DEEPOCEAN

REPORT

equinor

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M/V EDDA FLORA, AUGUST 2020

ENVIRONMENTAL - CORAL SURVEY

EQ20907 - EGYPTIAN VULTURE CORAL SURVEY - 2020

RESPONSIBLE **SURVEY**

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Rev	**Date**	**Reason for Issue**	**Originator**	**Checker**	**Approver**

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1. INTRODUCTION

1.1 GENERAL

This report covers the detailed documentation and analysis of the results from the 2020 Egyptian Vulture Coral Survey. An overview of the area is illustrated in Figure 1.1.

Details of geodetic parameters, tidal datum, navigation systems, survey sensors, applied offsets and main equipment settings are included in *EQ20907_META_20200907.xlsx* which is supplied as one of the data deliverables.

Table 1.1 - Egyptian Vulture Coral Survey - Summary of Survey Details

Project	Egyptian Vulture Coral Survey
Work Order	A.XP1.AP.10131
Vessel	*Edda Flora*
ROV	*Superior 01*
Survey Date	08/08/2020 to 13/08/2020
Survey and metadata	*EQ20907_META_20200907.xlsx*
Geodesy / Datum	
Spheroid	International ED50
EPSG Code	1612
Projection	Universal Transverse Mercator – Zone 32 North, 9° East
Vertical Datum	Mean Sea Level (using GNSS Tides)
Time Reference	Universal Time Coordinated (UTC)

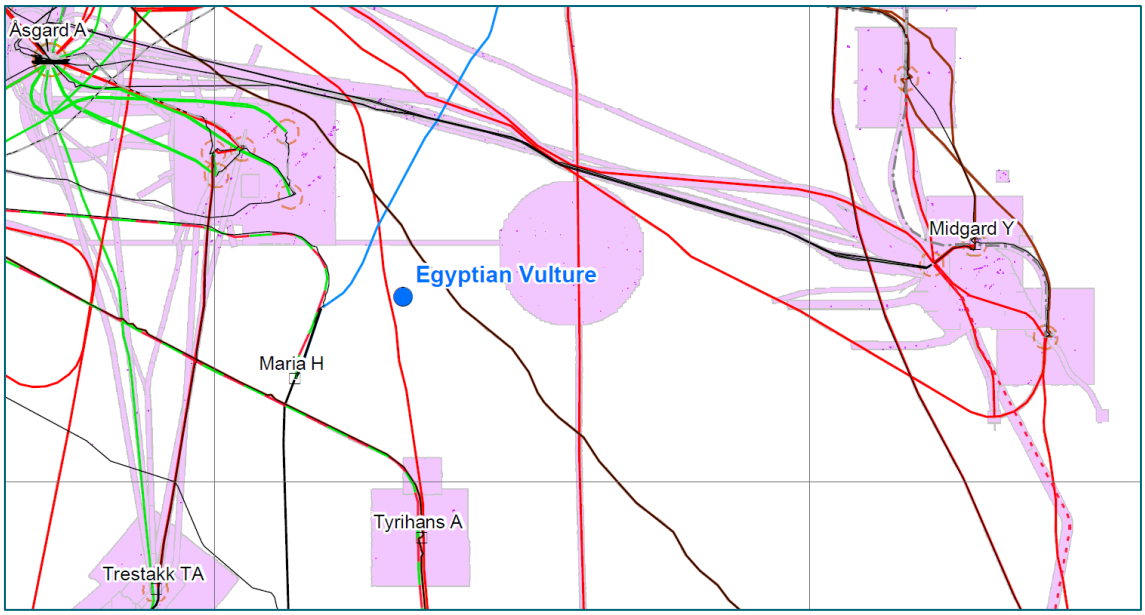


Figure 1.1 - Egyptian Vulture Coral Survey - Location Overview

1.2 ABBREVIATIONS

The following abbreviations may be used in this delivery, Table 1.2.

Table 1.2 - Abbreviations

Definition	Description
ADW	Acoustic Deep Water
AHRS	Attitude and Heading Reference System
ASCII	American Standard Code for Information Interchange
ASW	Acoustic Shallow Water
CCP	Continuous Cathodic Protection
cm	Centimetre
CP	Cathodic Protection
CTD	Conductivity Temperature Depth
CVI	Close Visual Inspection
DCC	Distance Cross Course
DGPS	Differential Global Position System
DO	DeepOcean AS
DODBMS	DeepOcean Database Management System
DOC	Depth of Cover
DP	Dynamic Positioning
DTM	Digital Terrain Model
DVD	Digital Versatile Disc
DVL	Doppler Velocity log
Dwg	AutoCAD drawing format
E	East
ED50	European Datum 1950
ERB	Export Riser Base
EPSG	European Petroleum Survey Group
FHR	First Hand Report
FiGS	FORCE Technology's field gradient measurement sensor
FOC	Fibre Optic Cable
GEP	Gas Export Pipeline
GNSS	Global Navigation Satellite System
GPS	Global Position System
GVI	General Visual Inspection
HiPAP	High Precision Acoustic Positioning
Hz	Hertz
IMU	Inertial Measurement Unit
IOGP	International Association of Oil & Gas Producers
ITRF	International Terrestrial Reference Frame
km	Kilometre
KP	Kilometre Post

Definition	Description
LxHxW	Length x Height x Width
Lat	Latitude
Long	Longitude
LBL	Long Base Line
m	metre
MBES	Multibeam Echosounder
MSB	Mean Seabed
MSL	Mean Sea Level
N	North
OEP	Oil Export Pipeline
OGP	International Association of Oil and Gas Producers
Pdf	Portable document format
POLPRED	Proudman Oceanographic Lab Tidal Prediction Software
Rev	Revision
ROV	Remotely Operated Vehicle
s	second
S	South
SBP	Sub-bottom Profiler
SV	Sound Velocity
SITRAS	Equinor Inspection and Condition Reporting System for Pipelines
SoW	Scope of Work
SSBL	Super Short Base Line
SSDM	Seabed Survey Data Model
SSS	Side Scan Sonar
SVP	Sound velocity profiler
Temp	Temperature
TOC	Top of Cover
TOP	Top of pipe
UKOOA	United Kingdom Offshore Operators Association
USBL	Ultra Short Base Line
UTC	Universal Time Coordinated
UTM	Universal Transverse Mercator
VIS	Visual
W	West
WGS84	World Geodetic System 1984
XYZ	Easting, Northing & Depth (DO delivery file format)

1.3 REFERENCES

The following documents are referred to regarding survey operations, data processing and reporting.

1.3.1 GEODESY REFERENCES

Ref	Document No	Document Title, Revision	Issued by
[1]	Guidance Note number 10	Geodetic Transformations Offshore Norway, version 1, April 2001	EPSG (now OGP)
[2]	Memo	Datum transformations between ED50 and WGS84 offshore Norway, 22.03.2002	Equinor (TEK F&T LET SDI, PTT TTJ NKG)

1.3.2 EQUINOR SPECIFIC DOCUMENTS

Ref	Document No	Document Title, Revision	Issued by
[3]	EQ20907	EQ20907_Egyptian_Vulture_Coral Survey_ WP_rev01, 16.07.2020	Equinor
[4]	4600023602	Frame Agreement for Offshore Survey Services	Equinor
[5]	TR1007	TR1007 v6.02 Specification for Subsea surveys, valid from 2019-05-03	Equinor
[6]	TR1063	TR1063 v3.02 Geographical Information Data Formats, valid from 2017-08-04	Equinor
[7]	TR2234	TR2234 v8.01 Data format specification for external survey of subsea pipelines and cables, valid from 2019-05-28	Equinor
[8]	GL0557	GL0557 v2.01 Guideline for Subsea surveys, valid from 2019-04-03	Equinor
[9]	-	Survey and Seabed Intervention Frame agreements TPD PRD FE MO GMS Survey and Reporting Clarifications_Rev13, valid from 11.01.2018	Equinor
[10]	-	Supporting guideline for coral survey Rev8_23082018. Coral mapping, guideline	Equinor
[11]	12NCQKD-2	Monitoring of Drilling Activities in Areas with Presence of Cold Water Corals, Guideline (DNV), Rev 01, 2013-01-15	Equinor
[12]	-	Visual inspection and classification of cold water corals	Equinor

