
Public Works and Government Services Canada

Dredging

Glace Bay SCH

Cape Breton County, N.S.

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APPENDIX C

Underwater Benthic Habitat Survey 2020

Public Services and Procurement Canada

GLACE BAY DFO-SCH (DFRP #03692) GLACE BAY, NOVA SCOTIA

Underwater Benthic Habitat Survey

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FINAL REPORT



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Summary

Englobe Corp. (Englobe) was retained by Public Services and Procurement Canada (PSPC), on behalf of the Department of Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH), to complete an Underwater Benthic Habitat Survey (UBHS) at Glace Bay DFO-SCH (DFRP #03692) located in Glace Bay, Nova Scotia (NS). Three dredge areas identified as A, B and C are proposed at the SCH. Dredge areas A and B are located within the harbour channel. Dredge area C is located along the west side of the SCH and is bound by a large breakwater that extends from the southwest to the northeast and a smaller breakwater that extends roughly south to north. The current UBHS program focuses on dredge area C. The objective of the UBHS work is to characterize the underwater benthic habitat through underwater videos following transects which would provide site-specific information on the substrate type and marine macrofloral/faunal species present.

Underwater videos along three transects throughout dredge area C were filmed on October 27, 2020. Analysis of the videos indicates that the proposed dredge area C is comprised of approximately 66% subtidal plain and approximately 34% is rock/cobble. Wood debris was observed along three intervals and metal debris was observed along five intervals of the first transect, T1.

The subtidal plain is a rippled sand and soft-bottomed silty sand substrate with no to little macrofloral life including sparse coverage of goat tang (*Polyides rotundus*), *Phyllophora truncata*, sea lettuce (*Ulva lactuca*), toothed wrack (*Fucus serratus*) and sea felt (*Pylaiella littoralis*). Periwinkles, sand shrimp, unidentifiable fish species, blowholes (bioturbation), green crab, sandworm sand coils, American plaice, pink coral, American lobster and Atlantic rock crab were observed in this habitat.

The rock/cobble area with various patches of silty sand contained toothed wrack, *Phyllophora truncate*, sea lettuce and lobster claw. This area was observed to provide habitat for periwinkles, pink coral, Atlantic rock crab, long horned sculpin, sand shrimp, moon snail, common rock barnacles, American plaice, green crab and unidentifiable fish species.

No endangered species were observed during the survey. However, sparse potential occurrence of sea cheese (2% coverage) was observed along the final two intervals of T1 (100-110m); this is a rare invasive species that should be verified, analyzed and monitored to reduce the chances of spreading this species to other areas of the harbour. It is recommended that the material dredged from this area be transported off site and disposed of on land.

The sandy habitat observed in dredge area C appeared to be more limited than the rockier habitat. Regardless, the area seemed desirable by macrofauna with blowholes (bioturbation), sand shrimp, periwinkles and fish species. The rockier habitat was much more abundant with macroflora as well as periwinkles, common rock barnacles, pink coral, crab and unidentifiable fish species. Although four fish species were observed, more are likely present. It is possible that they move to cover or leave the area when the divers are in the water. The hard bottom observed with a diverse macro-benthic algal community is typically a productive and important fish habitat.

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1 Introduction

Englobe Corp. (Englobe) was retained by Public Services and Procurement Canada (PSPC), on behalf of the Department of Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH), to complete an Underwater Benthic Habitat Survey (UBHS) at Glace Bay DFO-SCH (DFRP #03692) located in Glace Bay, Nova Scotia (NS). Three dredge areas identified as A, B and C are proposed at the SCH. Dredge areas A and B are located within the harbour channel. Dredge area C is located along the west side of the SCH and is bound by a large breakwater that extends from the southwest to the northeast and a smaller breakwater that extends roughly south to north. The current UBHS program focuses on dredge area C. The objective of the UBHS work is to characterize the underwater benthic habitat through underwater videos following transects which would provide site-specific information on the substrate type and marine macrofloral/faunal species present.

A Site Location Plan is presented on Figure 1 in Appendix A.

2 Scope and Methodology

Englobe retained the services of a diving team/crew from Commercial Diving & Marine Services Atlantic (CDMS) based in Edwardsville, NS. Under Englobe's supervision, the divers navigated to each identified transect location using a handheld Global Positioning System (GPS). The crew completed an underwater video survey along three transect lines for a total length of 175 metres (m). Transect locations were approved by PSPC and are provided with the date and time of filming in Table 1, below. Refer to Figure 2 in Appendix A for a transect line location plan.

Table 1 – Transect Coordinates & Date and Time of Sampling

Transect id	Sample coordinates (latitude, longitude – decimal degrees)				2020 Date & time of filming (24 hour clock)
	start		finish		
T1	46.198525°	-59.948925	46.198886°	-59.947605°	October 27, 10:19
T2	46.198350°	-59.947605°	46.198546°	-59.948395°	October 27, 10:45
T3	46.198566°	-59.947972°	46.198798°	-59.947666°	October 27, 10:59

A GPS was used to locate the pre-determined start and finish points of transects. Each transect was continuously filmed pausing at each 5 m mark and scanning to the right and left to provide a wider view of the habitats.

