο)(a) L(	ocation and Lan	изсаре Зирроп	d. Downstream benefits provide	d to fish and wildlife.			9		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			4		
			f. Hydrologic connectivity (impo	ediments and flow restrictions).			7		
	1		g. <b>Dependency</b> of downstream h	cy of downstream habitats on quantity or quality of discharges. 8					
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).					
7		0	Additional Notes:	dditional Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			7		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.			9		
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.	7				
	(n/a for upland	ls)	f Type of vegetation						
			a. Hydrologic stress on vegetati	on.			8		
			h. Use by animals with hydrolog	ic requirements.			5		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
	_		j. Water quality of standing wat	rater by observation (I.e., discoloration, turbidity).       7			7		
Current		With Impact	k. Water quality data for the type	e of community.			7		
Ourient		With impact	I. Water depth, wave energy, an	d currents.			7		
8		0	Additional Salinity 23 PPT. Dry Notes:	r season.					
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species			9			
			III. Regeneration/recruitment	7					
	X Veç	getation	IV. Age, size distribution.	8					
	-	<i></i>	V. Snags, dens, cavity, etc.	8			8		
	Ber	nthic	VI. Plants' condition.	8			<u>×</u>		
	Rot	h	VIII. Lanu management practices	a channels hummocks)			<u> </u>		
Both VIII. Topographic features (re			IX Submargad vagatation (anly	2, sharmois, harmooksj.			<b>.</b>		



Site/Project Name	Application Numbe	umber Assessment Area Name or Number					
				A13			
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size			
1100	Dry Forest Woodla	nd	Direct Impact	Acres			
Basin/Watershed Name/Number Affect	ted 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 hydrolog	ic connection with wetlands, other su	urface water, uplar	nds				
Downsloping towards a depressional	wetland. Small isolated pool of fr	eshwater located	l outside of the AA to the e	east.			
Assessment area description							
Karst outcrops scattered throughout	with a ~20ft canopy of mixed hard	dwood species.					
Significant nearby features		Uniqueness (considering the relative rarity in relation to the regional landscape.)					
Mastic Trail to the north. Cleared land	l adjacent to the East.						
Functions		Mitigation for prev	vious permit/other historic us	e			
Stormwater runoff storage and treatn	nent, Wildlife habitat	N/A					
Anticipated Wildlife Utilization Based on that are representative of the assessme be found )	Literature Review (List of species nt area and reasonably expected to	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	n (List species directly observed, or o	l other signs such as	s tracks, droppings, casings	, nests, etc.):			
White-winged dove, Bananaquit, Cay	nan 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					

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:			
		-		-		A13				
Impact or Mitic	pation:			Assessment Conducted by:		Assessment Date:				
	<b>J</b>	Impact		RM & TS			05/15/24			
		impaor					00,10,21			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)			
The scoring of would be su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions			
					Enter Notes	below (do NOT sc	ore each subcategory individually)			
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			5			
			b. Invasive plant species.				7			
500(6)(a)	c. Wildlife access			A (proximity and barriers).			8			
.500(6)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			8			
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			5			
			f. Hydrologic connectivity (impo	ediments and flow restrictions).			8			
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	/ges. 8					
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			8			
7	1	0	Additional Karst formations all Notes:	Additional Karst formations allow for stormwater to pool and store for wildlife utilization. Notes:						
,		Ŭ								
		-	a. Appropriateness of water leve	Is and flows.						
			b. Reliability of water level indic	ators.						
			c. Appropriateness of <b>soil moist</b>	ppropriateness of <b>soil moisture</b> .						
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	tes/points of discharge.						
	(n/a for upland	ls)	Fire frequency/severity.							
			i. Type of vegetation.							
			h. Use by animals with hydrolog	Use by animals with hydrologic requirements.						
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).					
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidit	y).					
Current		With Impost	k. Water quality data for the type	e of community.						
Current		with impact	I. Water depth, wave energy, an	d currents.						
	]		Additional							
		0	Notes:							
	I		I. Appropriate/desirable species				8			
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				7			
			III. Regeneration/recruitment				8			
	<u> </u>	getation	IV. Age, size distribution.			8				
			V. Snags, dens, cavity, etc.		10					
	Benthic VI. Plants' co		VI. Plants' condition.	ion.			7			
	Det	Ь	VII. Land management practices	a channels hummacks)			5			
Both		VIII. I opographic reatures (rerugia, channels, nummocks).     9								



Site/Project Name	Application Numbe	er	Assessment Area Name	Assessment Area Name or Number			
			A	14			
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size			
1100	Dry Forest Woodla	ind	Direct Impact	Acres			
Basin/Watershed Name/Number Affe	cted Waterbody (Class)	Special Classification	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance)				
N/A	N/A		N/A				
Geographic relationship to and hydrolog	gic connection with wetlands, other s	urface water, uplan	ds				
Assessment area description							
Karst outcrops scattered throughout	t with a ~10-20ft canopy of mixed	hardwood species	S.				
Significant nearby features		Uniqueness (considering the relative rarity in relation to the regional landscape.)					
Mastic Trail to the north. Cleared lan	d adjacent to the west.						
Functions		Mitigation for prev	ious permit/other historic us	e			
Stormwater runoff storage and treat	nent, Wildlife habitat	N/A					
Anticipated Wildlife Utilization Based or that are representative of the assessme be found )	n Literature Review (List of species ent area and reasonably expected to	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	i.						
Observed Evidence of Wildlife Utilization	on (List species directly observed, or	other signs such as	s tracks, droppings, casings,	nests, etc.):			
Smooth-billed Ani, Green Iguana, WI	nite-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					

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
		-		-		A14			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	:		
, ,		Impact		RM & TS			05/15/24		
		•							
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				7		
E00(6)(a)	c. Wildlife access to and from			A (proximity and barriers).			7		
d. E e. A			d. Downstream benefits provide	ownstream benefits provided to fish and wildlife. 6			6		
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				4		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5		
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	5				
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			5		
7		0	Additional Recently cleared up Notes:	dditional Recently cleared upland habitat located to the west of the AA. Notes:					
			a. Appropriateness of water leve	Is and flows.					
			c. Appropriateness of soil moist	sture.					
500(	(6)(b) Motor Ep	ironmont	d. Flow rates/points of discharge	ge.					
.500(	(n/a for upland	ds)	e. Fire frequency/severity.	severity.					
	· ·	,	f. Type of vegetation.	ype of vegetation.					
			g. Hydrologic stress on vegetati	stress on vegetation.					
			n. Use by animals with hydrolog	associated with water quality (i.e., plants tol	erant of poor WO)				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	γ).				
	]		k. Water quality data for the type	e of community.	<i>,</i> ,				
Current		With Impact	I. Water depth, wave energy, an	d currents.					
	1		Additional						
		0	Notes:						
			I. Appropriate/desirable species				7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				7		
			III. Regeneration/recruitment				7		
	X Ve	getation	IV. Age, size distribution.				7		
			V. Snags, dens, cavity, etc.				8		
	Benthic VI. Plants' condition.			7			7		
	Dot	h	VII. Land management practices	a channels hummocks)			8		
Both			Vini. ropographic realures (rerugia, channels, numinocks).     8       V     Submerged vegetation (only score if present)						



Site/Project Name	A	Application Number		Assess	Assessment Area Name or Number		
					A	15	
FLUCCs code	Further classification	on (optional)		Impact Type		Assessment Area Size	
1100	Dry	Forest Woodla	nd	Direc	t 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 hyd	rologic connection with w	etlands, other su	urface water, uplar	nds			
Lagoons and Mangroves located	to the East.						
Assessment area description							
Small amounts of karst outcrops	scattered throughout w	vith a ~10-20ft	canopy of mixed	hardwood s	species.		
Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)						
Mastic Trail to the East.							
Functions			Mitigation for prev	/ious permit/c	other historic use		
Stormwater runoff storage and tr	reatment, Wildlife habita	at	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (L ssment area and reasonal	ist of species bly expected to	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 spec	ies.						
Observed Evidence of Wildlife Utiliz	zation (List species direct	ly observed, or o	l other signs such a	s tracks, drop	opings, casings, i	nests, etc.):	
Bananaquit							
Additional relevant factors:							
Access road present. Significant	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				

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
		-		-		A15			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	):		
	-	Impact		RM & TS			05/15/24		
		•							
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	t support outside of AA.			5		
			b. Invasive plant species.				5		
500(6)(2)	c. Wildlife access to and fror			A (proximity and barriers).			6		
d. le.			d. Downstream benefits provided to fish and wildlife.				7		
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			7		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			6		
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	6				
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).		6			
6		0	Additional Notes:						
			a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of <b>soil moist</b>	ure.					
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	rge.					
	(n/a for upland	ls)	f Type of vegetation	Fire trequency/severity.					
			Hydrologic stress on vegetation.						
			h. Use by animals with hydrolog	by animals with hydrologic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).				
	-		j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
Garront			I. Water depth, wave energy, an	d currents.					
		0	Additional Occasional pooling Notes:	of water in adjacent depressional areas on ei	ther side of the acce	ess road.			
			I. Appropriate/desirable species				6		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				5		
			III. Regeneration/recruitment				6		
	X Ve	getation	IV. Age, size distribution.	6			6		
		athia	V. Snags, dens, cavity, etc.		8				
	Bei	IUNIC	VI. Flants condition.				<u> </u>		
	Bot	'n	VIII. Topographic features (refugi	a. channels, hummocks).			8		
			IX Submerged vegetation (only	-					



Site/Project Name		Application Number		Assessment Area Name or Number						
					А	16				
FLUCCs code	Further classificat	tion (optional)		Impact	туре	Assessment Area Size				
3112	Seasor	nally Flooded Ma	ingrove		Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.O	FW, AP, other local/state/federal	designation of importance)				
N/A	N/A				N/A					
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds						
Shallow surface water flow ways	adjacent to the AA.									
Assessment area description										
Seasonally flooded mangrove fo	Seasonally flooded mangrove forest.									
Significant nearby features			Uniqueness (con landscape.)	nsideri	ng the relative rarity in	relation to the regional				
Active lime rock mine to the sour	th. 2ft AGL abandoned	I road present.	Central Mangrove Wetland							
Functions			Mitigation for prev	vious p	permit/other historic use	;				
Stormwater runoff storage and t	reatment, Wildlife habi	tat	N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ssment area and reason	(List of species ably expected to	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 terrstr	ial species.									
Observed Evidence of Wildlife Utili	zation (List species dire	ctly observed, or	I other signs such a	s track	s, droppings, casings,	nests, etc.):				
Stilts, Anhinga										
Additional relevant factors:										
Mangroves are impounded for m from tidal fluctuations.	<i>l</i> langroves are impounded for mosquitto control use on the south side. No impoundment evidence on the nothern side. Some flushing rom tidal fluctuations.									
Assessment conducted by:			Assessment date	e(s):						
RM & TS			05/15/24							

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
		-		-			A16		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	::		
		Impact		RM & TS			05/15/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the ty urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dns Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			5		
			b. Invasive plant species.				9		
	c. Wildlife access to and f			A (proximity and barriers).			7		
.500(6)(a) L	ocation and Lan	dscape Support	d. <b>Downstream benefits</b> provide	d to fish and wildlife.		8			
			e. Adverse impacts to wildlife in A	A from <b>land uses</b> outside of AA.			4		
			f. Hvdrologic connectivity (imp	pair connectivity (impediments and flow restrictions)					
	1		g <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges	hardes 8				
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands ( <b>upland</b> AAs only).					
	1		Additional Impoundments to th	e south and west.					
6		0	Notes:	Notes:					
		<u>.</u>	a. Appropriateness of water leve	Is and flows.			8		
			b. Reliability of water level indic	ators.			8		
			c. Appropriateness of <b>soil moist</b>	ure.			8		
.500(	(6)(b) Water Env	vironment	<ul> <li>a. Flow rates/points of discharge</li> <li>b. Fire frequency/severity</li> </ul>	3.		<u> </u>			
	(n/a for upland	ls)	f. Type of vegetation.		9				
			g. Hydrologic stress on vegetati	on.			5		
			h. Use by animals with hydrolog	ic requirements.			4		
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8		
	-		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
Current		With Impact	k. Water quality data for the type	e of community.					
Guirein		With impact	I. Water depth, wave energy, an	d currents.			5		
7		0	Additional Salinity: 51PPT. Dry Notes: level.	v season. Seasonally flooded, no water preser	nt at the time of the	assessment. Adva	ntatious roots ~1 foot up above ground		
			I. Appropriate/desirable species				8		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				7		
	X Ve	getation	IV. Age, size distribution.	8					
	_		V. Snags, dens, cavity, etc.	7			7		
	Bei	nthic	VI. Plants' condition.	5					
	Bot	h	VII. Land management practices	a channels hummocks)					
Both VIII. Topographi			Vin. Topographic realures (relugi				1		



Site/Project Name		Application Number		Assessment Area Name or Number						
					А	17				
FLUCCs code	Further classifica	tion (optional)		Impact	Туре	Assessment Area Size				
	Ponds, P	Ponds, Pools, Mangrove			Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.OF	FW, AP, other local/state/federal	designation of importance)				
N/A	N/A				N/A					
Geographic relationship to and hyd	rologic connection with	wetlands, other s	urface water, uplar	nds						
Buffer to Meagre Bay Pond	Buffer to Meagre Bay Pond									
Assessment area description										
Mangrove lagoon										
Significant nearby features			Uniqueness (con landscape.)	nsiderir	ng the relative rarity in	relation to the regional				
Meagre Bay Pond, Active lime ro	ck mine.		Meagre Bay Pond							
Functions			Mitigation for prev	vious pe	ermit/other historic use	)				
Stormwater runoff storage and the	reatment, Wildlife habi	itat	N/A							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ssment area and reason	(List of species ably expected to	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 terrstr	ial species.									
Observed Evidence of Wildlife Utili	zation (List species dire	ctly observed, or	I other signs such a	s tracks	s, 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	e(s):						
RM & TS			05/15/24							

Site/Project Na	ame:			Application Number:		Assessment Area Name or Number:			
		-		-			A17		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date	:		
		Impact		RM & TS			05/15/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to ons Minimal lev wetland/s fui	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				8		
	a antion and Lan	deserve Comment	c. Wildlife access to and from A	A (proximity and barriers).			6		
.500(6)(a) Location and Landscape Support d. Downstream e. Adverse impa			d. Downstream benefits provide	d to fish and wildlife.			9		
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA				4		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5		
	1		g. Dependency of downstream h	Dependency of downstream habitats on quantity or quality of discharges.       9         Protection of wetland functions provided by uplands (upland AAs only).       9			9		
Current		With Impact	h. Protection of wetland functions						
6		0	Additional Notes:	dditional Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			6		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.			8		
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	е.			<u> </u>		
	(n/a for upland	ls)	f Type of vegetation				<u> </u>		
			a. Hydrologic stress on vegetation.	on.			7		
			h. Use by animals with hydrolog	ic requirements.			5		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		5		
Current		With Impact	k. Water quality data for the type	e of community.			6		
Current			I. Water depth, wave energy, an	d currents.			5		
7		0	Additional Salinity: 30PPT. Dry Notes: ground.	v season. Seasonally flooded, no water prese	nt at the time of the	assessment. Manç	grove pneumatophores @ 13in above		
			I. Appropriate/desirable species				8		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species			8			
			III. Regeneration/recruitment				5		
	X Veç	getation	IV. Age, size distribution.	5					
	_		V. Snags, dens, cavity, etc.	7			7		
	Ber	nthic	VI. Plants' condition.	4			4		
	Rot	h	VII. Lanu management practices	a channels hummocks)			4 7		
Both VIII. Topographic featu			Vin. Topographic realures (relugi				1		



Site/Project Name	Арр	Application Number			Assessment Area Name or Number		
					Α	18	
FLUCCs code	Further classification	(optional)		Impact	Туре	Assessment Area Size	
3112	Seasonally	asonally 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 hydr	ologic connection with wetle	lands, other su	urface water, uplar	nds			
Central Mangrove Wetland to the	North						
Assessment area description							
Seasonally flooded mangroves w	ith large karst deposits s	cattered thro	ughout.				
Significant nearby features		Uniqueness (co landscape.)	nsiderii	ng the relative rarity in	relation to the regional		
Active limerock mine			Adjacent to the Central Mangrove Wetland				
Functions			Mitigation for prev	vious p	ermit/other historic use	)	
Stormwater runoff storage and tre	eatment, Wildlife habitat		N/A				
Anticipated Wildlife Utilization Based that are representative of the assess be found )	d on Literature Review (List sment area and reasonably	t of species / expected to	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 terrstri	al species.						
Observed Evidence of Wildlife Utiliz	ation (List species directly	observed, or c	other signs such a	s track	s, droppings, casings,	nests, etc.):	
See Taylors notes							
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
RM & TS			05/15/24				

Site/Project Na	ime:			Application Number:			Assessment Area Name or Number: A18		
mpact or Mitig	ation:			Assessment Conducted by:			Assessment Date	»	
		Impact		RM & T	6			05/15/24	
	Scoring Guidar	ice	Optimal (10)	Moderate(7)		Minii	mal (4)	Not Present (0)	
The scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface wat functions	Condition is less than optimal, but maintain most wetland/surface wat	sufficient to erfunctions	Minimal leve wetland/su fund	l of support of urface water ctions	Condition is insufficient to provide wetland/surface water functions	
			1			Enter Notes b	elow (do NOT sc	re each subcategory individually)	
			a. Quality and quantity of hab	itat support outside of AA.				5	
			b. Invasive plant species.					7	
.500(6)(a) Location and Landscape Support			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 <b>land uses</b> outside of AA.				5		
			t. Hydrologic connectivity (in	mpediments and flow restrictions).				5	
Current		With Impact	g. <b>Dependency</b> of downstrear	n nabitats on quantity or quality of disch	arges.			0	
			h. Protection of wetland function	ons provided by uplands ( <b>upland</b> AAs or	nly).	2ET above ar	do		
C		0	Notes:	Turning North to South through the AA.	Approximatiy	~2FT above gia	10e.		
6		U							
			a Appropriatopago of water la	wele and flows				7	
			<ul> <li>Appropriateness of water level in</li> <li>B. Reliability of water level in</li> </ul>	dicators.				<i>i</i> 9	
			c. Appropriateness of soil mo	visture.				7	
500/	C)(h) )// atau Euro		d. Flow rates/points of discha	J. Flow rates/points of discharge.					
.500(6	o)(b) water Env (n/a for upland	ironment Is)	e. Fire frequency/severity.					7	
	(	,	f. Type of vegetation.					8	
			g. Hydrologic stress on vege	tation.				7	
			h. Use by animals with hydro	logic requirements.				3	
			i. Plant community composit	ion associated with water quality (i.e., p	turbidity)	of poor WQ).		8	
			k. Water quality data for the t	vpe of community.	, tarbiaity).				
Current With Impact I. Water depth, wave energy, and currents.								4	
			Additional Dry Season. No	standing water present at time of assess	ment. Pneum	atphore height a	approximatly 6in	above ground.	
7		0	Notes:						
			I. Appropriate/desirable specie	es				8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species	s				7	
			III. Regeneration/recruitment	III. Regeneration/recruitment     6       IV. Age, size distribution     6				6	
•	<u> </u>	jetation	IV. Age, size distribution. 6				6		
	Ber	othic	VI. Plants' condition. 5				5		
•	001		VII. Land management practices. 5				5		
	Bot	h	VIII. Topographic features (refugia, channels, hummocks). 8				8		
			IX. Submerged vegetation (or	nly score if present).					
Current		With Impact	X. Upland assessment area						
			Notes: 10% Black Mana	rove, 75% White Mangrove, 15% Buttor	wood. 10-30F	T height, Crowr	n density: All mar	grove are showing moderate crown	
6		0	density but with s	stunted growth. Black sooty mold presen	t on leaves an	nd limbs.		- • • • • • • • •	
			] [			1			
Raw Scor (if u	e = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00				
			ļ						
Current		With Impact				1			
		•	1 1	Functional Loss (FL) [For Impact Assessment Areas]:					
0.63		0.00		FL = ID x Impact Acres =	0.000	]			
	Impact Delta (I	D)	NOTE: If impact	is proposed to be mitigated at a mitigation sing UMAM, then the credits required for	ion bank that r mitigation is				
			equal to Functio	nal Loss (FL). If impact mitigation is p	roposed at a				
Current -	w/Impact	0.630	mitigation bank cannot be used t	that was not assessed using UMAM,	then UMAM				

Site/Project Name	Applicatio	on Number	Assessment Area Name or Number				
				A19			
FLUCCs code	Further classification (option	onal)	Impact Type	Assessment Area Size			
3112	Seasonally Floo	oded Mangrove	Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classific	ation (i.e.OFW, AP, other local/state/feder	al designation of importance)			
N/A	N/A		N/A				
Geographic relationship to and hydr	ologic connection with wetlands	, other surface water, up	lands				
Central Mangrove Wetland to the	North						
Assessment area description							
Seasonally flooded mangroves w	ith large karst deposits scatte	red throughout.					
Significant nearby features		Uniqueness ( landscape.)	considering the relative rarity in	n relation to the regional			
Active limerock mine to the South		Adjacent to th	Adjacent to the Central Mangrove Wetland				
Functions		Mitigation for p	revious permit/other historic us	Se .			
Stormwater runoff storage and tre	eatment, Wildlife habitat	N/A	N/A				
Anticipated Wildlife Utilization Based that are representative of the asses be found )	d on Literature Review (List of s sment area and reasonably expo	pecies Anticipated Uti ected to classification (I assessment ar	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 terrstri	al species.						
Observed Evidence of Wildlife Utiliz	ation (List species directly obse	rved, or other signs such	as tracks, droppings, casings	s, nests, etc.):			
Bananaquit							
Additional relevant factors:							
Assessment conducted by:		Assessment da	ate(s):				
RM & TS		05/15/24	05/15/24				

