Ecology Method

PHOTO CREDIT: PATRICE FRANCIS

The University of the West Indies

Centre for Marine Sciences

Outline

- Transect/ plot establishment
- Mangroves species composition, density & diversity
- Mangrove height and canopy width
- Mangrove trunk diameter
- Prop root/Aerial root network
- Ecosystem services : Fish larvae

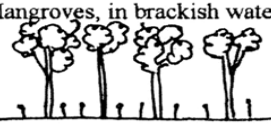
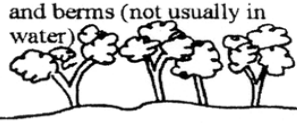
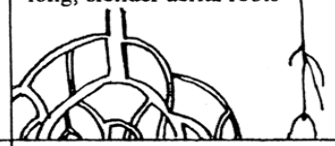
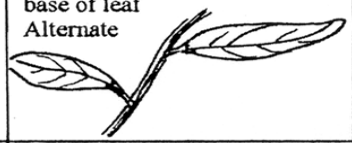
Transect/Plot establishment

- Establish transect from seaward edge towards land
- Use GPS unit to record the location
- Establish plots- 10 X 10m

Photo credit: Patrice Francis

Species composition, density, height and canopy width

Identify the type of mangrove

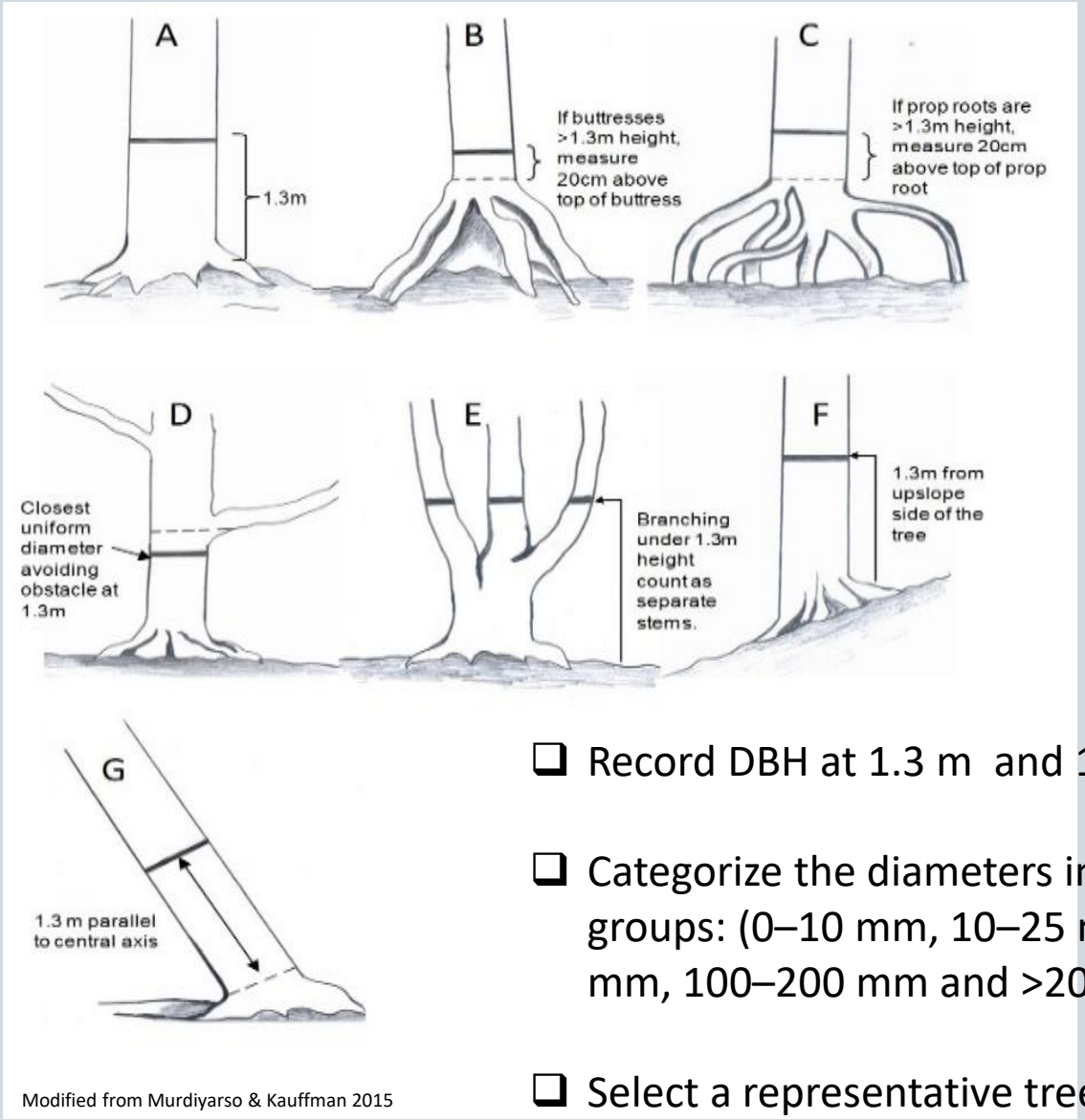
Characteristic	Red Mangrove	Black Mangrove	White Mangrove	Buttonwood
Habitat	Along the shoreline, and in rivers and lagoons, in salty water 	Usually to landward of Red Mangroves in shallower, salty water 	Usually to landward of Black Mangroves, in brackish water 	Near the sea on rocks, beaches, and berms (not usually in water) 
Roots	Thick stilt or prop roots and long, slender aerial roots 	No prop roots; surrounded by thin breathing roots, which stick out above water 	Thick, knobby breathing roots; no prop roots 	No prop or breathing roots 
Leaves Appearance Position	Large, rounded, and leathery Opposite 	Long and thin, Salt crystals on back Opposite 	Rounded, sometimes with pinkish stems Opposite 	Long and thin, 2 small bumps (salt glands) at base of leaf Alternate 
Flowers	Yellow-cream with 4 pointed petals 	White 	Very small, white 	Very small, in clusters 
Fruits	Form torpedo-like plantlets on the tree 	About 1 inch long, flattened 	Green and ribbed, in clusters 	In clusters in rounded heads 

