



Figure 6-8, Pond 6

6.3.7 Pond 7 (2007)

Pond 7 (Figure 6-10) is located approximately 200 m northeast of Pond 6 and lies on the southeast boundary of the Project footprint. Pond 6 drains into Pond 7 which outflows north to Pond 1. The total area of Pond 7 measured 12,492.06 m² and the deepest location measured was 0.65 m deep. The substrate was comprised mostly of muck with aquatic vegetation. Two single bag fyke nets and two minnow traps were set throughout the pond and fished for approximately 18 hrs over night. A total of 38 three spine stickleback and 1 Atlantic salmon were caught, weighed, measured and then released back into the pond.



Figure 6-9, Pond 7

Habitat Quantification

A DFO generated spreadsheet was used for habitat quantification, the spreadsheet was used in conjunction with the habitat data collected in the field and the species presence data. Table 6-34 presents an overview of the habitat information used to determine habitat areas. Table 6-35 shows the habitat suitabilities of each habitat type for the species present, i.e., brook trout, Atlantic salmon and threespine stickleback. DFO spreadsheet calculations were used to determine the final habitat equivalent units of each habitat type present (Table 6-36). The pond is part of the Watson Brook drainage basin, which is known to support Atlantic salmon, brook trout and stickleback. Therefore total HEU's (Table 6-36) have been calculated for Atlantic salmon, brook trout and threespine stickleback and were 0.29 ha, 0.92 ha and 1.24 ha respectively.

Table 6.34 Summary of Pond 7 habitat values used to calculate aerial extents

Step 1	Note: Only enter the values in the cells shaded blue, the subtotals, totals and ratios will be calculated automatically					
Enter Lake name: POND 7						
Part 1 Entering Lake depth(s):						
IF Lake Depth is less than or equal to 10 m:			IF Lake Depth is greater than 10 m:			
Path 1			Path 2			
A Enter Depth of Littoral Zone:	1	OR	A-1 Enter mean depth of Non-Littoral Zone:	0		
B Enter Mean Depth of Lake:	1		B-1 Enter depth of Benthic Zone:	0		
Path 2 (Continued...)						
IF Lake Depth is greater than 10 m:		Mean depth of Non-Littoral Zone:		<i>(Reduced Value)</i>		
		Depth of the Benthic Zone:		<i>(Reduced Value)</i>		
		Benthic Pelagic ratio:				
Part 2 Enter the values for the estimated bottom surface area:						
Littoral Zone (No vegetation):						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	51.90	Sand:	4.87
	Boulder:	12.97	Cobble:	76.22	Silt:	0.00
			Gravel:	95.68	Muck:	7,902.52
					Clay:	0.00
SubTotals:		13		224		7,907
Littoral Zone (Vegetation)						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	0.00	Sand:	0.00
	Boulder:	0.00	Cobble:	0.00	Silt:	0.00
			Gravel:	0.00	Muck:	4,347.90
					Clay:	0.00
SubTotals:		0		0		4,348
Non-Littoral Zone						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	0.00	Sand:	0.00
	Boulder:	0.00	Cobble:	0.00	Silt:	0.00
			Gravel:	0.00	Muck:	0.00
					Clay:	0.00
SubTotals:		0		0		0
Part 3 Summary Table for Bottom Surface Area Totals:						
Habitat Types	Bottom Surface area (m²)					
Littoral Coarse/No vegetation	13					
Littoral Medium/No vegetation	224					
Littoral Fine/No vegetation	7,907					
subtotal Littoral/No vegetation	8,144					
Littoral Coarse/Vegetation	0					
Littoral Medium/Vegetation	0					
Littoral Fine/Vegetation	4,348					
Subtotal Littoral/Vegetation	4,348					
Subtotal Littoral	12,492					
Non-littoral Coarse/Pelagic	0					
Non-littoral Medium/Pelagic	0					
Non-littoral Fine/Pelagic	0					
Subtotal nonlittoral	0					
Total Available Habitat	12,492					

Table 6.35 Habitat suitabilities for species present within Pond 7.

