

Port Everglades PED Phase Environmental Baseline – ESA Survey



Acropora palmata



Acropora cervicornis



Acropora cervicornis thicket



Dendrogyra cylindrus



Orbicella annularis



Orbicella faveolata



Orbicella franksi



Mycetophyllia ferox

Presentation Goals

- Review NMFS provided data sheets and spreadsheets to explain how data made it from data collector to spreadsheet
- Explain calculations within comment notes
- Answer questions

ESA Site Description Notes – Comment Section

- Divers provided information on the site characteristics based on visual observations in the notes section.
- Observations included areas of sand habitat or other notable features/habitat changes.
- During qaqc- If sand dominated portions of the survey site were noted, a calculation of the hardbottom habitat was made based on the diver notes and sand was removed.
 - **Calculation: X m of hardbottom along 50m tape x 4m belt = Surveyed m² /transect**
 - **Each transect had a maximum possible survey area of 200m²/ transect = 800m²/site**
- If sand was not noted and notes were consistent with site photos, 200m² was recorded as a site description indicating that the entire length was hardbottom habitat.
- If sand was photographed and no site notes/linear intercepts were recorded, the site was one of 20 sites that was designated as “in progress.”

ESA Site Survey- Other Comment Notes

- Notes were often paraphrased/omitted if they did not mention changes in habitat or ESA listed corals
- In general notes were entered if: Changes in habitat were noted and delineated along the transect.
- ESA-listed species were noted off transect or data taken for ESA corals found “off transect” were recorded as a note. Dimensions of off-transect corals were not entered.
- General site observations (e.g. octos abundant, macroalgae present) were often omitted.

Site description- habitat calculation

- **Example 1.** Site 100 (W transect).
- Diver notes: 0-23m hardbottom. 23-50m (and continuing west) sand patch. Cyano mats, several damaged xestos.

Dial Cordy and Associates, Inc				ESA Coral Surveys 86 6/13/17		
Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:	
6/29	MS	LC	2	West (50m) 90m	1:45	
Site Name:				Center Target:		
100				2011		
Visibility:				Temperature:		
50'				80° 69' depth @ 50m, 57' @ 0m		
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	MILT	0.9	0.25m South	15.0x10x10	100%	Not ESA
2	MILT	19.2	0	2.0x0.0x0.8	100%	↓
3	No Corals			0x0x0		
4						
5						
6						
7						
8						
9						
10						
Comments:				QA/QC:		
0-23m hardbottom 23-50m (and continuing west) sand patch Cyano mats several damaged xestos				MS ABC		
				QA/QC Office:		
				Coral _____ Data Entry _____		

Site description- habitat calculation

- **Example 1.** Site 100 (W transect).
- Diver notes: 0-23m hardbottom. 23-50m (and continuing west) sand patch. Cyano mats, several damaged xestos.
- Habitat calculation: hardbottom from 0-23m. 23m x **4m** belt = **92m²** . **92m²** was recorded as the note on the datasheet.

Hardbottom



Sand covered with cyanobacterial mats



Date: 1/29	Diver: MS	Buddy: LC	Dive of the Day: 2	Transect Direction/Length (m): West (50m) 90m	Time: 9:45
Site Name: 100			Center Target: 10111		
Visibility: 50'			Temperature: 80° 69' depth @ 50m, 57' @ 0m		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	MILT 0.9	0.25m South	12.2x7.0x1.0	100%	NOT ESA
2	MILT 19.2	0	0.0x0.0x0.8	100%	↓
3	No Corals		0x0x0		
4					
5					
6					
7					
8					
9					
10					
Comments: 0-23m hardbottom, 23-50m (and continuing west) sand patch, Cyano mats, several damaged xestos				QA/QC: MS	JAC
				QA/QC Office:	
				Coral _____	Data Entry _____

Other Notes:

- **Example 1.** Site 100 (W transect).
- Diver notes: 0-23m hardbottom. 23-50m (and continuing west) sand patch. Cyano mats, several damaged xestos.
- Sand patch 23-50m was entered as the notes for the West transect

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER)	Colony Notes
North	9:29	50	9:01:11	67	82	0	NO CORALS									Heavy cyano; Hardbottom ridges with small sand channels/depressions
South	9:47	50	9:01:11	67	82	0	NO CORALS									Cyano; 0m-39m hardbottom ridges with sand channels and depressions; 39m-50m rubble
East	9:25	50	9:01:11	68	80	0	NO CORALS									Wide sand channels between 16m-23.5m and starting at 38m; Cyano; several damaged xestospongia
West	9:45	50	9:01:11	69	80	0	NO CORALS									Sand patch 23m-50m



Site description- habitat calculation

- **Example 2.** Site 100 (E transect).
- Diver notes: Hardbottom with wide sandy channels between 16 and 23.5m and starting at 38m continuing east. Cyano, xestos numerous some damaged (see photos). Green macroalgae abundant.