Sutton , A.H., L.G. Sorenson and M.A. Keeley. 2004. Wondrous West Indian Wetlands: Teachers' Resource Book. West Indian Whistling-Duck Working Group of the Society for the Conservation and Study of Caribbean Birds, Boston MA.

- Determine height of tree using telescoping pole/ clinometer/ meter pole

Photo credit: Patrice Francis

Trunk Diameter/Diameter at Breast Height(DBH)



Modified from Murdiyarso & Kauffman 2015

- Record DBH at 1.3 m and 1.5m
- Categorize the diameters into five groups: (0–10 mm, 10–25 mm, 25–100 mm, 100–200 mm and >200 mm).
- Select a representative tree from each category and determine the diameter at 0.1 m, 0.5 m, 1.0 m and 2 m.

Photo credit: Patrice Francis

Prop roots & Pneumatophores/Aerial roots network

- Establish 3 Subplots (1 X 1 m)- low, medium & high
- Count the total number of prop roots in each subplot & determine diameter at 0.1 and 0.5m for 20 random roots


Low density


Medium density


High density

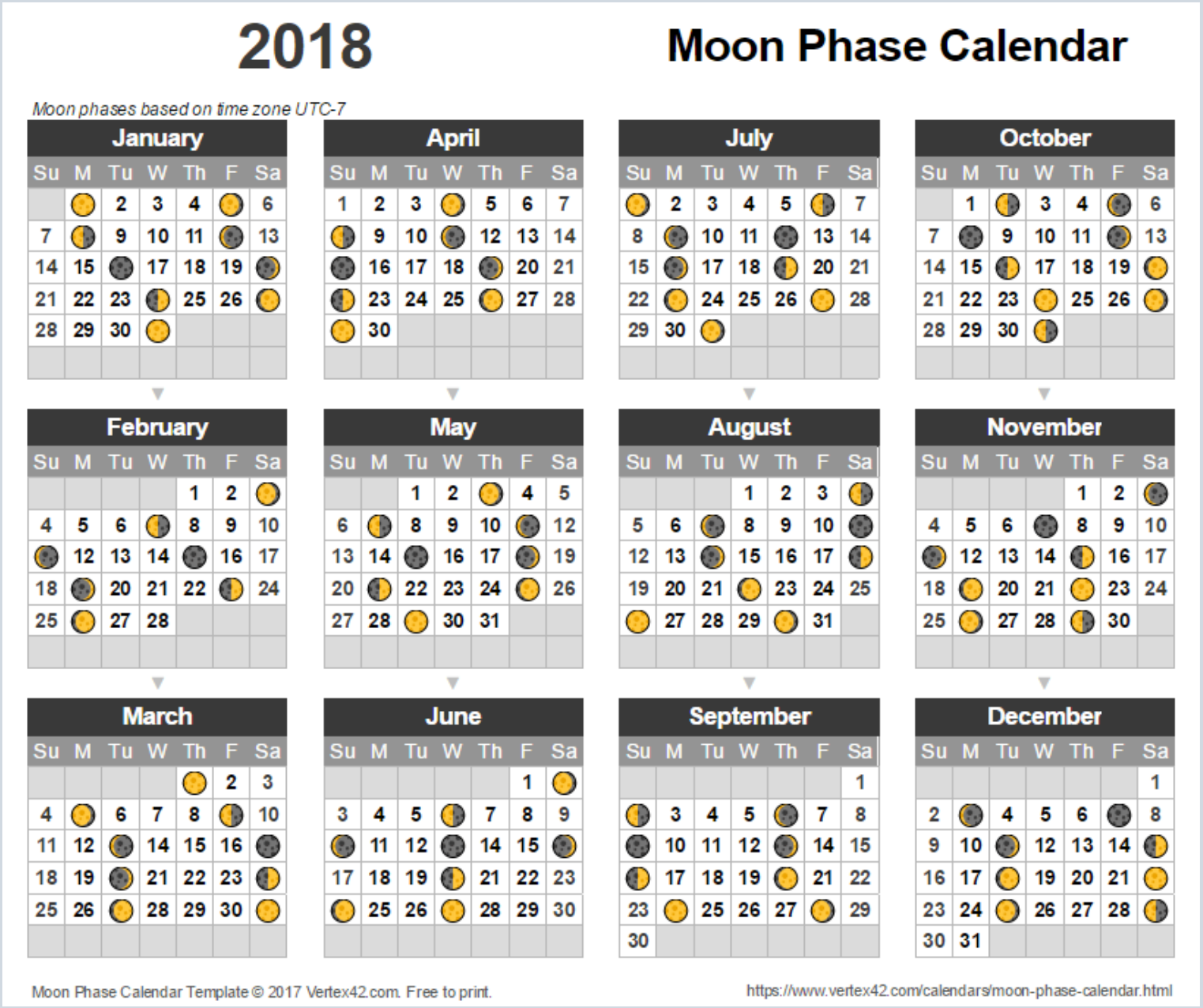
- ❑ Establish 3 Subplots (1 X 1 m)- low, medium & high
- ❑Count the total number of aerial roots in each subplot & determine diameter and height for 20 random roots

Medium density

High density