An Englobe representative was on-site to guide the dive crew in the event that any issue arose and to obtain supporting habitat and biological information.

At every 5 m for each transect, Englobe interpreted the underwater video including site specific substrate type and marine macrofloral/faunal species present; detailed descriptions of biological presence and/or habitat that are related to commercial, recreational or aboriginal fisheries; and general delineations of substrate types and a general characterization. In addition, a summary statement about the overall quality of fish habitat in the survey area was made.

3 Underwater Habitat Survey Results

The results of the transect surveys are presented in Appendix B (Tables B.1 to B.3) which includes the following information for each 5 m increment of transect line:

- ▶ Visual determination of substrate type (in order of dominance);
- ▶ Macrofaunal species identification and abundance; and
- ▶ Macrofloral species identification and percent coverage.

A summary of the information provided in Appendix B is described below. Photographs of each 5 m transect segment have been included in Appendix C.

For the purpose of the video survey review and macrofaunal species identification and enumeration, four categories were developed to characterize the observed abundance levels.

The categories are as follows:

A = Abundant

Numerous (not quantifiable) observations made throughout the entire 5 m segment.

C = Common

Numerous (not quantifiable) observations made intermittently along the 5 m segment.

O = Occasional

Quantifiable observations made intermittently along the 5 m segment.

U = Uncommon

Quantifiable observations made infrequently along the 5 m segment.

Transect T1

T1 was located within dredge area C of the Glace Bay DFO-SCH. T1 was 110 m in length extending southwest to northeast and parallel to the large breakwater, as shown in Figure 2.

The surficial sediment was predominantly sand and/or silty sand covering most of the transect (0-40m and 50-80m), boulder/bedrock was predominant from 40-50m and cobble was noted to predominantly cover the end of the transect (80-110m). Gravel covering between 1% to 20% was noted at the beginning and end of the transect (0-20m and 70-110m), wood debris (1% to 2% coverage) was noted along three of the intervals (5-10m, 20-25m and 80-85m) while metal debris (1% to 10% coverage) was noted along five of the intervals (40-45m and 90-110m). Shell fragments were observed along two intervals (0-5m and 15-20m).

In terms of observed macrofauna, sand shrimp (*Crangon septemspinosa*), periwinkles (*Littorina* sp.), common rock barnacles (*Semibalanus balanoides*) and pink coral (*Clathromorphum circumscriptum*) were most commonly observed along the entire transect. Bioturbation (blowholes) were observed from 10-40m. Single individuals of green crab (*Carcinus maenas*), sandworm (*Neanthes virens*) sand coil, long horn sculpin (*Myoxocephalus octodecimspinosus*), moon snail (*Euspira heros*), American plaice (*Hippoglossoides platessoides*), Atlantic rock crab (*Cancer irroratus*), potential sea cheese (*Didemnum vexillum*), and one fast-moving unidentifiable fish species were observed over the transect.

Macrofloral life included goat tang (*Polyides rotundus*) observed in a small patch (5% coverage) along one interval (20-25m), toothed wrack (*Fucus serratus*) was observed in patches (between 2% to 20% coverage) from 40-45m and 85-110m, sparse lobster claw (*Fucus serratus*) (1% coverage) was observed from 40-45m and 90-110m, *Phyllophora truncata* (2% to 60% coverage) was observed from 40-45m, 50-55m and 80-110m, and sparse sea lettuce (*Ulva lactuca*) (1% to 2% coverage) was observed from 85-110m.

Transect T2

T2 was located within dredge area C to the south. T2 was 30 m in length extending roughly southwest to northeast parallel to the small breakwater located along the southeast boundary of dredge area C, as shown in Figure 2.

The surficial sediment was predominantly silty sand along the first two intervals (0-10m) with 40% coverage, while cobble was predominant throughout the remaining length of the transect (10-30m) with 40% to 60% coverage, gravel was observed over the entire length of the transect (10% to 30% coverage), and boulder/bedrock was observed from 10-25m (10% to 20% coverage). Shell fragments were observed along the first interval.

In terms of observed macrofauna, periwinkles were observed from 5-25m, two Atlantic rock crab were observed from 10-20m, sparse pink coral (2% to 5% coverage) was observed from 15-30m, one American plaice was observed between 20-25m, one green crab was observed between 25-30m and four fast-moving unidentifiable fish species were observed between 10-20m.

Sea lettuce (5% to 20% coverage) and *Phyllophora truncata* (10% to 30% coverage) were most commonly observed over the entire transect (from 0-10m and 15-30m). Sparse goat tang (5% coverage) was observed along one interval (5-10m), and toothed wrack (10% coverage) was observed along one transect (10-15m).

Transect T3

T3 was located within dredge area C, along the northeast boundary. T3 was 35 m in length extending roughly southwest to northeast, north of the small breakwater, as shown in Figure 2.

The surficial sediment was predominantly sand covering the entire transect, with cobble observed from 0-15m and from 25-30m (10% to 30% coverage), and gravel from 10-15m and 30-35m (1% coverage).

In terms of observed macrofauna, pink coral was observed at 0-10m, sand shrimp were observed at 5-10m and at 20-25m, periwinkles were observed at 5-10m and 20-30m, one American lobster (*Homarus americanus*) was observed at 10-15m, one Atlantic rock crab was observed at 30-35m and three fast-moving unidentifiable fish species were observed between 5-10m.