1.3.3 DEEPOCEAN PROJECT QA & HSE REFERENCES

Ref	Document No	Document Title, Revision	Issued by
[13]	NO.E11221-HSEQS-CHA-001	Emergency Notification Chart - Edda Flora - Generic - EQ20509	DeepOcean
[14]	NO.E11221-HSEQS-CHA-002	Emergency Notification Chart - Edda Flora - API - EQ20509	DeepOcean
[15]	NO.E11221-HSEQS-LIS-001	Project HSEQ Activity List - Equinor Survey and LCV	DeepOcean
[16]	NO.E11221-HSEQS-PLA-001	Project HSEQ Plan - Equinor Survey and LCV	DeepOcean
[17]	NO.E11221-HSEQS-PLA-002	Emergency Preparedness Plan	DeepOcean
[18]	NO.E11221-HSEQS-REP-001	HAZOP Report - Generic Operations Edda Flora 2020	DeepOcean

1.3.4 DEEPOCEAN DOCUMENTS AND SURVEY PROCEDURES

Ref	Document No	Document Title, Revision	Issued by
[19]	DO-SUR-PRO-001	Survey Operations	DeepOcean
[20]	DO-SUR-PRO-012	Method Of Survey Operations	DeepOcean
[21]	DO-SUR-PRO-013	Method Of Calibrations and Verifications	DeepOcean
[22]	DO-SUR-GUI-001	USBL - SSBL System Procedure	DeepOcean
[23]	DO-SUR-GUI-002	Attitude and Heading Reference Procedure	DeepOcean
[24]	DO-SUR-GUI-003	Vessel & ROV Based Multibeam Echosounder Procedure	DeepOcean
[25]	DO-SUR-GUI-004	Acoustic (Geophysical) Sensors Procedure	DeepOcean
[26]	DO-SUR-GUI-005	Environmental Data Procedure	DeepOcean
[27]	DO-SUR-GUI-006	ROV Survey Sensor Procedure	DeepOcean
[28]	DO-SUR-GUI-007	Online Survey Operations and Software Procedure	DeepOcean
[29]	DO-SUR-GUI-009	Vessel Geometric Control and Sensor Calibrations Procedure	DeepOcean
[30]	DO-SUR-GUI-010	Long Baseline (LBL) Procedure	DeepOcean
[31]	DO-SUR-GUI-011	Survey Data Management Procedure	DeepOcean
[32]	DO-SUR-GUI-012	GNSS Positioning Procedure	DeepOcean
[33]	DO-SUR-GUI-013	PHINS Guideline	DeepOcean
[34]	DO-SUR-GUI-014	DelphINS - General and Processing Information	DeepOcean
[35]	NO.E11221-SUR-PRO-001	Survey Operations Procedure RevA	DeepOcean
[36]	NO.E11221-SUR-PRO-002	Edda Flora Mobilisation and Calibration Procedure RevA	DeepOcean

2. SURVEY DESCRIPTION

2.1 SCOPE OF WORK

The scope of work was outlined in the work package document, APPENDIX C.

2.2 PERFORMED SURVEY COVERAGE

The survey was performed between August 08 and August 13 2020. Survey coverage summary is listed in Table 2.1 in chronological order.

Table 2.1 - Egyptian Vulture Coral Survey - Performed Survey Coverage

Line / Location	Date	KP From	KP To	Method
+500	08/08/2020	-0.036	5.806	MBES/SSS
+400	08/08/2020	5.832	0.000	MBES/SSS
+600	08/08/2020	0.013	5.815	MBES/SSS
+700	08/08/2020	5.831	0.002	MBES/SSS
+800	08/08/2020	0.003	5.831	MBES/SSS
+900	08/08/2020	5.836	-0.001	MBES/SSS
+1000	09/08/2020	-0.013	5.826	MBES/SSS
+1100	09/08/2020	5.841	0.000	MBES/SSS
+1200	09/08/2020	-0.006	5.830	MBES/SSS
+1300	09/08/2020	5.842	0.013	MBES/SSS
+1400	09/08/2020	-0.004	5.811	MBES/SSS
+1500	09/08/2020	5.827	0.035	MBES/SSS
+1600	09/08/2020	0.049	5.781	MBES/SSS
+1700	09/08/2020	5.793	0.070	MBES/SSS
+1800	09/08/2020	0.078	5.739	MBES/SSS
+1900	09/08/2020	5.737	0.123	MBES/SSS
+2000	09/08/2020	0.139	5.682	MBES/SSS
+2100	09/08/2020	5.691	0.194	MBES/SSS
+2200	09/08/2020	0.223	5.613	MBES/SSS
+2300	09/08/2020	5.576	0.259	MBES/SSS
+2400	09/08/2020	0.308	5.521	MBES/SSS
+2500	09/08/2020	5.481	0.366	MBES/SSS
+2600	09/08/2020	0.410	5.406	MBES/SSS
+2700	09/08/2020	5.356	0.500	MBES/SSS
+2800	09/08/2020	0.545	5.277	MBES/SSS
+2900	09/08/2020	5.189	0.649	MBES/SSS
+3000	09/08/2020	0.734	5.106	MBES/SSS
+3100	10/08/2020	5.033	0.832	MBES/SSS
+3200	10/08/2020	0.915	4.901	MBES/SSS
+3300	10/08/2020	4.832	1.062	MBES/SSS
+3400	10/08/2020	1.128	4.660	MBES/SSS
+3500	10/08/2020	4.587	1.310	MBES/SSS
+3600	10/08/2020	1.447	4.378	MBES/SSS
+3700	10/08/2020	4.178	1.654	MBES/SSS
+3800	10/08/2020	1.839	3.945	MBES/SSS
+3900	10/08/2020	3.727	2.200	MBES/SSS
Crossline	10/08/2020	2.900	2.950	MBES/SSS
-2900	10/08/2020	2.186	3.574	MBES/SSS
-2800	10/08/2020	3.940	1.958	MBES/SSS
-2700	10/08/2020	1.703	4.215	MBES/SSS

Line / Location	Date	KP From	KP To	Method
Infill Line	10/08/2020	5.460	5.769	MBES/SSS
+300	10/08/2020	5.835	0.020	MBES/SSS
+200	10/08/2020	-0.007	5.842	MBES/SSS
+100	10/08/2020	5.853	0.012	MBES/SSS
Centreline	10/08/2020	0.001	5.856	MBES/SSS
-100	10/08/2020	5.850	0.020	MBES/SSS
-200	10/08/2020	-0.024	5.832	MBES/SSS
-300	10/08/2020	5.834	0.006	MBES/SSS
-400	10/08/2020	0.019	5.826	MBES/SSS
-500	10/08/2020	5.812	0.055	MBES/SSS
-600	11/08/2020	0.062	5.681	MBES/SSS
-700	11/08/2020	5.677	0.099	MBES/SSS
-800	11/08/2020	0.104	5.610	MBES/SSS
-900	11/08/2020	5.592	0.139	MBES/SSS
-1000	11/08/2020	0.120	5.562	MBES/SSS
-1100	11/08/2020	5.539	0.206	MBES/SSS
-1200	11/08/2020	0.202	5.483	MBES/SSS
-1300	11/08/2020	5.483	0.273	MBES/SSS
-1400	11/08/2020	0.316	5.535	MBES/SSS
-1500	11/08/2020	5.514	0.411	MBES/SSS
-1600	11/08/2020	0.471	5.392	MBES/SSS
-1700	11/08/2020	5.375	0.508	MBES/SSS
-1800	11/08/2020	0.560	5.264	MBES/SSS
-1900	11/08/2020	5.189	0.664	MBES/SSS
-2000	11/08/2020	0.765	5.091	MBES/SSS
-2100	11/08/2020	5.029	0.861	MBES/SSS
-2200	11/08/2020	0.941	4.902	MBES/SSS
-2300	11/08/2020	4.810	1.079	MBES/SSS
-2400	11/08/2020	1.176	4.642	MBES/SSS
-2500	11/08/2020	4.548	1.369	MBES/SSS
-2600	11/08/2020	1.485	4.352	MBES/SSS
EQ20907_023	12/08/2020	-	-	Visual Survey
EQ20907_018	13/08/2020	-	-	Visual Survey
EQ20907_005	13/08/2020	-	-	Visual Survey
EQ20907_027	13/08/2020	-	-	Visual Survey

2.3 DATA QUALITY

There were no issues relating to poor data quality.