Site/Project Na	ime:	-		Application Number:		Assessment Area Name or Number: A19		
Impact or Mitiga	ation:			Assessment Conducted by:		Assessment Date	:	
		Impact		RM & TS			05/15/24	
	Scoring Guidan	се	Optimal (10)	Moderate(7)		inimal (4)	Not Present (0)	
The scoring of would be sui sur	f each indicator itable for the typ rface water asse	is based on what be of wetland or bessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suff maintain most wetland/surface waterfu	icient to Minimal lo inctions f	evel of support of d/surface water functions	Condition is insufficient to provide wetland/surface water functions	
					Enter Note	s below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habita	at support outside of AA.			6	
			b. Invasive plant species.				6	
.500(6)(a) Location and Landscape Support			c. Wildlife access to and from AA (proximity and barriers).				6	
			d. Downstream benefits provide	ed to fish and wildlife.			7	
			e. Adverse impacts to wildlife in	AA from <b>land uses</b> outside of AA.			4	
			f. Hydrologic connectivity (imp	pediments and flow restrictions).			5	
Current		With Impact	g. <b>Dependency</b> of downstream	nabitats on quantity or quality of discharge	9S.		8	
			h. Protection of wetland function	ns provided by uplands ( <b>upland</b> AAs only).	+			
			Notes:	i small upland Islands scattered throughou	t.			
6		U						
			a Appropriateness of water low	als and flows			7	
			b. Reliability of water level indi	cators.			8	
			c. Appropriateness of <b>soil mois</b>	sture.			8	
500(6	6)(b) Water Env	ironment	d. Flow rates/points of discharg	ge.			7	
.000(0	(n/a for upland	s)	e. Fire frequency/severity.				7	
			t. Type of vegetation.	tion			8	
			h. Use by animals with hydrolo	aic requirements.			3	
			i. Plant community compositio	<b>on</b> associated with water quality (i.e., plant	s tolerant of poor WQ)	•	8	
			j. Water quality of standing wa	ater by observation (I.e., discoloration, tu	bidity).			
Current With Impact k. Water quality data for				be of community.				
			I. Water depth, wave energy, and currents.					
7		0	Additional Dry Season. No sta Notes:	anding water present at time of assessme	nt.			
<b>I</b>			I. Appropriate/desirable species				7	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species			7		
	., .,		II. Regeneration/recruitment			7		
-	X Veg	etation	V. Age, size distribution. 6				6	
	Ben	thic	VI. Plants' condition.				5	
-	231		VII. Land management practices. 5				5	
-	Bot	ſ	VIII. Topographic features (refug	I. Topographic features (refugia, channels, hummocks). 8				
			IX. Submerged vegetation (only	/ score if present).				
Current		With Impact	A. Upland assessment area					
6		0	Notes: 45% Black Mangro Black sooty mold p	ove, 20% White Mangrove, 35% Buttonwoo present on leaves and limbs. Lead tree pre	od. 10-30FT height, Crusent on edge of habita	own density: All man t.	groves are showing low crown density.	
Raw Score (if ເ	<b>e</b> = Sum of abc uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00			
Current		With Impact	1					
Gurrent				Functional Loss (FL) [For Impact Assessment Areas]:				
0.63		0.00	FI	L = ID x Impact Acres =	0.000			
	Impact Delta (I	D)	NOTE: If impact is was assessed usir	proposed to be mitigated at a mitigation og UMAM, then the credits required for m	bank that itigation is			
Current - w/Impact			was assessed using UNIAIN, 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					
Carron		0.000	mitigaiton bank.					

Site/Project Name		Application Number		Assessment Area Name or Number					
					А	20			
FLUCCs code	Further classificat	ion (optional)		Impact	Туре	Assessment Area Size			
3112	Season	Seasonally Flooded Man			Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class	5)	Special Classification	ON (i.e.Ol	FW, AP, other local/state/federal	designation of importance)			
N/A	N/A				N/A				
Geographic relationship to and hyd	rologic connection with v	wetlands, other su	urface water, uplar	nds					
North sound located to the north	of the AA.								
Assessment area description									
Mangrove forest within mosquitto control area.									
Significant nearby features			Uniqueness (co landscape.)	nsiderii	ng the relative rarity in	relation to the regional			
Cattle pasture to the south			Central Mangrove Wetland						
Functions			Mitigation for prev	vious p	ermit/other historic use	)			
Stormwater runoff storage and t	reatment, Wildlife habit	tat	N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ( ssment area and reasona	(List of species ably expected to	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 terrstr	ial species.								
Observed Evidence of Wildlife Utili	zation (List species direc	ctly observed, or o	other signs such a	s track	s, droppings, casings,	nests, etc.):			
Cayman Parrot, Butterfly, Yellow	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	e(s):					
RM & TS		05/16/24							

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A20		
Impact or Mitig	nation [.]			Assessment Conducted by:		Assessment Date		
	gation.	Impact			Assessment Date	05/16/24		
		impaci					03/10/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)	
The scoring o would be si si	of each indicator uitable for the typ urface water ass	is based on what pe of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fu	vel of support of /surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	s support outside of AA.			8	
			b. Invasive plant species.				8	
.500(6)(a) Location and Landscape Support d. <b>Downstream benefits</b> e. Adverse impacts to wild f. <b>Hydrologic connectivit</b>			c. Wildlife access to and from A	A (proximity and barriers).			7	
			d. Downstream benefits provided to fish and wildlife.				9	
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				7	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			6	
	7		g. Dependency of downstream h	abitats on quantity or quality of discharges.		8		
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).				
			Additional Access roads for m	osquitto control fragments habitat and some h	ydrologic conectivity	у.		
8		0	Notes:					
	•		a. Appropriateness of <b>water leve</b>	Is and flows.			7	
			b. Reliability of water level indic	ators.			9	
			c. Appropriateness of soil moist	ure.			8	
.500	(6)(b) Water Env	vironment	d. Flow rates/points of discharge.				6	
	(n/a for upland	ds)	e. Fire frequency/severity.				7	
			t. Type of vegetation.				9 7	
			h. Use by animals with hydrolog				4	
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8	
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidity).			4	
0	]		k. Water quality data for the type	e of community.			8	
Current			I. Water depth, wave energy, an	d currents.			6	
7		0	Additional Salinity: N @ 27PP Notes:	T, S @ 31PPT. Green film substance observe	d on the waters surf	face, high tannins		
			I. Appropriate/desirable species				9	
.500(	6)(c) Community	/ Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				7	
	X Veç	getation	IV. Age, size distribution.				8	
	_		V. Snags, dens, cavity, etc.				8	
	Ber	nthic	VI. Plants' condition.	6			6	
	Det	۰h	VII. Land management practices	a channels hummacks)			5	
	BOI		Vin. Topographic realures (relugi	jia, channels, nummocks). 9				



Site/Project Name	Application Number	Application Number A		Assessment Area Name or Number				
			<b>م</b>	21				
FLUCCs code	Further classification (optional)		Impact Type	Assessment Area Size				
3112	Seasonally Flooded Ma	ingrove	Direct Impact	Acres				
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification	on (i.e.OFW, AP, other local/state/federa	I designation of importance)				
N/A	N/A		N/A					
Geographic relationship to and hydr	ologic connection with wetlands, other s	urface water, uplar	ids					
North sound located to the north	of the AA.							
Assessment area description								
Low quality mangrove forest within mosquitto control area.								
Significant nearby features		Uniqueness (cor landscape.)	nsidering the relative rarity in	relation to the regional				
North sound to the north.		Central Mangrove Wetland						
Functions		Mitigation for prev	ious permit/other historic use	e				
Stormwater runoff storage and tr	eatment, Wildlife habitat	N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of species sment area and reasonably expected to	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 terrstri	al species.							
Observed Evidence of Wildlife Utiliz	ation (List species directly observed, or	I other signs such as	s tracks, droppings, casings,	nests, etc.):				
Fish, West Indian Woodpecker, B	utterfly, Cayman Parrot.							
Additional relevant factors:								
Access road running North to South.								
Assessment conducted by:		Assessment date	(s):					
RM & TS		05/16/24						

Site/Project Na	ime:			Application Number:			Assessment Area Name or Number: A21		
Impact or Mitig	ation:	-		Assessment Conducted by:		Assessment			
impact of willige	allon.	Impact		RM & TS		Assessment	05/16/24		
	Scoring Guidan	ICE	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)		
The scoring of would be sui sui	f each indicator itable for the typ rface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but suf maintain most wetland/surface water	fficient to functions	Minimal level of support o wetland/surface water functions	f Condition is insufficient to provide wetland/surface water functions		
					E	nter Notes below (do NO	score each subcategory individually)		
			a. Quality and quantity of habita	t support outside of AA.			7		
			b. Invasive plant species.				8		
500(6)(a) I c	ocation and Lan	dscape Support	c. Wildlife access to and from A	A (proximity and barriers).			8		
			d. <b>Downstream benefits</b> provide	ed to fish and wildlife.			8		
			e. Adverse impacts to wildlife in a	AA from land uses outside of AA.			7		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5		
Current		With Impact	g. Dependency of downstream h	nabitats on quantity or quality of discharg	jes.		8		
Junent			h. Protection of wetland function	s provided by uplands ( <b>upland</b> AAs only	).				
7		0	Additional Access roads for m Notes:	osquitto control fragments habitat and so	ome hydrologi	c conectivity.			
			a. Appropriateness of water leve	els and flows.			7		
			b. Reliability of water level indic	cators.			9		
			c. Appropriateness of <b>soil mois</b>	ture.			8		
.500(6	6)(b) Water Env	ironment	e. Fire frequency/severity.				7		
	(n/a for upland	s)	f. Type of vegetation.				9		
			g. Hydrologic stress on vegetat	ion.			6		
			h. Use by animals with hydrolog	gic requirements.			7		
			i. Plant community composition	n associated with water quality (i.e., plan	nts tolerant of	poor WQ).	8		
j. Water quality of star				e of community	irdiaity).		8		
Current		With Impact	Water depth, wave energy, and currents.				6		
Additional Salinity				PT, E @ 19PPT. Green film substance of	oserved on the	e waters surface			
7		0	Notes:						
			I. Appropriate/desirable species				9		
.500(6	S)(c) Community	Structure	II. Invasive/exotic plant species	blant species			9		
	V Mar	latation	III. Regeneration/recruitment	ration/recruitment			<u>ــــــــــــــــــــــــــــــــــــ</u>		
	<u> </u>	σιαιιΟΠ	V. Snags, dens. cavity. etc.	ens, cavity, etc.			7		
	Ber	ithic	VI. Plants' condition.				4		
•			VII. Land management practices	tices.			4		
	Bot	h	VIII. Topographic features (refug	c features (refugia, channels, hummocks).			8		
			IX. Submerged vegetation (only	score it present).					
Current		With Impact	Additional						
			Notes: 30% Red Mangrove	e, 5% Black Mangrove, 65% White Mang	rove, 30% Bu	ttonwood. <10FT height, C	Crown density: Very Low Crown Density on		
6		0	all species. Black s	ooty mold on leave and limbs throughout	l.				
Raw Scor (if u	<b>e</b> = Sum of abo uplands, divide l	ove scores/30 by 20)		Impact Acres =	0.00				
1			•						
Current		With Impact		Functional Loss (FL) [For Impact Assessment Areas]:					
0.67		0.00	FL	= ID x Impact Acres =	0.000				
	Impact Delta (I	D)	NOTE: If impact is was assessed usin	proposed to be mitigated at a mitigation g UMAM, then the credits required for n	n bank that nitigation is				
Current - w/Impact 0.670			equal to Functiona mitigation bank the cannot be used to a mitigaiton bank	at was (FL). If impact mitigation is prop at was not assessed using UMAM, th assess impacts; use the assessment me	bosed at a then UMAM thod of the				

Site/Project Name	Aŗ	Application Number		,	Assessment Area Name or Number		
					Α	22	
FLUCCs code	Further classificatio	on (optional)		Impact	Туре	Assessment Area Size	
3112	Seasonal	Seasonally Flooded Mangrove			Direct Impact	Acres	
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.Ol	FW, AP, other local/state/federal	designation of importance)	
N/A	N/A				N/A		
Geographic relationship to and hyd	rologic connection with we	etlands, other su	urface water, uplar	nds			
North sound located to the north	of the AA.						
Assessment area description							
Mangrove forest within mosquitto control area.							
Significant nearby features	Uniqueness (coi landscape.)	nsiderii	ng the relative rarity in	relation to the regional			
North sound located to the north	of the AA.		Central Mangrove Wetland				
Functions			Mitigation for prev	/ious p	ermit/other historic use	)	
Stormwater runoff storage and tr	reatment, Wildlife habita	ıt	N/A				
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (Li ssment area and reasonab	ist of species bly expected to	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 terrstr	ial species.						
Observed Evidence of Wildlife Utiliz	zation (List species directly	ly observed, or o	L other signs such a	s track	s, droppings, casings,	nests, etc.):	
Cayman Parrot, Butterfly, Yellow	Warbbler, Land Crab, C	Common Gallin	ule				
Additional relevant factors:							
Access road running East to West.							
Assessment conducted by:			Assessment date	(s):			
RM & TS		05/16/24					

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A22		
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date	:	
	Jacon	Imnact		RM & TS			05/16/24	
		impact					03/10/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)	
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			7	
			b. Invasive plant species.				9	
500(6)(0)	ocation and Lon	decano Support	c. Wildlife access to and from A	A (proximity and barriers).			7	
e. Adverse impacts to wildlif			d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.		7		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			5	
	1		g. Dependency of downstream h	abitats on quantity or quality of discharges.		9		
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands ( <b>upland</b> AAs only).				
7		0	Additional Access roads for mo Notes:	dditional Access roads for mosquitto control fragments habitat and some hydrologic conectivity. Notes:				
		<u>.</u>	a. Appropriateness of water leve	Is and flows.			7	
			b. Reliability of water level indic	ators.			9	
			c. Appropriateness of <b>soil moist</b>	ure.			8	
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	ge.			4	
	(n/a for upland	ls)	f Type of vegetation				<u> </u>	
			a. Hydrologic stress on vegetation.	on vegetation			7	
			h. Use by animals with hydrolog	ic requirements.			5	
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		7	
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity).			6	
Current		With Impact	k. Water quality data for the type	e of community.			6	
Current		with impact	I. Water depth, wave energy, an	d currents.			4	
6		0	Additional Salinity: N @ 26PP Notes:	Γ, S @ 25PPT. Green film substance observe	d on the waters surf	face, high tannins		
			I. Appropriate/desirable species				9	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				6	
	X Veç	getation	IV. Age, size distribution.				7	
	_	- (I. ¹ -	V. Snags, dens, cavity, etc.				8	
	Ber	nthic	VI. Plants condition.	7			<u> </u>	
	Rot	h	VIII. Topographic features (refuci	a channels hummocks)			8	
	DOI		IV Submargad vagatation (anly				<u> </u>	



Site/Project Name	ŀ	Application Number		Assessment Area Name or Number					
					Α	23			
FLUCCs code	Further classificati	ion (optional)		Impact	Туре	Assessment Area Size			
1831	Man-	Man-modified with t			Direct Impact	Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class	3)	Special Classification	on (i.e.O	FW, AP, other local/state/federal	designation of importance)			
N/A	N/A				N/A				
Geographic relationship to and hyd	rologic connection with w	vetlands, other su	urface water, uplar	nds					
Stormwater flows north to the ce	netral mangrove wetla	nd.							
Assessment area description									
Man-modified with trees. Monoculture of Buttonwood.									
Significant nearby features		Uniqueness (co landscape.)	nsideri	ng the relative rarity in	relation to the regional				
Central Mangrove Weltand to the	North								
Functions			Mitigation for prev	vious p	permit/other historic use	)			
Livestock grazing area and Wildl	ife habitat.		N/A						
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (I sment area and reasona	List of species ably expected to	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 Utili	zation (List species direc	tly observed, or o	L other signs such a	s track	s, droppings, casings,	nests, etc.):			
Hickity turtle, Snowy Egret, Yello	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						

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-		A23		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:		
	5	Impact		RM & TS			05/16/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	Minimal (4) Not Present		
The scoring of would be su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons vetland/s	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			5	
b. Invasive plant species.							8	
.500(6)(a) Location and Landscape Support d. <b>Downstream benefits</b> provid e. Adverse impacts to wildlife in			c. Wildlife access to and from A	A (proximity and barriers).			7	
			d. Downstream benefits provide	d to fish and wildlife.			6	
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			7	
f. Hydrologic connectivity (ir				ediments and flow restrictions).			6	
	1		g. Dependency of downstream h	abitats on quantity or quality of discharges.		7		
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			8	
			Additional Karst deposits at the	e surface of the AA. Evidence of flashy hydro	ogy in the AA.			
7		0	Notes:	Notes:				
	-		a. Appropriateness of water leve	Is and flows.				
			b. Reliability of water level indic	ators.				
			c. Appropriateness of <b>soil moist</b>	ure.				
.500	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	arge.				
	(n/a for upland	ds)	e. Fire frequency/severity. f Type of vegetation					
			a. Hydrologic stress on vegetation.					
			h. Use by animals with hydrolog	ogic requirements.				
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).			
	-		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).			
Current		With Impact	k. Water quality data for the type	k. Water quality data for the type of community.				
Guiront			I. Water depth, wave energy, an	d currents.				
			Additional					
0		0	Notes.					
			I. Appropriate/desirable species				6	
.500(	6)(c) Community	v Structure	II. Invasive/exotic plant species				8	
			III. Regeneration/recruitment				4	
	X Veç	getation	IV. Age, size distribution.	7			7	
		athia	v. Snags, dens, cavity, etc.	5			5	
	Ber	iunic	VI. Flams conumon.				5	
	Bot	:h	VIII. Topographic features (refugi	a. channels. hummocks).			5	
	Both VIII. Topographic features (refugi			corro if procont)			~	



Site/Project Name	Applicatio	on Number	Assessment Area	Assessment Area Name or Number			
				A24			
FLUCCs code	Further classification (opti	onal)	Impact Type	Assessment Area Size			
1831	Man-modifie	ed with trees	Direct Impact	t Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Clas	sification (i.e.OFW, AP, other local/st	tate/federal designation of importance)			
N/A	N/A		N/A				
Geographic relationship to and hyc	rologic connection with wetlands	, other surface water	, uplands				
Man-modified habitat with small are also present in the AA. Poss	trees present. Karst deposits a bly for agricultural use.	are scattered throug	phout. Some depressional	areas with pools of water			
Assessment area description							
Historic agricultural field, heavy	land disturbances present.						
Significant nearby features		Uniquenes landscape.	s (considering the relative	rarity in relation to the regional			
Active construction to the West the AA.	of the AA. Residential to the So	outh of					
Functions		Mitigation for	or previous permit/other hist	toric use			
Livestock grazing area and Wild	ife habitat.	N/A	N/A				
Anticipated Wildlife Utilization Base that are representative of the asse be found )	ed on Literature Review (List of s ssment area and reasonably exp	pecies Anticipated ected to classificatic assessmen	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 Utili	zation (List species directly obse	rved, or other signs s	such as tracks, droppings, c	asings, nests, etc.):			
Hickity turtle, Snowy Egret, Yello	ow warbler, Cayman parrot, Sn	nooth-billed Ani, La	nd Crab				
Additional relevant factors:							
Piled up fencing and vegitation from clearing activites present within the AA.							
Assessment conducted by:		Assessmer	nt date(s):				
RM & TS		05/16/24	05/16/24				

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
		-		-			A24		
Impact or Mitio	ation:			Assessment Conducted by:		Assessment Date	9:		
	,	Impact		RM & TS		05/16/24			
		impuot					0010121		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Mir	nimal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fu	vel of support of /surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sc	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	s support outside of AA.			5		
			b. Invasive plant species.				7		
500(6)(a) L	agatian and Lan	dagang Support	c. Wildlife access to and from A	A (proximity and barriers).			6		
.500(0)(a) L(	d. Downstream benefit			d to fish and wildlife.			7		
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			5		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			7		
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.			6		
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).			7		
	1		Additional Used for agriculture						
6		0	Notes:						
		<u>I</u>	a. Appropriateness of water leve	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of soil moist	ure.					
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	je.					
	(n/a for upland	ls)	e. Fire frequency/severity.						
			a Hydrologic stress on vegetation.	tion					
			h. Use by animals with hydrolog	aic requirements.					
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).				
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidit	y).				
Current		With Impost	k. Water quality data for the type	e of community.					
Current		with impact	I. Water depth, wave energy, an	d currents.					
	1		Additional Salinty of small poo	ls: 15PPT					
0		0	Notes:						
			I. Appropriate/desirable species				7		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				7		
			III. Regeneration/recruitment	7					
	X Ve	getation	IV. Age, size distribution.	5					
	_		V. Snags, dens, cavity, etc.	7					
	Ber	nthic	VI. Plants' condition.	7			<u> </u>		
	Rot	h	VIII. Lanu management practices	a channels hummocks)			<u> </u>		
1	Both VIII. Topographic features (refug			a, onamico, naminoroj.			<u> </u>		