Dial Cordy and Associates, Inc **ESA Coral Surveys** B6 10/13/17

Date: 7/29	Diver: MS	Buddy: LC	Dive of the Day: 2	Transect Direction/Length (m): East (Sun) 122m	Time: 9:25	
Site Name: 100			Center Target: 90 11			
Visibility: 50'			Temperature: 50°			
53' depth at 0m, 62' @ 50'						
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	MALI	25.1	1.2m South	8.8 x 9.0 x 0.6	100%	Cyano surrounding coral NOT ESA
2	NO CORALS			0x0x0		
3						
4						
5						
6						
7						
8						
9						
10						

Comments: Hard bottom with wide sandy channels between 16m and 23.5m and starting at 38m continuing East
 Cyano numerous, some damaged (see photos)
 xestos numerous, some damaged (see photos)
 green MA abundant

QA/QC: MS QDC

QA/QC Office: Coral _____ Data Entry _____

Site description- habitat calculation

- **Example 2.** Site 100 (E transect).
- Diver notes: Hardbottom with wide sandy channels between 16 and 23.5m and starting at 38m continuing east. Cyano, xestos numerous some damaged (see photos). Green macroalgae abundant.
- Habitat calculation: hardbottom from 0-16m and from 23.5-38m. $(16 + 14.5) \text{ m} \times 4\text{m belt} = 122\text{m}^2$. 122m^2 recorded as a note on the datasheet.

Hardbottom



Sand with cyanobacterial mats



Date: 7/29	Diver: MS	Buddy: LC	Dive of the Day: 2	Transect Direction/Length (m): East (Sun) 122m	Time: 9:25
Site Name: 2017	100	Center Target: 9011	Temperature: 50°		
Visibility: 50'	53' depth at 0m, 62' @ 50m				
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1 MALI	25.1	1.2m South	8.8 x 7.0 x 0.6	100%	Cyano surrounding coral
2	NO CORALS		0x0x0		
3					
4					
5					
6					
7					
8					
9					
10					
Comments: Hard bottom with wide sandy channels between 16m and 23.5m and starting at 38m. Cyano continuing East. XESTOS - numerous, some damaged (see photos). green MPA abundant			QA/QC: MS	QA/QC Office: JDC	
			Coral _____	Data Entry _____	

Other Notes:

- **Example 2.** Site 100 (E transect).
- Diver notes: Hardbottom with wide sandy channels between 16 and 23.5m and starting at 38m continuing east. Cyano, xestos numerous some damaged (see photos). Green macroalgae abundant.
- “Wide sand channels between 16-23.5m and starting at 38m. Cyano; several damaged xestospongia” was entered in notes section
- MALI was verified as non-ESA species and not entered in the data.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER)	Colony Notes
North	9:29	50	9:01:11	67	82	0	NO CORALS									Heavy cyano; Hardbottom ridges with small sand channels/depressions
South	9:47	50	9:01:11	67	82	0	NO CORALS									Cyano; 0m-39m hardbottom ridges with sand channels and depressions; 39m-50m rubble
East	9:25	50	9:01:11	68	80	0	NO CORALS									Wide sand channels between 16m-23.5m and starting at 38m; Cyano; several damaged Xestospongia
West	9:45	50	9:01:11	69	80	0	NO CORALS									Sand patch 23m-50m

Site description- habitat calculation

- **Example 3.** Site 100 (N transect).
- Diver notes: HB ridges with small sand channels/depressions. Heavy cyano.

Dial Cordy and Associates, Inc **ESA Coral Surveys** 136 10/13/17

Date: 7/29	Diver: GDC	Buddy: RP	Dive of the Day: 2	Transect Direction/Length (m): North 200m	Time: 929	
Site Name: 100			Center Target: 9011			
Visibility: 50			Temperature: 22 Depth			
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm cm	% Live Tissue	Colony Notes:
1	MALF	31.2	0.3m EAST.	22.5x14.4x3	100	Not ESA
2	NO Corals			0x0x0		
3						
4						
5						
6						
7						
8						
9						
10						
Comments: Heavy cyano HB ridges with small sand channels/depressions				QA/QC: GDC	ms	
				QA/QC Office:		
				Coral _____	Data Entry _____	

Site description- habitat calculation

- **Example 3.** Site 100 (N transect).
- Diver notes: HB ridges with small sand channels/depressions. Heavy cyano.
- Habitat calculation: During QAQC site descriptions were verified by comparison with photos. No significant sand found. **200m²** recorded as a note on the datasheet.

Hardbottom



Hardbottom with small sand patches



Date: 7/29	Diver: gpc	Buddy: RP	Dive of the Day: 2	Transect Direction/Length (m): North 200m	Time: 9:29
Site Name: 100			Center Target: 9011		
Visibility: 50			Temperature: 82 Depth Depth		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	MALE 31.2	0.3m EAST	22.5x14.4x3	100	Not ESA
2	NO CORALS		0x0x0		
3					
4					
5					
6					
7					
8					
9					
10					
Comments: Heavy cyano			QA/QC: gpc ms		
			QA/QC Office: Coral _____ Data Entry _____		

Other Notes:

- **Example 3.** Site 100 (N transect).
- Diver notes: HB ridges with small sand channels/depressions. Heavy cyano.
- “Heavy cyano; hardbottom ridges with small sand channel depressions” entered in notes for this transect.
- MALI was verified as non-ESA species and not entered in the data.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER)	Colony Notes
North	9:29	50	9:01:11	67	82	0	NO CORALS									Heavy cyano; Hardbottom ridges with small sand channels/depressions
South	9:47	50	9:01:11	67	82	0	NO CORALS									Cyano; 0m-39m hardbottom ridges with sand channels and depressions; 39m-50m rubble
East	9:25	50	9:01:11	68	80	0	NO CORALS									Wide sand channels between 16m-23.5m and starting at 38m; Cyano; several damaged Xestospongia
West	9:45	50	9:01:11	69	80	0	NO CORALS									Sand patch 23m-50m

Site description- habitat calculation

- **Example 4.** Site 100 (S transect).
- Diver notes: 0-39m HB ridges with sand channels and depressions. 39-50m ridge ends-rubble.