Macrofloral species observed along the transect included *Phyllophora truncata* (5% to 10% coverage) from 0-15m, toothed wrack (2% to 5% coverage) from 5-10m and from 20-25m, goat tang (1% to 5% coverage) from 5-15m, sparse sea lettuce (1% coverage) from 15-20, and sea felt (*Pylaiella littoralis*) from 25-30m. No macrofloral species were observed along the final interval.

4 Conclusions

The Glace Bay DFO-SCH underwater video analysis indicates that the proposed dredge area C consists of two habitat types. One habitat type (observed from 0-40m and 50-80m along T1, from 0-10m along T2, and throughout T3) consisted of sandy subtidal plains while the second habitat type (observed from 40-50m and 80-110m along T1 and 10-30m along T2) consisted of a cobble/rock substrate. Based on the survey results 66% of Dredge Area C consists of a sandy subtidal plain and 34% is rock/cobble. No endangered species were observed during the survey. However, sparse potential occurrence of sea cheese (2% coverage) was observed along the final two intervals of T1 (100-110m); this is a rare invasive species that should be verified, analyzed and monitored to reduce the chances of spreading this species to other areas of the harbour. It is recommended that the material dredged from this area be transported off site and disposed of on land.

Within dredge area C, the survey area defined by T1 (0-40m and 50-80m), T2 (0-10m) and T3 is made up of rippled sandy subtidal plains with areas of a more soft-bottomed habitat with silty sand substrate. Little to no macrofloral life was observed within this habitat type along T1. Goat tang (1% to 5% coverage from 25-30m at T1, 5-10m at T2 and 5-15m at T3), *Phyllophora truncata* (2% to 20% coverage along T1, T2 and T3), sea lettuce (1% to 20% along T2 and T3), toothed wrack (2% to 5% coverage along two intervals of T3) and sea felt (5% coverage along one interval of T3) were present in sparse quantities.

Within this sandy habitat, periwinkles were identified along all three transects, sand shrimp and unidentifiable fish species were identified at T1 and T3. Blowholes (bioturbation), green crab, sandworm sand coils and American plaice were identified at T1 and pink coral, American lobster and Atlantic rock crab were identified at T3.

The habitat observed within dredge area C defined by T1 (40-50m and 80-110m) and T2 (10-30m) is made up of one habitat type consisting of dominant boulder, bedrock and cobble substrate with various patches of silty sand. Toothed wrack, *Phyllophora truncata* and sea lettuce were identified along T1 and T2 and lobster claw was identified at T1. This habitat was observed to provide habitat for periwinkles, pink coral and Atlantic rock crab at T1 and T2, long horned sculpin, sand shrimp, moon snail, common rock barnacles and possibly sea cheese at T1, and American plaice, green crab and unidentifiable fish species at T2.

Wood debris was observed along three intervals and metal debris was observed along five intervals of T1.

The sandy habitat observed in dredge area C appeared to be more limited than the rockier habitat. Regardless, the area seemed desirable by macrofauna with blowholes (bioturbation), sand shrimp, periwinkles and fish species most commonly observed. The rockier habitat was much more abundant with macrofloral as well as periwinkles, common rock barnacles, pink coral, crab and unidentifiable fish species. Although four fish species were observed, more are likely present. It is possible that they move to cover or leave the area when the divers are in the water. The hard bottom observed with a diverse macro-benthic algal community is typically a productive and important fish habitat.

5 Report Use and Conditions

This report was prepared for the exclusive use of PSPC and DFO and is based on data and information obtained during a site visit by Englobe on the subject property; and is based solely upon the condition of the property on the date of such inspection, supplemented by information obtained and described herein. The evaluation and conclusions contained in this report have been prepared in light of the expertise and experience of Englobe. Environmental conditions are dynamic in nature and changing circumstances in the environment and in the use of the property can alter radically the conclusions and information contained herein.

Appendix A Figures



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Public Services and Procurement Canada

Underwater Benthic Habitat Assessment

Glace Bay DFO-SCH (DFRP #03692)
Glace Bay, NS

Site Location Plan



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Dartmouth, NS B3B 2A7
902-468-6486



Discipline: Environment		Prepare by: AS		Verify by: AS	
Scale: 1: 50,000		Draw by: JJ		Approval by: DC	
Date: December 2020		Figure no: 1			
Page setup: Paper size: Letter		Register no.:			
Figure 1					

Man.	Project	Otp	Project	Phase	Electronic ref.	Rev.
148	1900182	31	0	-	-	-



LEGEND:

- Transect Location and Length
- Sandy Substrate
- Cobble/Rock Substrate
- Direction of Transect
- Dredge Area "A"
- Dredge Area "B"
- Dredge Area "C"

Public Services and Procurement Canada



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Underwater Benthic Habitat Assessment