3. SUMMARY OF RESULTS

At the Egyptian Vulture area, water depth ranges from 288m in the northeast to 310m in the centre of the area near the planned priority #2 well location. The general trend of the mean seabed profile slopes from north to south. Generations of iceberg ploughmarks have pivoted on the seabed in different directions influencing the bathymetry over the entire site.

In total, 31 targets were detected within the survey area; all of these were interpreted to be possible coral reef structures. Four reef locations were confirmed by visual inspection and classified according to the criteria defined in document, *Supporting guideline for coral survey Rev8_23082018,* reference [10].

4. DETAILED RESULTS

4.1 INTRODUCTION

This section presents results from the acquired MBES and SSS data and the subsequent visual inspections. In total, 31 targets exceeding 1m height were detected within the survey area; all of these were interpreted to be possible coral reef structures. Four of the potential coral structures were visually inspected and confirmed. A total of 10 video still pictures have been included with this report, refer to Section 7.

All observations are listed in Digital Delivery file:

EQ20907_EVENTS_EGYPTIAN-VULTURE-CORALS_20200816.xlsx.

4.2 MBES/SSS SURVEY

4.2.1 BATHYMETRY

Minimum Water Depth: 288m on a ridge in the northeast.
Maximum Water Depth: 310m in the centre of the area near the planned priority #2 well location.

The general trend of the mean seabed profile slopes from the north towards the southern part of the area. Generations of iceberg ploughmarks have pivoted on the seabed in different directions influencing the bathymetry over the entire site, Figure 4.1.

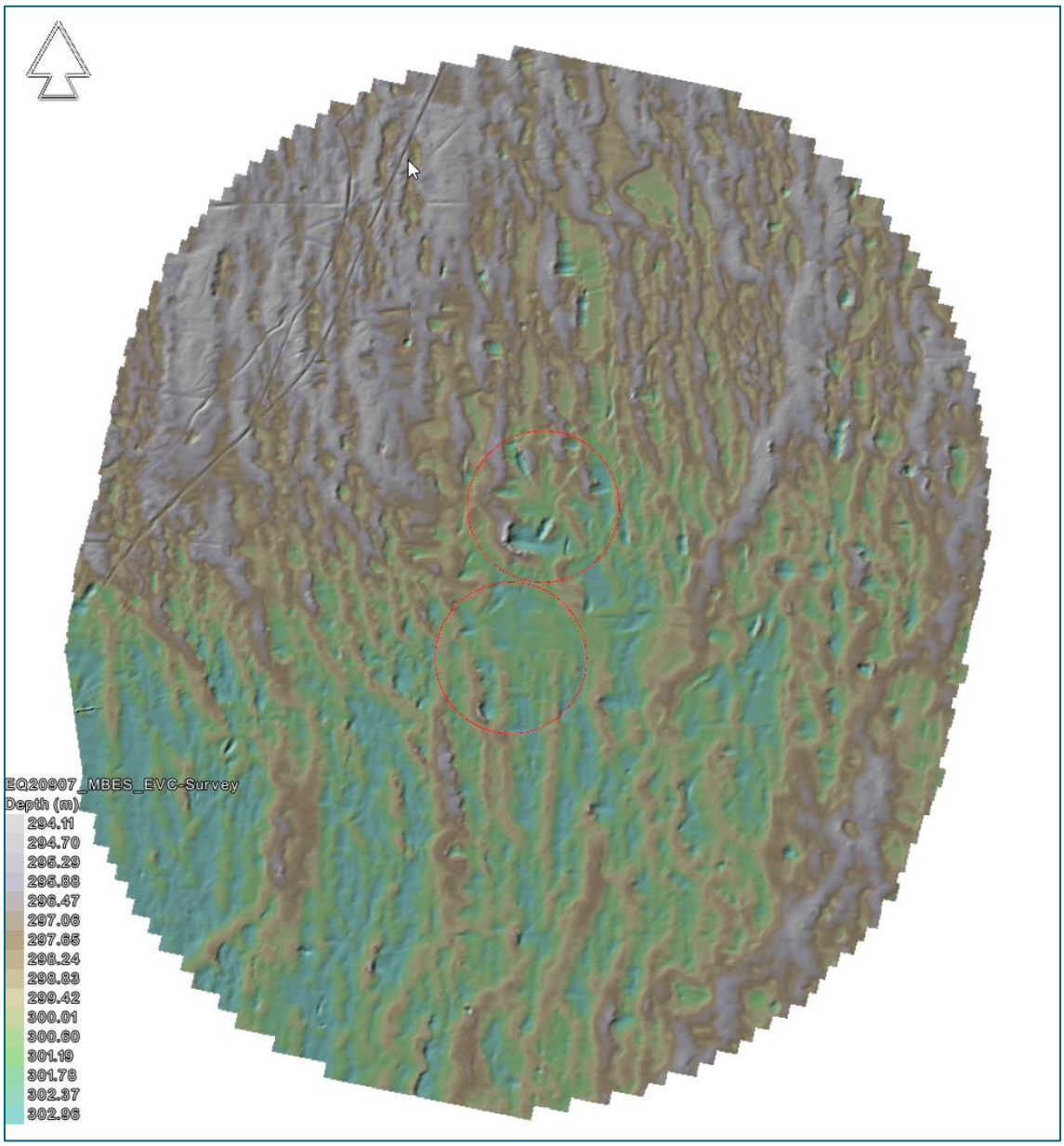


Figure 4.1 - Egyptian Vulture Coral Survey - Bathymetric overview. Red circles are 500m zones of proposed well locations

4.2.2 SEABED FEATURES

Low sonar reflectivity dominates the seabed and is interpreted as a cover of younger, very soft to soft sandy clays. On the levees of the ploughmarks, high reflective, harder sediments are locally exposed, interpreted as predominantly sandy clay with gravelly sediment, cobbles and boulders, Figure 4.2. Circular features with depths down to 1.5-2.0m were interpreted as pockmarks. Both unit (width <5 m) and larger mother pockmarks (widths up to 30m) were abundant across the entire site, Figure 4.3.