	Species	Life Stage	Littoral Zone					Non-Littoral Zone			
			Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic
1	Atlantic Salmon (anadromous)	Spawning	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		YOY	1.00	0.89	0.34	NA	NA	0.00	NA	NA	0.00
		Juvenile	1.00	0.95	0.34	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
2	Brook Trout (freshwater resident)	Spawning	0.00	0.84	0.76	NA	NA	0.67	NA	NA	0.00
		YOY	1.00	1.00	0.00	NA	NA	0.00	NA	NA	0.00
		Juvenile	1.00	1.00	0.00	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.67	0.34	NA	NA	0.00	NA	NA	0.00
3	Threespine stickleback (Freshwater resident)	Spawning	0.00	0.67	1.00	NA	NA	0.89	NA	NA	0.00
		YOY	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		Juvenile	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.67	0.84	NA	NA	1.00	NA	NA	0.00

Table 6.36 Habitat equivalent units for species present within Pond 7, measured in m².

	Species	Littoral Zone					Non-Littoral Zone			Total Available Habitat	
		Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic		Fine/Pelagic
<input type="checkbox"/> 1	Atlantic Salmon (anadromous)	13	213	2689	0	0	0	0	0	0	2914.6
<input type="checkbox"/> 2	Brook Trout (freshwater resident)	13	224	6010	0	0	2913	0	0	0	9159.8
<input type="checkbox"/> 3	Threespine stickleback (Freshwater resident)	0	150	7907	0	0	4348	0	0	0	12404.9

6.3.8 Pond 8 (2007)

Pond 8 (Figure 6-11) is located approximately 300 m northwest of Pond 1, into which it outflows. The total area of Pond 8 measured 57,804.68 m² and had an average depth of 0.63 m, the deepest location measured 0.90 m deep. The shoreline substrate was comprised primarily of cobble, gravel and muck; while the remainder of the littoral zone was muck with aquatic vegetation.

Two single bag fyke nets and two minnow traps were set throughout the pond for two sets. The first set averaged 18 hours over night and yielded a total of 14 brook trout and 55 three spine sticklebacks. The second set averaged 123 hours (6 nights) and yielded a total of 41 brook trout (two of which were recaptures), 26 three spine sticklebacks and 1 juvenile Atlantic salmon.

The pond's inflow was located on the north side while the outflow was on the south side and drained into Pond 1. A secondary outflow located on the southwest side of the pond drained west into Pond 10.



Figure 6-10, Pond 8

Habitat Quantification

A DFO generated spreadsheet was used for habitat quantification, the spreadsheet was used in conjunction with the habitat and species data collected in the field. Table 6-37 presents an overview of the habitat information used to determine habitat areas. Table 6-38 shows the habitat suitabilities of each habitat type for the species present, i.e., brook trout, Atlantic salmon and threespine stickleback. DFO spreadsheet calculations were used to determine final habitat equivalent units of each habitat type present (Table 6-39). The pond is part of the Watson Brook drainage basin, which is known to support Atlantic salmon, brook trout and stickleback. Therefore total HEU's (Table 6-38) have been calculated for Atlantic salmon, brook trout and threespine stickleback and were 0.10 ha, 3.91ha and 5.75 ha respectively.