Site/Project Name	Application Nu	Number Assessment Area Name or Number		or Number				
				В	1			
FLUCCs code	Further classification (optional)		Impact T	уре	Assessment Area Size			
3112	Seasonally Flooded	Mangrove			Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificat	ion (i.e.OFW	V, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hyd	rologic connection with wetlands, othe	er surface water, upla	inds					
Mangroves located on other side	of road, and impacted mine site							
Assessment area description								
Mangrove fringe dominated by b	lack and white mangrove edge of t	ne site						
Significant nearby features		Uniqueness (co landscape.)	onsidering	g the relative rarity in r	elation to the regional			
Mine, open water pond, piles								
Functions		Mitigation for pre	evious per	rmit/other historic use				
Isolated, no downstream benefits	5							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of specie sment area and reasonably expected	Anticipated Utiliz to classification (E, assessment area	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 Utili	zation (List species directly observed,	or other signs such a	as tracks,	, droppings, casings, ı	nests, etc.):			
Birds, butterflies, small burrow h	oles							
Additional relevant factors:								
Assessment conducted by:		Assessment date	e(s):					
JS, MM, LK		05/14/24						

Site/Project Name:				Application Number:		Assessment Area Name or Number:		
		-		-			B1	
Impact or Mitig	ation:			Assessment Conducted by:		Assessment Date	):	
		Impact		JS, MM, LK		05/14/24		
		-		i				
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			2	
			b. Invasive plant species.				8	
	c. Wildlife access to and from A			A (proximity and barriers).			3	
.500(6)(a) Lo	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			2	
			e. Adverse impacts to wildlife in A	A from <b>land uses</b> outside of AA.			3	
f Hydro			f. Hvdrologic connectivity (imp	ediments and flow restrictions).			2	
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges	or quality of discharges			
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			N/A	
	1		Additional					
3		0	Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			6	
			b. Reliability of water level indic	ators.			7	
			c. Appropriateness of soil moist	ure.			7	
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.			2	
	(n/a for upland	ls)	e. Fire frequency/severity.				/	
			n. Type of vegetation.				/ 8	
			h. Use by animals with hydrolog	c requirements			2	
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		4	
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		8	
•	]		k. Water quality data for the type	of community.			7	
Current		vvitn impact	I. Water depth, wave energy, an	d currents.			7	
6		0	Additional Salinity 22ppt. Wate Notes:	er depth - 10"+				
			I. Appropriate/desirable species				8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species	9			9	
			III. Regeneration/recruitment				5	
	X Veg	getation	IV. Age, size distribution.	7			7	
	_		V. Snags, dens, cavity, etc.	7			7	
	Ber	nthic	VI. Plants' condition.	5			5	
	Pot	h	VII. Land management practices	a channals hummocks)			I	
Both VIII. Topographic features (refugi				ra, channels, nummocks). 4			-+ N1/A	



Site/Project Name Applicatio		lication Number	Iumber Assessment Area Name or N		or Number			
					B	2		
FLUCCs code	Further classification	(optional)		Impac	t Туре	Assessment Area Size		
3112	Seasonally	Flooded Ma	ngrove			Acres		
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)		
Geographic relationship to and hyd	rologic connection with wetla	ands, other su	Irface water, uplar	nds				
Located East of isolated open wa	ater and roadway. Mine adj	jacent.						
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 prev	vious p	permit/other historic use			
stormwater filtration and storage	)							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review (List ssment area and reasonably	t of species expected to	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 Utili	zation (List species directly o	observed, or c	other signs such a	s tracl	ks, droppings, casings,	nests, etc.):		
insects - mosquitoes, termites, a	noles, birds							
Additional relevant factors:								
Salinity 26ppt, algal presence	Salinity 26ppt, algal presence							
Assessment conducted by:			Assessment date	e(s):				
JS, MM, LK 05/14/24								

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:	
		-		<u>-</u>			B2	
Impact or Mitic	nation:			Assessment Conducted by:		Assessment Date		
	<b>J</b>	Imnact		IS MM I K			05/14/24	
		impact					00/14/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)	
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	ondition is less than optimal, but sufficient to aintain most wetland/surface waterfunctions functions			
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			3	
			b. Invasive plant species.				9	
500(0)(-) I	c. Wildlife access to and from A			A (proximity and barriers).			6	
.500(6)(a) L	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			2	
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				2	
f. Hydrologic connectivity			f. Hydrologic connectivity (imp	ediments and flow restrictions).			3	
	7		g. Dependency of downstream h	Instream habitats on quantity or quality of discharges. 3				
Current		With Impact	h. Protection of wetland functions	and functions provided by uplands (upland AAs only). N/A				
	1		Additional					
4		0	Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			7	
			b. Reliability of water level indic	ators.			8	
			c. Appropriateness of <b>soil moist</b>	ure.			10	
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	e			6	
	(n/a for upland	ls)	e. Fire frequency/severity.			/		
			a Hydrologic stress on vegetation.	00		10		
			h. Use by animals with hydrolog	ic requirements.		2		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		 N/A	
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).		6	
0	]		k. Water quality data for the type	of community.			7	
Current			I. Water depth, wave energy, an	d currents.			7	
7		0	Additional Salinity 26ppt. Wate	er depth - 3".				
			I. Appropriate/desirable species				8	
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				4	
	X Veg	getation	IV. Age, size distribution.				6	
	_		V. Snags, dens, cavity, etc.	7			7	
	Ber	nthic	VI. Plants' condition.	5			5	
	Pot	h	VII. Land management practices	a channals hummocks)			<u> </u>	
	Both VIII. Topographic features (refug			ra, channels, nummocks).			1	



Site/Project Name	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 A	ffected Waterbody (Class)	Special Classificat	ion (i.e.OFW, AP, other local/st	tate/federal designation of importance)					
Geographic relationship to and hydro	blogic connection with wetlands, othe	er surface water, upla	inds						
West of mine access road. South o	of mine pond. Old access road to	the south.							
Assessment area description									
10'-20' black and white mangroves	s, no standing water								
Significant nearby features		Uniqueness (co landscape.)	onsidering the relative r	rarity in relation to the regional					
Mine access road and old access	road.								
Functions		Mitigation for pre	evious permit/other hist	toric use					
Minimal habitat, stormwater (mini	nal)								
Anticipated Wildlife Utilization Based that are representative of the assess be found )	on Literature Review (List of specie ment area and reasonably expected	Anticipated Utiliz to classification (E, assessment area	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 Utiliza	ation (List species directly observed	or other signs such a	as tracks, droppings, ca	asings, nests, etc.):					
Butterflies									
Additional relevant factors:									
Assessment conducted by:		Assessment date	e(s):						
JS, MM, LK		05/14/24	05/14/24						

Site/Project Name: Application Number: Assessment Area Name or Number:						ea Name or Number:		
Impact or Mitiga	ation:	-		- Assessment Conducted bv:		Assessment Da	te:	
		Impact		JS, MM, L	к		05/14/24	
	Querin e Quiden			Madavata (7)		Minimal (4)		
	Scoring Guidan	ce	Optimal (10)	Moderate(7)		Minimal (4)	Not Present (0)	
The scoring of would be suir sur	f each indicator itable for the typ rface water asse	is based on what e of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but s maintain most wetland/surface wate	ufficient to erfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions	
						Enter Notes below (do NOT s	core each subcategory individually)	
			a. Quality and quantity <b>of habita</b>	at support outside of AA.			3	
			b. Invasive plant species.				9	
.500(6)(a) Lo	ocation and Lan	dscape Support	c. Wildlife access to and from A	AA (proximity and barriers).			8	
			d. Downstream benefits provide	ed to fish and wildlife.			7	
			e. Adverse impacts to wildlife in	AA from land uses outside of AA.			5	
			f. Hydrologic connectivity (imp	pediments and flow restrictions).			N/A	
Current		With Impact	g. <b>Dependency</b> of downstream	nabitats on quantity or quality of discha	rges.		3	
			h. Protection of wetland function	ns provided by uplands ( <b>upland</b> AAs on	ly).		N/A	
		-	Notes:					
6		0						
			a Appropriatorias of water law	als and flows			6	
			a. Appropriateness of water level b. Reliability of water level indi	cators.			<u>ہ</u> 5	
			c. Appropriateness of soil mois	sture.			5	
500/6	S)(b) Motor Env	ironmont	d. Flow rates/points of discharg	ge.			N/A	
0)006.	(n/a for upland	s)	e. Fire frequency/severity.	N/A				
			f. Type of vegetation.				7	
			g. Hydrologic stress on vegetar	tion.			8	
			i. Plant community compositio	n associated with water quality (i.e., pl	ants tolerant	of poor WQ).	N/A	
			j. Water quality of standing wa	ater by observation (I.e., discoloration,	turbidity).		N/A	
Ourseast		\ <b>A</b> /:(b. June of t	k. Water quality data for the typ		N/A			
Current		with impact	I. Water depth, wave energy, a	nd currents.			N/A	
			Additional Salinity 26ppm. No	water, but mangroves present.				
6		0	Notes.					
			L Appropriate/desirable species				9	
.500(6)	5)(c) Community	Structure	II. Invasive/exotic plant species				9	
			III. Regeneration/recruitment				4	
-	X Veg	etation	IV. Age, size distribution.	distribution. 7				
	-	a •	V. Snags, dens, cavity, etc.	6			6	
-	Ber	INIC	VI. Flants condition.	n. 4			4	
	Bot	n	VIII. Topographic features (refuc	 gia, channels, hummocks).			2	
			IX. Submerged vegetation (only	v score if present).			N/A	
Current		With Immast	X. Upland assessment area				N/A	
Gurrent		with impact	Additional Notes: 10-20ft beight 100	65% White	A Manarove 2	0% huttonwood 5% Soil is dr	v and compact causing shallow	
6		0	roots.Dead branch	es and sooty mold present.	s manyruve z		and compact causing shallow	
-		-						
			] [	Impact Acros -	0.00			
Raw Score	e = Sum of abo	ve scores/30		mpaur Auros =	0.00			
(If U	upianos, divide l	Jy ∠U)			-			
			1					
Current		With Impact		Functional Loss (FL)				
			1	[For Impact Assessment Areas]:				
0.60		0.00	FI	L = ID x Impact Acres =	0.000			
			NOTE: If impact is	proposed to be mitigated at a mitigati	on bank that			
Impact Delta (ID)		was assessed usin	was assessed using UMAM, then the credits required for mitigation is					
				aual to Functional Loss (FL). If impact mitigation is proposed at a itigation bank that was not assessed using UMAM, then UMAM annot be used to assess impacts; use the assessment method of the itigation bank				

Site/Project Name	n Number Assessment Area Name or Number							
				B4				
FLUCCs code	Further classification (optional		Impact Type	Assessment Are	a Size			
1831	Man modified with	nout trees		Ac	res			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificat	tion (i.e.OFW, AP, other local/s	tate/federal designation of importa	ance)			
Geographic relationship to and hyd	ologic connection with wetlands, oth	er surface water, upla	ands					
Mangroves located to north and v	west. Adjacent to Mastic Reserve.							
Assessment area description								
Area appears to have been cleared in recent years								
Significant nearby features		Uniqueness (co landscape.)	onsidering the relative	rarity in relation to the re	egional			
Mastic Reserve to the north/north east	west of AA.Residential to south/	Cleared	Cleared					
Functions		Mitigation for pre	evious permit/other hist	toric use				
Habitat and foraging.								
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of species sment area and reasonably expected	Anticipated Utiliz to classification (E, assessment area	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 Utiliz	ration (List species directly observed	, or other signs such a	as tracks, droppings, c	asings, nests, etc.):				
birds, butterflies, insects								
Additional relevant factors:								
No standing water, no visable wa	No standing water, no visable water at surface							
Assessment conducted by:		Assessment dat	e(s):					
JS, MM, LK		05/15/24	05/15/24					

Site/Project Name:				Application Number:		Assessment Area Name or Number:			
		-		-		B4			
Impact or Mitic	pation:			Assessment Conducted by:		Assessment Date	:		
,		Impact		JS. MM. LK			05/15/24		
				···,,					
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			5		
			b. Invasive plant species.				7		
	c. Wildlife access to and from A			A (proximity and barriers).			8		
.500(6)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			6		
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				7		
	f. Hydrologic connectivity			ediments and flow restrictions).			7		
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.	es. 4				
Current		With Impact	h. Protection of wetland functions	ctions provided by uplands ( <b>upland</b> AAs only). 7					
	1		Additional						
6		0	Notes:						
			a. Appropriateness of <b>water leve</b>	Is and flows.					
			b. Reliability of water level indic	ators.					
			c. Appropriateness of <b>soil moist</b>	ure.					
.500(	(6)(b) Water Env	rironment	d. Flow rates/points of discharge	je.					
	(n/a for upland	ls)	e. Fire frequency/severity.						
			<ol> <li>Type of vegetation.</li> <li>Hydrologic stress on vegetation.</li> </ol>						
			h. Use by animals with hydrolog						
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).				
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	y).				
	]		k. Water quality data for the type	of community.					
Current			I. Water depth, wave energy, an	d currents.					
			Additional						
0		0	NOTES:						
	-		I. Appropriate/desirable species				7		
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment				9		
	<u> </u>	getation	IV. Age, size distribution.	5					
			V. Snags, dens, cavity, etc.	8					
	Ber	nthic	VI. Plants' condition.	8			8		
	D - 1	h	VII. Land management practices	ces. 3			3		
	Both VIII. Topographic features (refug			gia, channels, hummocks).					



Site/Project Name		Application Numbe	r		Assessment Area Name	or Number			
					E	5			
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size			
1813	Mar	n made without t	rees			Acres			
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hyd	rologic connection with	wetlands, other s	l urface water, uplai	nds					
Uplands									
Assessment area description	Assessment area description								
AA cleared. FAC wet plants pres to south. Construction site to so	ent. Surrounded by fo uth.	rest all around. I	Mastic Reserve no	earby	to the north/west. Res	sidential and roadway			
Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)								
Mastic Reserve									
Functions	Mitigation for prev	vious p	permit/other historic use	)					
Habitat									
Anticipated Wildlife Utilization Base that are representative of the asses be found )	ed on Literature Review ssment area and reason	(List of species ably expected to	Anticipated Utiliza classification (E, assessment area	ation b T, SS( )	y Listed Species (List s C), type of use, and inte	pecies, their legal nsity of use of the			
Birds, butterflies, insects									
Observed Evidence of Wildlife Utili	zation (List species dire	ctly observed, or	I other signs such a	s track	ks, droppings, casings,	nests, etc.):			
Birds, butterflies									
Additional relevant factors:									
Assessment conducted by:			Assessment date	e(s):					
JS, MM, LK			05/15/24						

Site/Project Name:				Application Number:	Assessment Area	ssessment Area Name or Number:			
		-		- I I I I I I I I I I I I I I I I I I I			B5		
Impact or Mitic	pation:			Assessment Conducted by:	Assessment Date	:			
1		Impact		JS. MM. LK		05/15/24			
		impaor							
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	nimal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dins Minimal lev wetland/ fu	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				7		
	c. Wildlife access to and from A			A (proximity and barriers).			8		
.500(6)(a) Location and Landscape Support d. <b>Downstream benefits</b> prov e. Adverse impacts to wildlife			d. Downstream benefits provide	d to fish and wildlife.			7		
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA				2		
f. Hydrologic connectivity			f. Hvdrologic connectivity (imp	ediments and flow restrictions).			7		
	1		g <b>Dependency</b> of downstream h	habitats on quantity or quality of discharges 4					
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			6		
			Additional Mastic Reserve nea	arby to the north/west. Residential and roadwa	ay to south. Constru	ction site to south.			
6		0	Notes:	Notes:					
	•		a. Appropriateness of water leve	Is and flows.			N/A		
			b. Reliability of water level indic	ators.			N/A		
			c. Appropriateness of soil moist	ure.			N/A		
.500(	(6)(b) Water Env	ironment	d. Flow rates/points of discharge	9.	N/A				
	(n/a for upland	ls)	e. Fire frequency/severity.	N/A					
			a Hydrologic stress on vegetation	on			N/A N/A		
			h. Use by animals with hydrolog	ic requirements.			N/A		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		N/A		
			j. Water quality of standing wat	ater by observation (I.e., discoloration, turbidity).					
Current		With Impact	k. Water quality data for the type	e of community.			N/A		
Guirein			I. Water depth, wave energy, an	d currents.			N/A		
0		0	Additional No surface water pr Notes:	esesnt. Uplands					
			I. Appropriate/desirable species				7		
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				7		
			III. Regeneration/recruitment		9				
	X Veç	getation	IV. Age, size distribution.		4				
	_		V. Snags, dens, cavity, etc.	8			8		
	Ber	nthic	VI. Plants' condition.				8		
	Rot	h	VIII Topographic features (refugi	a channels hummocks)			<u> </u>		
	Both VIII. I opographic features (refugi						, NI/A		



Site/Project Name Application			n Number Assessment Area Name or Number		or Number				
					E	6			
FLUCCs code	Further classifica	tion (optional)		Impact	t Туре	Assessment Area Size			
3112	Season	ally flooded mar	ngroves			Acres			
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classification	<b>0N</b> (i.e.O	FW, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hyd	rologic connection with	wetlands, other su	Lurface water, uplar	nds					
Mastic Reserve to the west. Natio	onal Trust Property. Pl	EM lagoons to se	outheast.						
Assessment area description									
Black mangrove dominated area. Mangrove heights 10'-30' tall.									
Significant nearby features	Uniqueness (co landscape.)	nsideri	ing the relative rarity in	relation to the regional					
National Trust trail. Adjacent to N	lastic Reserve.		Adjacent to Mastic Reserve. National Trust property.						
Functions			Mitigation for prev	vious p	permit/other historic use	•			
Habitat and water storage									
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review ssment area and reason	(List of species ably expected to	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 Utiliz	zation (List species dire	ctly observed, or o	L other signs such a	s track	ks, droppings, casings,	nests, etc.):			
birds, butterflies, reptiles (anoles	5)								
Additional relevant factors:									
On National Trust trail	On National Trust trail								
Assessment conducted by:			Assessment date	e(s):					
JS, MM, LK		05/15/24							
Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
----------------------------------------	--------------------------------------------------------------	-----------------------------------------------	-------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------	-----------------------------	----------------------------------------------	----------------------------------------------------------------------	--	--
		-		-		B6			
Impact or Mitig	jation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/15/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
a. Quality and quantity of habita				support outside of AA.			9		
			b. Invasive plant species.				9		
500(0)())	c. Wildlife access to and from A			A (proximity and barriers).			9		
.500(6)(a) L	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.			9		
			e. Adverse impacts to wildlife in A	ts to wildlife in AA from <b>land uses</b> outside of AA			9		
f. Hydrologic connec			f. Hvdrologic connectivity (imp	ediments and flow restrictions).		9			
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges		9			
Current		With Impact	h. Protection of wetland functions	s provided by uplands ( <b>upland</b> AAs only).			9		
9		0	Additional Notes:	Additional Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			8		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of soil moist	ure.			9		
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	le.			8		
	(n/a for upland	ls)	. Fire frequency/severity.				/		
			a Hydrologic stress on vegetation.	tion			9		
			h. Use by animals with hydrolog	ic requirements.			N/A		
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity).			N/A		
Current		With Impost	k. Water quality data for the type	e of community.			8		
Current		with impact	I. Water depth, wave energy, an	d currents.			N/A		
9		0	Additional Salinity = 40 ppt Notes:						
			I. Appropriate/desirable species				9		
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				10		
			III. Regeneration/recruitment				7		
	X Veg	getation	IV. Age, size distribution.				9		
			V. Snags, dens, cavity, etc.	9			9		
	Ber	nthic	VI. Plants' condition.				9		
	Dot	h	VII. Land management practices	a channals hummocks)			<u> </u>		
Both VIII. Topographic features (refug									



Site/Project Name	Application Nur	mber Assessment Area Name or Number			or Number			
			E		37			
FLUCCs code	Further classification (optional)		Impact	Туре	Assessment Area Size			
3112	Seasonally flooded r	nangroves			Acres			
Basin/Watershed Name/Number A	Special Classificati	ion (i.e.Of	FW, AP, other local/state/federal	designation of importance)				
Geographic relationship to and hydro	logic connection with wetlands, othe	r surface water, upla	nds					
North of mine site. West of old mir	ne access road. South of Central M	langrove.						
Assessment area description								
Seasonally flooded mangrove impounded by old access road								
Significant nearby features	Uniqueness (co landscape.)	onsiderii	ng the relative rarity in	relation to the regional				
Mine site		Adjacent to old	Adjacent to old access road					
Functions		Mitigation for pre	vious p	ermit/other historic use	•			
Stormwater treatment and habitat								
Anticipated Wildlife Utilization Based that are representative of the assess be found )	on Literature Review (List of species ment area and reasonably expected	Anticipated Utiliz to classification (E, assessment area	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 Utiliza	ation (List species directly observed,	or other signs such a	as track	s, droppings, casings,	nests, etc.):			
West Indian wood pecker, termites	s, other birds							
Additional relevant factors:								
Per NRA area to the west is drier and dominated by logwood trees.								
Assessment conducted by:		Assessment date	e(s):					
JS, MM, LK		05/15/24	05/15/24					