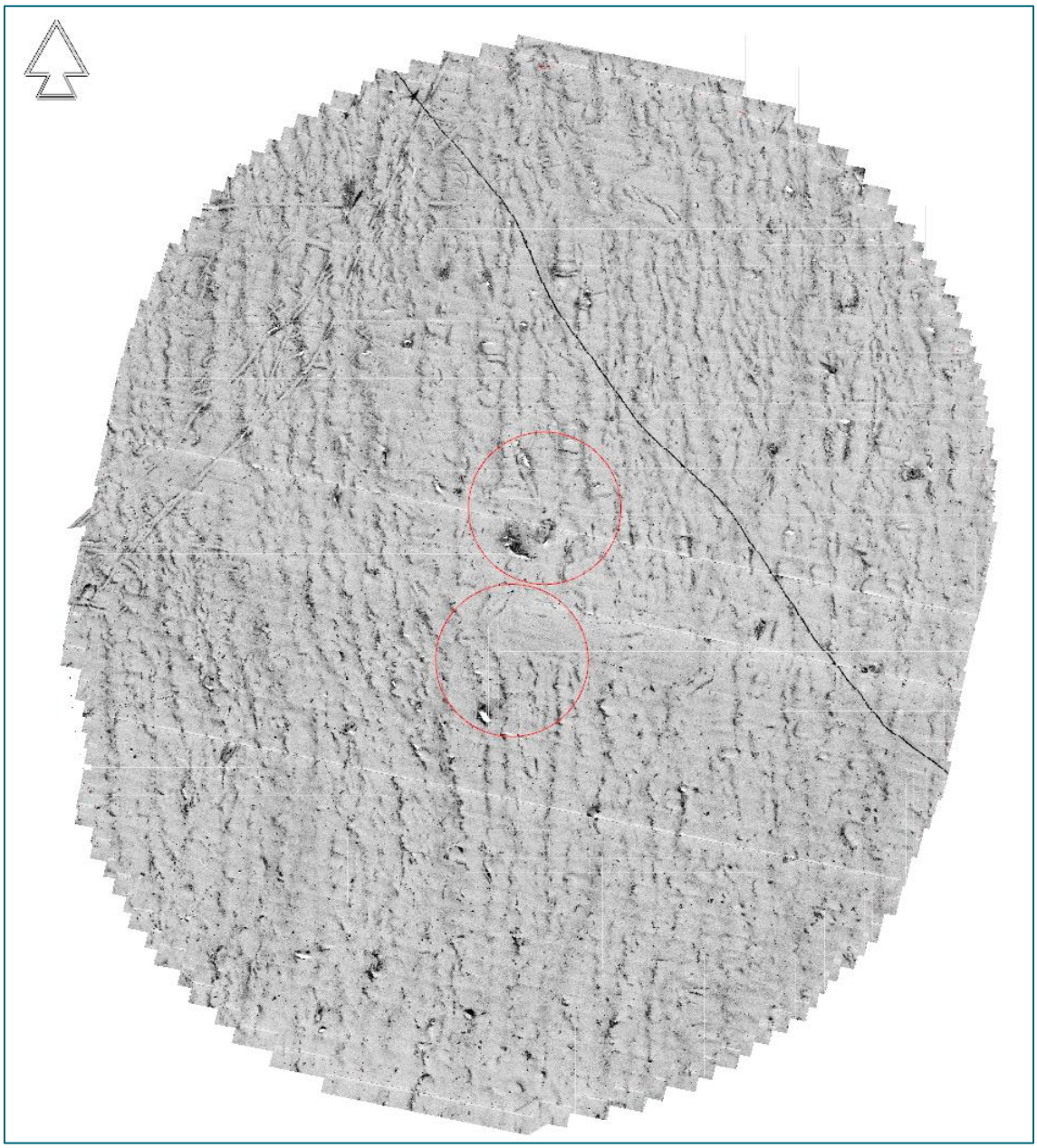


Figure 4.2 - Egyptian Vulture Coral Survey - SSS coverage and seabed reflectivity. Red circles are 500m zones of proposed well locations

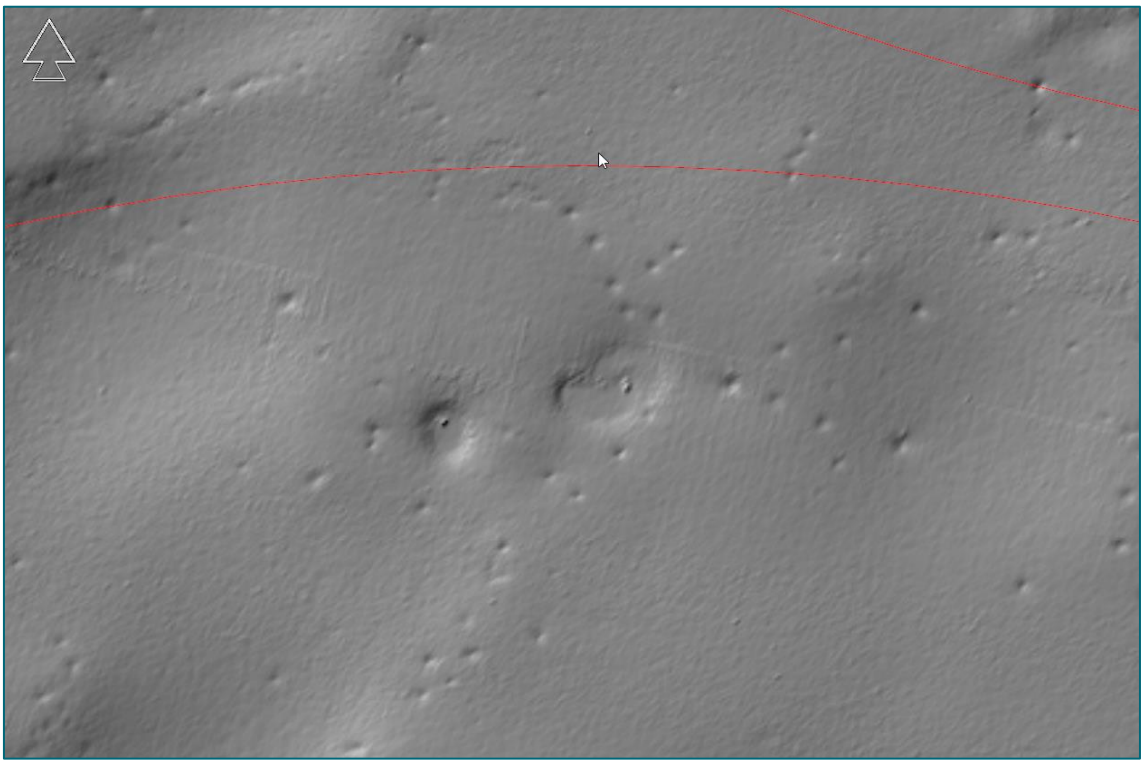


Figure 4.3 - Egyptian Vulture Coral Survey - MBES data example. Pockmarks within 500m zones (red lines)

The potential reef areas were interpreted on the basis of their irregular shape and topography on MBES and SSS data, Figure 4.4. A total of 31 targets with height >1m were detected on the MBES/SSS data, including minor single coral heads, clusters of coral mounds and reef structures. The most prominent ones reflected lengths of up to 17.2m, widths of up to 15.9m and heights of up to 5.3m. The interpreted coral structures are usually associated with the levees and slopes of plough marks. All the detected possible coral structures are listed in Table 4.1.

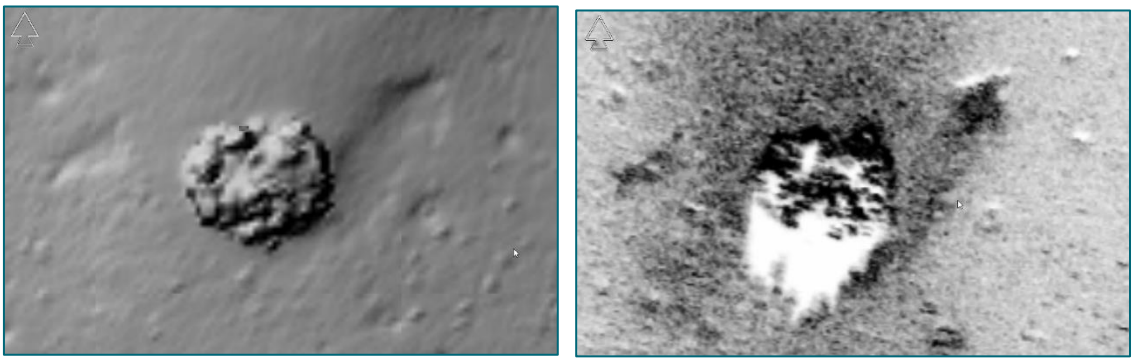


Figure 4.4 - Egyptian Vulture Coral Survey - SSS and MBES data examples

Table 4.1 - Egyptian Vulture Coral Survey - Possible Coral reef structure location summary