Dial Cordy and Associates, Inc				ESA Coral Surveys		
Date: 4/29	Diver: GPC	Buddy: RP	Dive of the Day: 2	Transect Direction/Length (m): South 50m	Time: 9:47	B6 10/13/12
Site Name: 100			Center Target: 90111			
Visibility: 50			Temperature: 82			
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes	
1. MALI	36.5	2.7m EAST	24.5x18x1	100	NOT EST	
2. MALI	32.0	0.4m EAST	25.2x27.5x2	90	Sponge Comp + OYano	
3. MALI	29.8	1.9m EAST	14.6x15.7x1	100	↓	
4. MALI	29.5	0.6m WEST	34.5x27.0x1	100		
5. MALI	38.1	4.6m WEST	13.1x10.2x1	100		
6.						
7.						
8.						
9.						
10.						
Comments: CYANO 0-39m HB ridges with sand channels + depressions 39-50 Ridge ends - rubble Sponge Disease				QA/QC: [Signature]	MS	
				QA/QC Office:		
				Coral _____	Data Entry _____	

Site description- habitat calculation

- **Example 4.** Site 100 (S transect).
- Diver notes: 0-39m HB ridges with sand channels and depressions. 39-50m ridge ends-rubble.
- Habitat calculation: During QAQC site descriptions were verified by comparison with photos. Rubble is considered habitat. No significant sand found on transect. **200m²** recorded as a note on the datasheet.

Hardbottom with some sand (off-transect)



Hardbottom with small sand patches



Date: <i>11/29</i>	Diver: <i>APC</i>	Buddy: <i>RP</i>	Dive of the Day: <i>2</i>	Transect Direction/Length (m): <i>South 50</i>	Time: <i>9:47</i>
Site Name: <i>100</i>			Center Target: <i>90111</i>		
Visibility: <i>50</i>			Temperature: <i>82</i>		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
<i>MALE</i>	<i>36.5</i>	<i>2.7m EAST</i>	<i>24.5x19x1</i>	<i>100</i>	<i>NOT ESA</i>
<i>MALE</i>	<i>32.0</i>	<i>0.4m EAST</i>	<i>25.2x27.5x2</i>	<i>90</i>	<i>Sponge Comp + cyano</i>
<i>MALE</i>	<i>29.8</i>	<i>1.9m EAST</i>	<i>14.6x15.7x1</i>	<i>100</i>	
<i>MALE</i>	<i>29.5</i>	<i>0.6m West</i>	<i>34.5x27.0x1</i>	<i>100</i>	
<i>MALE</i>	<i>38.1</i>	<i>4.0m West</i>	<i>13.1x10.2x1</i>	<i>100</i>	
Comments: <i>Cyano 0-3m HB ridges with sand channels + depressions. 39-50 Ridge ends - rubble. Sponge Disease</i>			QA/QC: <i>MS</i>		
			Coral _____ Data Entry _____		

Other Notes:

- **Example 4.** Site 100 (S transect).
- Diver notes: 0-39m HB ridges with sand channels and depressions. 39-50m ridge ends-rubble.
- “Cyano; 0-39m hardbottom ridges with sand channels and depressions; 39-50m rubble” entered in notes for this transect.
- MALI corals were verified as non-ESA species and not entered in the data.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER)	Colony Notes
North	9:29	50	9:01:11	67	82	0	NO CORALS									Heavy cyano; Hardbottom ridges with small sand channels/depressions
South	9:47	50	9:01:11	67	82	0	NO CORALS									Cyano; 0m-39m hardbottom ridges with sand channels and depressions; 39m-50m rubble
East	9:25	50	9:01:11	68	80	0	NO CORALS									Wide sand channels between 16m-23.5m and starting at 38m; Cyano; several damaged Xestospingia
West	9:45	50	9:01:11	69	80	0	NO CORALS									Sand patch 23m-50m

Site description- habitat calculation

- **Example 5.** Site 20 (N transect).
- Diver notes: Numerous dead hard corals in survey area.
- Sand was not noted.

Dial Cordy and Associates, Inc **ESA Coral Surveys** 86 6/9/12

Date: 8/2/2012	Diver: PF	Buddy: J/RS	Dive of the Day: 4	Transect Direction/Length (m): N023 to S0 200.8	Time: 13:44:50	
Site Name: 20			Center Target: 13 03 19			
Visibility: 40 ft			Temperature: 83°F			
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm cm	% Live Tissue	Colony Notes:
1	Ace2	17.8 m	0.1 m west	37.0 x 35.0 x 7.5	10%	13 pts.
2	Ace2	16.9 m	0.15 m west	28.0 x 24.0 x 13.0	30%	12 pts.
3	Ace2	16.9 m	1/2 off transect 5.0 m west	62.0 x 46.0 x 20.0	80%	71 pts.
4	Ace2	16.7 m	1/2 off transect 6.7 m west	53.0 x 28.0 x 11.0	100%	25 pts.
5	Ace2	16.5 m	1/2 off transect 4.5 m west	25.0 x 21.0 x 12.0	50%	11 pts.
6	Ace2	15.0 m	1/2 off transect 5.5 m west	22.0 x 14.0 x 8.0	10%	2 pts.
7	O.FW	9.0 m	1/2 off transect 2.7 m west	38.0 x 22.5 x 14.0	80%	worms algal cover
8	Ace2	24.5 m	1/2 off transect 2.3 m west	19.0 x 14.0 x 15.0	40%	12 pts.
9	Ace2	17.0 m	2.0 m east	34.0 x 17.0 x 16.0	100%	33 pts.
10	Ace2	17.0 m	2.0 m east	28.0 x 16.0 x 12.0	80%	36 pts.
Comments: Numerous dead hard coral colonies in survey area.				QA/QC: PF JPC		
				QA/QC Office:		
				Coral _____ Data Entry _____		

