

APPENDIX I

FISH HABITAT AND INVERTEBRATE RESULTS (NOVEMBER 2008)



**GOLDBORO
LNG**

November 26, 2008



NOVA SCOTIA ENVIRONMENT

155 Main Street
Suite 205
Antigonish, Nova Scotia
B2S 2B6

ATTENTION: Paul Keats, District Manger

***Surface Water Monitoring – Fish Habitat and Invertebrate Results (Condition 2.5),
Maple LNG, Goldboro, Nova Scotia***

Dillon Consulting Limited is pleased to provide the results of the pre-construction (baseline) fish habitat and invertebrate assessment for the MapleLNG project in Goldboro, Nova Scotia for the Spring and Fall of 2008.

Methods

Invertebrate and fish monitoring sites were visited on June 4 and September 15, 2008 as part of the overall Surface Water Monitoring plan for the project (Condition 2.5).

The following stations identified in the monitoring plan were assessed:

137
Chain Lake Drive
Suite 100
Halifax
Nova Scotia
Canada
B3S 1B3
Telephone
(902) 450-4000
Fax
(902) 450-2008

ISO 9001 Registered

Summary of Sample Locations (Figure 1)

Invert Site ID	Nearest Surface Water Sampling ID	Location	GPS Location (UTM) ¹	Invertebrate and Fish Habitat Events 2008	Fish Species Event 2008
BCB1	SW-4	Bettys Cove Brook - upstream	608567, 5002124	June, September	September
BCB2	SW-5 downstream	Bettys Cove Brook – downstream (upstream of HWY 316)	608289, 5001063	June, September	September
Dung Cove Pond	SW-3	Dung Cove Pond	607147, 5001758	June, September	September
DCT3	SW-1	unnamed Tributary (to Dung Cove) - upstream	607283, 5002430	June, September	September
DCT2	SW-2	unnamed Tributary (to Dung Cove) - downstream	607092, 5002039	June, September	September
DCT1	Not applicable	Not applicable – collected as part of wetland assessment	607153, 5002065	June	Not applicable

Total No. Pgs.

23

¹ GPS Locations reflect actual sampling/observation sites and vary slightly from locations in Schedule A of MapleLNG Limited Industrial Approval.

**Attachment
Staff**

**Dillon Consulting
Limited**

The invertebrate samples were collected in a quantitative manner with a surber sampler, with the exception of the Dung Cove Pond site which was collected with a grab sampler. Additional details on invertebrate sampling methods are provided in the attached reports (**Attachment 1 and 2**).

Fish habitat surveys were undertaken to identify key fish habitat characteristics using standard DFO visual assessment protocols. Fish surveys were undertaken using spot electrofishing (Smith-Root Model 12 B) in the streams and minnow traps in Dung Cove Pond.

Discussion of Results

Invertebrate results are provided in **Attachments 1 and 2**. Chironomids, stonefly nymphs and caddisfly larvae dominated the invertebrate production during both the spring and fall sampling events. Diversity was similar in both Betty's Cove Brook and the unnamed tributary to Dung Cove. The EPT (*Ephemeroptera, Plecoptera, Trichoptera*) Index (an indicator of habitat quality) was high in the upstream sites and moderate in the downstream sites in the spring and moderate at all stream sites in the fall. Productivity and EPT ratios were low in Dung Cove Pond during both sampling events.

Fish habitat survey data is provided in **Attachment 3**. Fish habitat character reflects gradient (lower gradient terrain present upstream in Bettys Cove Brook and higher gradient with boulders and bedrock in the lower stream reaches). The habitat in Dungs Cove Pond is typical of a barrier beach pond. Although no fish were captured in minnow traps in Dung Cove Pond, it is expected that the species previously identified (AMEC, 2006– mummichog, banded killifish, ninespine stickleback, brook trout and eel) are present. Brook trout were captured at both the upstream and downstream Bettys Cove Brook sites and in the downstream unnamed tributary site. Brook trout were not captured in the upstream tributary site which had very low flow during both sample periods. Eel were captured in all the stream sites. Previous fish species captured in Bettys Cove Brook included brook trout, ninespine stickleback and eel (AMEC, 2006). No previous fish surveys were conducted in the unnamed tributary.

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November 26, 2008

If you have questions or comments on the information contained herein, please contact the undersigned.