FID	SHAPE	SURVEYREF	SURVEYDATE	LOCALITY	INSTRUMENT	REMARKS
1	Polygon	EQ20907	11/08/2020	EQ20907_001	MBES, SSS	Possible coral
2	Polygon	EQ20907	11/08/2020	EQ20907_002	MBES, SSS	Possible coral
3	Polygon	EQ20907	11/08/2020	EQ20907_003	MBES, SSS	Possible coral
4	Polygon	EQ20907	11/08/2020	EQ20907_004	MBES, SSS	Possible coral
6	Polygon	EQ20907	11/08/2020	EQ20907_006	MBES, SSS	Possible coral
7	Polygon	EQ20907	11/08/2020	EQ20907_007	MBES, SSS	Possible coral
8	Polygon	EQ20907	11/08/2020	EQ20907_008	MBES, SSS	Possible coral
9	Polygon	EQ20907	11/08/2020	EQ20907_009	MBES, SSS	Possible coral
11	Polygon	EQ20907	11/08/2020	EQ20907_011	MBES, SSS	Possible coral
12	Polygon	EQ20907	11/08/2020	EQ20907_012	MBES, SSS	Possible coral
13	Polygon	EQ20907	11/08/2020	EQ20907_013	MBES, SSS	Possible coral
14	Polygon	EQ20907	11/08/2020	EQ20907_014	MBES, SSS	Possible coral
15	Polygon	EQ20907	11/08/2020	EQ20907_015	MBES, SSS	Possible coral
16	Polygon	EQ20907	11/08/2020	EQ20907_016	MBES, SSS	Possible coral
17	Polygon	EQ20907	11/08/2020	EQ20907_017	MBES, SSS	Possible coral
19	Polygon	EQ20907	11/08/2020	EQ20907_019	MBES, SSS	Possible coral
20	Polygon	EQ20907	11/08/2020	EQ20907_020	MBES, SSS	Possible coral
21	Polygon	EQ20907	11/08/2020	EQ20907_021	MBES, SSS	Possible coral
22	Polygon	EQ20907	11/08/2020	EQ20907_022	MBES, SSS	Possible coral
24	Polygon	EQ20907	11/08/2020	EQ20907_024	MBES, SSS	Possible coral
25	Polygon	EQ20907	11/08/2020	EQ20907_025	MBES, SSS	Possible coral
26	Polygon	EQ20907	11/08/2020	EQ20907_026	MBES, SSS	Possible coral
29	Polygon	EQ20907	11/08/2020	EQ20907_029	MBES, SSS	Possible coral
30	Polygon	EQ20907	11/08/2020	EQ20907_030	MBES, SSS	Possible coral
31	Polygon	EQ20907	11/08/2020	EQ20907_031	MBES, SSS	Possible coral
32	Polygon	EQ20907	11/08/2020	EQ20907_032	MBES, SSS	Possible coral
33	Polygon	EQ20907	11/08/2020	EQ20907_033	MBES, SSS	Possible coral

4.3 VISUAL SURVEY

In total, 31 targets exceeding 1m height were defined from MBES and SSS records; all of these were interpreted to be potential coral reef structures. Four possible reef locations were selected for visual inspection, Table 4.2. The presence of live corals was confirmed at all sites. The KP position is based on the east to west running centre line of proposed 1# priority well location. Track files for the visual surveys are included in the NaviModel project provided with the digital deliverables.

A geodatabase with inspected and possible coral reefs is included as part of the survey deliverables.

Table 4.2 - Egyptian Vulture Coral Survey - Visually inspected corals

Location	Date	Time from	Time To	KP	Easting (m)	Northing (m)	Length (m)	Height (m)	Width (m)
EQ20907_005	13/08/2020	02:49:56	03:26:02	3.066	407922.61	7208470.05	17.2	1.2	15.9
EQ20907_018	13/08/2020	01:43:44	02:08:42	1.058	410144.65	7209301.83	14.9	5.3	12.3
EQ20907_023	12-13/08/2020	23:37:08	00:15:15	4.367	407120.46	7211018.67	13.9	2.3	12.1
EQ20907_027	13/08/2020	03:56:21	04:24:43	3.061	407702.89	7207385.56	5.7	1.0	7.4

Detailed results from the visual inspections are included in sub-sections from 4.3.1.1 to 4.3.1.4, summarised in Table 4.3. For the visual survey, the ROV performed a perimeter survey facing the reef and crosslines flying over the top.

Table 4.3 - Egyptian Vulture Coral Survey - Visually observed coral location targets and status

FID	SHAPE	SURVEYREF	SURVEY DATE	LOCALITY	INSTRUMENT	AREA	COVERAGE CORAL	SPECIMENS	CLASS	REMARKS
005	Polygon	EQ20907	13/08/2020	EQ20907_005	Visual	<15 m^2	0-20%	<5	**POOR**	Poor *Lophelia*, poor Coral Garden
018	Polygon	EQ20907	13/08/2020	EQ20907_018	Visual	< 15 m^2	0-20%	<5	**POOR**	Poor *Lophelia*, poor Coral Garden
023	Polygon	EQ20907	12.-13/08/2020	EQ20907_023	Visual	<5	<5	5-10	**POOR**	Poor *Lophelia*, fair Coral Garden
027	Polygon	EQ20907	13/08/2020	EQ20907_027	Visual	< 15 m^2	0-20%	<5	**POOR**	Poor *Lophelia*, poor Coral Garden

4.3.1.1 SITE EQ20907_005

Survey	EGYPTIAN VULTURE CORAL SURVEY		
KP	3.066	Offset to Centre Line	690m Right
Easting (m)	407922.61	Northing (m)	7208470.05
Lophelia condition			Coral Garden
Area of living *Lophelia*		Coverage (% of living corals)	Specimens per 25m²
POOR	< 15 m²	0 - 20 %	< 5
FAIR	15 - 50 m²	20 - 40 %	5 - 10
GOOD	50 - 100 m²	40 - 60 %	10 - 15
EXCELLENT	> 100 m²	>60 %	> 15
Other Comment	**POOR REEF / POOR CORAL GARDEN.** Sporadic species of *Gorgonians* and a few live *Lophelia pertusa.*		

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_01
Date	13/08/2020
Time (UTC)	03:00:28
Easting (m)	407916.79
Northing (m)	7208471.77
ROV Depth (m)	291.7
ROV Altitude (m)	3.7
Heading (° T)	95.4
Comment	**Site EQ20907_005 –** Sporadic *Gorgonians*, no live *Lophelia* in the western part of the reef, direction of view indicated by red arrow in MBES/track image

Figure 4.5 - EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_01

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_02
Date	13/08/2020
Time (UTC)	03:05:45
Easting (m)	407928.21
Northing (m)	7208478.92
ROV Depth (m)	289.3
ROV Altitude (m)	2.1
Heading (° T)	226.7
Comment	**Site EQ20907_005 -** Sporadic *Gorgonians* and no live *Lophelia* in the western part of the reef. Direction of view indicated by black arrow in MBES/track image

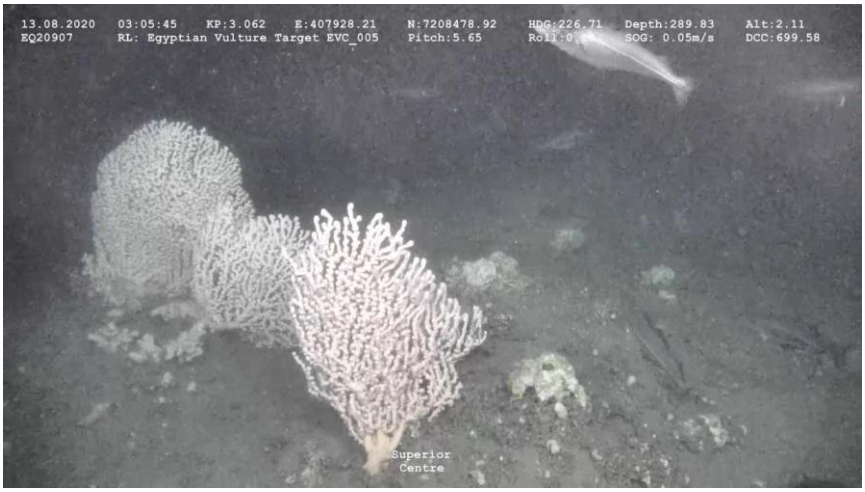
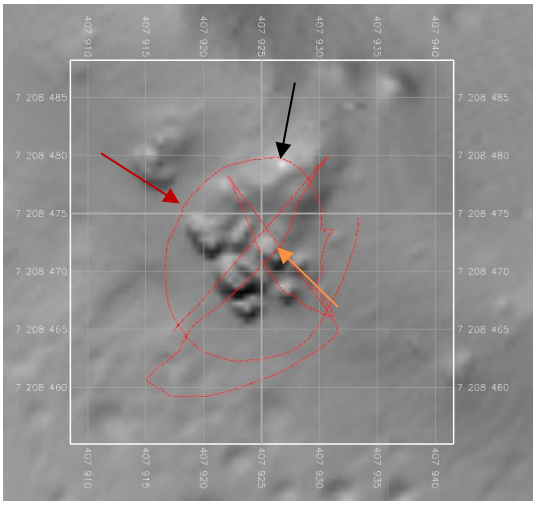


Figure 4.6 - EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_02

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_03
Date	13/08/2020
Time (UTC)	03:13:28
Easting (m)	407926.77
Northing (m)	7208468.41
ROV Depth (m)	290.5
ROV Altitude (m)	3.5
Heading (° T)	322.9
Comment	**Site EQ20907_005 -** Very little live *Lophelia* and sporadic *Gorgonians* at the centre of the reef. Direction of view indicated by orange arrow in MBES/track image.