Ecosystem services: Fisheries

New Moon



2018 Moon Phase Calendar

Moon phases based on time zone UTC-7

January

Su	M	Tu	W	Th	F	Sa
		2	3	4		6
7		9	10	11		13
14	15		17	18	19	
21	22	23		25	26	
28	29	30				

February

Su	M	Tu	W	Th	F	Sa
				1	2	
4	5	6		8	9	10
	12	13	14		16	17
18		20	21	22		24
25		27	28			

March

Su	M	Tu	W	Th	F	Sa
					2	3
4		6	7	8		10
11	12		14	15	16	
18	19		21	22	23	
25	26		28	29	30	

April

Su	M	Tu	W	Th	F	Sa
1	2	3		5	6	7
	9	10		12	13	14
	16	17	18		20	21
	23	24	25		27	28
	30					

May

Su	M	Tu	W	Th	F	Sa
		1	2		4	5
6		8	9	10		12
13	14		16	17		19
20		22	23	24		26
27	28		30	31		

June

Su	M	Tu	W	Th	F	Sa
					1	
3	4	5		7	8	9
	11	12		14	15	
17	18	19		21	22	23
	25	26		28	29	30

July

Su	M	Tu	W	Th	F	Sa
	2	3	4	5		7
8		10	11		13	14
15		17	18		20	21
22		24	25	26		28
29	30					

August

Su	M	Tu	W	Th	F	Sa
			1	2	3	
5	6		8	9	10	
12	13		15	16	17	
19	20	21		23	24	25
	27	28	29		31	

September

Su	M	Tu	W	Th	F	Sa
						1
	3	4	5		7	8
	10	11	12		14	15
	17	18	19		21	22
23		25	26	27		29
30						

October

Su	M	Tu	W	Th	F	Sa
	1		3	4		6
7		9	10	11		13
14	15		17	18	19	
21	22	23		25	26	
28	29	30				

November

Su	M	Tu	W	Th	F	Sa
				1	2	
4	5	6		8	9	10
	12	13	14		16	17
18		20	21		23	24
25		27	28		30	