Yours truly,

DILLON CONSULTING LIMITED

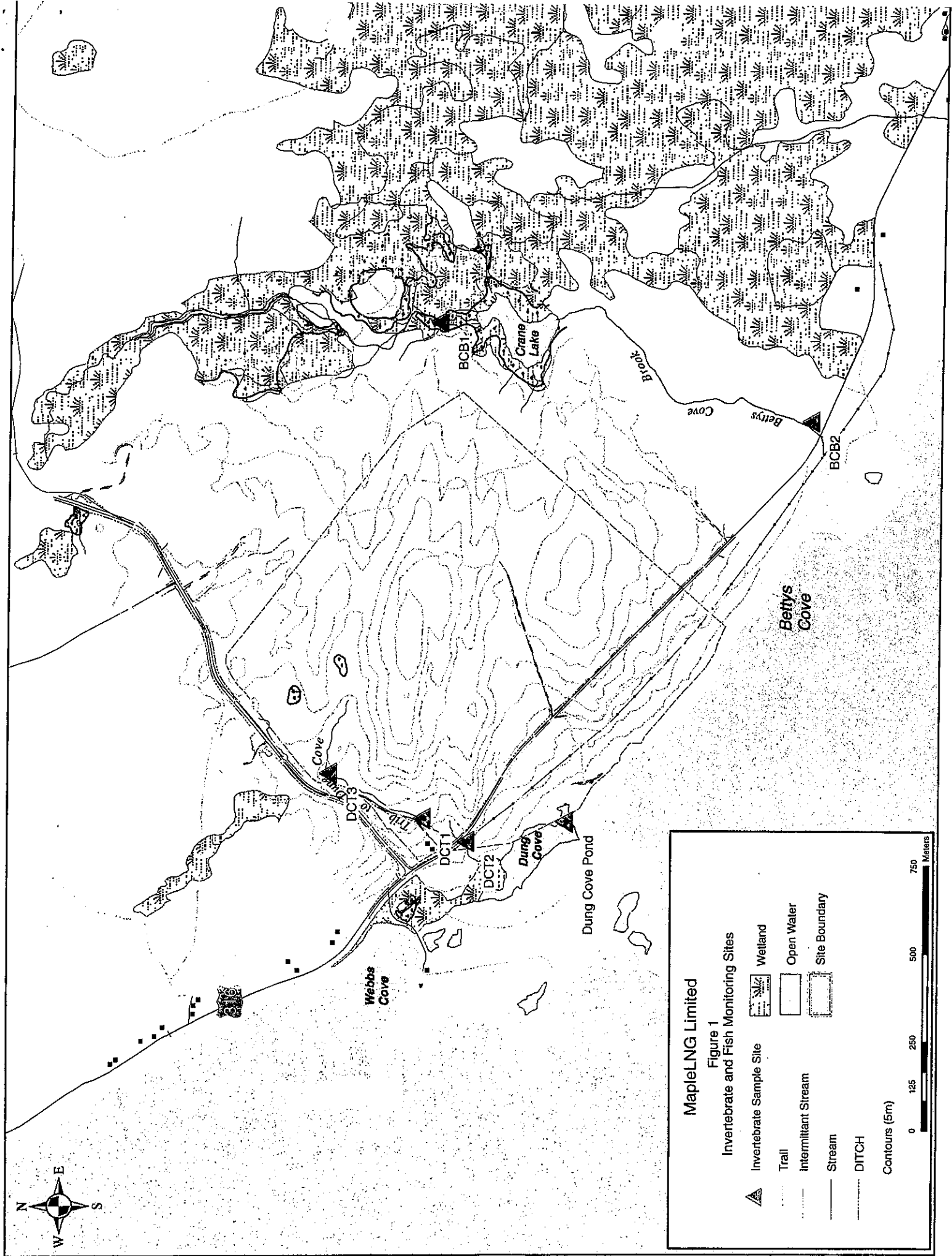
S. 20

Biologist

Project Manager

cc: Dan Hiltz – NSEL

Our File: 07-8277-8200



Attachment 1
Invertebrate Analysis Report
June 2008

Aquatic Habitat Assessment for
Three Goldboro area watercourses, Guysborough County, Nova Scotia
Spring 2008

INTRODUCTION

Betty's Cove Brook is located at Goldboro, Guysborough County, Nova Scotia (approximately 0608195 easterly 5003361 northerly). It flows in a southern direction to Crane Lake and empties into the southern end of Betty's Cove. It is a tertiary stream with a mixture of runs, riffles and pools. The stream is perennial. Riparian vegetation is primarily coniferous with old growth forests at the head of the brook. Grass and moss is common and several wetlands can be found throughout the watershed. Bottom sediments consist of cobble, rock, boulder and gravel/sand. Stream cover and shade is generally low (<50%). Human impact is evident from industrial and road development, including logging roads.

Dung Cove tributary is a primary stream running southwest to Dung Cove (may also be known as Webb's Cove). It is a small, narrow riffle/run with wetlands. Riparian vegetation is primarily deciduous, but conifers can be found throughout. Cover is low to moderate. Grass and moss are common and several wetlands can be found, particularly near the cove outlet. Bottom sediments consist primarily of cobble and gravel. Boulders are common in the upper reaches.