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
		-		-		B7			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/15/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
a. Quality and quantity of habita				support outside of AA.			6		
			b. Invasive plant species.				9		
	c. Wildlife access to and from A			A (proximity and barriers).		8			
.500(6)(a) L	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.		8			
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				5		
f. Hydrologic connectiv			f. Hvdrologic connectivity (imp	ediments and flow restrictions).		6			
	7		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges		7			
Current		With Impact	h. Protection of wetland functions	provided by uplands ( <b>upland</b> AAs only).			, N/А		
7		0	Additional Adjacent to old acce Notes:	dditional Adjacent to old access road causing a lack of hydrologic connection to wetland. Notes:					
		<u></u>	a. Appropriateness of <b>water leve</b>	Is and flows.			8		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of soil moist	ure.			9		
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.	7				
	(n/a for upland	ls)	e. Fire frequency/severity.		7				
			n. Type of vegetation.	00	9				
			h. Use by animals with hydrolog	ic requirements			6		
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity).			N/A		
•	]		k. Water quality data for the type	of community.			N/A		
Current		with impact	I. Water depth, wave energy, an	d currents.			N/A		
8		0	Additional Salinity = 38 ppt Notes:						
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				8		
	<u> </u>	getation	IV. Age, size distribution.				9		
	5	- 41- ' -	V. Snags, dens, cavity, etc.	9			<u> </u>		
	Ber	ntniC	VI. Flants condition.				<u> </u>		
	Rot	'n	VIII. Topographic features (refugi	a. channels, hummocks)			8		
	Both VIII. Topographic features (refugi						N/A		



Site/Project Name	Applicati	Application Number		Assessment Area Name or Number				
				B8				
FLUCCs code	Further classification (opt	ional)	Impact Type	Assessment Area Size				
3112	Seasonally floo	oded mangroves		Acres				
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificati	ON (i.e.OFW, AP, other local/state/federa	I designation of importance)				
Geographic relationship to and hyd	rologic connection with wetlands	s, other surface water, upla	nds					
South of central mangroves. Nor	th of mines							
Assessment area description								
seasonally flooded mangroves n	orth of mines. Central mangro	oves to north						
Significant nearby features		Uniqueness (co landscape.)	nsidering the relative rarity in	relation to the regional				
Central mangroves, mines								
Functions		Mitigation for pre	vious permit/other historic us	e				
Habitat, stormwater treatment								
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review (List of s sment area and reasonably exp	species Anticipated Utiliza bected to classification (E, assessment area	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 Utiliz	zation (List species directly obse	erved, or other signs such a	as tracks, droppings, casings,	nests, etc.):				
birds, insects								
Additional relevant factors:								
Assessment conducted by:		Assessment date	e(s):					
JS, MM, LK		05/15/24	05/15/24					

Site/Project Na	ame:			Application Number:		Assessment Area Name or Number:			
		-		-	B8				
Impact or Mitig	jation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/15/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
a. Quality and quantity of habita				support outside of AA.			5		
b. Invasive plant species.							9		
500(0)())	.500(6)(a) Location and Landscape Support d. <b>Downstream benefits</b> provide			A (proximity and barriers).		9			
.500(6)(a) Lo				d to fish and wildlife.		6			
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA				4		
f. Hydrologic			f. Hvdrologic connectivity (imp	ediments and flow restrictions).		7			
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges		6			
Current		With Impact	h. Protection of wetland functions	Protection of wetland functions provided by uplands ( <b>upland</b> AAs only).			N/A		
7		0	Additional Notes:	vdditional Notes:					
		<u> </u>	a. Appropriateness of <b>water leve</b>	Is and flows.			9		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.			9		
.500(	6)(b) Water Env	vironment	d. Flow rates/points of discharge	9.	<u>7</u>				
	(n/a for upland	ls)	f Type of vegetation	3. Fire frequency/severity.			 		
			a. Hydrologic stress on vegetation	on.	8				
			h. Use by animals with hydrolog	ic requirements.	9				
			i. Plant community composition	associated with water quality (i.e., plants tole	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit		9			
Current		With Impost	k. Water quality data for the type	e of community.			6		
Current		with impact	I. Water depth, wave energy, an	d currents.			8		
9		0	Additional Salinity = 55 ppt. Ta Notes:	nins present in water. Water depth - 12".					
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				10		
			III. Regeneration/recruitment				8		
	X Veg	getation	IV. Age, size distribution.	8			8		
			V. Snags, dens, cavity, etc.	7			7		
	Ber	nthic	VI. Plants' condition.	8			8		
	Dat	h	VII. Land management practices	a channals hummocks)			<u></u> 8		
Both VIII. Topographic features (refug			vin. Topographic realures (relugi						



Site/Project Name	Application Number	mber Assessment Area Name or Number						
			E	39				
FLUCCs code	Further classification (optional)	Imp	act Type	Assessment Area Size				
1813	Man-modified upland w	ith trees		Acres				
Basin/Watershed Name/Number	ffected Waterbody (Class)	Special Classification (i.	e.OFW, AP, other local/state/federal	designation of importance)				
Geographic relationship to and hydro	blogic connection with wetlands, other s	urface water, uplands						
North of mines and pond. Adjacer	nt 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 previou	s permit/other historic use	)				
Habitat								
Anticipated Wildlife Utilization Based that are representative of the assess be found )	I on Literature Review (List of species sment area and reasonably expected to	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 Utiliza	ation (List species directly observed, or	l other signs such as tra	acks, droppings, casings,	nests, etc.):				
Eveidnece of crabs, birds - observ	ved two Cayman parrots.							
Additional relevant factors:								
No surface water observed in AA.								
Assessment conducted by:		Assessment date(s):						
JS, MM, LK		05/15/24						

Site/Project Na	ame:			Application Number:		Assessment Area Name or Number:			
		-		-		B9			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/15/24			
	Scoring Guidar	ice	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	of each indicator uitable for the typ urface water asso	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water actions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	pre each subcategory individually)		
a. Quality and quantity of habita				support outside of AA.			5		
			b. Invasive plant species.				9		
	c. Wildlife access to and from A			A (proximity and barriers).		8			
.500(6)(a) Lo	ocation and Lan	dscape Support	d. <b>Downstream benefits</b> provide	d to fish and wildlife.		6			
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				3		
	f. Hydrologic connectivity			ediments and flow restrictions)			5		
	7		a <b>Dependency</b> of downstream h	abitata an quantity or quality of discharges					
Current		With Impact	b. Protection of wetland functions	provided by uplands (upland AAs only)			6		
			Additional North of mino and n			0			
6		0	Notes:	Notes:					
			a. Appropriateness of <b>water leve</b>	is and flows.			N/A		
			b. Reliability of water level indic	ators.			N/A		
			c. Appropriateness of <b>soil moist</b>	ure.			N/A		
.500(	(6)(b) Water Env	ironment	d. Flow rates/points of discharge	le.			N/A		
(	(n/a for upland	s)	. Fire frequency/severity.				N/A		
			f. Type of vegetation.	Type of vegetation.			N/A		
			g. Hydrologic stress on vegetati	Hydrologic stress on vegetation.			N/A		
			h. Use by animals with hydrolog	c requirements.	areat of poor WO		N/A		
			i. Water quality of standing wet	associated with water quality (i.e., plants to			N/A		
	<b>1</b>		. Water quality of statiung wat	of community	y).				
Current		With Impact	N. Water quality uata for the type				N/A		
			Additional				N/A		
0		0	Notes:						
	-		I. Appropriate/desirable species				8		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				5		
	X Veg	jetation	IV. Age, size distribution.				5		
			V. Snags, dens, cavity, etc.	7			7		
	Ber	othic	VI. Plants' condition.	6			6		
			VII. Land management practices				4		
	Both VIII. Topographic features (refugi			gia, channels, hummocks). 7					



Site/Project Name	Application Numbe	Application Number			Assessment Area Name or Number			
				B	10			
FLUCCs code	Further classification (optional)	ation (optional)		Туре	Assessment Area Size			
3112	Seasonally Flooded Mangr	ove Forest			Acres			
Basin/Watershed Name/Number Affect	ed Waterbody (Class)	Special Classification	N (i.e.Of	FW, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hydrologi	c connection with wetlands, other su	l urface water, uplanc	ds					
Assessment area description								
Mangrove dominated system with black, white and red mangroves. Mangrove height - 10-30'								
Significant nearby features		Uniqueness (cons landscape.)	siderii	ng the relative rarity in	relation to the regional			
Mosquito ditches, access road (grave	l), mangroves on both sides							
Functions		Mitigation for previo	ous p	ermit/other historic use				
Habitat, stormwater storage								
Anticipated Wildlife Utilization Based on that are representative of the assessmer be found )	Literature Review (List of species at area and reasonably expected to	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 o	other signs such as	track	s, droppings, casings,	nests, etc.):			
yellow warblers, fish, butterflies, hero	n							
Additional relevant factors:								
access road separates both, north side salinity 35 ppt, south side salinity 27 ppt.								
Assessment conducted by:		Assessment date(s	s):					
JS, MM, LK		05/14/24						

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
		-		-		B10			
Impact or Mitio	lation:			Assessment Conducted by:		Assessment Date:			
		Imnact		JS MM I K		05/14/24			
		impact				05/14/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (4)	Not Present (0)		
The scoring o would be su su	The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed functions			Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
a. Quality and quantity of habita				support outside of AA.			7		
			b. Invasive plant species.				8		
	c. Wildlife access to and from			A (proximity and barriers).		8			
.500(6)(a) Lo	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.		8			
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA.				6		
	f. Hydrologic			(impediments and flow restrictions).			4		
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges		7			
Current		With Impact	h. Protection of wetland functions	a provided by uplands ( <b>upland</b> AAs only).			, N/А		
	1		Additional						
7		0	Notes:	Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			7		
			b. Reliability of water level indic	ators.			8		
			c. Appropriateness of <b>soil moist</b>	ure.			8		
.500(	6)(b) Water Env	rironment	d. Flow rates/points of discharge	9.	4				
	(n/a for upland	ls)	e. Fire frequency/severity.		7				
			a Hydrologic stress on vegetation.	le of vegetation.			7		
			h. Use by animals with hydrolog	ic requirements.	7				
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit		6			
Original			k. Water quality data for the type	e of community.			7		
Current		with impact	I. Water depth, wave energy, an	d currents.			6		
7		0	Additional 6 feet deep on sout Notes:	h side, 24" on north side.					
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				7		
	<u> </u>	getation	IV. Age, size distribution.	8			8		
	_		V. Snags, dens, cavity, etc.	8			8		
	Ber	nthic	VI. Plants condition.	7			<u> </u>		
	Rot	h	VIII Topographic features (refugi	ICES. 6			8		
Both VIII. Topographic features (refug			IV Submargad vagatation (anly		N1/A				



Site/Project Name	Application Number	ber Assessment Area Name or Number			or Number			
				B	11			
FLUCCs code	Further classification (optional)	Impact Type		Туре	Assessment Area Size			
3112	Seasonally Flooded Ma	ngroves			Acres			
Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classificatio	n (i.e.OF	FW, AP, other local/state/federal	designation of importance)			
Geographic relationship to and hydr	ologic connection with wetlands, other s	I urface water, uplan	ds					
Assessment area description								
Mangrove forest with mosquito di	itches							
Significant nearby features		Uniqueness (considering the relative rarity in relation to the regional landscape.)						
Functions		Mitigation for previ	ious p	ermit/other historic use				
Habitat, stormwater treatment								
Anticipated Wildlife Utilization Based that are representative of the assess be found )	d on Literature Review (List of species sment area and reasonably expected to	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 Utiliz	ation (List species directly observed, or	other signs such as	s tracks	s, droppings, casings,	nests, etc.):			
Birds, gallinule, butterflies, aquat	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						

Site/Project Na	ame:			Application Number:		Assessment Area Name or Number:			
		-		-		B11			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/16/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	Minimal (4) Not F			
The scoring o would be su su	of each indicator uitable for the typ urface water ass	is based on what be of wetland or essed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Dins Minimal lev wetland/s fui	vel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
a. Quality and quantity of habita				s support outside of AA.			7		
			b. Invasive plant species.				10		
500(0)())	c. Wildlife access to and from A			A (proximity and barriers).		8			
.500(6)(a) L	ocation and Lan	ascape Support	d. Downstream benefits provide	d to fish and wildlife.		8			
			e. Adverse impacts to wildlife in AA from <b>land uses</b> outside of AA				6		
			f. Hvdrologic connectivity (imp	ediments and flow restrictions).	7				
	1		a <b>Dependency</b> of downstream h	abitats on quantity or quality of discharges		7			
Current		With Impact	h. Protection of wetland functions	. Protection of wetland functions provided by uplands ( <b>upland</b> AAs only).			N/A		
8		0	Additional high water level AA Notes:	Additional high water level AA. Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			9		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.		9			
.500(	(6)(b) Water Env	vironment	d. Flow rates/points of discharge	. Flow rates/points of discharge.			6 7		
	(n/a for upland	ls)	e. Fire frequency/severity.				/ Q		
			a. Hydrologic stress on vegetation.	A. Type of vegetation.			7		
			h. Use by animals with hydrolog	ic requirements.	6				
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		8		
			j. Water quality of standing wat	er by observation (I.e., discoloration, turbidity).			5		
Current		With Impost	k. Water quality data for the type	e of community.			6		
Current		with impact	I. Water depth, wave energy, an	d currents.			7		
7		0	Additional North 30ppt, south a Notes:	35ppt, water level up to access road, green al	gae on north side. T	urbid water. Wate	r depth - 10" on north, 12" on south.		
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				10		
			III. Regeneration/recruitment				4		
	X Ve	getation	IV. Age, size distribution.	7			7		
	_		V. Snags, dens, cavity, etc.	8			8		
	Ber	nthic	VI. Plants condition.				<u> </u>		
	Rot	h	VIII. Lanu management practices	a channels hummocks)			7		
	Both VIII. Topographic features (refugi						, 		



Site/Project Name	ite/Project Name				Assessment Area Name or Number		
					В	12	
FLUCCs code	Further classifica	tion (optional)		Impac	t Type	Assessment Area Size	
3112	Seasonally	y Flooded Mangr	ove Forest			Acres	
Basin/Watershed Name/Number	Affected Waterbody (Clas	s)	Special Classificati	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)	
Geographic relationship to and hyd	rologic connection with	wetlands, other s	I surface water, uplands				
Central Mangrove wetlands to no	orth, mangrove forest	to south. Bisecte	ed by mosquito re	bad			
Assessment area description							
Seasonally flooded mangrove forest							
Significant nearby features		Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional		
Mosquito road, mangrove forest			Hydrology disconnected from N/S sides				
Functions			Mitigation for prev	vious	permit/other historic use	)	
Water storage, habitat							
Anticipated Wildlife Utilization Base that are representative of the asses be found )	d on Literature Review sment area and reason	(List of species ably expected to	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 Utili	zation (List species dire	ctly observed, or	l other signs such a	s trac	ks, droppings, casings,	nests, etc.):	
Yellow warbler, Inca dove							
Additional relevant factors:							
salinity 35ppt on south side, 36 p							
Assessment conducted by:			Assessment date	e(s):			
JS, MM, LK			05/16/24				

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:			
		-		-		B12			
Impact or Mitio	ation:			Assessment Conducted by:		Assessment Date:			
		Imnact		IS MM I K			05/16/24		
		impact					00/10/24		
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	level of support of nd/surface water functions			
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity <b>of habitat</b>	support outside of AA.			7		
			b. Invasive plant species.				9		
			c. Wildlife access to and from A	A (proximity and barriers).			7		
.500(6)(a) Lo	ocation and Lan	dscape Support	d. Downstream benefits provide	d to fish and wildlife.			7		
			e. Adverse impacts to wildlife in A	A from <b>land uses</b> outside of AA			6		
			f Hydrologic connectivity (imp	ediments and flow restrictions)			5		
	1		a <b>Dependency</b> of downstream b	abitats on quantity or quality of discharges	7				
Current		With Impact	h Protection of wetland functions	Protection of wetland functions provided by uplands (upland AAs only)			, N/А		
			Additional			•			
7		0	Notes:						
			a. Appropriateness of <b>water leve</b>	Is and flows.			7		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.		9			
.500(	6)(b) Water Env	rironment	d. Flow rates/points of discharge	2.		5			
	(n/a for upland	ls)	e. Fire frequency/severity.			/			
			1. Type of vegetation.	00		9			
			h. Use by animals with hydrolog	Is with hydrologic requirements.			6		
			i. Plant community composition	<b>n</b> associated with water quality (i.e., plants tolerant of poor WQ). <b>Iter by observation</b> (I.e., discoloration, turbidity).			8		
			j. Water quality of standing wat				5		
•	]		k. Water quality data for the type	of community.			6		
Current		vvitn impact	I. Water depth, wave energy, an	d currents.					
7		0	Additional 18" deep on north and 18" on south side. Notes:						
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
			III. Regeneration/recruitment				5		
	X Veg	getation	IV. Age, size distribution.				7		
	_		V. Snags, dens, cavity, etc.				7		
	Ber	nthic	VI. Plants' condition.	7			7		
	Dat	h	VII. Land management practices	a channals hummocks)			6		
	Both VIII. Topographic features (ref					U			



Site/Project Name	Application Numb	Application Number		Assessment Area Name or Number		
				B	13	
FLUCCs code	Further classification (optional)		Impact	Туре	Assessment Area Size	
3112	Seasonally Flooded Ma	angroves			Acres	
Basin/Watershed Name/Number	ffected Waterbody (Class)	Special Classificatio	on (i.e.Of	FW, AP, other local/state/federal	designation of importance)	
Geographic relationship to and hydro	blogic connection with wetlands, other s	L surface water, uplan	nds			
Within cow pasture, connected wi	th mangroves that are around mosq	uito roads				
Assessment area description						
Seasonally flooded mangroves ad	jacent to cow pasture uplands.					
Significant nearby features		Uniqueness (cor landscape.)	nsiderii	ng the relative rarity in	relation to the regional	
Cow pasture, mosquito roads						
Functions		Mitigation for previous permit/other historic use				
Water retention, habitat						
Anticipated Wildlife Utilization Based that are representative of the assess 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 Utiliza	ation (List species directly observed, or	other signs such as	s track	s, droppings, casings,	nests, etc.):	
Grackle, crab holes, insects, butte	erflies, tri-colored heron, egret					
Additional relevant factors:						
Assessment conducted by:		Assessment date	(s):			
JS, MM, LK		05/16/24				

Site/Project Na	ame:			Application Number:		Assessment Area	a Name or Number:		
		-		-		B13			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
	-	Impact		JS, MM, LK		05/16/24			
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (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 functions				Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	el of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				9		
500(0)(-)			c. Wildlife access to and from A	A (proximity and barriers).			9		
.500(6)(a) L	ocation and Lan	dscape Support	d. Downstream benefits provide	d to fish and wildlife.			8		
			e. Adverse impacts to wildlife in A	A from land uses outside of AA.			7		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			8		
	7		g. Dependency of downstream h	abitats on quantity or quality of discharges.		7			
Current		With Impact	h. Protection of wetland functions	. Protection of wetland functions provided by uplands ( <b>upland</b> AAs only).			N/A		
8		0	Additional Notes:						
	•	<u>I</u>	a. Appropriateness of <b>water leve</b>	Is and flows.			8		
			b. Reliability of water level indic	ators.			9		
			c. Appropriateness of <b>soil moist</b>	ure.		9			
.500(	(6)(b) Water Env	vironment	1. Flow rates/points of discharge.				6		
	(n/a for upland	ls)	e. Fire frequency/severity.				/		
			n. Type of vegetation.	on		8			
			h. Use by animals with hydrolog		8				
			i. Plant community composition	associated with water quality (i.e., plants tol	erant of poor WQ).		9		
	_		j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidity).			8		
Current		With Impost	k. Water quality data for the type	e of community.			9		
Current		with impact	I. Water depth, wave energy, an	d currents.			7		
8		0	Additional salinity 21 ppt. Wate Notes:	Additional salinity 21 ppt. Water depth - 4" deep. Mud crabs present. Some turbidity observed. Notes:					
			I. Appropriate/desirable species				9		
.500(6	6)(c) Community	Structure	II. Invasive/exotic plant species				9		
III. Regeneration/recruitment			III. Regeneration/recruitment				5		
	X Veç	getation	IV. Age, size distribution.				6		
	-	- (I. ¹ -	V. Snags, dens, cavity, etc.	7			7		
	Ber	ntnic	VI. Plants condition.	7			<u> </u>		
	Rot	'n	VIII Topographic features (refugi	a channels hummocks)			6		
	Both VIII. Topographic features (refug				U NI/A				



Site/Project Name		Application Numbe	ber Assessment Area Name or Nur		or Number	
					В	14
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size
3112	r	Mangrove Lagoo	on Ac			Acres
Basin/Watershed Name/Number Affected Waterbody (Class)			Special Classification	ON (i.e.C	DFW, AP, other local/state/federal	designation of importance)
Geographic relationship to and hydr	wetlands, other s	L urface water, uplar	nds			
South of Central mangrove mang	roves. Surrounded by	y residential dev	elopment and agr	ricultu	ire.	
Assessment area description						
Lagoon surrounded by white mar	ngroves, manmade wi	ith trees adjacen	t, adjacent to res	identi	al and roadway	
Significant nearby features			Uniqueness (co landscape.)	nsider	ing the relative rarity in	relation to the regional
Central mangroves to the north						
Functions			Mitigation for previous permit/other historic use			
Habitat						
Anticipated Wildlife Utilization Base that are representative of the asses be found )	(List of species hably expected to	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 Utiliz	ation (List species dire	ctly observed, or	l other signs such a	s tracl	ks, droppings, casings,	nests, etc.):
green iguanas, fish						
Additional relevant factors:						
Assessment conducted by:			Assessment date	e(s):		
JS, MM, LK			05/16/24			