Table 6.37 Summary of Pond 8 habitat values used to calculate aerial extents

Step 1	Note: Only enter the values in the cells shaded blue, the subtotals, totals and ratios will be calculated automatically					
Enter Lake name: POND 8						
Part 1 Entering Lake depth(s):						
IF Lake Depth is less than or equal to 10 m:		OR		IF Lake Depth is greater than 10 m:		
Path 1				Path 2		
A Enter Depth of Littoral Zone:	1			A-1 Enter mean depth of Non-Littoral Zone:	0	
B Enter Mean Depth of Lake:	1			B-1 Enter depth of Benthic Zone:	0	
Path 2 (Continued...)						
IF Lake Depth is greater than 10 m:		Mean depth of Non-Littoral Zone:		<i>(Reduced Value)</i>		
		Depth of the Benthic Zone:		<i>(Reduced Value)</i>		
		Benthic Pelagic ratio:				
Part 2 Enter the values for the estimated bottom surface area:						
Littoral Zone (No vegetation):						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	9.78	Sand:	78.22
	Boulder:	4.89	Cobble:	268.89	Silt:	0.00
			Gravel:	752.90	Muck:	107.56
				Clay:	0.00	
SubTotals:		5		1,032		186
Littoral Zone (Vegetation)						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	0.00	Sand:	0.00
	Boulder:	0.00	Cobble:	0.00	Silt:	0.00
			Gravel:	0.00	Muck:	56,582.44
				Clay:	0.00	
SubTotals:		0		0		56,582
Non-Littoral Zone						
Substrate:	Coarse	m²	Medium	m²	Fine	m²
	Bedrock:	0.00	Rubble:	0.00	Sand:	0.00
	Boulder:	0.00	Cobble:	0.00	Silt:	0.00
			Gravel:	0.00	Muck:	0.00
				Clay:	0.00	
SubTotals:		0		0		0
Part 3 Summary Table for Bottom Surface Area Totals:						
Habitat Types	Bottom Surface area (m²)					
Littoral Coarse/No vegetation	5					
Littoral Medium/No vegetation	1,032					
Littoral Fine/No vegetation	186					
subtotal Littoral/No vegetation	1,222					
Littoral Coarse/Vegetation	0					
Littoral Medium/Vegetation	0					
Littoral Fine/Vegetation	56,582					
Subtotal Littoral/Vegetation	56,582					
Subtotal Littoral	57,805					
Non-littoral Coarse/Pelagic	0					
Non-littoral Medium/Pelagic	0					
Non-littoral Fine/Pelagic	0					
Subtotal nonlittoral	0					
Total Available Habitat	57,805					

Table 6.38 Habitat suitabilities for species present within Pond 8.

	Species	Life Stage	Littoral Zone					Non-Littoral Zone			
			Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic
1	Atlantic Salmon (anadromous)	Spawning	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		YOY	1.00	0.89	0.34	NA	NA	0.00	NA	NA	0.00
		Juvenile	1.00	0.95	0.34	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
2	Brook Trout (freshwater resident)	Spawning	0.00	0.84	0.76	NA	NA	0.67	NA	NA	0.00
		YOY	1.00	1.00	0.00	NA	NA	0.00	NA	NA	0.00
		Juvenile	1.00	1.00	0.00	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.67	0.34	NA	NA	0.00	NA	NA	0.00
3	Threespine stickleback (Freshwater resident)	Spawning	0.00	0.67	1.00	NA	NA	0.89	NA	NA	0.00
		YOY	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		Juvenile	0.00	0.00	0.00	NA	NA	0.00	NA	NA	0.00
		Adult	0.00	0.67	0.84	NA	NA	1.00	NA	NA	0.00

Table 6.39 Habitat equivalent units for species present within Pond 8, measured in m².

	Species	Littoral Zone					Non-Littoral Zone			Total Available Habitat	
		Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic		Fine/Pelagic
<input type="checkbox"/> 1	Atlantic Salmon (anadromous)	5	980	63	0	0	0	0	0	0	1047.9
<input type="checkbox"/> 2	Brook Trout (freshwater resident)	5	1032	141	0	0	37910	0	0	0	39087.5
<input type="checkbox"/> 3	Threespine stickleback (Freshwater resident)	0	691	186	0	0	56582	0	0	0	57459.2

6.3.9 Pond 9 (2007)

Pond 9 (Figure 6-12) is located approximately 200 m north of Pond 8, within the northeast section of the Project footprint. Substrate throughout the pond consisted mostly of aquatic vegetation (grass/sedges) and the shoreline substrate comprised of cobble and gravel. There was no visible inflow and the outflow was well defined for approximately 15 m and then splayed over grasses (overland flow) and bog.