Dung Cove is a closed lagoon fed by Dung Cove tributary. Bottom sediment is sandy with high organics over a hard cobble bottom. The barrier beach is cobble and gravel. Overflow likely occurs during storm conditions.

METHODS

Assessments and sampling were carried out on June 4, 2008. Two sites on Betty's Cove Brook, three sites on Dung Cove tributary and one site in Dung Cove were chosen for sampling, allowing for coverage of runs, riffles, wetlands and cove habitats. Habitat parameters included bottom type, cover, approach types and riparian vegetation. PH, water temperature and photos were taken at all sites.

Invertebrates were sampled at all sites using either a 0.33 m² Surber sampler or a 0.04 m² grab. Samples were preserved in 90% isopropanol in the field and returned to the lab for analysis. The analysis consisted of sieving the sediments through a 0.3 mm mesh screen and manually sorting for invertebrates. Identifications were made by microscope to lowest practical taxonomic level possible using standard references.

RESULTS

Overview

Site characteristics are summarized in Table 1. Invertebrate biometrics are summarized in Table 2.

The EPT: total ratio was calculated for all samples and is shown in Table 2. This is a commonly used water quality assessment index that is based on the abundance of three pollution-sensitive orders of macroinvertebrates (Ephemeroptera, Plecoptera, and Trichoptera) present in streams. The numbers of these three taxa are compared to the abundance of other macroinvertebrates in the stream to calculate the EPT to total ratio index.

Betty's Cove Brook Site 1 (BCB1)

Site 1 is located in a deep narrow channel of the brook in a mature beaver meadow. It is highly channeled. Riparian vegetation was primarily black spruce with some larch. Bottom sediment consisted of sand and detritus overlying bedrock. The banks were grassy and undercut. Shade was low. The pH measured 5.1 and the water temperature was 12.2°C.

The invertebrate community consisted of stonefly nymphs, chironomid larvae and other fly larvae. Caddisfly larvae were present in smaller numbers. Diversity was similar to the site on Betty's Cove Brook. The EPT: total ratio was high at 51.8 and was dominated by stonefly nymphs.

Betty's Cove Brook Site 2 (BCB2)

This site is located just above the road culvert near the outlet to Betty's Cove. It is a wide riffle/run with boulders, cobble, and gravel. Fines are low. Instream vegetation was present. Riparian vegetation includes alders and black spruce. The pH measured 5.1 and the water temperature was 14.1°C.

Species composition consisted of chironomids, caddisfly larvae, mayfly nymphs and stonefly nymphs. Beetle larvae, alderfly larvae, bivalves and leeches were present in small numbers. This is similar to the upstream site. Diversity was also similar to the upstream site. The EPT: total ratio was moderate at 39.4 and was represented by all three groups.

Dung Cove

Dung Cove is located at the northern edge of Betty's Cove. A cobble barrier beach encloses this freshwater cove; however, saltwater from Betty's Cove may enter Dung Cove during storm conditions. The cove is just over 250 meters in length and is surrounded by woods. The upper approach is hilly. Shade is minimal. One tributary enters the cove from the northeast. The bottom is hard, consisting primarily of cobble. Overlying organic debris is high. The sediment appears sandier closer to the barrier beach. The pH was 5.6 and the temperature was 16.1°C.

Invertebrate productivity was similar to the stream sites and was dominated by chironomids. Mayfly nymphs and beetle larvae were also found. Oligochaetes and leeches were present in low numbers. Diversity was low. The EPT: total ratio was low at 17. Stonefly nymphs were absent. Species community structure is typical for habitats with high organic material and low flow (i.e. chironomids).

Dung Cove Tributary Site 1 (DCT1)

Site 1 is located in a wetland situated above Highway 316. Water levels were low and shade was high. Riparian vegetation is primarily coniferous. Bottom sediments are muddy with high organic debris. The pH measured 5.9 and the temperature was 9.9°C. Productivity was low in the wetland. The invertebrate community consisted of small numbers of fly larvae, caddisfly cases, oligochaetes and nematodes. This is typical of wetlands with low flow and high organic debris. The EPT: total ratio was low (0%).

Dung Cove Tributary Site 2 (DCT2)

Site 2 is located immediately below Highway 316 in riffle/run surrounded by alders. Sediment type consists of rock, cobble, gravel and organic detritus. Shade was moderate (25- 49%) with low shrubs and deciduous trees. Water temperature was 9.9°C, while the pH was 5.9.

This site exhibited higher productivity levels than the other sites on Dung Cove tributary or Betty's Cove Brook. Chironomids and stonefly nymphs dominated. Caddisfly larvae, beetle larvae and other fly larvae were abundant. Small numbers of oligochaetes and leeches were present. Bivalves were also found at this site. The EPT: total ratio was moderate at 30.4, with predominantly stonefly and caddisfly larvae.