December

Su	M	Tu	W	Th	F	Sa
						1
2		4	5	6		8
9	10		12	13	14	
16	17		19	20	21	
23	24		26	27	28	
30	31					

https://www.vertex42.com/calendars/moon-phase-calendar.html

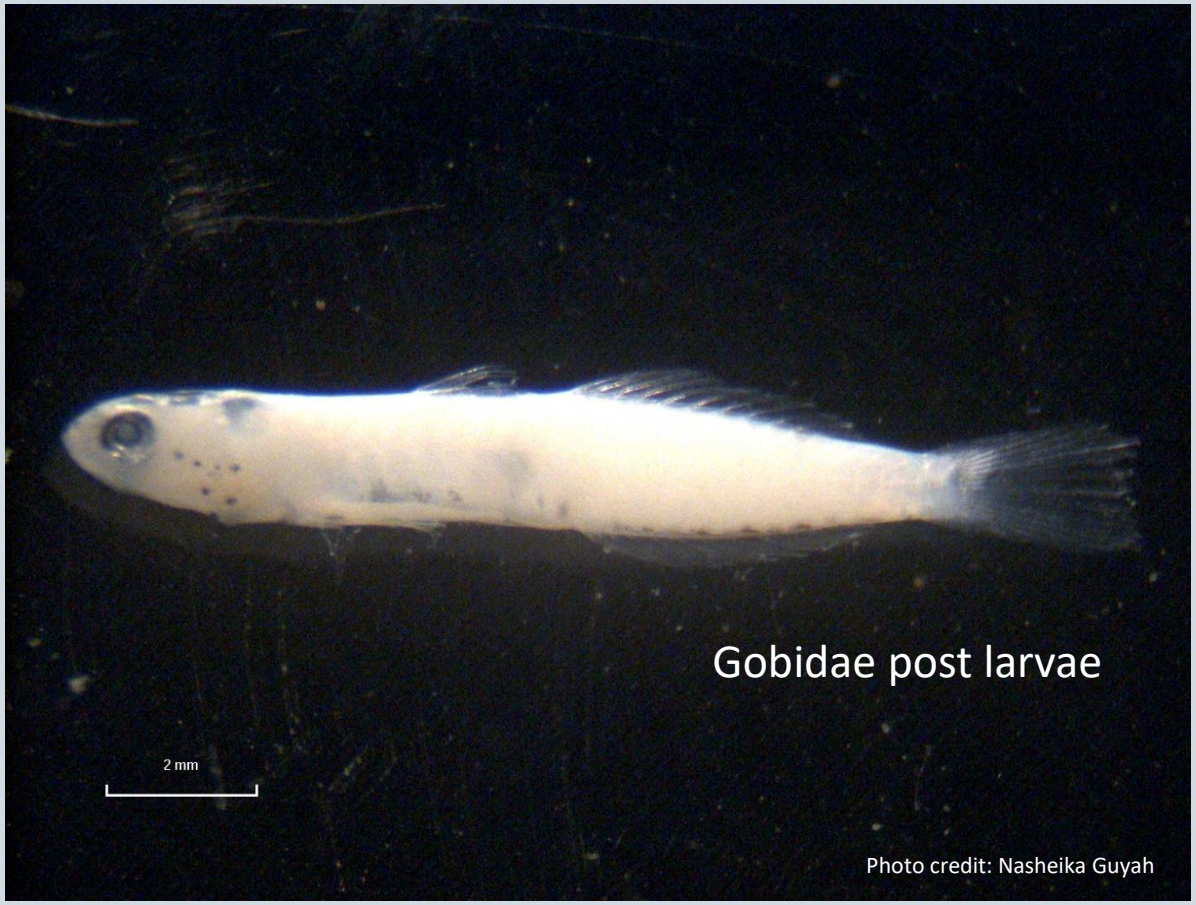
Ecosystem services: Fisheries

- ❑Attach light traps in at least 1m water depth
- ❑Collect larvae from light trap sample collection bucket early next day to prevent predation.
- ❑Preserve samples in ethanol.
- ❑Identify fish larvae under a stereo microscope using ID guides.

Photo credit: Nasheika Guyah

Photo credit: Okuto Takama

Fisheries: Post larvae & Juvenile



Gobidae post larvae

Photo credit: Nasheika Guyah

Gray snapper

Photo credit: Nasheika Guyah

Photo Credit: Patrice Francis

Red mangrove canopy, Bogue, Montego Bay, Jamaica