Pond 9 had a total area of 3,573.15 m² and the deepest location in the pond measured 0.6 m. Emergent vegetation was visible throughout the pond with exception to the areas that measured 0.6 m deep.

One double bag fyke net and one minnow trap were set in the pond for a 17 hour, overnight set. Neither the minnow trap nor the fyke net yielded any fish; there were however tadpoles and water beetles caught in the fyke net. The pond is not considered fish habitat.



Figure 6-11, Pond 9

6.3.10 Pond 10 (2007)

Pond 10 (Figure 6-13) is located approximately 200 m south of Pond 9. The outflow is on the southeast side of the pond and provides some drainage into Pond 8. The pond was shallow throughout, approximately 0.35 m or less, with emergent vegetation visible over most of the pond. The total area of the pond was calculated to be 3,677.36 m².

Fish sampling gear was not set in the pond due to shallow water levels. The pond is not considered to contain fish habitat.



Figure 6-12, Pond 10

7.0 REFERENCES

AMEC Earth & Environmental Ltd. 2003. Standard Operating Procedures, Electrofishing. St. John's, NL Revised October 2003.

Bradbury, C. M.M. Roberge, and C.K. Minns. 1999. Life History Characteristics of Freshwater Fishes Occurring in Newfoundland and Labrador, with Major Emphasis on Lake Habitat Characteristics. Can. MS Rep. Fish. Aquat. Sci. 2485:vii+150p.

Bradbury, C.,A.S. Power and M.M. Roberge. 2001. Standard Methods Guide for the Classification/Quantification of Lacustrine Habitat in Newfoundland and Labrador. Fisheries and Oceans, St. John's, NF. 60p.

Fish Habitat Management Branch. 1986. The Department of Fisheries and Oceans Policy for the Management of Fish Habitat. Minister of Supply and Services Canada 1986. (Cat No. Fs 23-98/1986E).

Grant, C.G.J. and E.M. Lee. 2004. Life History Characteristics of Freshwater Fishes Occurring in Newfoundland and Labrador, with Major Emphasis on riverine Habitat Requirements. Can. Manuscr. Rep. Fish. Aquat. Sci. 2672: xii + 262p.

Lagler, K. 1978. Capture, Sampling and Examination of Fishes. In T. Bagenal (Ed.), *Methods for Assessment of Fish Production in Fresh Waters 3rd ed.* (pp. 7-47). Oxford, UK: Blackwell Scientific Publications Ltd.

McCarthy, J.H., C.G.J. Grant and D.A. Scruton. 2007. Standard Methods Guide for the Classification and Quantification of Fish Habitat in Rivers of Newfoundland and Labrador.

Newbury, R.W. and M.N. Gaboury. 1993. Stream Analysis and Fish Habitat Design. Newbury Hydraulics Limited, The Manitoba Habitat Heritage Corporation, Manitoba Fisheries Branch, Manitoba. 262pp.

Scruton, D.A., T.C. Anderson, C.E. Bourgeois, and J.P. O'Brien. 1992. Small stream surveys for public sponsored habitat improvement and enhancement projects. Can. Manuscr. Rep. Fish. Aquat. Sci. No. 2163: v + 49pp.

Scruton, D.A. and R.J. Gibson. 1995. Quantitative electrofishing in Newfoundland: Results of workshops to review current methods and recommend standardization of techniques. Can. Manuscr. Rep. Fish. Aquat. Sci. v11+148pp., 4 appendices.

Sooley, D.R.E., E.A. Luiker and M.A. Barnes. 1998. Standard Methods Guide for Freshwater Fish and Fish Habitat Surveys in Newfoundland and Labrador: Rivers and Streams. Fisheries and Oceans, St. John's, NF. iii + 50pp.