Dung Cove Tributary Site 3 (DCT3)

This site is located furthest upstream of the other sites on the tributary. It is adjacent to and flows under the site road. It is a narrow, low flow stream in a wooded (spruce) area. The banks are mossy and highly undercut. The area has considerable deadwood falls. Cover is low. Bottom substrate consists of rock, gravel, sand and silt with high levels of organic material, particularly decomposing needles and moss. Boulders are present throughout the area. Stream width was less than one meter. Water temperature was 9.4°C and the pH was 5.4.

The invertebrate population was similar to Betty's Cove Brook and was dominated by stonefly nymphs and chironomids. Caddisfly larvae, mayfly nymphs, beetle larvae and alderfly larvae were present but uncommon. The EPT: total ratio was high at 67.8 and was dominated by stonefly nymphs.

CONCLUSIONS

The study area consists of Dung Cove and two similar tributaries, with flats, riffle/runs and wetlands present throughout the watercourses. Flow rates varied, with higher rates nearer the mouth of the brooks. Instream vegetation was present in most sites. Riparian vegetation included conifers (mostly black spruce) and shrubs. The pH throughout the area was acidic, ranging from 5.1-5.9.

Chironomids, stonefly nymphs and caddisfly larvae dominated the invertebrate population. Mayfly nymphs were present in both brooks, as well as Dung Cove. Beetles, bivalves, alderfly larvae and oligochaetes contributed to the rest of the species composition. Productivity was low in the wetland. Diversity was similar in both tributaries. The EPT: total ratios were high in the upper sites and moderate for the lower sites on both tributaries. All three groups were

represented at most sites, although stonefly nymphs dominated. Ratios were low for Dung Cove and the wetland on Dung Cove tributary. These areas also exhibited low flow levels and higher organic and wood debris.

REFERENCES

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadable streams and rivers. EPA/841/B-99-002. 334 pp

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Table 1.
Habitat Characteristics,
Goldboro Area, Guysborough County
June 4, 2008

Site/Parameter	BCB1	BCB2	Dung Cove	DCT1	DCT2	DCT3
Temperature (°C)	12.2	14.1	16.1	9.9	9.9	9.4
pH	5.1	5.1	5.6	5.9	5.9	5.4
Habitat	Flat	Riffle/run	Enclosed cove	wetland	Riffle/run	run

Table 2.
Biometrics for aquatic sediment samples.
Goldboro area watercourses, Guysborough County, Nova Scotia
June 4, 2008

Sample location	BCB1	BCB2	Dung Cove	DCT1	DCT2	DCT3
Species	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²
DIPTERA						
Athericidae						
- <i>Atherix</i>					44	
Chironomidae larvae	400	477	1600		1954	333
Chironomidae pupae		22			44	22
Ceratopongidae						
- <i>Culicoides</i>	11					
- <i>Probezzia</i>	100	22		50		11
Empididae						
- <i>Chelifera</i>	78	11			44	
Simuliidae	33				22	
Tipulidae						
- <i>Antocha</i>	22					
Unidentified/damaged	11					
PLECOPTERA						
Chloroperlidae	22				44	
- <i>Rasvena</i>		11				
Chloroperlidae/Perlodidae	255				133	733
Perlidae						
Perlodidae	11				122	22
Unidentified young nymph	344	233			355	44
Unidentified/damaged					33	
TRICHOPTERA						
Limnophelidae						
- <i>Apatania</i>						11
- <i>Hydatophylax</i>					22	
- <i>Pycnopsyche</i>	33	11	50		11	22
Philoptamidae						
Phryganeidae		22				
Pschyomiidae						
- <i>Lype</i>	22				100	
Polycentropidae	22					
- <i>Cyrnellus</i>		11			11	
- <i>Polycentropus</i>						11
Cases	56	89		100	33	
Unidentified/damaged	67	11	50		155	
ODONATA						
Anisoptera						
Zygoptera						
EPHEMEROPTERA						
Baetidae						
- <i>Baetis</i>					22	
Ephemerellidae						
- <i>Eurylophella</i>	22	133	50			
Unidentified/ Damaged		22	300		22	22

Sample location	BCB1	BCB2	Dung Cove	DCT1	DCT2	DCT3
Species	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²
HEMIPTERA						
Corixidae			300			
COLEOPTERA						
Dytiscidae larvae	22				11	11
Dytiscidae adult						
Elmidae larvae		11			56	
Elmidae adult					44	
Psephenidae						
- <i>Ectopria</i>		11				
MEGALOPTERA						
<i>Stalis</i>		11				22
MOLLUSCA						
Pisiiidae	11	11				
- <i>Pisidium</i>					11	
ANNELIDA						
Oligochaete		11	100	50	89	
NEMATODA						
Unidentified				100		
HIRUDINEA						
Glossiphoniidae		22	100			
AMPHIPODA			50			
Gammarid			50			
<i>Hyalella azteca</i>					11	11
HYDRACARINA						
SUMMARY						
Total Organisms	1542	1152	2650	300	3393	1275
Number of Taxa	16	17	10	4	19	12
EPT:Total Ratio	51.8	39.4	17	0	30.4	67.8