Figure 4.7 - EQ20907_PIC_EGYPTIAN-VULTURE-005_20200813_03

Video Clips	DATA_20200813024956289, DATA_20200813030456997, DATA_20200813031957008



Site EQ20907_005

4.3.1.2 SITE EQ20907_018

Survey	EGYPTIAN VULTURE CORAL SURVEY		
KP	1.058	Offset to Centre Line	1954m Right
Easting (m)	410144.65	Northing (m)	7209301.83
Lophelia condition			Coral Garden
Area of living *Lophelia*		Coverage (% of living corals)	Specimens per 25m²
POOR	< 15 m²	0 - 20 %	< 5
FAIR	15 - 50 m²	20 - 40 %	5 - 10
GOOD	50 - 100 m²	40 - 60 %	10 - 15
EXCELLENT	> 100 m²	>60 %	> 15
Other Comment	**POOR REEF / POOR CORAL GARDEN.** Sporadic species of *Gorgonians* and no live *Lophelia pertusa.*		

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-018_20200813_01
Date	13/08/2020
Time (UTC)	01:51:23
Easting (m)	410138.78
Northing (m)	7209299.70
ROV Depth (m)	290.1
ROV Altitude (m)	4.3
Heading (° T)	57.8
Comment	**Site EQ20907_018 –** *Gorgonians* and no live *Lophelia* at the centre of the reef. Direction of view indicated by red arrow in MBES/track image

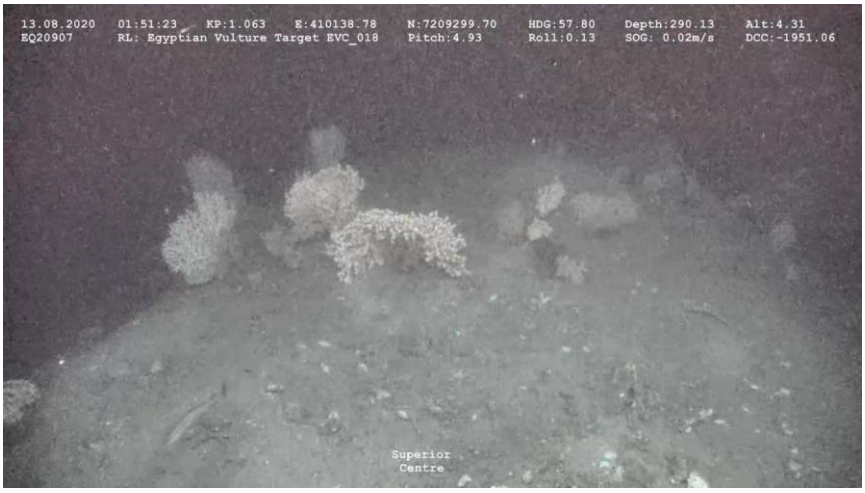
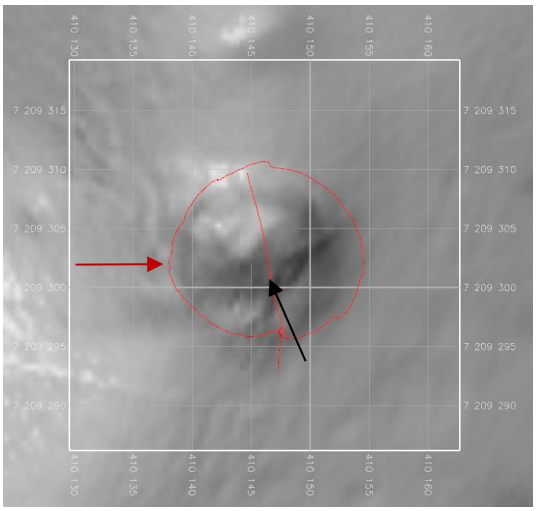


Figure 4.8 - EQ20907_PIC_EGYPTIAN-VULTURE-018_20200813_01

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-018_20200813_02
Date	13/08/2020
Time (UTC)	02:07:42
Easting (m)	410146.71
Northing (m)	7209300.52
ROV Depth (m)	287.5
ROV Altitude (m)	5.3
Heading (° T)	343.6
Comment	**Site EQ20907_018 -** *Gorgonians* and no live *Lophelia* at the centre of the reef. Direction of view indicated by black arrow in MBES/track image

Figure 4.9 - EQ20907_PIC_EGYPTIAN-VULTURE-018_20200813_02

Video Clips	DATA_20200813014344800, DATA_20200813015845005



Site EQ20907_018

4.3.1.3 SITE EQ20907_023

Survey	EGYPTIAN VULTURE CORAL SURVEY		
KP	4.367	Offset to Centre Line	3023m Right
Easting (m)	407120.46	Northing (m)	7211018.67
Lophelia condition			Coral Garden
Area of living *Lophelia*		Coverage (% of living corals)	Specimens per 25m²
POOR	< 15 m²	0 - 20 %	< 5
FAIR	15 - 50 m²	20 - 40 %	5 - 10
GOOD	50 - 100 m²	40 - 60 %	10 - 15
EXCELLENT	> 100 m²	>60 %	> 15
Other Comment	POOR REEF / POOR CORAL GARDEN. Different species of *Gorgonians* and no live *Lophelia pertusa.*		

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_01
Date	12/08/2020
Time (UTC)	23:55:10
Easting (m)	407111.88
Northing (m)	7211013.32
ROV Depth (m)	292.2
ROV Altitude (m)	2.4
Heading (° T)	32.9
Comment	**Site EQ20907_023 –** Different species of *Gorgonians*, no live *Lophelia* in the south-western part of the reef. Direction of view indicated by red arrow in MBES/track image

Figure 4.10 - EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_01

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_02
Date	13/08/2020
Time (UTC)	00:01:57
Easting (m)	407118.55
Northing (m)	7211029.52
ROV Depth (m)	292.0
ROV Altitude (m)	1.8
Heading (° T)	151.9
Comment	**Site EQ20907_023 -** Sporadic *Gorgonians* and no live *Lophelia* in the northern part of the reef. Direction of view indicated by black arrow in MBES/track image

Figure 4.11 - EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_02

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_03
Date	13/08/2020
Time (UTC)	00:13:18
Easting (m)	407121.14
Northing (m)	7211016.12
ROV Depth (m)	289.3
ROV Altitude (m)	3.1
Heading (° T)	298.9
Comment	**Site EQ20907_023 -** Sporadic *Gorgonians* and no live *Lophelia* in the northern part of the reef. Direction of view indicated by orange arrow in MBES/track image

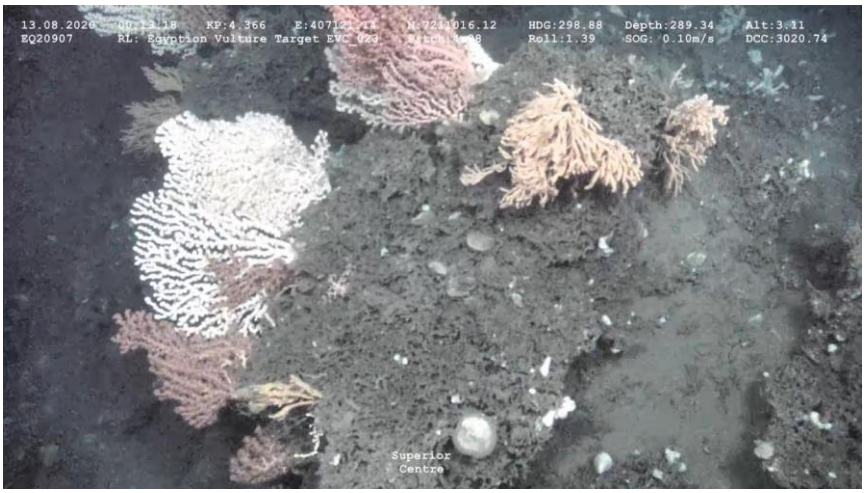
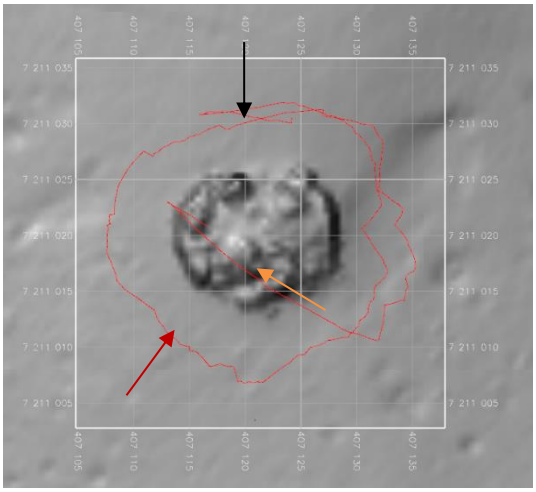