Site description- habitat calculation

- **Example 5.** Site 20 (N transect).
- Diver notes: Numerous dead hard corals in survey area
- Habitat calculation: No sand was noted by the diver and during QAQC site photos were examined and there was no evidence of sand. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



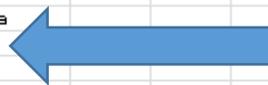
86 15/9/12

Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:
8/6/2017	PF	JW/RS	4	North 50 200R	13:44:50
Site Name:	Center Target:			Temperature:	
20	13:03:19			83°F	
Visibility:	max depth 24 ft				
40 ft					
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes:
1	17.8 m	0.1 m West	37.0 x 35.0 x 7.5	10%	13 pts.
2	16.9 m	0.95 m West	28.0 x 24.0 x 13.0	30%	12 pts.
3	16.9 m	* OFF TRANSECT 5.0 m West	(NOTE 5) 21.0 x 40.0 x 20.0	80%	71 pts.
4	16.7 m	* OFF TRANSECT 6.7 m West	33.0 x 28.0 x 11.0	100%	25 pts.
5	16.5 m	* OFF TRANSECT 4.5 m West	25.0 x 21.0 x 12.0	50%	11 pts.
6	15.0 m	* OFF TRANSECT 5.5 m West	28.0 x 14.0 x 8.0	10%	2 pts.
7	9.0 m	* OFF TRANSECT 2.7 m West	38.0 x 28.5 x 14.0	80%	worms, algal cover
8	24.5 m	* OFF TRANSECT 2.3 m West	19.0 x 14.0 x 15.0	40%	12 pts.
9	17.0 m	2.0 m East	34.0 x 17.0 x 16.0	100%	33 pts.
10	17.0 m	2.0 m East	28.0 x 16.0 x 12.0	80%	36 pts.
Comments:			QA/QC:		
All corals dead hard coral colonies in survey area.			PF [Signature]		
			QA/QC Office:		
			Coral _____ Data Entry _____		

Other Notes:

- **Example 5.** Site 20 (N transect). Corals 3-8 were located off the transect.
- The colony information for corals 3-8 was not entered since it was not a requirement of the survey but a note that additional corals were observed off transect was made.
- the note only references ACER corals but one OFAV was noted. A more complete note entry would be "Several ACER and one OFAV colony were observed OFF TRANSECT"

Transect Direction	Time	Visibility (ft)	Center Target	on Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	Branch Tips (ACER)	Colony Notes
North	13:44	40	13:03:19	24	83	1	ACER	17.8	0.1	West	37	35	7.5	10	13	Numerous dead scleractinians in survey area
North	13:44	40	13:03:19	24	83	2	ACER	16.9	0.95	West	28	24	13	30	12	Additional ACER colonies OFF TRANSECT
North	13:44	40	13:03:19	24	83	9	ACER	17.0	2.0	East	34	17	16	100	33	
North	13:44	40	13:03:19	24	83	10	ACER	17.0	2.0	East	28	16	12	80	36	
South	14:22	40	13:03:19	24	83	0	NO CORALS									Numerous dead scleractinians in survey area
East	13:37	40	13:03:19	23	82	0	NO CORALS									
West	13:48	50	13:03:19	23	82	0	NO CORALS									WPD observed at survey site; recently dead scleractinians; Additional ACER colonies OFF TRANSECT



Site description- habitat calculation

- **Example 6.** Site 20 (W transect).
- Diver notes: White plague active. Recently dead colonies. ACER off transect 8m south at 20m. 42 branches 50cmx40cm

Dial Cordy and Associates, Inc. ESA Coral Surveys B6 10/9/17

Date: 7/1/2017	Diver: JC	Buddy: LC	Dive of the Day: 4	Transect Direction/Length (m): West 50 20m	Time: 1348	
Site Name: 20			Center Target: 1303.19			
Visibility: 30			Temperature: 82			
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	NO CORALS			0x0x0		ACER off - transect
2	NO DATA					
3						
4						
5						
6						
7						
8						
9						
10						
Comments: White plague active Recently dead colonies. ACER off transect 8m South at 20m 42 branches 50cm x 40cm						QA/QC: <u>JJC</u> <u>PF</u>
				QA/QC Office: Coral _____ Date Entry _____		

Site description- habitat calculation

- **Example 6.** Site 20 (W transect).
- Diver notes: White plague active. Recently dead colonies. ACER off transect 8m south at 20m. 42 branches 50cmx40cm.
- Habitat calculation: No sand was noted by the diver and during QAQC site photos were examined and there was no evidence of sand. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