Glace Bay DFO-SCH (DFRP #03692)
Glace Bay, NS

Sample Location Plan

		Dec. 2020	JJ	AS	DC
No.	Version	Date	By	Verif	Appr.
Discipline: Environment		Prepare by: AS		Verify by: AS	
Scale: 1: 2,000		Draw by: JJ		Approval by: DC	
Date: December 2020		Figure no: 2			
Page setup: Paper size: (17.00 x 11.00 inches)		Register no.:			
Man.	Project	Otp	Project	Phase	Electronic ref.
148	1900182	31			

Appendix B Transect Surveys

Table B.1 Transect T1 (110 m Survey, Oct 27, 2020) - Glace Bay DFO-SCH, NS

Transect Distance / Interval (m)	Substrate (Estimated % Coverage ¹)	Macrofaunal Life Observed (Estimated Abundances ²)	Macrofloral Life Observed (Estimated % Coverage)
0-5	Sand 98%; Gravel 1.5%; Shell hash 0.5%	-	-
5-10	Sand 98%; Wood debris 2%	-	-
10-15	Sand 99%; Gravel 1%	Bioturbation (blowholes) C	-
15-20	Sand 99%; Gravel 0.5%; Shell hash 0.5%	Bioturbation (blowholes) C	-
20-25	Sand 99%; Wood debris 1%	1 Green crab (<i>Carcinus maenas</i>) U; 1 Sandworm (<i>Neanthes virens</i>) sand coil U; Bioturbation (blowholes) C	-
25-30	Silty sand 100%	1 Sand shrimp (<i>Crangon septemspinosa</i>) U; 2 Bioturbation (blowholes) U	Goat tang (<i>Polyides rotundus</i>): 5%
30-35	Silty sand 100%	1 Sand shrimp (<i>Crangon septemspinosa</i>) U; Bioturbation (blowholes) C	-
35-40	Sandy silt 100%;	2 Sand shrimp (<i>Crangon septemspinosa</i>) U; Bioturbation (blowholes) C	-
40-45	Silty sand 25%; Boulder/ Bedrock 70%; Metal debris 5%	periwinkles (<i>Littorina</i> sp.) C; 1 Long horn sculpin (<i>Myoxocephalus octodecimspinosus</i>) U	Toothed wrack (<i>Fucus serratus</i>): 20%; Lobster claw (<i>Ceranium rubrum</i>): 1%; <i>Phyllophora truncata</i> 5%
45-50	Silty sand 30%; Boulder/ Bedrock 70%;	2 Sand shrimp (<i>Crangon septemspinosa</i>) U; 1 Moon snail (<i>Euspira heros</i>) U; Pink coral (<i>Clathromorphum circumscriptum</i>) 5%	-
50-55	Silty sand 98%; Cobble 2%	Periwinkles (<i>Littorina</i> sp.) C; 4 Sand shrimp (<i>Crangon septemspinosa</i>) U	<i>Phyllophora truncata</i> 2%
55-60	Sand 100%;	4 Sand shrimp (<i>Crangon septemspinosa</i>) U	-
60-65	Sand 99%; Cobble 1%;	8 Sand shrimp (<i>Crangon septemspinosa</i>) U; Periwinkles (<i>Littorina</i> sp.) C; 1 Unknown fish U	-
65-70	Sand 100%	1 Sand shrimp (<i>Crangon septemspinosa</i>) U	-
70-75	Sand 98%; Gravel 2%	3 Sand shrimp (<i>Crangon septemspinosa</i>) U; 1 American plaice (<i>Hippoglossoides platessoides</i>) U	-
75-80	Sand 98%; Cobble 1%; Gravel 1%	1 Sand shrimp (<i>Crangon septemspinosa</i>) U	-
80-85	Silty sand 24%; Cobble 70%; Gravel 5%; Wood debris 1%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; 1 Atlantic rock crab (<i>Cancer irroatus</i>) U; Pink coral (<i>Clathromorphum circumscriptum</i>) 5%	<i>Phyllophora truncata</i> 20%
85-90	Silty sand 10%; Cobble 70%; Gravel 20%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 5%	<i>Phyllophora truncata</i> 60%; Toothed wrack (<i>Fucus serratus</i>): 2%; Sea lettuce (<i>Ulva lactuca</i>): 1%
90-95	Silty sand 10%; Cobble 60%; Gravel 20%; metal debris 10%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 20%	<i>Phyllophora truncata</i> 30%; Toothed wrack (<i>Fucus serratus</i>): 5%; Sea lettuce (<i>Ulva lactuca</i>): 2%; Lobster claw (<i>Ceranium rubrum</i>): 1%
95-100	Silty sand 10%; Cobble 60%; Gravel 20%; metal debris 10%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 20%; Periwinkles (<i>Littorina</i> sp.) C	<i>Phyllophora truncata</i> 50%; Toothed wrack (<i>Fucus serratus</i>): 10%; Sea lettuce (<i>Ulva lactuca</i>): 1%; Lobster claw (<i>Ceranium rubrum</i>): 1%
100-105	Silty sand 10%; Cobble 60%; Gravel 20%; metal debris 10%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 25%; Periwinkles (<i>Littorina</i> sp.) C; (Possible) Sea cheese (<i>Didemnum vexillum</i>) 2%	<i>Phyllophora truncata</i> 40%; Toothed wrack (<i>Fucus serratus</i>): 10%; Sea lettuce (<i>Ulva lactuca</i>): 1%; Lobster claw (<i>Ceranium rubrum</i>): 1%
105-110	Silty sand 20%; Cobble 50%; Gravel 20%; metal debris 10%	Common rock barnacle (<i>Semibalanus balanoides</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 20%; Periwinkles (<i>Littorina</i> sp.) C; (Possible) Sea cheese (<i>Didemnum vexillum</i>) 2%	<i>Phyllophora truncata</i> 20%; Toothed wrack (<i>Fucus serratus</i>): 5%; Sea lettuce (<i>Ulva lactuca</i>): 5%; Lobster claw (<i>Ceranium rubrum</i>): 1%