Site/Project Na	Site/Project Name:			Application Number:		Assessment Area Name or Number:		
		-		-		B14		
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:		
		Impact		JS, MM, LK			05/16/24	
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions	
					Enter Notes	below (do NOT sco	ore each subcategory individually)	
			a. Quality and quantity of habitat	support outside of AA.			7	
			b. Invasive plant species.				6	
500(0)())	<i>e</i> 11		c. Wildlife access to and from A	A (proximity and barriers).			6	
.500(6)(a) Lo	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			8	
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			6	
			f. Hydrologic connectivity (imp	ediments and flow restrictions).			8	
	a <b>Dependency</b> of downstream h			abitats on quantity or quality of discharges.	7			
Current		With Impact	h. Protection of wetland functions	<ul> <li>Protection of wetland functions provided by uplands (upland AAs only).</li> </ul>			N/A	
7		0	Additional Notes:					
			a. Appropriateness of <b>water leve</b>	Is and flows.			8	
			b. Reliability of water level indic	ators.			9	
			c. Appropriateness of <b>soil moist</b>	ure.		8		
.500(	(6)(b) Water Env	vironment	I. Flow rates/points of discharge.				8	
	(n/a for upland	ls)	f Type of vegetation			7		
			a. Hydrologic stress on vegetation.	Hydrologic stress on vegetation.			7	
			h. Use by animals with hydrolog	ic requirements.	8			
			i. Plant community composition	associated with water quality (i.e., plants tolerant of poor WQ).			8	
	_		j. Water quality of standing wat	er by observation (I.e., discoloration, turbidit	8			
Current		With Impact	k. Water quality data for the type	e of community.			8	
Suiteill			I. Water depth, wave energy, an	d currents.			8	
8		0	Additional salinity 7 ppt, Water Notes:	Additional salinity 7 ppt, Water depth - 20" deep. Notes:				
I. Appropriate/desirable species			I. Appropriate/desirable species				7	
.500(6	.500(6)(c) Community Structure II. Invasive/exotic plant species					6		
			III. Regeneration/recruitment				7	
	X Veg	getation	IV. Age, size distribution.				8	
			V. Snags, dens, cavity, etc.				8	
	Ber	nthic	VI. Plants' condition.				7	
	Dot	h	VII. Land management practices	a channals hummocks)			<u>р</u> 7	
1	Both VIII. Topographic features (refu			a, onanneis, nunnnuoksj.			/ 	



Site/Project Name		Application Numbe	ber Assessment Area Name or		or Number		
					В	15	
FLUCCs code	Further classifica	tion (optional)		Impac	t Туре	Assessment Area Size	
1500		Dry Shrubland				Acres	
Basin/Watershed Name/Number	Affected Waterbody (Clas	ss)	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance)				
Geographic relationship to and hyc	wetlands, other s	I urface water, uplar	nds				
Upland adjacent to prision and d	leveloped areas. Centr	al Mangrove wet	land to the north	. Adja	cent 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 Utiliza classification (E, assessment area	ation b T, SS( )	y Listed Species (List s C), type of use, and inte	pecies, their legal ensity of use of the	
Birds, reptiles, insects							
Observed Evidence of Wildlife Utili	zation (List species dire	ctly observed, or	l other signs such a	s track	ks, droppings, casings,	nests, etc.):	
Yellow warbler, butterflies							
Additional relevant factors:							
Assessment conducted by:			Assessment date	e(s):			
JS, MM, LK			05/16/24	<b>∖</b> - <b>/</b> -			

Site/Project Na	ame:			Application Number:		Assessment Area	Name or Number:		
		-		-		B15			
Impact or Mitig	gation:			Assessment Conducted by:		Assessment Date:			
		Impact		JS, MM, LK		05/16/24			
		•							
	Scoring Guidar	nce	Optimal (10)	Moderate(7)	Min	imal (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 functions			Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficien maintain most wetland/surface waterfunction	t to Minimal lev ons fur	rel of support of surface water nctions	Condition is insufficient to provide wetland/surface water functions		
					Enter Notes	below (do NOT sco	ore each subcategory individually)		
			a. Quality and quantity of habitat	support outside of AA.			6		
			b. Invasive plant species.				6		
		deserve Comment	c. Wildlife access to and from A	A (proximity and barriers).			6		
.ουυ(ο)(a) L	ocation and Lan	uscape Support	d. Downstream benefits provide	d to fish and wildlife.			4		
			e. Adverse impacts to wildlife in A	AA from land uses outside of AA.			4		
			f. Hydrologic connectivity (imp	ediments and flow restrictions).		I	N/A		
	]		g. Dependency of downstream h	abitats on quantity or quality of discharges.		5			
Current		With Impact	h. Protection of wetland functions		5				
5		0	Additional Notes:						
			a. Appropriateness of water leve	Is and flows.			N/A		
			b. Reliability of water level indic	ators.			N/A		
			c. Appropriateness of <b>soil moist</b>	N/A					
.500(	(6)(b) Water Env	rironment	d. Flow rates/points of discharge.				N/A		
	(n/a for upland	ls)	e. Fire frequency/severity.				N/A		
			t. Type of vegetation.				N/A		
			h. Use by animals with hydrolog	N/A					
			i. Plant community composition	associated with water quality (i.e., plants tolerant of poor WQ).			N/A		
			j. Water quality of standing wat	ter by observation (I.e., discoloration, turbidity).			N/A		
0	]		k. Water quality data for the type	r quality data for the type of community. N/A					
Current		with impact	I. Water depth, wave energy, an	d currents.			N/A		
0		0	Additional Notes:	Additional Notes:					
	•		I. Appropriate/desirable species				6		
.500(	6)(c) Community	Structure	II. Invasive/exotic plant species				6		
			III. Regeneration/recruitment				5		
	X Veç	getation	IV. Age, size distribution.				6		
			V. Snags, dens, cavity, etc.				7		
	Ber	nthic	VI. Plants' condition.				6		
		<b>F</b>	VII. Land management practices		7		7		
	Both VIII. Topographic features (refug			a, channels, nummocks).			1		



Appendix K.2 -Terrestrial Habitat Descriptions

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman

# 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:

#### **1.0Man-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**.



#### 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)

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman

# Key Species Tables and Species Action Plans from the *National Biodiversity Action Plan* of 2009

#### **Table of Contents**

#### 1. Key Species Tables

- Mangrove
- Pools, Ponds and Mangrove Lagoons
- Farm and Grassland
- Dry Shrubland
- Forest and Woodland
- Urban and Man-Modified Areas
- Roads

#### 2. Species Action Plans (SAP)

- Bats
- Brown Booby
- Cayman Parrot
- Cayman Pygmy Blue butterfly
- Grand Cayman Blue Iguana
- Mosquito fish
- Red-footed Booby
- Vitelline Warbler
- West Indian Whistling Duck
- White Land Crab
- White-tailed Tropicbird

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					
~ ~ ~	PAI	RT 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						
	PAI	RT 2	I					
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						
<b>KEY SPECIES for POOLS, PONDS AND MANGROVE LAGOONS</b>								
----------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------	---------------------------------	------					
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						
	Herons, egrets, waterfowl							
	West Indian Whistling-duck	Dendrocygna arborea	SAP					
	Antillean nighthawk (Rickery-dick)	Chordeiles gundlachii						
Invertebrates	Pygmy Blue butterfly	Brephidium exilis thompsoni	SAP					
	РА	RT 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						
	INV	ASIVE						
Reptiles	Red-eared slider	Trachemys scripta						
Plants	Water Snowflake	Nymphoides indica						

KEY SPECIES for FARM AND GRASSLAND				
Category	Detail	Scientific Reference	NBAP	
	PAI	RT 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	
Reptiles	Grand Cayman Blue iguana	Cyclura lewisi	SAP	
Plants		Agalinis kingsii		
	PAI	RT 2		
none				
INVASIVE				
Birds	Monk parakeet (Parrot SAP)	Myiopsitta monachus	SAP	

KEY SPECIES for DRY SHRUBLAND			
Category	Detail	Scientific Reference	NBAP
	PAR	T 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	
	PAR	T 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	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 gunalachi Patagiognas laugogaphala	
	Caribbean dove	I entotila iamaicensis collaris	
	West Indian woodnecker	Melanernes 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	2	<u> </u>
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	Diceroprocia caymanensis	
Invertebrates	Coursen Brac cicada	Diceroprocia ciedvesi	
Plants		Allophylus cominia var. cavmanensis	
Plants	Cayman Silverbush	Argythamnia proctorii	
Plants		Reloglottis costaricensis	
Plants	Yoke wood	Catalna longissima	
Plants	Cedar	Cedrela odorata	SAP
Plants		Celtis trinervia	
Plants	Ironwood	Chionanthus cavmanensis	SAP
Plants	Silver Thatch palm	Coccothrinax proctorii	SAP
Plants	1	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 /	SAP
Dianta		thomsoniana Occocolados magulats	-
Pidnis Dianta		Deceociades maculata	
Plants		riosinecnea cocnieala Ranvolfia nitida	
Plants		Tillandsia fastucoidas	
Plants		Trichilia havanensis	
Plants	Bull rush	Zamia integrifolia	
Plante	Satinwood	Zantha miczi yona Zanthowlum flavum	
1 101113	Satimwood	zaninozyiani jiavani	

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	<b>!</b>		
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		
	INVASI	VE			
Birds	Monk parakeet (Parrot SAP)	Myiopsitta monachus	SAP		
Reptiles	Red-eared slider	Trachemys scripta			

KEY SPECIES for ROADS					
Category	Detail	Scientific Reference			
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			
	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 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 <i>pools</i> , <i>ponds and mangrove lagoons</i> .
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.

### Associated Habitats and Species for Bats

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: <u>www.Caymanwildlife.org</u>.

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 ecosystem 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	ongoing
and practical management, and raise awareness of the ecological role of bats.	

Bats PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Targeted awareness towards the promotion of the	DoE	CIG NT	2006	1-4
(Trade & Transport) Law.				
PL2. Protect <i>Bats</i> under Schedule I of the National	DoE	CIG	2006	1-4
Conservation Law, through establishment of				
conservation regulations.	DE		2010	1.2
<b>PL3.</b> Act to protect all known established natural roosts,	DOE	CIG MP	2010	1,3
and implement protection of newly discovered natural		IN I		
<b>PI</b> A Promote amendment of the Planning Law to	DoP	DoF CIG	2010	2.3
facilitate rapid imposition of ston-orders on illegal	DOI	DOLCIG	2010	2,3
developments and provide a responsive and effective				
enforcement mechanism.				
PL5. Strengthen the Development Plan on Grand	DoP	CIG MP	ongoing	2,3
Cayman, incorporating a long-term vision for the	CPA	DoE	0 0	
environmental, social, and economic development of the				
Islands.				
PL6. Promote establishment of a Development Plan for	DoP	CIG MP	ongoing	2,3
the Sister Islands, incorporating a long-term vision for	DCB	DoE		
the environmental, social, and economic development of				
the Islands.				-
<b>PL7.</b> Enable DoE Conservation Officers to implement	DoE	CIG	ongoing	3
legal eradication of invasive species, as necessary to				
ensure the survival of endangered native species.				
Safeguards & Management	NT			
SM1. Maintain and expand bat house construction and	NI	DOE IntC	ongoing	2
Programme, towards conserving M. malagaug		MP		
<b>SM2</b> Develop and implement sustainable management	DoE	Dot NT	2015	234
strategies for conservation of A <i>jamaicansis</i> and B <i>nana</i>		CIG MP	2013	2,3,4
which reasonably mitigate local farmers for damage to	DUA	IntC		
their fruit crops		inte		
<b>SM3.</b> Eradicate Monk parakeets <i>Myiopsitta monachus</i>	DoE	MP	2009	2
from the Cayman Islands, towards removing this crop-				-
pest.				
<b>SM4.</b> Use the <i>Environmental Protection Fund</i> to	CC	DoE NT	2015	3

purchase and protect / establish management agreements		MP CIG		
with landowners of the <i>caves</i> and <i>forest and woodland</i>		IntC		
associated with the Old Man Bay (Bat) Caves, Grand				
Cavman to assist in the preservation of <i>E. fuscus</i> and <i>A.</i>				
<i>iamaicensis.</i> This system is also a historic roost site for				
T brasiliensis				
<b>SM5</b> Investigate feasibility of establishing Cayman Brac	CC	NT MP	2010	3
Bluff Cave site as a protected area/ establish	cc	DoE CIG	2010	5
management agreements with landowners, towards		DOL CIU		
management agreements with fandowners, towards		Inte		
preserving the only known roost of <i>E. sezekorm</i> .	CC	NT MD	2010	2
Sivio. Investigate reasionity of establishing Miller's Cave	LL		2010	3
system as a protected area / establish management		DOE CIG		
agreements with landowners, towards preserving A.		IntC		
jamaicensis.			2010	-
SM7. Investigate feasibility of establishing Dolphin.	CC	NTMP	2010	3
Cave (Sybil McLaughlin's property on Queen's		DoE CIG		
Highway) as a protected area / establish management		IntC		
agreements with landowners, to assist in the preservation				
of A. jamaicensis.				
SM8. Investigate status of the Salinas Reserve cave, to	CC NT	MP DoE	2010	3
assist in the preservation of A. jamaicensis, M.		IntC		
waterhousii and T. brasiliensis.				
SM9. Investigate the feasibility of establishing protected	CC	NT MP	2010	3
caves at two sites on Cayman Brac bluff, one at the base,		DoE CIG		
the other a single cave with small opening about 20 feet		IntC		
up on the bluff face - the latter being home to ca. 500 M.				
molossus.				
SM10. Investigate feasibility of restoring the Agriculture	DoA	NT MP	2010	3
Pavilion Cave, and establishing the site as a protected		DoE CIG		
area. This is currently inaccessible to bats due to the		IntC		
dumping of garbage. Cleanup and fencing would be a				
simple inexpensive way to restore this cave roost for				
potential recolonisation by A. <i>jamaicensis</i> and M.				
<i>waterhousii</i> , in line with DoA's Agritourism initiative.				
<b>SM11.</b> Investigate feasibility of establishing Spot Bay	CC	NT MP	2010	3
Bat Cave as a protected area / establish management	00	DoE CIG	2010	5
agreements with landowners to assist in the preservation		IntC		
of Macrotus waterhousii		inte		
SM12 Encourage maintenance and planting of mature	DoF	NT	2008	23
fruit trees in developed areas <i>P</i> falcatus for example	OFUBP	111	2000	2,5
will roost adjacent to housing complexes if mature <i>Ficus</i>	QLIIDI			
remain				
SM13 Supply pative trees suitable for bats feeding and	DoE	NT	2008	2.3
roosting, through the Native Tree Nursery	OEIIDD	111	2008	2,5
<b>SM14</b> Use the Environmental Protection Fund to	CC	DoE NT	2015	224
SW14. Use the Environmental Protection Fund to	CC .	DOE NI MD CIC	2015	2,3,4
purchase and protect / establish management agreements		MP CIG		
with landowners of a <i>cave</i> suitable for establishment as a		DE		
show-cave. Develop on-site access and interpretation				
to facilitate visitation by school-groups, towards				
educating students regarding the geological and				
biological interest of <i>caves</i> .	DEU		2005	
SM15. Control predation by rats and cats.	DEH	NT	2007	3
	DoE HS			
	DoA			
<b>SM16</b> . Restore damaged roosting habitat where possible	DoE NT		2010	3

	MP			
SM17. Establish a full-time DoE field conservation	DoE		2012	2,3,4
officer on Cayman Brac and Little Cayman to implement				
conservation actions.				
SM18. Implement associated HAPs.	DoE		2015	1,2,3,4
Advisory				
A1. Maintain communications with planning agencies	DoE	DoP	ongoing	2,3
and developers, towards early identification of potential		NRA MP		
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.				
A2. Work with planners to encourage maintenance of	DoE	DoP	ongoing	2,3
mature fruit trees in developments. P. falcatus, for		NRA MP		
example, will roost adjacent to housing complexes if				
mature Ficus trees remain.				
A3. Promote the use of native plants in landscaping,	DoP	DoE	2009	2,3,4
through maintenance of existing vegetation and use of a				
Recommended Planting Palette in new developments.				

Bats PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Further monitoring via mist-netting is needed to	DoE NT	IntC	2010	3
assess whether <i>P. falcatus</i> and <i>E. sezekorni</i> are still				
present on Grand Cayman, and if so, determine extent of				
<b>PM2</b> Augment existing studies with more conhisticated	DoE NT	IntC	2010	2
radio telemetry efforts and acoustical monitoring via	DOE NI	Inte	2010	3
Anabat or Sonobat				
<b>RM3.</b> Determine location of new roost sites for all	DoE NT	IntC	2010	3
species, a priority being species for which no roost sites	DOLINI	inte	2010	5
are currently known, such as <i>B. nana</i> , and species with a				
dependency on primary forest, such as <i>P. falcatus</i> .				
<b>RM4.</b> Determine foraging habitat requirements and key	DoE NT	IntC	2010	3
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).				
<b>RM5.</b> Extend bat monitoring programme, to monitor	DoE NT	IntC	2010	3
populations, impact of development and effectiveness of				
Conservation management efforts.	DoE NT	IntC	ongoing	2
scientists when their methods and studies have the	DOENT	mic	ongoing	5
potential to benefit the conservation of Cayman Islands				
bats.				
<b>RM7</b> . Ban unnecessarily invasive research techniques.	DoE NT	IntC	ongoing	2.3
which might encourage desertion of roosts, with			0.0	y -
particular attention to sensitive species such as E.				
sezekorni.				
<b>RM8</b> . Work with international experts to determine	DoE NT	IntC	ongoing	3
appropriate management of specific sites and species,				
especially where species are sensitive to critical				
environmental conditions, or disturbance, such as <i>E</i> .				
sezekorni.			2012	224
<b>RM9.</b> Investigate feasibility of implementing <i>Parrot Jam</i>	DOE MP	DoT NT	2012	2,3,4
<i>Project</i> – a financial / PR incentive scheme to offset crop	DOA	CIG		
<b>BM10</b> Construct quarters for visiting scientists in	DoE		2012	234
Cayman Brac and support research initiatives	DOL		2012	2,3,4
complimentary to the objectives of the NBAP.				
Communication & Publicity				
<b>CP1.</b> Continue proactive public awareness initiative, to	NT	DoE IntC	ongoing	2,4
raise awareness of the Bat House Conservation			000	,
Programme to conserve M. molossus, and reduce				
incidental deaths of the endemic Eptesicus fuscus.				
<b>CP2.</b> Raise public awareness of the sensitivity of some	NT	DoE	ongoing	2,3,4
bats species to disturbance, such as E. sezekorni.				
<b>CP3.</b> Subject to SM14, utilise a "show colony" site to	CC	DoE NT	2015	2,3,4
raise public awareness of the importance of bats.		MP CIG		
CD4 Establish a schools in 1	NT	DE DE	2010	224
in conjunction with appropriate RM actions.	1111	IntC	2010	2,3,4

<b>CP5.</b> Establish a lectures and publicity programme for	DoE NT	IntC	ongoing	4
all visiting scientists.				
<b>CP6.</b> Raise awareness of the value of native landscaping	DoE DoP	MP CN	2010	3
for wildlife.	NT	GC OS		
	QEIIBP	SB LCN		
<b>CP7.</b> Investigate potential for red-light / infra-red live	DoE NT	IntC	2010	3,4
streaming link to active colony, to that the public can				
view a colony in action.				
CP8. Utilise native flora and fauna, and associated	CIG DoT	DoE	2010	4
preservation efforts, in the international promotion of the	QEIIBP	NT MP		
Cayman Islands.				

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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	Verbesina caymanensis
7. Maritime cliffs and ironshore	White-tailed tropicbird Phaethon lepturus
11. Coastal shrubland	Cayman parrot Amazona leucocephala
16. Caves	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

<b>2.</b> 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	2011
developmental impacts on established nest sites.	
4. Reduce predation by non-native species.	2011
5. Preserve the aesthetic and ecological value of this area of outstanding natural	2015
beauty.	
6. Improve media profile and public understanding of the Brown booby.	2009

Brown booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				1
<b>PL1.</b> Pass and implement the National Conservation Law.	CIG	DoE	2006	1-6
<b>PL2.</b> Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	3
<b>PL3.</b> Protect <i>Sula leucogaster</i> under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-6
<b>PL4.</b> 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
<b>PL5.</b> Promote establishment of a <i>Development Plan</i> 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
<b>PL6.</b> Universal enforcement of leash laws for dogs on the Sister Isles.	DoA	DoE CIG MP	2010	3,4
<b>PL7.</b> 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			-	-
<b>SM1.</b> Establish the bluff face Crown lands and Little Cayman Brac as protected areas, and use the <i>Environmental Protection Fund</i> 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
<b>SM2.</b> 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
<b>SM3.</b> Use the <i>Environmental Protection Fund</i> 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
<b>SM4.</b> Use the <i>Environmental Protection Fund</i> 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
<b>SM5.</b> 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	DoE DoT		2010	3
prohibition of access to the large cave (N19°44'50"	SIDA			
W79°43'40") during breeding season.				
<b>SM7.</b> Management of climbing activities, including code	DoE DoT	SIDA	2010	3
of conduct, development of new routes, bolt placement				
and seasonal access restrictions.				
SM8. Develop code of conduct for boat operators.	DoE DoT	SIDA	2010	3
SM9. Develop and implement long-term non-native	DEH	DoE	2010	3,4
predator control on site.	DoA	SIDA		
<b>SM10.</b> Promote spaying and neutering of domestic cats.	DoA	DoE	ongoing	3,4
SM11. Eradicate feral dogs and Iguana iguana in	DoE	DEH	2010	3,4
Cayman Brac.		IntC		
		DoA MP		
SM12. Establish a full-time DoE field conservation	DoE		2012	1-6
officer on Cayman Brac and Little Cayman to implement				
conservation actions.				
SM13. Implement associated HAPs.	DoE		2015	1-6
Advisory				
A1. Recommend maintenance of an unsealed road for	DoE	LS, DoP	2008	3,5
500m directly west of lighthouse, with no further	DCB	AGC		
expansion, and no perimeter road on the eastern bluff.	NRA	SIDA		
A2. Recommend appropriate building set-back from the	DoE	SIDA	2008	3,5
bluff edge and base.	DCB	MP DoP		
A3. Recommend appropriate restrictions on removal of	DoE	SIDA	2008	3,5
vegetation from the bluff edge.	DCB	MP DoP		
A4. Targeted awareness of the need for the National	DoE	CIG NT	2006	1-6
Conservation Law and the Endangered Species (Trade &				
Transport) Law.				