B6 10/9/17

Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:
8/1/2017	JC	LS	4	West 50	1348
Site Name:			Center Target:		
20			13-03-19		
Visibility:			Temperature:		
50			82		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	NO CORALS		0x0x0		ACER off - transect
2					
3					
4					
5					
6					
7					
8					
9					
10					
Comments:				QA/QC:	
White plague active Recently dead colonies. ACER off transect 8m south 42 branches 50cmx40cm				QA/QC Office:	
				Coral	Date Entry

Other Notes:

- **Example 6.** Site 20 (W transect).
- Diver notes: White plague active. Recently dead colonies. ACER off transect 8m south at 20m. 42 branches 50cmx40cm
- No ESA-listed corals were observed
- Additional ACER colonies OFF TRANSECT was entered as a note on the West transect.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	Branch Tips (ACER)	Colony Notes
North	13:44	40	13:03:19	24	83	1	ACER	17.8	0.1	West	37	35	7.5	10	13	Numerous dead scleractinians in survey area
North	13:44	40	13:03:19	24	83	2	ACER	16.9	0.95	West	28	24	13	30	12	Additional ACER colonies OFF TRANSECT
North	13:44	40	13:03:19	24	83	9	ACER	17.0	2.0	East	34	17	16	100	33	
North	13:44	40	13:03:19	24	83	10	ACER	17.0	2.0	East	28	16	12	80	36	
South	14:22	40	13:03:19	24	83	0	NO CORALS									Numerous dead scleractinians in survey area
East	13:37	40	13:03:19	23	82	0	NO CORALS									
West	13:48	50	13:03:19	23	82	0	NO CORALS									WPD observed at survey site; recently dead scleractinians; Additional ACER colonies OFF TRANSECT



Site description- habitat calculation

- **Example 7.** Site 20 (S transect).
- Diver notes: Numerous dead hard coral colonies

Dial Cordy and Associates, Inc. ESA Coral Surveys 56 1/9/17

Date: 2-14-17		Diver: PF		Buddy: JH/PS		Dive of the Day: 4		Transect Direction/Length (m): South 50 200		Time: 1422:00	
Site Name: 20						Center Target: 13-03-19					
Visibility: 40 ft						Temperature: 83°F max depth 24 ft					
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes						
1			0x0x0		<div style="color: red; font-weight: bold; font-size: 1.2em;">NO CORALS</div> <div style="font-size: 2em; transform: rotate(-30deg); opacity: 0.5;"> No corals Landscape only </div>						
2											
3											
4											
5											
6											
7											
8											
9											
10											
Comments: numerous dead hard coral colonies.						QA/QC: [Signature] [Signature] QA/QC Office: _____ Coral _____ Data Entry _____					

Site description- habitat calculation

- **Example 7.** Site 20 (S transect).
- Diver notes: Numerous dead hard coral colonies
- Habitat calculation: No sand was noted by the diver and during QAQC site photos were examined and there was no evidence of sand. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



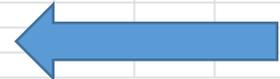
130 1/19/17

Date: 2-11-17	Diver: PF	Buddy: JA/PS	Dive of the Day: 4	Transect Direction/Length (m): South 50	Time: 1422:00
Site Name: 20	Center Target: 13:03:19			Temperature: 83°F	
Visibility: 40ft	Max depth 24ft.				
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1			0x0x0		
2					
3					
4					
5					
6					
7					
8					
9					
10					
Comments: numerous dead hard coral colonies.			QA/QC: [Signature]	QA/QC Office: [Signature]	
			Coral _____	Data Entry _____	

Other Notes:

- **Example 7.** Site 20 (S transect).
- Diver notes: Numerous dead hard coral colonies
- No ESA-listed corals were observed
- The notes section for the south transect reads: "Numerous dead scleractinians in survey area"

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	Branch Tips (ACER)	Colony Notes
North	13:44	40	13:03:19	24	83	1	ACER	17.8	0.1	West	37	35	7.5	10	13	Numerous dead scleractinians in survey area
North	13:44	40	13:03:19	24	83	2	ACER	16.9	0.95	West	28	24	13	30	12	Additional ACER colonies OFF TRANSECT
North	13:44	40	13:03:19	24	83	9	ACER	17.0	2.0	East	34	17	16	100	33	
North	13:44	40	13:03:19	24	83	10	ACER	17.0	2.0	East	28	16	12	80	36	
South	14:22	40	13:03:19	24	83	0	NO CORALS									Numerous dead scleractinians in survey area
East	13:37	40	13:03:19	23	82	0	NO CORALS									
West	13:48	50	13:03:19	23	82	0	NO CORALS									WPD observed at survey site; recently dead scleractinians; Additional ACER colonies OFF TRANSECT



Site description- habitat calculation

- **Example 8.** Site 20 (E transect).
- Diver notes: BLANK

Dial Cordy and Associates, Inc *Go over out other reef* **ESA Coral Surveys** *B6 10/9/17*

Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:	
<i>8 Feb 2017</i>	<i>JC</i>	<i>LC</i>	<i>4</i>	<i>East 50 200m</i>	<i>1337</i>	
Site Name: <i>20</i>				Center Target:		
Visibility: <i>40</i>				Temperature:	<i>27.3</i>	
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes:
1.	<i>NACORALS</i>			<i>0x0x0</i>		
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
Comments:				QA/QC:		
				<i>[Signature]</i>	<i>[Signature]</i>	
				QA/QC Office:		
				Coral _____	Data Entry _____	