Notes: Visibility is fair

" - " = None Observed

¹ Boulder (>256 mm), Cobble (>64-256 mm), Gravel (>2-64 mm), Sand (0.06-2 mm), Silt (<0.06 mm).

² A = Abundant, C = Common, O = Occasional, U = Uncommon (see below).

A = Abundant; Numerous (not quantifiable) observations made throughout the entire 5 m segment.

C = Common; Numerous (not quantifiable) observations made intermittently along the 5 m segment.

O = Occasional; Quantifiable observations made intermittently along the 5 m segment.

U = Uncommon; Quantifiable observations made infrequently along the 5 m segment.

Table B.2 Transect T2 (30 m Survey, Oct 27, 2020) - Glace Bay DFO-SCH, NS

Transect Distance / Interval (m)	Substrate (Estimated % Coverage ¹)	Macrofaunal Life Observed (Estimated Abundances ²)	Macrofloral Life Observed (Estimated % Coverage)
0-5	Silty sand 40%; Gravel 30%; Cobble 28%; Shell hash 2%	-	<i>Phyllophora truncata</i> 20%; Sea lettuce (<i>Ulva lactuca</i>) 15%;
5-10	Silty sand 40%; Gravel 30%; Cobble 30%;	2 Periwinkles (<i>Littorina sp.</i>) U	<i>Phyllophora truncata</i> 15%; Sea lettuce (<i>Ulva lactuca</i>) 20%; Goat tang (<i>Polydora rotunda</i>) 5%;
10-15	Silty sand 30%; Gravel 20%; Cobble 40%; Boulder/ Bedrock 10%;	3 Unknown fish U; 1 Atlantic rock Crab (<i>Cancer pagurus</i>) U; Periwinkles (<i>Littorina sp.</i>) C;	Toothed wrack (<i>Fucus serratus</i>) 10%;
15-20	Silty sand 30%; Gravel 20%; Cobble 40%; Boulder/ Bedrock 10%;	1 Unknown fish U; 1 Atlantic rock Crab (<i>Cancer pagurus</i>) U; Periwinkles (<i>Littorina sp.</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 2%;	<i>Phyllophora truncata</i> 10%; Sea lettuce (<i>Ulva lactuca</i>) 10%;
20-25	Silty sand 20%; Gravel 20%; Cobble 40%; Boulder/ Bedrock 20%;	Periwinkles (<i>Littorina sp.</i>) C; Pink coral (<i>Clathromorphum circumscriptum</i>) 5%; 1 American plaice (<i>Hippoglossoides platessoides</i>) U;	<i>Phyllophora truncata</i> 20%; Sea lettuce (<i>Ulva lactuca</i>) 5%;
25-30	Silty sand 30%; Gravel 10%; Cobble 60%;	1 Green crab (<i>Carcinus maenas</i>) U; Pink coral (<i>Clathromorphum circumscriptum</i>) 5%;	<i>Phyllophora truncata</i> 30%; Sea lettuce (<i>Ulva lactuca</i>) 5%;

Notes: Visibility is fair

" - " = None Observed

¹ Boulder (>256 mm), Cobble (>64-256 mm), Gravel (>2-64 mm), Sand (0.06-2 mm), Silt (<0.06 mm).

² A = Abundant, C = Common, O = Occasional, U = Uncommon (see below).

A = Abundant; Numerous (not quantifiable) observations made throughout the entire 5 m segment.

C = Common; Numerous (not quantifiable) observations made intermittently along the 5 m segment.

O = Occasional; Quantifiable observations made intermittently along the 5 m segment.

U = Uncommon; Quantifiable observations made infrequently along the 5 m segment.