Attachment 2
Invertebrate Analysis Report
September 2008

Aquatic Habitat Assessment for
Three Goldboro area watercourses, Guysborough County, Nova Scotia
Fall 2008

INTRODUCTION

Betty's Cove Brook is located at Goldboro, Guysborough County, Nova Scotia (approximately 0608195 easterly 5003361 northerly). It flows in a southerly direction to Crane Lake and empties into the southern end of Betty's Cove. It is a tertiary stream with a mixture of runs, riffles and pools. The stream is perennial. Riparian vegetation is primarily coniferous with old growth forests at the head of the brook. Grass and are common and several wetlands can be found throughout the watershed. Bottom sediments consist of cobble, rock, boulder and gravel/sand. Stream cover and shade is generally low (<50%). Human impact is evident from industrial projects and road development, including logging roads.

Dung Cove tributary is a primary stream running southwest to Dung Cove (may also be known as Webb's Cove). It is a small, narrow riffle/run with wetlands. Riparian vegetation is primarily deciduous, but conifers can be found throughout. Cover is low to moderate. Grass and moss are common and several wetlands can be found, particularly near the cove outlet. Bottom sediments consist primarily of cobble and gravel. Boulders are common in the upper reaches.

Dung Cove is a closed lagoon fed by Dung Cove tributary. Bottom sediment is sandy with high organics over a hard cobble bottom. The barrier beach is cobble and gravel. Overflow likely occurs during storm conditions.

METHODS

Assessments and sampling were carried out on September 15, 2008. Two sites on Betty's Cove Brook, two on Dung Cove tributary and one site in Dung Cove were sampled, allowing for coverage of runs, riffles, and wetland habitats. Habitat parameters included bottom type, cover, approach types and riparian vegetation. Water temperature, pH and photos were taken at all sites.

Invertebrates were sampled at all sites using a 0.33 m² Surber sampler for the streams and a 0.04 m² grab in Dung Cove. Samples were preserved in 70% isopropanol in the field and returned to the lab for analysis. The analysis consisted of sieving the sediments through a 0.3 mm mesh screen and manually sorting for invertebrates. Identifications were made by microscope to lowest practical taxonomic level possible using standard references.

RESULTS

Overview

Site characteristics are summarized in Table 1. Invertebrate biometrics are summarized in Table 2.

The EPT: total ratio was calculated for all samples and is shown in Table 2. This is a commonly used water quality assessment index that is based on the abundance of three pollution-sensitive orders of macroinvertebrates (Ephemeroptera, Plecoptera, and Trichoptera) present in streams.

The numbers of these three taxa are compared to the abundance of other macroinvertebrates in the stream to calculate the EPT to total ratio index.

Betty's Cove Brook Site 1 (BCB1)

BCB1 is located in a deep narrow channel of the brook in a mature beaver meadow. It is highly channeled. Riparian vegetation is primarily black spruce with occasional larch. Bottom sediment consisted of sand and detritus overlying bedrock. The banks are grassy and undercut. Shade was low. The pH measured 6.3 (slightly higher than spring) and the water temperature was 15°C.

The invertebrate community consisted of mayfly and stonefly nymphs, chironomid larvae and caddisfly larvae. Amphipods were present in low numbers. Productivity was lower than at the downstream site on Betty's Cove Brook. The EPT: total ratio was moderate at 42.1 and all three groups were represented.

Betty's Cove Brook Site 2 (BCB2)

This site is located just above the road culvert near the outlet to Betty's Cove. It is a wide riffle/run with boulders, cobble, and gravel. Fines are low. Instream vegetation was present. Riparian vegetation includes alders and black spruce. The pH measured 5.8 and the water temperature was 16.2°C.

Species composition consisted of chironomids, caddisfly larvae, mayfly nymphs and stonefly nymphs. Beetle larvae, alderfly larvae, bivalves and leeches were present in small numbers. This is similar to the spring sample. Diversity was slightly higher than the upstream site. The EPT: total ratio was moderate at 42.5 and was represented by all three groups.

Dung Cove

Dung Cove is located at the northern edge of Betty's Cove. A cobble barrier beach encloses this freshwater cove; however, saltwater from Betty's Cove may enter Dung Cove during storm conditions. The cove is just over 250 meters in length and is surrounded by mostly coniferous woods. The upper approach is hilly. Shade is minimal. One tributary enters the cove from the northeast. The bottom is hard, consisting primarily of cobble. Overlying organic debris is high. The sediment appears sandier closer to the barrier beach. The pH was a neutral 7.1 and the temperature was 17.3°C.