Brown booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> 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 Hurrica	ane Paloma, No	v 2008.	
<b>RM2.</b> Investigate the potential for artificial augmentation of nesting ledges to assist in colony expansion / relocation.	DoE	NT, SIDA	2012	1,3
<b>RM3.</b> Monitor and eradicate <i>Iguana iguana</i> in Little Cayman and Cayman Brac.	DoE	DoA DEH MP	ongoing	4
<b>RM4.</b> 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
<b>RM5.</b> 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				
<b>CP1.</b> Develop and publicize a code of conduct for visitors (inc. climbers, cavers, boaters) outlining site status and restrictions.	DoE	SIDA DoT	2012	3,6
<b>CP2</b> . Produce brochure guides to the area.	DoT SIDA	DoE, NT	ongoing	6
<b>CP3.</b> Establish of a dedicated warden / nature tour guide, responsible for site interpretation.	DoT SIDA	DoE, NT	2015	1-6
<b>CP4.</b> Improve interpretative facilities at key areas.	DoT SIDA	DoE, NT	2012	3,6
<b>CP5.</b> Raise public awareness of the Brown booby and other birds through local media (e.g. <i>Know Your Islands</i> column), public talks and schools presentations (e.g. <i>Do You Know Me?</i> ), and natural history websites.	NT	DoE DE	ongoing	6
CP5. REPORT: DoE and NMBCA jointly fund development of Bird ID c Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 20	eards for NT "D 07.	o You Know M	e?" programme,	and Virtual
<b>CP6.</b> 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

## **REFERENCES and FURTHER READING FOR** Brown booby

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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	Vitelline warbler Dendroica vitellina
11. Coastal shrubland	Banana orchid Myrmecophila thompsoni
14. Dry shrubland	Silver Thatch palm Coccothrinax proctorii
15. Dry forest	Cedar Cedrela odorata
17. Farm and grassland	
18. Urban and man-modified areas	

## **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 reestablished 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	2015
Cayman Brac, toward sustaining parrot populations in perpetuity.	
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	ongoing
biodiversity conservation.	
5. Encourage adherence to local laws prohibiting trade and transport, illegal shooting	2006
and trapping of parrots, and active enforcement of these laws when contravened.	
6. Maintain wildlife corridors through protection of woodland in suburban areas, and	2010
planting mini-woodlands of local species to serve as foraging habitat.	
7. Reduce impacts from introduced predators.	2010

Policy & LegislationPL1. Pass and implement the National Conservation Law.CIGDoE20061-7PL2. Implement the Endangered Species (Trade & Transport) Law.DoECIG20065,7PL3. Protect Amazona leucocephala under Schedule I of the National Conservation Law , through establishment of conservation regulations.DoECIG20061-7PL4. Secure Cayman Islands Important Birds Areas microchipping and recording of all captive bred chicks.DoECIG NT20101PL5. Implement asix-month annesty on captive parots, to enable ringing/microchipping and recording of all individuals.DoEDoA20095PL6. Conservation Officers to commence active prosecution for infractions of protective laws, including illegal killing, collection and keeping of unregistered / unringed / un-microchipped birds.DoEDoA20105PL8. Promote amendment of the Planning Law, to facilitate rapid imposition of stop-orders on illegal development asion.DoPDoE CIG MP DoE20101,6PL9. Strengthen the <i>Development Plan</i> on Grand Cayman, incorporating a long-term vision for the sister Islands, incorporating a long-term vision for the Islands.DoPCIG MP DoEOngoing DoE1,6	Cayman parrot PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
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PLIL Enable DOE Conservation Officers to implement DOE CIG 2008 /	<b>PLII.</b> Enable Doe Conservation Officers to implement	DOE		2008	/
ansure the survival of and ansared native species	ansure the survival of endengered notive species				

Safeguards & Management				
<b>SM1.</b> Prioritise land acquisition options to establish	DoE CC	MP NT	2009	1.6
sufficient breeding and foraging reserves on Grand				7 -
Cavman and Cavman Brac to sustain the species, with				
special attention to the Mastic Reserve, Grand Cayman,				
and Hemmington Forest and the Brac Parrot reserve,				
Cayman Brac.				
SM2. Use the <i>Environmental Protection Fund</i> to protect	CC	DoE MP	2009	1
key IBA areas: consolidation of the Mastic Reserve,		NT		
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).				
SM3. Establish strategic woodland patches in <i>urban and</i>	DoE	MP NT	2006	6
man-modified areas, including LPP, to act as refugia, to		CIG DoP		
maintain wildlife corridors.		CPA		
		DCB		
SM4. Restore damaged habitat where possible.	DoE NT	MP	2010	1,2,6
<b>SM5.</b> Develop and implement sustainable management	DoE	DoT NT	2015	1,5
strategies for parrot conservation, which reasonably		CIG MP		
mitigate local farmers for damage to their fruit crops.		DoA AS		_
<b>SM6.</b> Reduce predation by introduced species.	DEH	HS	2010	7
	DoE			
	DoA		2000	-
SM7. Eradicate Monk parakeets Mylopsitta monachus	DOE	MP	2009	/
from the Cayman Islands, towards removing this crop-				
<b>SM9</b> Concernation propagation of Coden Coducts	DeE	NT MD	2010	26
Sivio. Conservation propagation of Cedar Ceareta	DOE		2010	2,0
restoration of denouncerate natural habitat and		QEIIBP IntC		
improvement of suburban areas		mic		
SMQ Develop and expand artificial past hoy	DoE	NT MD	2010	26
programme to increase capacity of degraded habitats	DOL	IntC	2010	2,0
<b>SM10</b> Establish a full-time DoE field conservation	DoF	Inte	2012	1-7
officer on Cayman Brac and Little Cayman to implement	DOL		2012	1 /
conservation actions.				
<b>SM11.</b> Implement ringing and recording programme for	DoE	DoA	2009	5
all captive parrots.				-
SM12. Commence active enforcement of non-	DoE	CIG	2009	5
compliance with laws protecting parrots.				
SM13. Implement associated HAPs.	DoE		2015	1-7
Advisory		•		•
A1. Secure amendment of gazetted road corridors in	DoE	NT	ongoing	1,6
order that they no pass through (i) critical east interior	NRA	DoP		
habitat, Grand Cayman (ii) the Nature Trail, Little		CPA		
Cayman and (iii) the parrot Reserve, Cayman Brac.		DCB		
A2. Establish management strategy to develop nature	NT	DoE	2006	4
tourism in reserves with sustainable financial planning.	SIDA	DoA	ongoing	
	CITA			
	SITA			
A3. Develop and recommend guidelines for native	DoE DoP	SIDA	2009	6
vegetation maintenance / landscaping, particularly for				
developments in littoral areas.	<b>D D</b>	<b>D D D</b>	2000	
<b>A4.</b> Promote use of native food plants in landscaping,	DoP	DoE	2009	6
through maintenance of existing vegetation and use of		1		1

Recommended Planting Palette in new developments.				
A5. Targeted awareness of the need for the National	DoE	CIG NT	2006	1-7
Conservation Law and the Endangered Species (Trade &				
Transport) Law.				

Cayman parrot PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Investigate feasibility of artificial nest box installation in protected areas	NT	DoE	2009	2,6
<b>BM2</b> Determine genetic status of race <i>hesterna</i>	DoF NT		2015	4
<b>RM3</b> Develop and implement predator control in	DoE	HS NT	2013	7
managed parrot habitats.	DoA	115 111	2007	/
<b>RM4.</b> Assess the ecological impact of <i>Iguana iguana</i> on	DoE	NT	2007	7
A. l. caymanensis.				
<b>RM5.</b> Undertake population dynamics study - improve	DoE	NT BC	ongoing	3
annual population estimates and map distribution of nest			0 0	
sites.				
<b>RM6.</b> Investigate feasibility of implementing <i>Parrot Jam</i>	DoE MP	DoT NT	2012	4,5
Project – a financial / PR incentive scheme to offset crop	DoA AS	CIG		
damages suffered by local fruit farmers.				
<b>RM7.</b> Construct quarters for visiting scientists in	DoE		2012	3
Cayman Brac, and support research initiatives				
complimentary to the objectives of the NBAP.				
Communication & Publicity				
<b>CP1.</b> Targeted awareness of this flagship species and its	NT DoT	CIG DE	2007	4,5
international importance to key sectors: tourism,	DoE	SITA		
business, Government, local community.		CITA		
CP2. Update National Symbols campaign.	NT		2006	4,5
CP3. Raise public awareness of Parrots and other birds	NT	DoE BC	2006	4,5
through local media (e.g. Know Your Islands), special		DE	ongoing	
events (e.g. Birds stamp issue), public talks and schools				
presentations (e.g. Do You Know Me?) and natural				
history websites.				
CP3. REPORT: DoE and NMBCA jointly fund development of Bird ID of Did Gride for the General Islands through General Did discussion and Control of Did Gride for the General Did discussion of the General Did discussion	cards for NT "D	o You Know M	e?" programme	, and Virtual
<b>CP4</b> Development of National Trust's interpretative	NT		2007	15
centre for conservation education	111		2007	т,5
<b>CP5</b> Install interpretative signage on National Trust	NT	DoF	2006	45
owned nature trails	111	DOL	2000	1,5
<b>CP6</b> Promote island wide awareness of the illegality	DoE	CIG	2008	5
and undesirability of moving parrots between islands	DOL	eie	2000	5
outside of managed transfers				
<b>CP7.</b> Raise awareness of the value of native landscaping	DoE DoP	MP CN	2010	6
for wildlife	NT	GC OS	2010	0
	OEIIBP	SBLCN		
<b>CP8.</b> Utilise native flora and fauna, and associated	CIG	DoE DoT	2010	4
preservation efforts, in the international promotion of the		NT MP		·
Cayman Islands.		QEIIBP		

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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	West Indian Whistling-duck Dendrocygna arborea
13. Pools, ponds and mangrove lagoons	

## 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 <i>Brephidium exilis thompsoni</i> , and incorporate	2015
30% of known habitat into protected areas.	
2. Promote preservation of <i>insitu</i> populations of <i>Brephidium exilis thompsoni</i> .	2015
3. Promote establishment of contingency populations of <i>Brephidium exilis thompsoni</i> .	2010

Cayman Pygmy Blue PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
<b>PL1.</b> Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2,3
<b>PL2.</b> Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	1,2
<b>PL3.</b> Protect <i>Brephidium exilis thompsoni</i> under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
<b>PL4.</b> 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
<b>PL5.</b> Strengthen the <i>Development Plan</i> 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
<b>PL6.</b> Promote establishment of a <i>Development Plan</i> 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				
<b>SM1.</b> Use the <i>Environmental Protection Fund</i> to establish a protected area / management agreement with landowners to protect natural <i>salt-tolerant succulents</i> habitat for <i>Brephidium exilis thompsoni</i> .	СС	NT, MP DoE CIG	2012	1,2
<b>SM2.</b> Use the <i>Environmental Protection Fund</i> to purchase and protect <i>salt-tolerant succulents</i> areas in Barkers, and manage access on site, towards maximising visitor experience / minimising impact.	CC	DoE NT CIG	2010	1,2
<b>SM3.</b> Use the <i>Environmental Protection Fund</i> to extend Meagre Bay Pond Animal Sanctuary, to incorporate areas of <i>salt-tolerant succulents</i> along the eastern shore, and prevent dumping in this area.	CC	DoE NT CIG	2012	1,2
<b>SM4.</b> Establish experimental site for the design and testing of techniques to restore artificial <i>salt-tolerant succulents</i> , and determine the feasibility of a restoration programme.	DoE	IntC	2012	1,3
<b>SM5.</b> Subject to successful conclusion of SM4, embark upon a programme of restoration of <i>salt-tolerant succulents</i> habitat to suitable man-modified areas.	DoE		2015	1,3
SM6. Implement associated HAPs.	DoE		2015	1,2,3
Advisory				
A1. Work with <i>Department of Planning</i> to formalize	DoE	DoP	2012	3

restoration protocol for quarry applications, incorporate adherence to <i>salt-tolerant succulents</i> guidelines where appropriate, and promote establishment of an escrow fund to cover costs of implementation.		СРА		
A2. Targeted awareness of the need for the National Conservation I aw and the Endangered Species (Trade &	DoE	CIG NT	2006	1,2,3
Transport) Law.				
Cayman Pygmy Blue PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
---------------------------------------------------------------------	--------	----------	--------	--------------------
Research & Monitoring				
<b>RM1.</b> Survey and map remaining populations of	DoE	NT	2012	1,2
Brephidium exilis thompsoni, towards determining				
conservation status.				
<b>RM2.</b> Identify and prioritise most significant <i>pools</i> ,	DoE	NT	2012	1,2,3
ponds and mangrove lagoons and salt-tolerant				
succulents areas in the Cayman Islands				
<b>RM3.</b> Instigate the design and testing of experimental	DoE		2012	1,3
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.				
<b>RM4.</b> Investigate potential for artificial relocation and	DoE	IntC	2012	1,3
rearing / head-starting of Brephidium exilis larvae to				
facilitate population establishment in suitable areas.				
<b>RM5.</b> Establish experimental site for the design and	DoE	IntC	2012	1,3
testing of artificial restoration techniques for salt-tolerant				
succulents.				
<b>RM6.</b> Facilitate and promote research into terrestrial	DoE	IntC	2010	1
invertebrates in the Cayman Islands.				
<b>RM7.</b> Establish and develop a national invertebrates	DoE		2012	1
collection, with searchable online facility.				
Communication & Publicity				
CP1. Raise public awareness of the unique nature of	DoE NT	MP CN	2008	1,2,3
Brephidium exilis thompsoni and other endemic flora and	QEIIBP	GC OS		
fauna.		SB LCN		
<b>CP2.</b> Promote establishment of "study ponds" in schools.	DoE	NT MP	2012	1,2,3
		DE		
CP3. Utilise native flora and fauna, and associated	CIG	DoE DoT	2010	1,2,3
preservation efforts, in the international promotion of the		NT MP		
Cayman Islands.		QEIIBP		

# **REFERENCES and FURTHER READING for** Cayman Pygmy Blue

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### Grand Cayman Blue iguana Cyclura lewisi

### **INSERT IMAGES**

#### **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	Century plant Agave caymanensis
14. Dry shrubland	Cocoplum Chrysobalanus icaco
17. Farm and grassland	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 <u>www.BlueIguana.ky</u>. 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	2009
support one thousand Blue iguanas (requirement 300 - 500 acres).	
2. Restore, maintain and protect free-roaming Blue iguanas in natural habitats.	ongoing
<b>3.</b> Provide genetically optimal animals for reintroduction through the existing on-island	ongoing
captive breeding and head-starting programme.	
4. Safeguard against catastrophic loss of Grand Cayman Blue iguana populations by	ongoing
maintaining the off-island captive breeding population.	
5. Ensure sustained support for the conservation of the Blue iguana through targeted	ongoing
education and awareness programmes.	
6. Secure sufficient financial, technical and human resources for the long-term	ongoing
sustainability of the Blue Iguana Recovery Programme.	

Grand Cayman Blue iguana PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
<b>PL1.</b> Pass and implement the National Conservation Law.	CIG	DoE	2006	1-6
<b>PL2.</b> Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
<b>PL3.</b> Protect <i>Cyclura lewisi</i> under Schedule I of the National Conservation Law , through establishment of conservation regulations.	DoE	CIG	2006	1-6
<b>PL4</b> . Implementation of Species Recovery Plan for <i>Cyclura lewisi</i> .	BIRP	DoE NT QEIIBP	ongoing - 2008	1-6
<b>PL5.</b> Maintain local and international volunteer support for captive facility and field work.	BIRP	NT	ongoing	6
<b>PL6.</b> 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
<b>PL7.</b> 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
<b>PL8.</b> 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
<b>PL9.</b> Strengthen the <i>Development Plan</i> 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				
<b>SM1.</b> Identify land acquisition options and prioritise for the establishment of a shrubland reserve.	NT most suitable ar	EAC	2006 were identified	1,2
End of Grand Cayman, 2007. Both incorporate areas of Crown land: one other located approximately midway between the Salina Reserve and Co	abutting the so lliers Pond.	uthern boundary	of the East End	quarry, the

SM2. Use Crown land protection and the Environmental	CC	DoE NT	2009	1,2
Protection Fund to negotiate and purchase a shrubland		MP		
reserve with Government and local landowners.				
SM3. Request international contributions and matched	DoE		2009-	1,2
Crown contributions of land / funds for reserve			2010	
establishment.				
SM4. Establish an inalienable protected shrubland area	DoE	NT	2010	1,2
of ca. 500 acres.				
SM5. Joint management agreement and nature tourism	DoE NT		ongoing -	1,2
strategy for sustainable financing of a reserve.			2010	
SM6. Suitable habitat in the Salina and Botanic Park to	BIRP	NT	2007 -	2
be stocked to capacity.			2010	
<b>SM7.</b> Optimize genetic diversity of worldwide breeding	BIRP	SDZ	ongoing -	3,4
strategy and expand to 225 individuals / 20 founder lines.			2007	
<b>SM8.</b> Acquire and protect parcel of shrubland (65A / 37)	NT	DoE	2009	1,2
to consolidate Salina Reserve and increase its carrying				
capacity for Blue Iguanas.				
<b>SM9.</b> 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		s and fruit, colle	cted daily.	
Dietary change is accompanied by a significant increase in fecundity.				1 -
<b>SM10.</b> Security improvements at the breeding facility.	BIRP	NT	2008-9	2
SM10. REPORT: Seven adult iguanas were killed inside the captive breed	ding facility in	what appears to	be a wilful act o	f vandalism,
2008. RCIP investigations have, as yet, failed to identify perpetrators. In the Park by feral dogs, 2008, DoE Conservation Officers were balted from	a second incide	nt, two free-roa	concerns. Some	dogs were
trapped, however, at least one remains at large.	If shooting the t	logs annu logar	concerns. Some	dogs were
SM11. Implement associated HAPs.	DoE		2015	1-6
Advisory				
A1. Secure amendment of gazetted road corridors	DoE	NT	2009	1,2
through the critical east interior habitat.				
A2. Train Government officers / key personnel in	BIRP	DoE	2006	6
identification of Iguana iguana and Cyclura lewisi.				
A3. Targeted awareness of the need for the National	DoE	CIG NT	2006	1-6
Conservation Law and the Endangered Species (Trade &				
Transport) Law.				

Grand Cayman Blue iguana PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Identify capacity of additional areas for restocking (Barkers, Mastic, Wilderness Farm etc.).	BIRP	NT DoE CIG	2006	2
RM1. REPORT: Completed. Barkers and Wilderness Farm would suppor management issues. The Mastic grassland pockets are now reverting to se identified as two shrubland areas in East End, 2007.	t small populati econdary growth	ons, but pose sig 1 woodland. Mo	gnificant ongoin st suitable sites	lg were
<b>RM2.</b> Develop and test methods of non-native predator control for managed iguana habitats.	BIRP	DoE	2007	2,6
<b>RM3.</b> Assess the ecological impact of <i>Iguana iguana</i> on <i>Cyclura lewisi</i> .	BIRP	DWCT ISG DoE	2010	2,6
<b>RM4.</b> Quantify genetic structure of wild and captive populations.	BIRP	DWCT	2008-9	3
<b>RM5.</b> Publish existing data on Blue iguana diet.	BIRP		2010	2,3
<b>RM6.</b> Regular health screening of captive and QEIIBP wild populations.	BIRP	WCS DoA	ongoing	2
<b>RM7.</b> Construct quarters for visiting scientists.	BIRP	DoE	2009	6
Communication & Publicity				
<b>CP1.</b> Targeted awareness campaign to key sectors of Government and the local community	NT	DoE	2006 ongoing	5
<b>CP2.</b> Local and international media campaign.	NT	DoE BIRP	ongoing - 2006	5
<b>CP3.</b> Launch of educational DVD / schools packs.	BIRP	NT DE	2006- 2009	5
<b>CP4.</b> Island wide awareness of the differences between <i>Iguana iguana</i> and <i>Cyclura lewisi</i> .	BIRP	NT IRCF DoE	ongoing - 2007	5
<b>CP5.</b> Construction of a <i>Blue iguana shrublands</i> interpretative centre / classroom.	BIRP	DoE CIG NT IntC	2009	5
<b>CP6.</b> Develop and expand merchandising lines.	BIRP	NT IRCF	ongoing	5,6
<b>CP7.</b> Use <i>Cyclura lewisi</i> as a flagship for <i>dry shrubland</i>	DoE NT	CIG	2008	1-6
preservation.			ongoing	
<b>CP8.</b> 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

### FURTHER READING AND REFERENCES for Blue iguana

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### 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 3.4 cm SL (male/unsexed), 3.58 cm 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	Bats
13. Pools, ponds and mangrove lagoons	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 <i>Mosquito fish</i> , survey and determine Red List status.	2015
2. Promote preservation of <i>insitu</i> populations of <i>Mosquito fish</i> .	2015
<b>3.</b> Promote establishment of contingency populations of <i>Mosquito fish</i> in modified	2015
pools and environments.	