Table B.3 Transect T3 (35 m Survey, Oct 27, 2020) - Glace Bay DFO-SCH, NS

Transect Distance / Interval (m)	Substrate (Estimated % Coverage ¹)	Macrofaunal Life Observed (Estimated Abundances ²)	Macrofloral Life Observed (Estimated % Coverage)
0-5	Silty sand 70%; Cobble 30%;	Pink coral (<i>Clathromorphum circumscriptum</i>) 1%;	<i>Phyllophora truncata</i> 10%;
5-10	Sand 90%; Cobble 10%;	1 Sand shrimp (<i>Crangon septemspinosa</i>) U; '1 Periwinkles (<i>Littorina sp.</i>) U; 3 Unknown fish U ; 'Pink coral (<i>Clathromorphum circumscriptum</i>) 2%;	<i>Phyllophora truncata</i> 5%; Toothed wrack (<i>Fucus serratus</i>): 2%; Goat tang (<i>Polyides rotundus</i>): 5%;
10-15	Sand 89%; Gravel 1%; Cobble 10%;	1 American lobster (<i>Homarus americanus</i>) U;	<i>Phyllophora truncata</i> 10%; Goat tang (<i>Polyides rotundus</i>): 1%;
15-20	Sand 100%;	-	Sea lettuce (<i>Ulva lactuca</i>): 1%;
20-25	Sand 100%;	1 Periwinkles (<i>Littorina sp.</i>) U; '1 Sand shrimp (<i>Crangon septemspinosa</i>) U;	Toothed wrack (<i>Fucus serratus</i>): 5%;
25-30	Sand 90%; Cobble 10%;	1 Periwinkles (<i>Littorina sp.</i>) U;	Sea felt (<i>Pylaiella littoralis</i>): 5%;
30-35	Sand 99%; Gravel 1%;	1 Atlantic rock Crab (<i>Cancer pagurus</i>) U;	-

Notes: Visibility is fair

" - " = None Observed

¹ Boulder (>256 mm), Cobble (>64-256 mm), Gravel (>2-64 mm), Sand (0.06-2 mm), Silt (<0.06 mm).

² A = Abundant, C = Common, O = Occasional, U = Uncommon (see below).





A = Abundant; Numerous (not quantifiable) observations made throughout the entire 5 m segment.


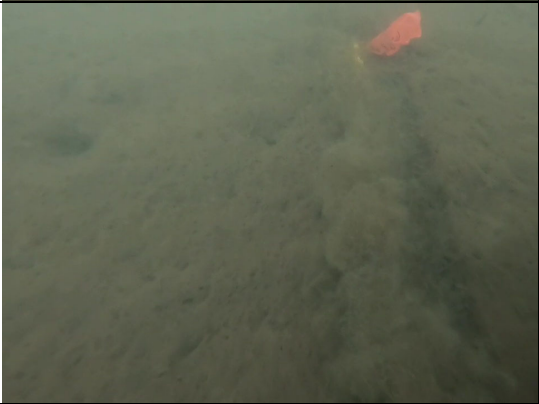
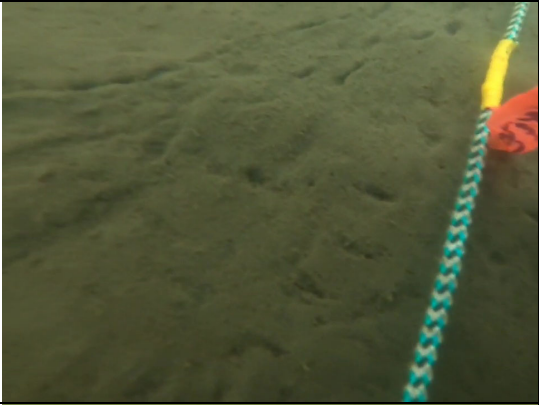

C = Common; Numerous (not quantifiable) observations made intermittently along the 5 m segment.

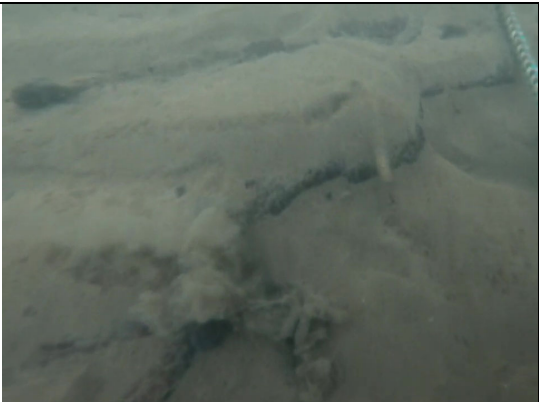


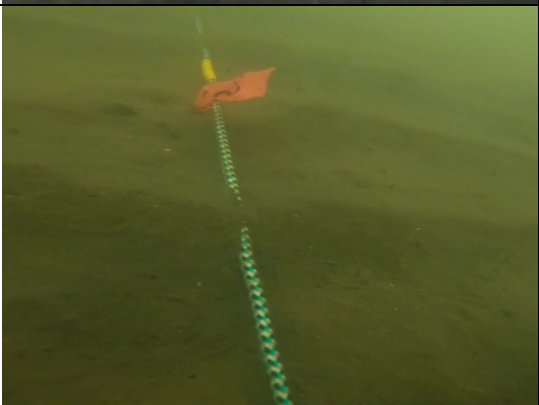
O = Occasional; Quantifiable observations made intermittently along the 5 m segment.