Invertebrate productivity was much lower than the stream sites and was dominated by chironomids and their empty tubes. Amphipods, fly larvae and caddisfly cases were also found. Mayflies, beetles and oligochaetes were not present during this sampling period. Diversity was very low. The EPT: total ratio was 0. Stonefly and mayfly nymphs were absent. Caddisfly cases were empty. Species community structure appears to be typical for habitats with high organic material and low flow (i.e. chironomids).

Dung Cove Tributary Site 1 (DCT1)

Not sampled.

Dung Cove Tributary Site 2 (DCT2)

Site 2 is located immediately below Highway 316 in riffle/run surrounded by alders. Sediment type consists of rock, cobble, gravel and organic detritus. Shade was moderate (25- 49%) with low shrubs and deciduous trees. Water temperature was 14.3°C, while the pH was 6.2.

Although this site exhibited higher productivity levels than the other sites on either brook in the spring, they were lower than all sites except BCB1 this fall. Chironomids and stonefly nymphs were still dominate. Caddisfly larvae, beetle larvae and other fly larvae were abundant. Small numbers of oligochaetes and amphipods were present. The EPT: total ratio was moderate at 30.7, with predominantly stonefly and caddisfly larvae (similar to the spring sample).

Dung Cove Tributary Site 3 (DCT3)

This site is located further upstream of Site DCT2. It is adjacent to and flows under the SOEI site road. It is a narrow, low flow stream in a wooded (spruce) area. The banks are mossy and highly undercut. The area has considerable deadwood falls. Cover is low. Bottom substrate consists of rock, gravel, sand and silt with high levels of organic material, particularly decomposing needles and moss. Boulders are present throughout the area. Stream width was less than one meter. Water temperature was 13.8°C and the pH was 5.8.

The invertebrate population was similar to the downstream site and was dominated by stonefly nymphs and chironomids, as before. Mayfly nymphs were also present. Caddisfly larvae, beetle larvae and amphipods were present but uncommon. The EPT: total ratio was moderate at 33.5 and was dominated by stonefly nymphs.

CONCLUSIONS

The study area consists of Dung Cove and two similar tributaries, with flats, riffle/runs and wetlands present throughout the watercourses. Flow rates varied, with higher rates nearer the mouth of the brooks. Instream vegetation was present in most sites. Riparian vegetation included conifers (mostly black spruce) and shrubs. The pH throughout the area was slightly acidic to neutral, ranging from 5.8-7.1.

Chironomids, stonefly nymphs and caddisfly larvae dominated the invertebrate population. Mayfly nymphs were present in both brooks, but not Dung Cove. Beetles, amphipods, alderfly larvae and oligochaetes contributed to the rest of the species composition. Isopods and nematodes were rare. Bivalves were lower in number than previously. Both streams showed similar diversity (species richness). Productivity was low in Dung Cove. The EPT: total ratios were moderate for all brook sites. All three pollution-sensitive groups were represented. Ratios were low for Dung Cove. This area also exhibited low flow levels and higher organic and wood debris.

REFERENCES

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadable streams and rivers. EPA/841/B-99-002. 334 pp
- Merritt, R.W. and K.W. Cummins. 1996. Aquatic Insects of North America (3rd ed.). Kendall/Hunt Publishing Company. 862 pp
- Nova Scotia Department of Natural Resources 2007
<http://www.gov.ns.ca/natr/wildlife/genstatus/>
- Pennack, R.W. 1978. Freshwater invertebrates of the United States (2nd ed.). J. Wiley & Sons, N.Y. 803 pp

Peckarsky, B.L., P.R. Fraissinet, M.A. Penton and D.J. Conklin, Jr. 1990. Freshwater macroinvertebrates of Northeastern United States. Cornell Univ. Press. 442 p

Table 1.
Habitat Characteristics,
Goldboro Area, Guysborough County
September 15, 2008

Site/Parameter	BCB1	BCB2	Dung Cove	DCT2	DCT3
Temperature (°C)	15	16.2	17.3	14.3	13.8
pH	6.3	5.8	7.1	6.2	5.8
Habitat	Flat	Riffle/run	Enclosed cove	Riffle/run	run

Table 2.
Biometrics for aquatic sediment samples.
Goldboro area watercourses, Guysborough County, Nova Scotia
September 15, 2008