Mosquito fish PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
<b>PL1.</b> 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
<b>PL3.</b> Protect <i>Limia caymanensis</i> and <i>Gambusia</i> <i>xanthosoma</i> under Schedule II of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2,3
<b>PL4.</b> 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
<b>PL5.</b> 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
<b>PL6.</b> Strengthen the <i>Development Plan</i> 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				
<b>SM1.</b> Use the <i>Environmental Protection Fund</i> to establish a protected area / management agreement with landowners to protect <i>Mosquito fish</i> populations.	CC	NT, MP DoE CIG	2010	2
<b>SM2.</b> Incorporate habitat requirements for <i>Mosquito fish</i> into restoration of <i>pools, ponds and mangrove lagoons.</i>	DoE	MP	2015	2
<b>SM3.</b> Encourage introduction of <i>Mosquito fish</i> into suitable <i>pools</i> , <i>ponds and mangrove lagoons</i> and other habitats.	DoE	MP	2015	3
SM4. Implement associated HAPs.	DoE		2015	1,2,3
Advisory		•	•	1
A1. Provide advice for landowners on the effective management <i>pools, ponds and mangrove lagoons</i> , to conserve <i>Mosquito fish.</i>	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				
<b>RM1.</b> Survey and map populations of <i>Mosquito fish</i> .	DoE		2012	1
RM2. Determine local IUCN status of Mosquito fish.	DoE		2012	1
<b>RM3.</b> Identify habitat requirements and key areas of natural habitat for <i>Mosquito fish</i> .	DoE	MRCU	2012	1,2,3
<b>RM4.</b> Investigate potential for artificial rearing to	DoE	IntC	2012	1,3
facilitate improved survivorship, and establishment of				
contingency populations in suitable sites.				
Communication & Publicity				
CP1. Raise awareness of the unique nature of Mosquito	DoE NT	MP, CN	2008	1,2,3
fish and other endemic flora and fauna.	QEIIBP	GC, OS		
		SB, LCN		
CP2. Raise awareness of <i>Mosquito fish</i> with a children's	DoE	NT MP	2012	1,2,3
competition to think of a "common name" for each, and		DE		
promotion of establishment of "study ponds" in schools.				
CP3. Utilise native flora and fauna, and associated	CIG	DoE DoT	2010	1,2,3
preservation efforts, in the international promotion of the		NT MP		
Cayman Islands.		QEIIBP		

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#### 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 (28km²) 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 sealevel 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	ongoing
influence, and encourage population stability and / or expansion, through	
appropriate conservation management.	
2. Establish a regular, long-term, minimum-disturbance monitoring programme for	2010
the booby colony.	
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
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PROPOSED ACTION				OBJECTIVE
Policy & Legislation				
<b>PL1.</b> Pass and implement the National Conservation	CIG	DoE	2006	1,2,3,4
Law.				
PL2. Implement the Endangered Species (Trade &	DoE	CIG	2006	1
Transport) Law.		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
PL3. Protect <i>Sula sula</i> under Schedule I of the National	DoE	CIG	2006	1,2,3,4
Conservation Law, through establishment of				
conservation regulations.	<b>D</b> D		2010	
<b>PL4.</b> Promote amendment of the Planning Law, to	DoP	DOE CIG	2010	1
facilitate rapid imposition of stop-orders on inegai				
developments and provide a responsive and effective				
enforcement mechanism.	DoD	CIC MD	ongoing	1
<b>rL3.</b> Promote establishment of a <i>Development 1 un</i> for the Sister Jelands, incorporating a long-term vision for	DOP		ongoing	1
the environmental social and economic development of	DCD	DOL		
the Islands				
PI 6 Promote sympathetic management of current	DoE NT	CIG	ongoing	1
airport facilities and appropriate siting and management	DOLINI		Ungoing	1
of proposed airport facilities, to ensure minimal risk to				
aircraft passengers from birdstrike, and minimal impact				
on local birdlife.				
<b>PL7.</b> Enable DoE Conservation Officers to implement	DoE	CIG	2008	1.3
legal eradication of invasive species, as necessary to				7-
ensure the survival of endangered native species.				
<b>PL8.</b> Commence prosecution for offences involving	DoE	CIG	2009	1
damage to existing Animal Sanctuaries and Ramsar sites,				
and associated buffer zones, and update and upgrade				
penalties for transgression of associated regulations.				
Safeguards & Management				
SM1. Continue protection and reserves management.	NT	DoE	ongoing	1,2,3,4
SM2. Demarcation of the northern boundary of the	DoE	NT	2010	1
reserve, using DoE's GPS capability.				
SM3. Subject to RM3, eradicate feral cats in Little	DEH	SIDA HS	2012	4
Cayman, and spay all domestic cats.	DoA			
	DoE			
SM4. Subject to RM3, develop and implement long-term	DEH NT	SIDA HS	2012	4
non-native predator control on site.	DoA			
	DoE		2010	1.2.2.1
<b>SM5.</b> Establish a full-time DoE field conservation officer	DoE		2012	1,2,3,4
on Cayman Brac and Little Cayman to implement				
conservation actions.		Lic	2012	1004
SM6. Update the 1995 Management Plan for the Booby	NT DOE	IntC	2012	1,2,3,4
Pond Nature Reserve.	D-E		2015	1024
SM1. Implement associated HAPs.	DOE		2015	1,2,3,4
Advisory		T	2012	1
AI. Recommend replaining of old fandrin site, with pative species congruent with the native vegetation of the	NI DOE		2012	1
Deeby Dond recerve				
A2 Bacommond restrictive guidelines for artificial	DoE	CIC	2010	1
A2. Recommend resultave guidennes for artificial	DOL		2010	1
A 3 Targeted awareness of the need for the National	DoF	CIG NT	2006	1234
Conservation I aw and the Endangered Species (Trade &	DUL		2000	1,2,3,7
Transport) Law.				

Red-footed booby PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Develop and implement regular, minimum	NT DoE	RSPB	2010	2
disturbance aerial monitoring programme for the booby	MRCU	IntC		
colony, to determine population size, incorporating				
occasional ground survey, to calibrate accuracy of aerial				
observations and determine breeding success.				
RM1. REPORT: DoE, with support of RSPB, purchases gyroscopic-mou	nt camera system	n for high quali	ty aerial photog	raphy, 2009.
<b>RM2.</b> Construct quarters for visiting scientists in Little	DoE	IntC	2012	1,2,3,4
Cayman and Cayman Brac, and support research				
initiatives complimentary to the objectives of the NBAP.				
RM2. REPORT: Accommodation for up to four individuals on Little Cay	man established	l by DoE, 2008.		
<b>RM3.</b> Conduct pilot project towards eradication of feral	DoE CSL	DoA	2015	1,3
cats in Little Cayman.				
RM3. REPORT: Pilot project completed by DoE and DoA, 2008. All pet	cats in Little Ca	ayman were mic	ro-chipped. Tw	enty eight cats
were removed through trapping, however, more remain. Trap-shy individ	uals will require	e alternative con	trol methods.	1.0
<b>RM4.</b> Monitor the rookery area, ensuring the buffer	NT DOE		2010	1,2
protection zone is adequate.				
Communication & Publicity		1	1	n
<b>CP1</b> . Produce brochure guides to the area.	DoT NT	DoE	ongoing	4
	SIDA			
<b>CP2.</b> Establish of a dedicated warden / nature tour guide,	NT	DoE DoT	2012	1,2,3,4
responsible for site maintenance.		SIDA		
<b>CP3.</b> Improve interpretative facilities at key areas.	NT	DoE DoT	ongoing	4
		SIDA		
<b>CP4.</b> Raise public awareness of the Red-footed booby	NT	DoE	ongoing	4
and other birds through local media (e.g. Know your		DE	0 0	
Islands column), public talks and schools presentations				
(e.g. Do You Know Me?), and natural history websites.				
CP4. REPORT: DoE and NMBCA jointly fund development of Bird ID c	cards for NT "D	o You Know M	e?" programme,	and Virtual
Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 20	)07.			

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### 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

2015
2006
ongoing
2009
2008
-

	Vitelline warbler	LEAD	PARTNERS	TARGET	MEETS
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PROPOSED ACTION				OBJECTIVE
Policy & Legislation				
<b>PL1.</b> Pass and implement the National Conservation Law.	CIG	DoE	2006	1-5
<b>PL2.</b> Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	5
<b>PL3.</b> Protect <i>Dendroica vitellina</i> 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
<b>PL5.</b> 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
<b>PL6.</b> Strengthen the <i>Development Plan</i> 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
<b>PL7.</b> Promote establishment of a <i>Development Plan</i> 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
<b>PL8.</b> 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			·	1
<b>SM1.</b> 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
<b>SM2.</b> Use the <i>Environmental Protection Fund</i> 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
<b>SM3.</b> Continue to request local / international funds and matched contributions to establish key reserves.	DoE NT	IntC	ongoing	1
<b>SM4.</b> 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
<b>SM5.</b> Establish strategic woodland patches in <i>urban and man-modified areas</i> , including LPP, to act as refugia and maintain wildlife corridors.	DoE	MP NT CIG DoP	2006	1,4
<b>SM6.</b> Control predation by rats, cats, <i>Iguana iguana</i> , and potential colonisation of the Shiny cowbird <i>Molothrus bonariensis</i> .	DEH DoE DoA	NT HS	2007	5
<b>SM7.</b> Restore damaged habitat where possible.	DoE NT MP		2010	1,4
<b>SM8.</b> 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	DoE	NT	ongoing	1
order that they no pass through (i) critical east interior	NRA	DoP		
habitat, Grand Cayman (ii) the Nature Trail, Little		CPA		
Cayman and (iii) the parrot Reserve, Cayman Brac.		DCB		
A2. Establish management strategy to develop nature	NT	DoE	2006	3
tourism in reserves with sustainable financial planning.	SIDA	DoA	ongoing	
	CITA			
	SITA			
A3. Develop and recommend guidelines for native	DoE DoP	SIDA	2009	4
vegetation maintenance / landscaping, particularly for				
developments in littoral areas.				
A4. Promote use of native plants in landscaping, through	DoP	DoE	2009	4
maintenance of existing vegetation and use of				
Recommended Planting Palette in new developments.				
A5. Targeted awareness of the need for the National	DoE	CIG NT	2006	1-5
Conservation Law and the Endangered Species (Trade &				
Transport) Law.				

Vitelline warbler PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Develop and implement methods of non-native	DoE	NT	20010	5
predator control for managed warbler habitats.	DoA	HS		
<b>RM2.</b> Assess the ecological impact of <i>Iguana iguana</i> on	DoE	NT	2010	5
the Vitelline warbler.				
<b>RM3.</b> Continue monitoring and map distribution of the	DoE NT		ongoing	2
Vitelline warbler in the Cayman Islands.	BC MP			
<b>RM4.</b> Assess population status of Vitelline warblers in	DoE NT		ongoing	2
the Swan Islands, towards contextualising conservation	BC MP			
status of local populations.				
<b>RM5.</b> Monitor habitat for early stages of the colonisation	DoE NT		ongoing	5
by Molothrus bonariensis.	BC MP			
<b>RM6.</b> Construct quarters for visiting scientists in	DoE		2012	2,3
Cayman Brac, and support research initiatives				
complimentary to the objectives of the NBAP.				
Communication & Publicity				
CP1. Raise public awareness of Vitelline warblers and	NT	DoE BC	2006	3
other birds through local media (e.g. Know Your		DE	ongoing	
Islands), special events (e.g. Birds stamp issue), public				
talks and schools presentations (e.g. Do You Know Me?)				
and natural history websites.				
CP1. REPORT: DoE and NMBCA jointly fund development of Bird ID of	ards for NT "D	o You Know M	e?" programme	, and Virtual
Bird Guide for the Cayman Islands through CaymanBiodiversity.com, 20	07. NT		2007	
CP2. Development of National Trust's interpretative	IN I		2007	3
centre for conservation education.	NT	DE	2006	2
<b>CP3.</b> Install interpretative signs on National Trust nature	NT	DoE	2006	3
			2010	2.4
<b>CP4.</b> Raise awareness of the value of native landscaping	DOE DOP	MP CN	2010	3,4
for wildlife.	NI	GC OS		
	QEIIBP	SB LCN	2010	
CP5. Utilise native flora and fauna, and associated	CIG	DOE DOT	2010	5
preservation efforts, in the international promotion of the		NTMP		
Cayman Islands.		QEIIBP		

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### 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 nonmigratory. 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	Red-footed booby Sula sula
9. Mangrove	Cayman parrot Amazona leucocephala
12. Salt-tolerant succulents	Cayman Pygmy Blue butterfly Brephidium exilis thompsoni
13. Pools, ponds and mangrove lagoons	
17. Farm and grassland	
18. Urban and man-modified areas	

### **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: <u>www.whistlingduck.org</u>.

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
<b>1.</b> Commence detailed studies of <i>Dendrocygna arborea</i> to determine status and dynamics of local populations.	2009
2. Implement planning and conservation action towards maintaining Dendrocygna	2012
arborea, and encouraging population stability, and recovery.	

West Indian Whistling-duck PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
<b>PL1.</b> Pass and implement the National Conservation Law.	CIG	DoE	2006	1,2
<b>PL2.</b> Implement the Endangered Species (Trade & Transport) Law.	DoE	CIG	2006	2
<b>PL3.</b> Protect <i>Dendrocygna arborea</i> under Schedule I of the National Conservation Law, through establishment of conservation regulations.	DoE	CIG	2006	1,2
<b>PL4.</b> 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
<b>PL5.</b> Strengthen the <i>Development Plan</i> 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
<b>PL6.</b> Promote establishment of a <i>Development Plan</i> 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
<b>PL7.</b> 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		1	•	1
<b>SM1.</b> Use the <i>Environmental Protection Fund</i> to protect key areas of habitat for <i>Dendrocygna arborea</i> .	CC	DoE MP NT	2006	2
<b>SM2.</b> Transfer Little Cayman Crown Wetlands to protected area status.	CC	DoE CIG MP NT	2012	2
<b>SM3.</b> Subject to SM2, designate Little Cayman Crown Wetlands a Ramsar site.	DoE	CC CIG MP NT	2012	2
<b>SM4.</b> Control predation by rats, cats, and deter potential for predation by <i>Iguana iguana</i> .	DEH DoE DoA	NT HS	2009	2
<b>SM5.</b> Restore damaged nesting habitat where possible.	DoE NT MP		2010	2
<b>SM6.</b> Establish a full-time DoE field conservation officer on Cayman Brac and Little Cayman to implement conservation actions.	DoE		2012	1,2
<b>SM7.</b> Incorporate isolated islands into development guidelines for restoration of degraded <i>pools, ponds and mangrove lagoons</i> , to facilitate roosting and nesting habitat for <i>Dendrocygna arborea</i> .	DoE	DoP CPA DCB MP	2012	1,2
SINIS. Implement associated HAPs.	DOE		2015	1,2

Advisory				
A1. Develop and recommend guidelines for native	DoE DoP	SIDA	2009	2
vegetation maintenance / landscaping, particularly for				
developments in wetland areas.				
A2. Promote use of native plants in landscaping, through	DoP	DoE	2009	2
maintenance of existing vegetation and use of				
Recommended Planting Palette in new developments.				
A3. Targeted awareness of the need for the National	DoE	CIG NT	2006	1,2
Conservation Law and the Endangered Species (Trade &				
Transport) Law.				

West Indian Whistling-duck PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Develop and implement methods of non-native	DoE	NT	2007	1,2
predator control in colony areas.	DoA	HS		
<b>RM2.</b> Complete detailed mapping of nest sites to	DoE	NT	ongoing	1
determine precise population distribution and numbers,				
and key areas of habitat.				
<b>RM3.</b> Undertake monitoring of artificial feeding sites to	DoE		2010	1
determine diet and nature of interactions, and need to				
develop guidelines.				
<b>RM4.</b> Collaborate with scientists from other Caribbean	DoE	SCSCB	2010	1
islands, to encourage work on projects complimentary to		IntC		
the conservation of Dendrocygna arborea.				
<b>RM5.</b> Investigate potential for artificial nest box	DoE	NT	2009	2
programme to promote population sustainability.				
Communication & Publicity				
CP1. Raise public awareness of Dendrocygna arborea	NT	DoE BC	2006	2
and other birds through local media (e.g. Know Your		DE	ongoing	
Islands), special events (e.g. Birds stamp issue), public				
talks and schools presentations (e.g. Do You Know Me?)				
and natural history websites.				
CP1. REPORT: DoE and NMBCA jointly fund development of Bird ID of	ards for NT "D	o You Know Me	e?" programme.	, and Virtual
<b>CP2</b> Install interpretative signs on nature trails	I NT	DoF	2006	2
CP2 REPORT: Informational signage featuring Whistling-ducks installe	d by NT_adjace	ent highways in t	Grand Cayman	2008 toward
discouraging roadside feeding, and encouraging traffic to slow down.	u by min, aujace	Jit ingirmajo	Stand Cayman,	2000, 10 mile
<b>CP3.</b> Use <i>Dendrocygna arborea</i> as a flagship for the	DoE NT	CIG	2010	2
protection of key areas of mangrove and salt-tolerant				
succulents.				
CP4. Utilise native flora and fauna, and associated	CIG	DoE DoT	2010	2
preservation efforts, in the international promotion of the		NT MP		
Cayman Islands.		QEIIBP		

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*Wondrous West Indian Wetlands: Teachers' Resource Book.* This 276-page workbook, published in July 2001, was written by the WIWD Working Group for teachers and educators in the West Indies.

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#### 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	Whelks & Soldier crab Cittarium pica & Coenobita clypeatus
9. Mangrove	Cayman parrot Amazona leucocephala
18. Urban and man-modified areas	West Indian Whistling-duck Dendrocygna arborea
19. Roads	

### **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
<b>1.</b> Ensure that local populations are protected from extirpation, and maintain the long-	2015
term stability of stock for sustainable harvest.	
2. Determine status of, and threats to, local populations.	2009
<b>3.</b> Ensure sustained support for the conservation of Land crabs through targeted	2008
education and awareness programmes.	

White Land crab	LEAD	PARTNERS	TARGET	MEETS
PROPOSED ACTION				OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation	CIG	DoE	2006	1,2,3
Law.				
PL2. Implement the Endangered Species (Trade &	DoE	CIG	2006	2
Transport) Law.				
PL3. Protect Cardisoma guanhumi under Schedule II of	DoE	CIG	2006	1,2,3
the National Conservation Law , through establishment				
of conservation regulations.			2010	
<b>PL4.</b> Promote amendment of the Planning Law, to	DoP	DoE CIG	2010	2,3
facilitate rapid imposition of stop-orders on illegal				
developments and provide a responsive and effective				
enforcement mechanism.	D-E		2010	1
<b>PL5.</b> Develop, maintain and enforce regulations	DOE	CIG	2010	1
appropriate to maintenance of the long-term sustainable	мсв			
narvesting of Caraisoma guannumi.	DeD		- nacina	1.0
<b>PL6.</b> Strengthen the <i>Development Plan</i> on Granu	DOP		ongoing	1,2
cayinan, incorporating a long-term vision for the	CrA	DOE		
Islande				
<b>PI 7</b> Promote establishment of a <i>Development Plan</i> for	DoP	CIG MP	ongoing	12
the Sister Islands incorporating a long-term vision for	DCB	DoE	ongoing	1,2
the environmental social and economic development of	DCD	DOL		
the Islands.				
Safeguards & Management				
<b>SM1.</b> Establish a closed season and bag limits for	DoE	IntC	2012	1
collectors, incorporating minimum carapace size limit for				
collection (possibly to allow ca. 6-7 years worth of				
reproduction), as necessary to maintain population				
stability.				
SM2. Utilise key habitat and migratory route data to	CC DoE	IntC	2012	1,2
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.				
SM3. Investigate potential for under road conduit /	DoE	DoP	2012	1,2
animal corridors at key road crossing sites.		NRA		
		CPA		
		DCB	2010	1.0
SM4. Consider ban on collection of berried females, and,	DoE		2012	1,2
subject to KM4, possibly all remains as necessary to				
maintain population stability.				

SM5. Implement associated HAPs.	DoE	2015	1,2,3
Advisory			
None.			