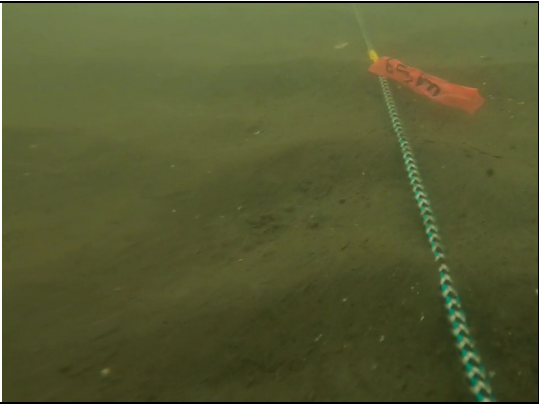

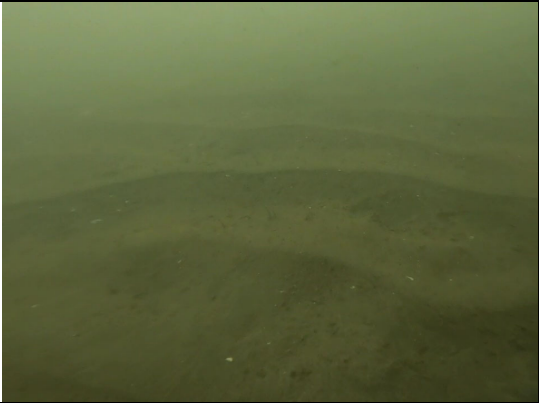

U = Uncommon; Quantifiable observations made infrequently along the 5 m segment.

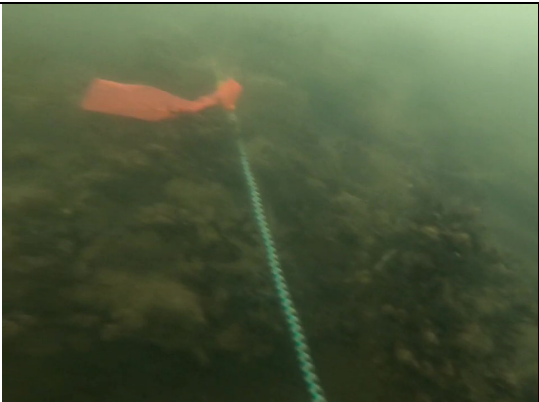
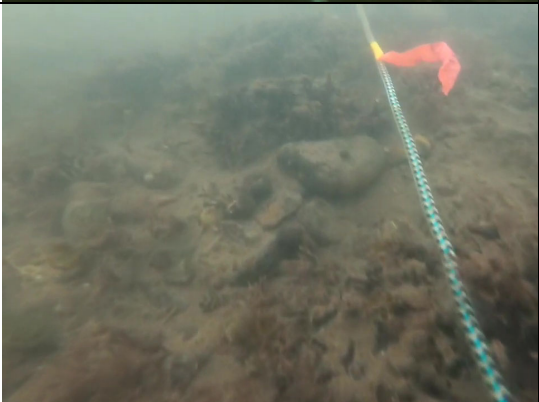
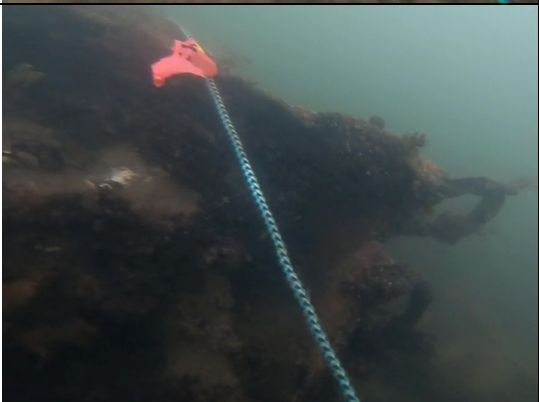

Appendix C Transect Photos


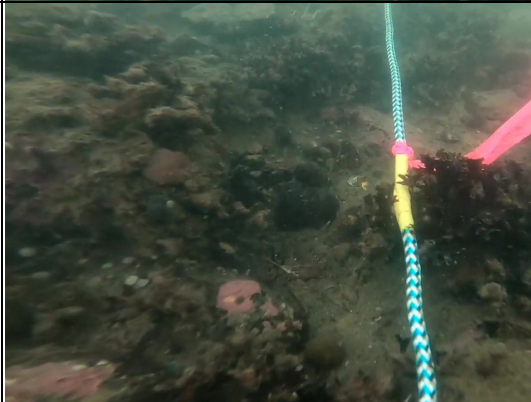


Transect Interval (m)	Representative Substrate Character
Transect T1	
0-5	
5-10	
10-15	
15-20	