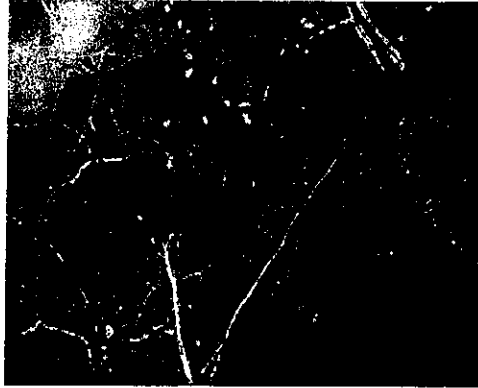
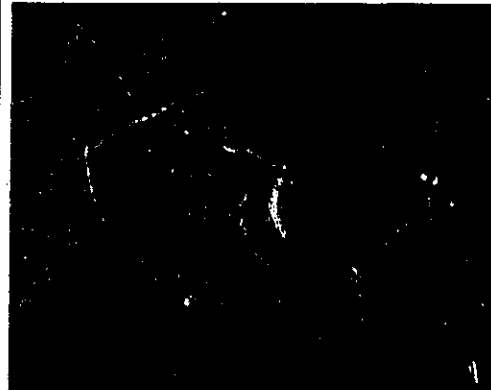
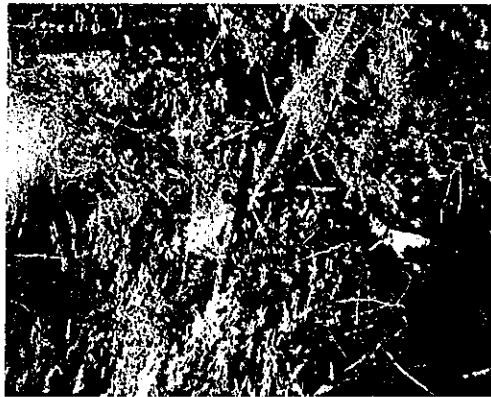
Sample location	BCB1	BCB2	Dung Cove	DCT2	DCT3
Species	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²
DIPTERA					
Athericidae					
- <i>Atherix</i>					
Chironomidae larvae	341	341	200	671	1210
Chironomidae pupae	11	11		44	22
Chironomidae tubes	88	22	(4600)	11	99
Ceratopongidae					
- <i>Culicoides</i>					
- <i>Probezzia</i>					
Empididae					
- <i>Chelifera</i>					
Simulidae				22	
Tabanidae					
- <i>Tabanus</i>			50	22	
Tipulidae					
- <i>Antocha</i>	11				
Unidentified/damaged					
PLECOPTERA					
Capniidae	55	33		55	
Chloroperlidae					
- <i>Rasvena</i>					
Chloroperlidae/Perlodidae					
Leuctridae	22	22		22	
Perlidae					
Perlodidae					
Unidentified young nymph		121		132	462
Unidentified/damaged					
TRICHOPTERA					
Glossosomatidae					
- <i>Glossosoma</i>				11	
Hydroptilidae					
- <i>Leucotrichia</i> ?				22	
- <i>Hydroptila</i>	11			11	
Hydropsychidae		11			
Limnophelidae					11
- <i>Apatania</i>					
- <i>Limnephilus</i>	11			11	22
- <i>Psychoglypha</i>				11	22
Odontoceridae					
- <i>Marilia</i> ?				11	
Philoptamidae					
Phryganeidae					
Pschyomiidae					
- <i>Lype</i>				99	
Polycentropidae					

Sample location	BCB1	BCB2	Dung Cove	DCT2	DCT3
Species	#/m ²	#/m ²	#/m ²	#/m ²	#/m ²
- <i>Cyrnellus</i>					
- <i>Polycentropus</i>	33	11			55
Cases	11	55	400	55	33
Unidentified/damaged	22	111		22	55
ODONATA					
Anisoptera					
Zygoptera					
EPHEMEROPTERA					
Baetidae					
- <i>Baetis</i>					
Ephemerellidae					
- <i>Eurylophella</i>	121	132			
Heptageniidae	22	88			11
- <i>Stenacron</i>		22			
- <i>Stenonema</i>		132			
Leptophlebiidae					
- <i>Habrophlebia</i>		22			
- <i>Leptophlebia</i>				11	
Unidentified/ Damaged	55	55		44	132
HEMIPTERA					
Corixidae					
COLEOPTERA					
Dytiscidae larvae					
Dytiscidae adult					
Haliplidae					
- <i>Haliphus</i>		11			
Elmidae larvae		44		143	55
Elmidae adult				22	
Psephenidae					
- <i>Ectopria</i>					
MEGALOPTERA					
<i>Nigronia</i>		11			
<i>Sialis</i>		11			
MOLLUSCA					
Pisiidae		11			
ANNELIDA					
Oligochaete		517		22	
NEMATODA					
Unidentified				11	
HIRUDINEA					
Glossiphoniidae		44			22
ISOPODA					
<i>Caecidotea</i>				11	
AMPHIPODA					
Gammarid	11				
<i>Hyalella azteca</i>			150		88
HYDRACARINA					
SUMMARY					
Total Organisms	836	1860	(5400)	1507	2299
Number of Taxa	13	20	4	21	12
EPT:Total Ratio	42.1	42.5	0	30.7	33.5