Site description- habitat calculation

- **Example 8.** Site 20 (E transect).
- Diver notes: Blank
- Habitat calculation: No sand was noted by the diver and during QAQC site photos were examined and there was no evidence of sand. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



Go run out other reel

Pb 10/19/17

Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:
<i>8 Feb 2017</i>	<i>JC</i>	<i>LC</i>	<i>4</i>	<i>East 30 200ft</i>	<i>1337</i>
Site Name:			Center Target:		
<i>20</i>			<i>13:03:19</i>		
Visibility:			Temperature:		
<i>40</i>			<i>82</i>		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes:
<i>NO CORALS</i>			<i>0 x 0 x 0</i>		
Comments:				QA/QC:	
				<i>JC</i>	<i>LC</i>
				QA/QC Office:	
				Coral _____	Data Entry _____

Other Notes:

- **Example 8.** Site 20 (E transect).
- Diver notes: BLANK
- No notes were entered for the E transect

Direction	Time	Visibility (ft)	Center Target	Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Onset Distance (m)	Onset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	Branch Tips (ACER)	Colony Notes
North	13:44	40	13:03:19	24	83	1	ACER	17.8	0.1	West	37	35	7.5	10	13	Numerous dead scleractinians in survey area
North	13:44	40	13:03:19	24	83	2	ACER	16.9	0.95	West	28	24	13	30	12	Additional ACER colonies OFF TRANSECT
North	13:44	40	13:03:19	24	83	9	ACER	17.0	2.0	East	34	17	16	100	33	
North	13:44	40	13:03:19	24	83	10	ACER	17.0	2.0	East	28	16	12	80	36	
South	14:22	40	13:03:19	24	83	0	NO CORALS									Numerous dead scleractinians in survey area
East	13:37	40	13:03:19	23	82	0	NO CORALS									
West	13:48	50	13:03:19	23	82	0	NO CORALS									WPD observed at survey site; recent dead scleractinians; Additional ACER colonies OFF TRANSECT



Site description- habitat calculation

- **Example 9.** Site 29 (S transect).
- Diver notes: Low relief hardbottom with octos, some sponges, xestos, cyanobacteria covered sponges and corals. Micro-valleys, sink holes with sand and rubble

Dial Cordy and Associates, Inc. ESA Coral Surveys 36 10/12/17

Date: 10/12/17	Diver: MR	Buddy: MS	Dive of the Day: 6	Transect Direction/Length (m): South 200m	Time: 2:55
Site Name: 29			Center Target: 02 12 03		
Visibility: 15'			Temperature: 84° Air 29°C 20 ft		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1			0.1 x 0.5 x 0.5		colonies
2					landscape only
3					
4					
5					
6					
7					
8					
9					
10					
Comments: Low relief hardbottom w/ octos. Some sponges - xestos, cyanobacteria covering sponges and corals. Micro-valleys, sink holes w/ sand + rubble.				QA/QC: MR PF	
				QA/QC Office: Coral _____ Data Entry _____	

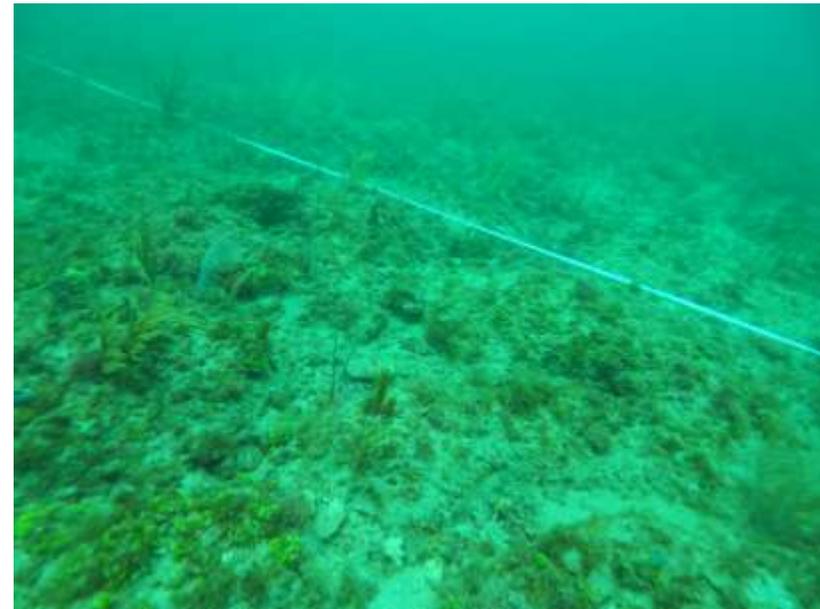
Site description- habitat calculation

- **Example 9.** Site 29 (S transect).
- Diver notes: Low relief hardbottom with octos, some sponges, xestos, cyanobacteria covered sponges and corals. Micro-valleys, sink holes with sand and rubble
- Habitat calculation: During QAQC site photos were examined and sand was not dominant. “Micro valleys” were part of the habitat. **200m²** recorded as a note on the datasheet.