20-25	
25-30	
30-35	
35-40	

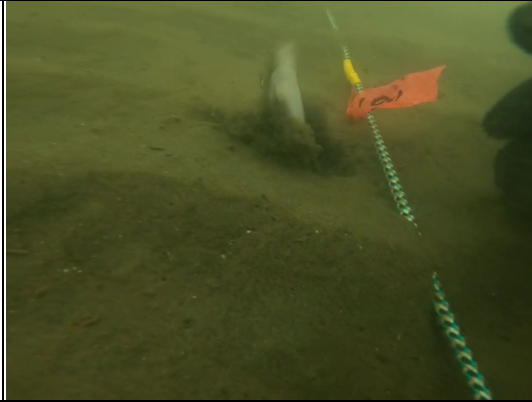


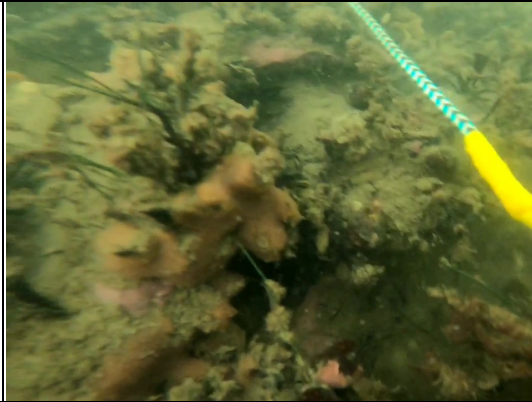

40-45	
45-50	
50-55	
55-60	

60-65	
65-70	
70-75	
75-80	

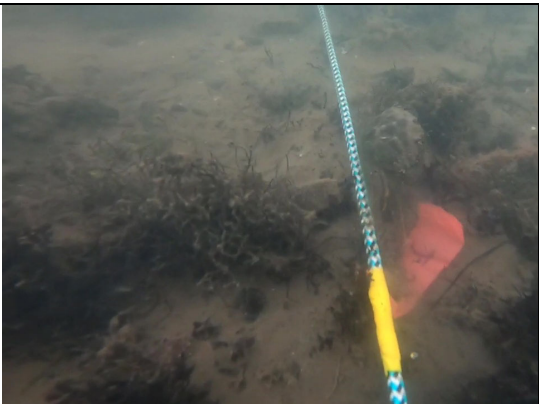
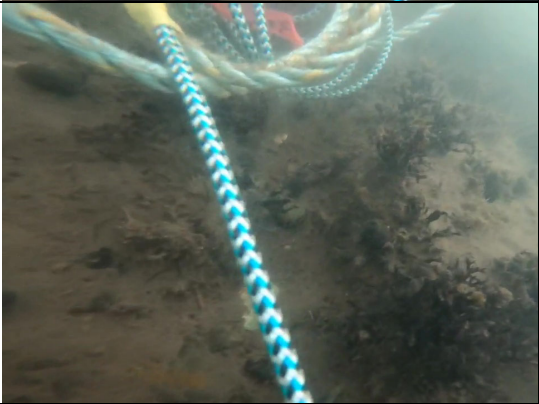

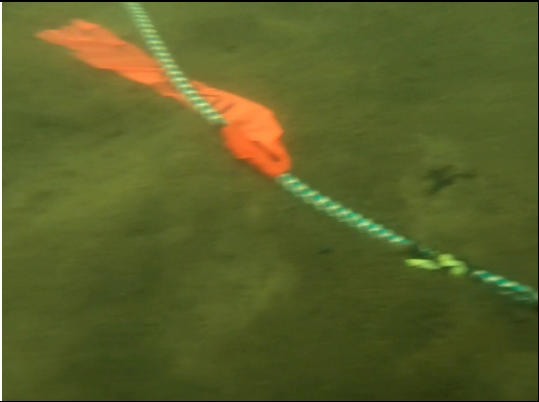
80-85	
85-90	
90-95	
95-100	

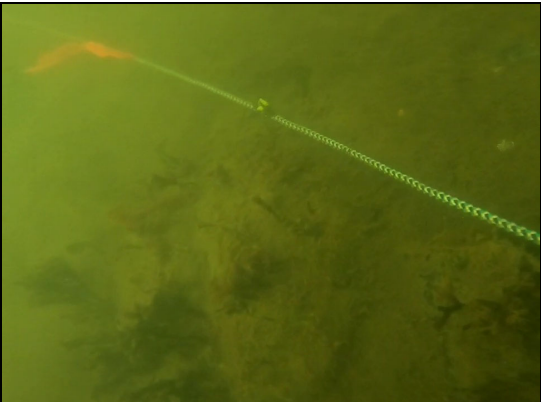

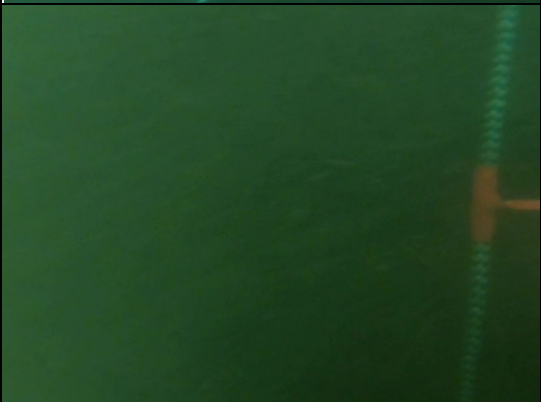
100-105	
105-110	
Additional Photos	
Green crab, <i>Carcinus maenas</i>	
Sand shrimp, <i>Crangon septemspinosa</i>	

<p>Periwinkles, <i>Littorina sp.</i></p>	
<p>Long horn sculpin, <i>Myoxocephalus octodecimspinosus</i></p>	
<p>Moon snail, <i>Euspira heros</i></p>	
<p>Pink coral <i>Clathromorphum circumscriptum</i></p>	

Fish (unknown sp.)	
American plaice, <i>Hippoglossoides platessoides</i>	
Atlantic rock crab, <i>Cancer irroratus</i>	
Sea cheese, <i>Didemnum vexillum</i>	
	

Transect T2	
0-5	
5-10	
10-15	
15-20	

20-25	
25-30	
Transect T3	
0-5	
5-10	

10-15	
15-20	
20-25	
25-30	