Attachment 3
Fish Habitat Survey Data
June and September 2008

Stream Name: Unnamed Tributary to Dung Cove Por Examined Downstream to Upstream
 Personnel: KIMJS Date: 06/04 and 09/15 2008

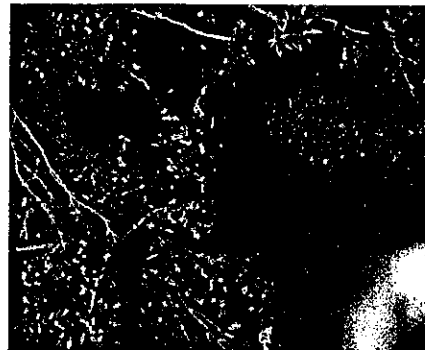
Stream Name: Unnamed Tributary to Dung Cove Por Examined Downstream to Upstream
 Personnel: KIMJS Date: 06/04 and 09/15 2008

[illegible]

Upstream September 2008

Upstream Sanisembar 2008

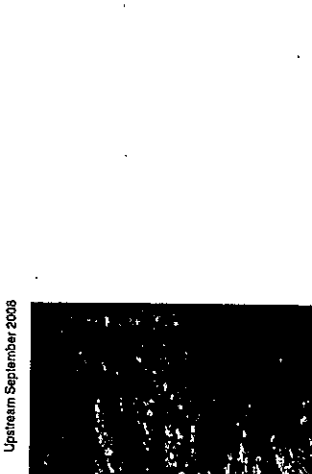
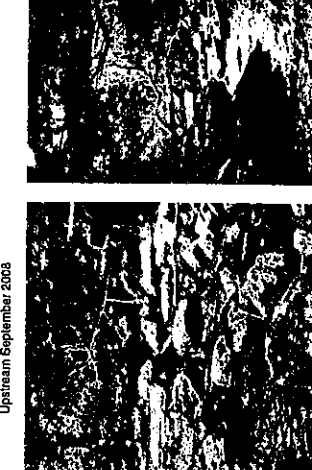
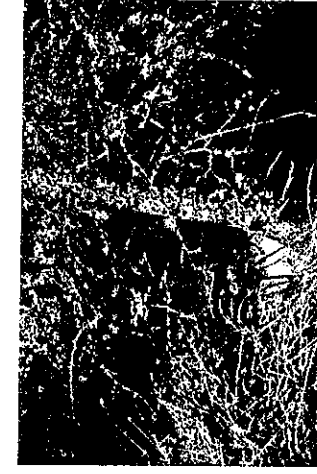
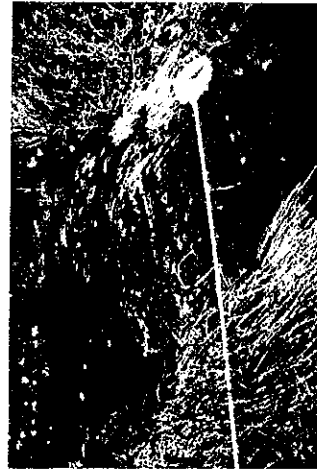
Downstream - September 2008

Downstream September 2008
316 Culvert Pool

Downstream - June 2008

Nova Scotia Waterscourse Data Sheet
 Stream Name: Baby's Cove Brook
 Project: BAWJS
 Examined Downstream to Upstream
 Date: 08/15/2005

Unit #	Stream Type	Channelage at Unit End (m)	Unit Length (m)	Average Width (m)	Avg. Depth Wet Width (m)	Substrate %										Silt %				Undercut Bank (%)	Overhanging Vegetation (%)	Large Woody Debris (m)	Shade (%)	Stream Banks								Pool Criteria		Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
						Bedrock	Boulders	Rock	Cobbles	Gravel	Sand	Fines	Embeddedness	Riffle	Run	Flat	Pool	Vegetation						Erosion				Depth (m)	Cover (%)	Stream (%)	Embeddedness	Median Substrate Size	Fines (%)		Length (m)	Turbulence (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
																		Moss	Bare Ground					Grass	Shrubs	Coniferous Trees	Deciduous Trees										Stubble	Bare Slope	Eroded																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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US1	Rv/Rf	60	60	2.5	0.4	5	10	10	25	25	25	H	10	20	65	5	60	80	20	30	40	40	10	10	80	20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													



Juvenile Hilsa in Feeder Brook Upstream September 2008

Downstream - Culvert June 2008

Downstream September 2008

Downstream September 2008

Date: 06/04 and: 09/15 2002

Personnel: KMJS

[illegible]The block contains three black and white photographs. The top photograph shows a person in a small boat on a river, with a dense forest in the background. The middle photograph shows a person in a boat on a river, with a dense forest in the background. The bottom photograph shows a person in a boat on a river, with a dense forest in the background.

David C. Reardon, 1999