Figure 4.12 - EQ20907_PIC_EGYPTIAN-VULTURE-023_20200813_03

Video Clips	DATA_20200812233708286, DATA_20200812235209003, DATA_20200813000709012



Site EQ20907_023

4.3.1.4 SITE EQ20907_027

Survey	EGYPTIAN VULTURE CORAL SURVEY		
KP	3.061	**Offset to Centre Line**	417m Left
Easting (m)	407702.89	**Northing (m)**	7207385.56
***Lophelia* condition**			**Coral Garden**
Area of living *Lophelia*		**Coverage (% of living corals)**	**Specimens per 25m²**
POOR	< 15 m²	0 - 20 %	< 5
FAIR	15 - 50 m²	20 - 40 %	5 - 10
GOOD	50 - 100 m²	40 - 60 %	10 - 15
EXCELLENT	> 100 m²	>60 %	> 15
Other Comment	**POOR REEF / POOR CORAL GARDEN.** Sporadic species of *Gorgonians* and a no live *Lophelia pertusa.*		

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-027_20200813_01
Date	13/08/2020
Time (UTC)	03:58:01
Easting (m)	407706.35
Northing (m)	7207396.67
ROV Depth (m)	291.6
ROV Altitude (m)	2.7
Heading (° T)	104.0
Comment	**Site EQ20907_027 –** Sporadic *Gorgonians*, no live *Lophelia* in the northern part of the reef. Direction of view indicated by red arrow in MBES/track image

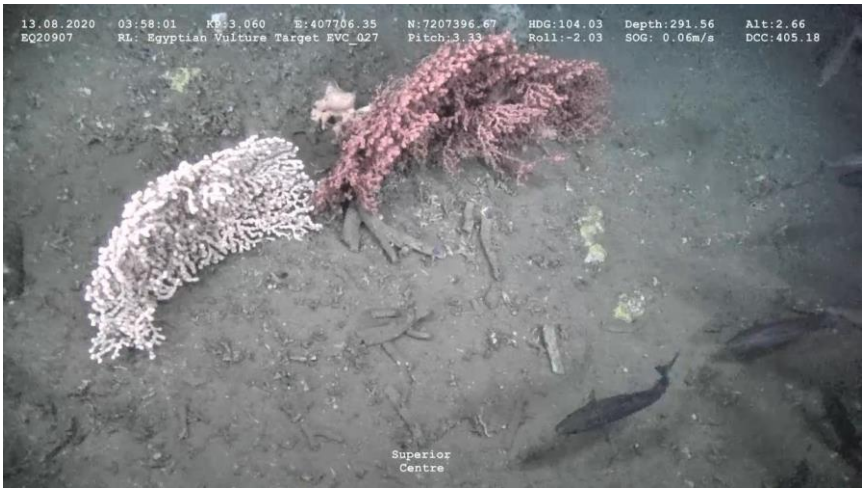


Figure 4.13 - EQ20907_PIC_EGYPTIAN-VULTURE-027_20200813_01

Name	Image EQ20907_PIC_EGYPTIAN-VULTURE-027_20200813_02
Date	13/08/2020
Time (UTC)	04:23:32
Easting (m)	407703.45
Northing (m)	7207385.46
ROV Depth (m)	292.7
ROV Altitude (m)	2.0
Heading (° T)	231.7
Comment	**Site EQ20907_027 -** Sporadic *Gorgonians* and no live *Lophelia* in the central part of the reef. Direction of view indicated by black arrow in MBES/track image

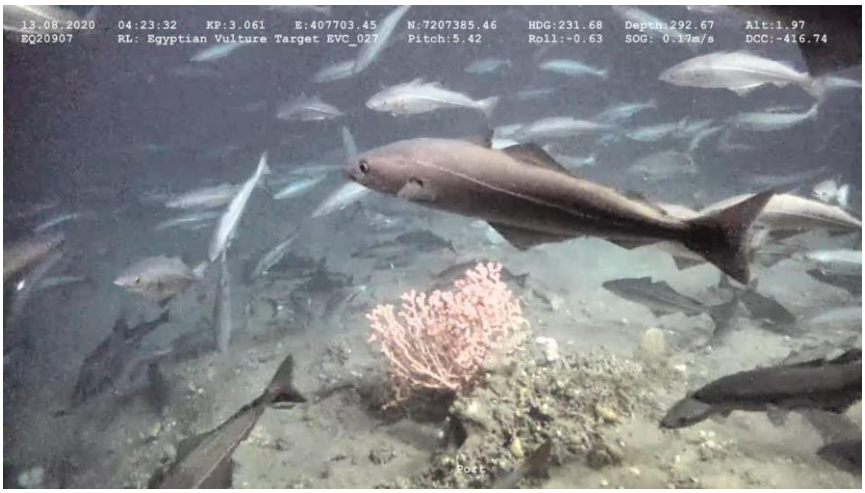
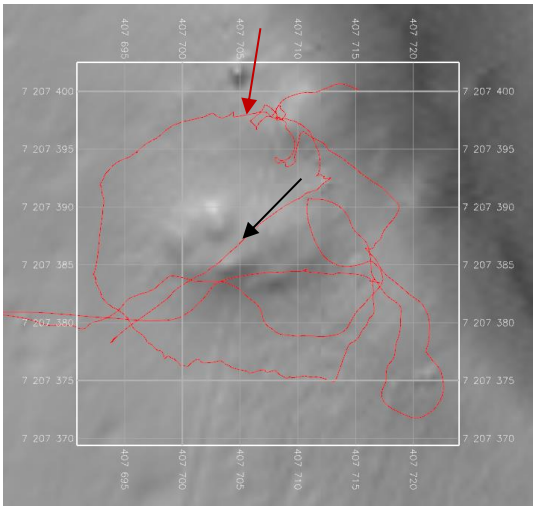


Figure 4.14 - EQ20907_PIC_EGYPTIAN-VULTURE-027_20200813_02

Video Clips	DATA_20200813035621276, DATA_20200813041122000



Site EQ20907_027

5. KP DATABASE

The proposed area was covered by lines spaced 100m either side of the area centreline, Figure 5.1.

The centreline and crossline KP databases are included as part of the Digital Data Delivery, Section 6.1.