White Land crab PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Research & Monitoring				
<b>RM1.</b> Map potential <i>Cardisoma guanhumi</i> habitat on all three islands.	DoE		2008	2
<b>RM2.</b> Survey existing population to determine baseline, immediate threats, and establish monitoring program.	DoE	MRCU	2010	1,2
<b>RM3.</b> Monitor biological aspects of catch through catchery sampling.	DoE		2010	1,2
<b>RM4.</b> Identification of local crab catchers, and potential crab processing and outlets.	DoE	MP	2011	1,2
<b>RM5.</b> Hold discussions with crab collectors to enlist their participation in the collection of catch information.	DoE	IntC MP	2011	1,2,3
<b>RM6.</b> 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
<b>RM7.</b> Determine peak spawning season and seasonal reproductive patterns.	DoE	IntC	2010	1,2
<b>RM8.</b> Determine critical migration routes, and influencing factors, towards implementing modification of road design to reduce mortality to <i>Cardisoma guanhumi</i> and other migrating Land crabs.	DoE	IntC	2012	1,2
<b>RM9.</b> Collaborate with international researchers to examine designs for under road conduits and animal corridors at key crossing sites along migratory routes for <i>Cardisoma guanhumi</i> and other migrating Land crabs.	DoE	IntC NRA MRCU	2012	1,2
Communication & Publicity				-
<b>CP1.</b> 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
<b>CP2.</b> Targeted awareness campaign to key sectors of Government to assist in adopting management and legislation recommendations.	DoE	CIG	2015	3
<b>CP3.</b> Produce educational fact sheet detailing ecology and biology of Land crabs for schools and local public.	DoE	DE	2009	3
<b>CP4.</b> 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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"Sustainable Management of the Black Land Crab *Gecarcinus ruricola*, Colombia (162/11/015)" <u>http://darwin.defra.gov.uk/documents/11015/4212/11-015%20AR1%20-%20edited.pdf</u>

### 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 tropic birds

ASSOCIATED HABITAT PLANS	ASSOCIATED SPECIES PLANS
1. Open sea	Verbesina caymanensis
7. Maritime cliffs and Ironshore	Brown booby Sula leucogaster
16. Caves	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 <i>Phaethon lepturus</i> to determine status of local	2009
populations, and the nature of their decline.	
2. Implement conservation action towards halting the decline of <i>Phaethon lepturus</i> ,	2012
and encouraging a population recovery.	
<b>3.</b> Increase nesting population of <i>Phaethon lepturus</i> by 100%.	2015

White-tailed tropicbirds PROPOSED ACTION	LEAD	PARTNERS	TARGET	MEETS OBJECTIVE
Policy & Legislation				
PL1. Pass and implement the National Conservation	CIG	DoE	2006	1,2,3
Law.				
PL2. Implement the Endangered Species (Trade &	DoE	CIG	2006	2
Transport) Law.				
PL3. Protect Phaethon lepturus under Schedule I of the	DoE	CIG	2006	1,2,3
National Conservation Law, through establishment of				
conservation regulations.				
PL4. Promote amendment of the Planning Law, to	DoP	DoE CIG	2010	2
facilitate rapid imposition of stop-orders on illegal				
developments and provide a responsive and effective				
enforcement mechanism.				
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	CPA	DoE		
Islands.				
<b>PL6.</b> Promote establishment of a <i>Development Plan</i> 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
<b>PL7.</b> 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				
<b>SM1.</b> Establish the bluff face Crown lands as protected areas, and use the <i>Environmental Protection Fund</i> 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
<b>SM2.</b> Control predation by rats, cats, and deter potential for predation by <i>Iguana iguana</i> .	DEH DoE HS DoA	NT	2009	2,3
<b>SM3.</b> Restore damaged nesting habitat where possible, and utilise artificial cavities as appropriate, towards recovering 1980s population levels.	DoE NT MP		2012	2,3
<b>SM4.</b> 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			1	
A1. Develop and recommend guidelines for native vegetation maintenance / landscaping, particularly for developments in littoral areas.	DoE DoP	SIDA	2009	2
<b>A2.</b> Promote use of native plants in landscaping, through maintenance of existing vegetation and use of <i>Recommended Planting Palette</i> in new developments.	DoP	DoE	2009	2
<b>A3.</b> 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				
<b>RM1.</b> Develop and implement methods of non-native	DoE	NT HS	2009	1,2,3
predator control in colony areas.	DoA	IntC		
<b>RM2.</b> Complete detailed mapping of nest sites to	DoE	NT IntC	2012	1
determine precise colony distribution and numbers.				
<b>RM3.</b> Undertake nest site monitoring, to determine	DoE	IntC	2012	1
feeding regimes, diet selection and breeding success,				
towards elucidating factors influencing fecundity.				
<b>RM4.</b> Assess population for possible effects of pollution	DoE	DoA MP	2012	1
and/or disease.		IntC		
<b>RM5.</b> Collaborate with scientists from other Caribbean	DoE	IntC	2012	1
islands, with previous experience of artificial nesting				
cavity construction for Phaethon lepturus.				
RM6. Construct quarters for visiting scientists in	DoE		2012	1,2,3
Cayman Brac, and support research initiatives				
complimentary to the objectives of the NBAP.				
Communication & Publicity				
CP1. Raise public awareness of Phaethon lepturus and	NT	DoE BC	2006	2
other birds through local media (e.g. Know Your		DE	ongoing	
Islands), special events (e.g. Birds stamp issue), public				
talks and schools presentations (e.g. Do You Know Me?)				
and natural history websites.				
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 Cayman	Biodiversity.co	om, 2007.	2007	2
CP2. Install interpretative signs on nature trails and areas	NI DOE		2006	2
OF Interest.		CIC	2000	2
<b>CP3.</b> Use <i>Phaethon lepturus</i> as a flagship for the	DOE NI	CIG	2009	2
protection of key areas of <i>Marine cliffs and fronshore</i> as				
areas of outstanding natural beauty.	CIC		2010	2
CP4. Utilise native flora and fauna, and associated	CIG	DOE DOT	2010	2
preservation efforts, in the international promotion of the		NT MP		
Cayman Islands.		QEIIBP		

### **REFERENCES and FURTHER READING for White-tailed tropicbirds**

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Appendix K.4 -Proposed Project Habitats and Land Uses Map

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman





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East-West Arterial Extension, Environmental Impact Assessment

# Habitats and Land Uses

Figure: A

### Man-modified Land Uses

Arra

- Commercial Man-made Pond
- Man-modified with Trees
- Man-modified without Trees
- 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





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



Seasonally Flooded Mangrove Forest and Woodland



Sources: Cayman DOE and ESRI

~	000	000
0	300	600



### Man-modified Land Uses

- Man-modified with Trees
- Man-modified without Trees

### Wetland_Habitats

Seasonally Flooded Mangrove Forest and Woodland

### Habitats and Land Uses Figure: C

# East-West Arterial Extension, Environmental Impact Assessment





Ser Part

600

- Feet

300



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 DOL and LSKI	Sources:	Cayman	DOE	and	ESRI
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0	200	600
0	300	000





521_Cay

East-West Arterial Extension, Environmental Impact Assessment

### Habitats and Land Uses Figure: E

### Man-modified Land Uses

- Commercial
- Man-modified with Trees
- Man-modified without Trees
- Residential

### Upland Habitats

Dry Forest and Woodland

### Wetland_Habitats

Seasonally Flooded Mangrove Forest and Woodland



### Sources: Cayman DOE and ESRI

11		
0	300	600
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Appendix K.5 -2020 Cayman Islands Ecosystem Accounting

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman







# Cayman Islands Ecosystem Accounting

2020 Ecosystem Account

February 2022



4 City Road London EC1Y 2AA



# This document has been prepared for the Government of the Cayman Islands by:

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### **Reviewer**

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### Acknowledgements

We would like to thank those who provided data to support this work.

### Disclaimer

Whilst eftec has endeavoured to provide accurate and reliable information, eftec is reliant on the accuracy of underlying data provided and those readily available in the public domain. eftec will not be responsible for any loss or damage caused by relying on the content contained in this report.

### **Document evolution**

Final report   01/2022   Reviewed by Jake Kuyer	report
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This report is based on eftec's Version 2 – January 2020 report template.



eftec offsets its carbon emissions through a biodiversityfriendly voluntary offset purchased from the World Land Trust (http://www. carbonbalanced.org) and only prints on 100% recycled paper.

# 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 assets¹. 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

² See: <u>https://seea.un.org/ecosystem-accounting</u>

³ More information is available at: <u>https://sdgs.un.org/goals</u> 2020 Ecosystem Account | February 2022

¹ See Box 1 for more detail.

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).

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	٠	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	٠	Not assessed

### Table 1: Description of confidence

### Cayman Islands Ecosystem Account

### Table 2: Ecosystem Service Flow and Asset Accounts

	Ecosystem Service Flow Accounts							
Produced at: January,		Physica	al flow (unit/yr.)		Asset Account			
2022	Reporting Confidence		Physical indicator	Reporting	Confidence	Valuation metric	(PV* Cl\$m)	
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	
A gui guiltung	5,061	•	Total livestock production (no./yr.)	2	•	Total value of livestock production	25	
Agriculture	-	٠	Total arable production (t/yr.)	18	•	Total value of arable production	272	
Carbon sequestration	68,500	٠	Total tonnes of CO ₂ e sequestered by coastal ecosystems (tCO ₂ e/yr.)	11	•	Total value of CO ₂ e sequestered by coastal ecosystems	272	
	9,393	•	Total tonnes of CO ₂ e sequestered by forest ecosystems (tCO ₂ e/yr.)	1	•	Total value of CO ₂ e sequestered by forest ecosystems	37	
Coastal protection	-	٠	Area of coral reef (km ² )	7	•	Coastal protection value by coral reefs	112	
Tourism	598,263	٠	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.

### Cayman Islands Ecosystem Account

### Table 3: Supplementary information

Due due a die te te sure a	Ecosystem Service Flow Accounts						Ecosystem	
Produced at: January,	Physical flow (unit/yr.)			Monetary value (Cl\$m/yr.)			Asset Account	
2022	Reporting	porting Confidence Physical indicator		Reporting Confidence		Valuation metric	(PV* Cl\$m)	
Other exchange values				·				
Tourism	598,263	٠	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	٠	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.

2020 Ecosystem Account | February 2022

### 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.

IUCN Code	Ecosystem	Grand	Cayman	Little	Cayman			
		Cayman	Brac	Cayman	Islands			
Terrestrial								
Total area (	km²)	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 (benth	ic and lagoon sl	helf)					
Total area (l	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			

### Table 4: Ecosystem Extent Account

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 for	est above 20 feet elevation (km ² )	38	-	-	38				
Area of protect	ted land (km²)	14	1	2	17				
Area of propos	ed protected land (km ² )	44	10	15	69				
Marine protected area (km ² )		88	7	15	110				
Carbon stock	Inside MPAs	446,100	100	12,600	458,800				
(MgC)	Outside MPAs	2,616,800	8,200	192,000	2,817,000				
Total area of s	pecies-specific habitat (km²)	5	15	2	22				
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Category	Sub-category	Grand Cayman	Cayman Brac	Little Cayman	Cayman Islands	
Charles	Aegiphilia caymanensis	2	-	-	2	
points by type (#)	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 2020 Ecosystem Account | February 2022

#### **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.

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# **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**).





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**).

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.

### Table 1: Presenting uncertainty in the physical and monetary terms of ecosystem services

# 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).

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

### Table A.1: Definitions of frequency of input data updates

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.

	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

### Table A.2: Input data for the Ecosystem Extent Account

# 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'.

Description	Source	Frequency	Workbook reference		
	Ecological communities	s and species			
Area of day forest above 20ft	Derived from GC Dry Forest		A1. Asset register tab		
alevation	Above 20ft	As source is updated			
elevation	Elevation_WGS84UTM.shp				
Area of protected land	Combination of sources	As source is undated	A1. Asset register tab		
Area or protected land	listed in workbook	As source is upualed			
Area of proposed protected land	Combination of sources	As source is undated	A1. Asset register tab		
Area or proposed protected faild	listed in workbook	As source is upualed			
Area of Marine Protected Areas	Combination of sources	As source is updated	A1 Accet register tab		
(MPAs)	listed in workbook	As source is updated	AT. ASSel Tegisler lab		
Total carbon stock (in and outside	Guzman et al (2017)	As new evidence becomes	A1 Assot register tab		
MPAs)	Guzman et al. (2017)	available	AT, Asset register tab		
Area of species habitats by type	Combination of sources	As source is updated	A1. Asset register tab		
	listed in workbook				
Species points	Combination of sources	As source is updated	A1. Asset register tab		
Species points	listed in workbook	As source is updated			
Land					
Land area owned by The Crown	Combination of sources	As source is updated	A1. Asset register tab		
	listed in workbook	As source is upualed			
Land area owned by the National	Combination of sources	As source is updated	A1 Accet register tab		
Trust	listed in workbook	As source is updated	AT. ASSELTERISLET LOD		

### Table A.3: Input data for the Ecosystem Condition Account

#### 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		

### Table A 4. Innut data fay atbay indicators

# 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 materiality⁵ 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 value⁶ (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 values⁷ 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).
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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).

Benefit	Physical indicator	Monetary valuation metric and method		
	Ecosystem Service Flow ar	nd Asset Accounts		
Fisheries	Volume of output	Market prices		
Agriculture	Volume of output	Value added by production		
Carbon sequestration	Tonnes of CO ₂ e sequestered	Non-traded central carbon value BEIS (2019), $\pounds/tCO_2e$		
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 inf	formation		
	Other exchange	values		
Tourism	Tourist visits	Remaining visitor expenditure attributed to		
		ecosystems		
	Welfare val	ues		
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.5: Overview of benefits

### 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.			
	Average number of goats, cattle, pigs and poultry (2015-2020).	Average detailed value added by livestock production (2015-2019) ¹ .			
Agriculture	-	Average detailed value added by arable production (2015-2019).			
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Benefit	Physical terms	Monetary terms		
Carbon	No change in sequestration rates over time	Value of carbon emissions increase over time		
sequestration	No change in sequestration rates 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		
	Average number of tourists (2010-2020).	(2016-2020).		
Amenityvalue	No change in number of houses compared to	Assumed constant economic value of benefit		
	the baseline year.	over time.		
	Supplementary informat	ion		
	Other exchange values	5		
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		
rounsm		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-scale⁸. 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 approach⁹. 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.

⁹ Market-based valuation method that estimates the net benefit of fishing by taking into account costs of other production factors and revenue generated.
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⁸ This is based on evidence from Meier et al. (2011) and Henshall (2009) cited in the Guzman et al., 2017).

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, Cl\$7.5/lbs. Resulting in an estimate of total annual revenue of recreation, subsistence and small-scale commercial fishing equal to Cl\$5.3 million, in 2020 prices. Total annual costs are estimated as 44%¹⁰ of total revenue which is Cl\$2.3 million. The annual net benefit is estimated as the difference between total revenue and total cost, just below Cl\$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.

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 t	erms			
Average price of reef fish species in the Cayman Islands, US\$/Ibs	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		

#### Table A.7: Input data for the fisheries benefits

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.
# A.1.4 Agriculture

Agricultural activities in the Cayman Islands include livestock (goats, pigs, cattle and poultry) and nonlivestock 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.

Description	Source	Frequency	Workbook reference
	Physical te	erms	
Grand Cayman total number	Economics and Statistics	As source is updated	2.1a
of goats	Office (2021)		
Grand Cayman total number	Economics and Statistics	As source is updated	2.1b
of pigs	Office (2021)		
Grand Cayman total number	Economics and Statistics	As source is updated	21c
of cattle	Office (2021)	As source is upuated	2.10
Cayman Brac total number of	Economics and Statistics	As source is undated	2.1.0
goats	Office (2021)	As source is updated	2.10
Cayman Brac total number of	Economics and Statistics		2.15
pigs	Office (2021)	As source is updated	2.11
Cayman Brac total number of	Economics and Statistics		21-
cattle	Office (2021)	As source is updated	2.1g
	Department of Environment	Source has been superseded	2.15
Sister Islands total poultry	(2020)	by updated source	2.10
Cayman Islands total poultry	Economics and Statistics		2.1:
production	Office (2021)	As source is updated	Ζ.11
Monetary terms			
Detailed value added by	Economics and Statistics	As source is undated	2.22
industry - Agriculture	Office (2020)	As source is updated	Z.Zd
	1	1	

#### Table A.8: Input data for agricultural benefits

The Cayman Islands GHG inventory (Department of Environment, 2020) does indicate that there is nonlivestock 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.

-			
Description	Source	Frequency	Workbook reference
	Physical te	erms	
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

#### Table A.9: Input data for water supply

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 Itd 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.

Description	Source	Frequency	Workbook reference
	Physical te	rms	
Summary of CUC CORE FIT	Department of Environment	As source is undated	412
programme	(2020)	As source is updated	4.1d
Summary of CUC DER	Department of Environment	As source is undated	4.1b
programme	(2020)	As source is updated	4.10
Solar panel or solar farms	Department of Environment	As source is undated	110
applications	(2020)	As source is updated	4.10
Monetary terms			
CUC's Core programme rate	Department of Environment	As source is undated	122
tier	(2020)	As source is updated	4.2a

#### Table A.10: Input data for renewable energy

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 CO₂ 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 tC¹¹ to tCO₂e 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.

Habitat	Murray et al. (2011); IUCN (2017)	Alongi (2014) ¹	Midpoint
	Terrest	rial	
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
Seagrass Saltmarsh Mangroves Estuaries Shelves	4.4 8.0 6.3 -	2.0 5.5 6.4 1.7 0.6	3.2 6.8 6.3 1.7 0.6

#### Table A.11: Carbon sequestration rates by habitat type (tCO₂e/ha/yr)

#### Table notes:

¹ The values reported were converted from gC/m²/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 CO₂ 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 tCO₂e 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

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 CO₂e 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 CO₂e 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 CO₂e 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.

Description	Source	Frequency	Workbook reference
	Physical te	erms	
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 t	erms	
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

#### Table A.13: Input data for carbon sequestration benefits

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 event¹², as well as modelling the proportion¹³ 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.

Description	Source	Frequency	Workbook reference
	Monetary t	erms	
Estimated annual coastal		As new evidence becomes	
protection value by coral	Guzman et al. (2017)	available	6.2a
reefs in the Cayman Islands		available	
Estimated attribution of		As now ovidence becomes	
coastal protection value to	Guzman et al. (2017)	As new evidence becomes	6.2b
coral reefs by island		avaliable	
US GDP deflator	US BEA (2021)	Annually	6.2c
Exchange rate: LISE to CIE	Economics and Statistics	Appually	6.24
	Office (2021)	Annually	0.20
Polative reaf contribution	Guzman at al (2017)	As new evidence becomes	6.20
	Guzman et al. (2017)	available	0.20

#### Table A.14: Input data for coastal protection benefits

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.
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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 doublecounting 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 tourists¹⁵, 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 approach¹⁶ 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 (stayover 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.
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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 categories¹⁷ 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 stay¹⁸ 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).
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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.

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 t	erms		
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	

#### Table A.16: Input data for tourism benefits

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 study¹⁹ 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.

Description	Source	Frequency	Workbook reference	
	Physi	cal terms		
Number of households on	Economics and Statistics	As source is undated	10.15	
the Cayman Islands	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	

#### Table A.17: Input data for amenity value

¹⁹ For more details on the hedonic pricing analysis used please see Guzman et al. (2017). 2020 Ecosystem Account | February 2022 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.

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 A.18: Input data tabs

#### 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.

		2019/20		2020/21			
Produced at: January 2022	<b>Ecosystem Service Flow Account</b>		Ecosystem	Ecosystem Serv	ice Flow Account	Ecosystem	
	Physical terms	Monetary terms (Cl\$m)	Asset Account (PV25 Cl\$m)	Physical terms	Monetary terms (Cl\$m)	Asset Account (PV25 Cl\$m)	Notes on changes
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. <b>Input data change:</b> 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
	9,393	1	35	9,393	1	37	year.
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

#### Table B.1: Changes in Ecosystem Service Flow and Asset Account values

	2019/20				2020/21		
Produced at: January	Ecosystem Service Flow Account		Ecosystem	Ecosystem Service Flow Account		Ecosystem	
2022	Physical terms	Monetary terms (Cl\$m)	Asset Account (PV25 Cl\$m)	Physical terms	Monetary terms (Cl\$m)	Asset Account (PV25 Cl\$m)	Notes on changes
							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

	2019/20			2020/21			
<b>Produced at:</b> January 2022	Physical terms	Monetary terms (Cl\$m)	Ecosystem Asset Account (PV25 Cl\$m	Physical terms	Monetary terms (Cl\$m)	Ecosystem Asset Account (PV25 Cl\$m	Notes on changes
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 benefit	S						
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.

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)
Agriculture	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	Control of arosion rates
protection	
Local recreation	Characteristics of living systems that that enable activities promoting health, recuperation or
Local recreation	enjoyment through active or immersive interactions
Tourism	Characteristics of living systems that that enable activities promoting health, recuperation or
TOUTSIT	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

#### Table C.1: Ecosystem services typology comparison

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# **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, see 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.

Terrestrial/	Cayman Islands classifications		IUCN GET	Notos on alignment	
benthic		Realm	Biome	Ecosystem functional group	Notes on angriment
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)

#### Table D.1: Ecosystem classification comparison

Terrestrial/	Cayman Islands		IUCN GET	Notes on alignment	
benthic	classifications	Realm	Biome	Ecosystem functional group	Notes on angiment
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/	Cayman Islands classifications		IUCN GET	Notes on alignment	
benthic		Realm	Biome	Ecosystem functional group	Notes of anglinent
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/	Cayman Islands classifications		IUCN GET	Notos on alignment	
benthic		Realm	Biome	Ecosystem functional group	Notes on angliment
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



4 City Road, London EC1Y 2AA Solution 444 (0) 20 7580 5383 Solution 6 eftec@eftec.co.uk Solution 6 eftec.co.uk Solution 6 eftecUK Appendix K.6 -Proposed Project and Gazetted Corridor Mapping

Environmental Statement, East-West Arterial Extension – Section 2 and Section 3, Grand Cayman



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 3 of 5 Proposed Project
Original Gazetted Corridor

Central Mangrove Wetland

Mastic Reserve

Mastic Trail

Parrot Nesting Habitat

Parcels



0

1,000

2,000