Hardbottom habitat with small “micro valley” of sand



Hardbottom habitat photographed



Date: <i>7/11/17</i>	Diver: <i>MR</i>	Buddy: <i>MS</i>	Dive of the Day: <i>6</i>	Transect Direction/Length (m): <i>SOUTH 150M</i>	Time: <i>2:55</i>
Site Name: <i>29</i>			Center Target: <i>02 12 03</i>		
Visibility: <i>15'</i>			Temperature: <i>84°</i>		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
<i>NO CORALS</i>			<i>0.1x0x0 colonies</i>		<i>1</i>
			<i>landscape only</i>		
Comments: <i>Low relief hardbottom w/ octos. Some sponges, xestos, cyanobacteria. Micro-valleys Cyanobacteria covering sink holes w/ sand + rubble.</i>			QA/QC: <i>MR PF</i>		
			Coral _____ Data Entry _____		

Other Notes:

- **Example 9.** Site 29 (S transect).
- Diver notes: Diver notes: Low relief hardbottom with octos, some sponges, xestos, cyanobacteria covered sponges and corals. Micro-valleys, sink holes with sand and rubble
- Habitat notes of “sink holes with sand and rubble; cyano” was recorded as the note for the South transect

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER only)	Colony Notes
North	14:40	15	2:12:03	18	84	0	NO CORALS									
South	14:55	15	2:12:03	20	84	0	NO CORALS									Sink holes with sand and rubble; Cyano
East	14:29	30	2:12:03	19	83	0	NO CORALS									Hardbottom with narrow sand filled grooves
West	14:49	30	2:12:03	19	83	1	ACER	28.5	1.4	South	18	18	16	100	11	Acera colony 8.0m South OFF TRANSECT at 22m



Site description- habitat calculation

- **Example 10.** Site 29 (E transect).
- Diver notes: Continuous low relief HB with narrow sand filled grooves meandering across the reef surface. Numerous hard coral colonies.

Dial Cordy and Associates, Inc **ESA Coral Surveys** Bb 10/12/17

Date: 7/27/17	Diver: PF	Buddy: LC	Dive of the Day: 6	Transect Direction/Length (m): EAST/50	Time: 14:29:30
Site Name: 29			Center Target: 021203		
Visibility: 50 ft			Temperature: 83°F		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1					No corals
2					
3					
4					
5					
6					
7					
8					
9					
10					
Comments: Continuous low relief HB w/ narrow sand filled grooves meandering across the reef surface. Numerous dead hard coral colonies.				QA/QC: [Signature] [Signature]	
				QA/QC Office: Coral _____ Data Entry _____	

Landscape None Representative photos

Site description- habitat calculation

- **Example 10.** Site 29 (E transect).
- Diver notes: Continuous low relief HB with narrow sand filled grooves meandering across the reef surface. Numerous hard coral colonies.
- Habitat calculation: During QAQC site photos were examined and sand was not dominant. “Narrow sand filled grooves” were part of the habitat. **200m²** recorded as a note on the datasheet.

Hardbottom habitat with pictured “narrow sand filled grooves”



Hardbottom habitat photographed



Date: <i>7/24/17</i>	Diver: <i>PF</i>	Buddy: <i>LC</i>	Dive of the Day: <i>6</i>	Transect Direction/Length (m): <i>EAST / 50 20m²</i>	Time: <i>14:29:30</i>
Site Name: <i>29</i>			Center Target: <i>021203</i>		
Visibility: <i>30 ft</i>			Temperature: <i>83 °F</i>		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
<i>1 No Corals</i>					
<i>2</i>					
<i>3</i>					
<i>4</i>					
<i>5</i>					
<i>6</i>					
<i>7</i>					
<i>8</i>					
<i>9</i>					
<i>10</i>					
Comments: <i>Continuous low relief HB w/ narrow sand filled grooves meandering across the reef surface. Numerous dead hard coral colonies.</i>			QA/QC: <i>UK PF</i>		
			QA/QC Office: Coral _____ Data Entry _____		

Other Notes:

- **Example 10.** Site 29 (E transect).
- Diver notes: Continuous low relief HB with narrow sand filled grooves meandering across the reef surface. Numerous hard coral colonies.
- Habitat notes of “hardbottom with narrow sand filled grooves” was recorded as the note for the East transect

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER only)	Colony Notes
North	14:40	15	2:12:03	18	84	0	NO CORALS									
South	14:55	15	2:12:03	20	84	0	NO CORALS									Sink holes with sand and rubble; Cyano
East	14:29	30	2:12:03	19	83	0	NO CORALS									Hardbottom with narrow sand filled grooves
West	14:49	30	2:12:03	19	83	1	ACER	28.5	1.4	South	18	18	16	100	11	Acet colony 8.0m South OFF TRANSECT at 22m



Site description- habitat calculation

- **Example 11.** Site 29 (N transect).
- Diver notes: Low-relief hardbottom. Octos common, macroalgae abundant.

Dial Cordy and Associates, Inc **ESA Coral Surveys** B6 10/12/12

Date:	Diver:	Buddy:	Dive of the Day:	Transect Direction/Length (m):	Time:
7/21/12	MR	MAS	6	North 50m down	2:40
Site Name:			Center Target:		
29			02 12 03		
Visibility:			Temperature:		
151			84° 17' max depth		

#	Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
1	NO corals			no colonies		
2				landscape only		
3						
4						
5						
6						
7						
8						
9						
10						

Comments: low relief hardbottom, Octos common, macroalgae abundant.	QA/QC: MR PK
	QA/QC Office: Coral _____ Data Entry _____

Site description- habitat calculation

- **Example 11.** Site 29 (N transect).
- Diver notes: Low-relief hardbottom. Octos common, macroalgae abundant.
- Habitat calculation: No sand was noted by the diver and during QAQC site photos were examined and there was no evidence of sand. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