Table 5.1 - Egyptian Vulture Coral Survey - As-Used KP Databases

Line	Start KP	End KP	File Name
Centreline	0.000	5.800	EQ20907_Egyptian_Vulture_EW_Centreline.rln
Crossline	0.000	7.022	EQ20907_Egyptian_Vulture_NS_Crossline.rln

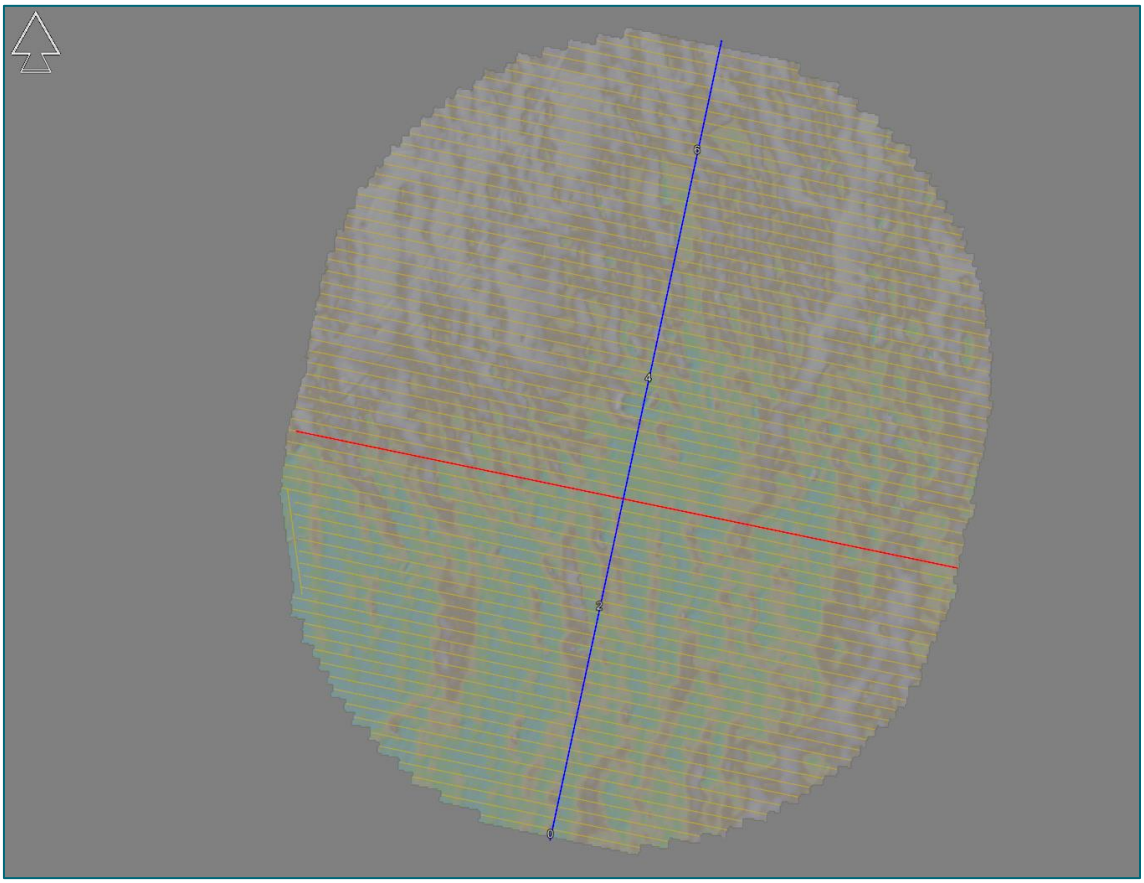


Figure 5.1 - Egyptian Vulture Coral Survey - Overview of Survey Lines - Centreline in red ; Crossline in blue

6. DATA INDEX

6.1 DIGITAL REPORT DELIVERY

All digital deliverables are listed in Metadata sheet, *EQ20907_META_20200907.xlsx*.

Table 6.1 - Egyptian Vulture Coral Survey - Digital Deliverables Index

Folder	File Type	Delivery Media	Delivery Media
		Rev 02	Rev 0
01_REPORT	(.docx / .pdf)	NO.E11221-SUR-DAT-053	FTP : 4503809011-TR-DEO-GMS-0237
02_CHARTS	(.pdf)	NO.E11221-SUR-DAT-053	FTP : 4503809011-TR-DEO-GMS-0237
03_METADATA	(.xlsx)	NO.E11221-SUR-DAT-053	FTP : 4503809011-TR-DEO-GMS-0237
04_NAVIMODEL_OUTLINE	(.gdb)	NO.E11221-SUR-DAT-053	-
04_SSDM	(.gdb)	NO.E11221-SUR-DAT-053	-
05_KP_DATA	(.rln)	NO.E11221-SUR-DAT-053	-
06_DTM	(.xyz)	NO.E11221-SUR-DAT-053	-
08_OBSERVATIONS	(.xlsx)	NO.E11221-SUR-DAT-053	-
09_SITRAS_GVI	(ASCII)	NO.E11221-SUR-DAT-053	-
10_NAVIMODEL	(.nmp)	NO.E11221-SUR-DAT-053	-
11_STILLSOBS	(.jpg)	NO.E11221-SUR-DAT-053	-
13_SSS	(.tif)	NO.E11221-SUR-DAT-053	-
14_BACKSCATTER	(.nmp)	NO.E11221-SUR-DAT-053	-
17_LOGFILES	(.xlsx)	NO.E11221-SUR-DAT-053	-
18_VIDEO_GVI	(.mp4)	NO.E11221-SUR-DAT-053	-

6.2 OBSERVATION LISTINGS

Full event listings for all observation types are listed in the DataFiles tab of the Survey Control and Metadata file, *EQ20907_META_20200907.xlsx.*

7. DIGITAL IMAGE PRINTS AND DATA EXAMPLES

The following georeferenced images are included as part of the digital deliverables and listed in the DataFiles tab of the Survey Control and Metadata file, *EQ20907_META_20200907.xlsx*.

Still Photo File Name	Still Capture Image #	Location	Easting (m)	Northing (m)	Date	Time	ROV Heading (°)
EQ20907_PIC_Egyptian-Vulture-005_20200813_01	1	05	407916.79	7208471.77	13/08/2020	03:00:28	95.4
EQ20907_PIC_Egyptian-Vulture-005_20200813_02	2	05	407928.21	7208478.92	13/08/2020	03:05:45	226.7
EQ20907_PIC_Egyptian-Vulture-005_20200813_03	3	05	407926.77	7208468.41	13/08/2020	03:13:28	322.9
EQ20907_PIC_Egyptian-Vulture-018_20200813_01	4	18	410138.78	7209299.70	13/08/2020	01:51:23	57.8
EQ20907_PIC_Egyptian-Vulture-018_20200813_02	5	18	410146.71	7209300.52	13/08/2020	02:07:42	343.6
EQ20907_PIC_Egyptian-Vulture-023_20200813_01	6	23	407111.88	7211013.32	12/08/2020	23:55:10	32.9
EQ20907_PIC_Egyptian-Vulture-023_20200813_02	7	23	407118.55	7211029.52	13/08/2020	00:01:57	151.9
EQ20907_PIC_Egyptian-Vulture-023_20200813_03	8	23	407121.14	7211016.12	13/08/2020	00:13:18	298.9
EQ20907_PIC_Egyptian-Vulture-027_20200813_01	9	27	407706.35	7207396.67	13/08/2020	03:58:01	104.0
EQ20907_PIC_Egyptian-Vulture-027_20200813_02	10	27	407703.45	7207385.46	13/08/2020	04:23:32	231.7

APPENDIX A SURVEY DATA PARAMETERS

The survey data parameters are listed in the Survey Control and Metadata file, *EQ20907_META_20200907.xlsx.*

The following data exists inside the file under separate tabs and contains the relevant parameters used during the survey.

- General
- Geo Acquisition
- Geo Final
- Vessel
- ROV_AUV
- Software
- CTD Summary
- Tides
- Pipe Tracker Summary
- DataFiles

The DataFiles tab lists all data files that are included in the delivery for this project, along with associated Metadata.

APPENDIX B FIRST HAND REPORTS / FIELD MEMOS

No First Hand Reports or Field Memos were issued in connection with the project.

APPENDIX C SCOPE OF WORK

The following Work Package document was issued in connection with the project. This document has been embedded within the word document and attached in the PDF version.

Scope of Work Document	
EQ20907_Egyptian_Vulture_Coral Survey_ WP_rev01	EQ20907_Egyptian_ Vulture_Coral Survey

APPENDIX D TASK PLAN

The following Task Plan was issued in connection with the project. This document has been embedded within the word document and attached in the PDF version.

Task Plan Document	
NO.E11221-SUR-TPL-078 EQ20907 - Egyptian Vulture Coral Survey Rev03	NO.E11221-SUR-TPL -078 EQ20907 - Egyp

APPENDIX E CHARTS

Charts, as listed in *EQ20907_META_20200907.xlsx*, are supplied in electronic format with this report.

APPENDIX F E-MAIL CORRESPONDENCE

There is no relevant project specific e-mail correspondence.