Date: <i>12/1/17</i>	Diver: <i>MR</i>	Buddy: <i>MAS</i>	Dive of the Day: <i>6</i>	Transect Direction/Length (m): <i>North 50m 200m</i>	Time: <i>2:40</i>
Site Name: <i>29</i>			Center Target: <i>02 12 03</i>		
Visibility: <i>15'</i>			Temperature: <i>84° 18' max depth</i>		
Species	Meter Mark	Colony Location	Size (LxWxH) in mm	% Live Tissue	Colony Notes
<i>NO CORALS</i>			<i>no colonies</i>		
			<i>landscape only</i>		
Comments: <i>low relief hardbottom. Octos common, macroalgae abundant.</i>			QA/QC: <i>MR</i> <i>PK</i>		
			QA/QC Office: Coral _____ Data Entry _____		

Other Notes:

- **Example 11.** Site 29 (N transect).
- Diver notes: Low-relief hardbottom. Octos common, macroalgae abundant.
- No habitat notes were entered as there was no reference to habitat other than hardbottom.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER only)	Colony Notes
North	14:40	15	2:12:03	18	84	0	NO CORALS									
South	14:55	15	2:12:03	20	84	0	NO CORALS									Sink holes with sand and rubble; Cyano
East	14:29	30	2:12:03	19	83	0	NO CORALS									Hardbottom with narrow sand filled grooves
West	14:49	30	2:12:03	19	83	1	ACER	28.5	1.4	South	18	18	16	100	11	Acet colony 8.0m South OFF TRANSECT at 22m



Site description- habitat calculation

- **Example 12.** Site 29 (W transect).
- Diver notes: Continuous low-relief HB with narrow sand filled grooves meandering across the reef surface. Macroalgal cover on reef surface.

Dial Cordy and Associates, Inc **ESA Coral Surveys** 86 10/2/17

Date: 24 July 2017	Diver: PF	Buddy: LC	Dive of the Day: 6	Transect Direction/Length (m): WEST/50 20m	Time: 14:49:00	
Site Name: 29			Center Target: 02:12:03			
Visibility: 30 ft			Temperature: 83°F			
	Species	Meter Mark	Colony Location	Size (LxWxH) in mm cm	% Live Tissue	Colony Notes:
1	ACER	22.5 m	1.4 m south	18.0 x 15.0 x 16.0	100%	11 pts.
2	ACER	22.0 m	* off transect 2.0 m south	15 x 22 x 14	30%	6 pts paly spongy
3						
4						
5						
6						
7						
8						
9						
10						
Comments: Continuous low relief HB w/ narrow sand filled grooves meandering across the reef surface. Macroalgal cover on reef surface				QA/QC: UR PF		
				QA/QC Office: Coral _____ Data Entry _____		

Site description- habitat calculation

- **Example 12.** Site 29 (W transect).
- Diver notes: Continuous low-relief HB with narrow sand filled grooves meandering across the reef surface. Macroalgal cover on reef surface.
- Habitat calculation: During QAQC site photos were examined and sand was not dominant. “Narrow sand filled grooves” were part of the habitat. **200m²** recorded as a note on the datasheet.

Hardbottom habitat photographed



Hardbottom habitat photographed



Dial Cordy and Associates, Inc **ESA Coral Surveys** B6 10/2/17

Date: 24 July 2017 Diver: PC Buddy: LC Dive of the Day: 6 Transect Direction/Length (m): WEST/50.20m Time: 14:49:00

Site Name: 29 Center Target: 02:12:03

Visibility: 30 ft Temperature: 83°F max depth 19 ft

	Species	Meter Mark	Colony Location	Size (LxWxH) in mm cm	% Live Tissue	Colony Notes:
1	ACER	28.5 m	1.4 m SOUTH	18.0 x 15.0 x 16.0	100%	11 pts.
2	ACER	22.0 m	8.0 m South * off TRANSECT	115 x 22 x 14	30%	6 pts paly spongy ovary
3						
4						
5						
6						
7						
8						
9						
10						

Comments: Continuous low relief HB w/ narrow sand filled grooves meandering across the reef surface. Macroalgal cover on reef surface.

QA/QC: UR PC

QA/QC Office: Coral _____ Data Entry _____

Other Notes:

- **Example 12.** Site 29 (W transect).
- Diver notes: Continuous low-relief HB with narrow sand filled grooves meandering across the reef surface. Macroalgal cover on reef surface.
- No habitat notes were entered as the habitat was noted to be continuous low-relief hardbottom. The observation of an additional ACER off transect was reported in the transect notes.

Transect Direction	Time	Visibility (ft)	Center Target	Location Depth (ft)	Temp (F)	Number	Species	Meter Mark (m)	Offset Distance (m)	Offset Direction	Length (cm)	Width (cm)	Height (cm)	% Live Tissue	# Branch Tips (ACER only)	Colony Notes
North	14:40	15	2:12:03	18	84	0	NO CORALS									
South	14:55	15	2:12:03	20	84	0	NO CORALS									Sink holes with sand and rubble; Cyano
East	14:29	30	2:12:03	19	83	0	NO CORALS									Hardbottom with narrow sand filled grooves
West	14:49	30	2:12:03	19	83	1	ACER	28.5	1.4	South	18	18	16	100	11	Acer colony 8.0m South OFF TRANSECT at 22m



Questions?

