Appendix 5.0

Appendix 5.1 – Field Work Chronology and Staff List

Appendix 5.1 – Field Work Chronology

Table 5.1.1 Summary of Environmental Fieldwork (Chronology)

Year	Date	Staff	Level of Effort	Task Description
2002	July 31	MC	-	Fish Community Sampling (on-site)
2002	September 25	MC	-	Fish Community Sampling / On-site & Zenon pond
2005	June 6	BD	-	Breeding Amphibian Survey
2005	June 7	BD	-	Breeding Amphibian Survey
2005	July 7	BD	4.0	Breeding Bird Survey
2005	July 12	BD	4.0	Breeding Bird Survey
2009	May 12	SR JS	8.0	Water Quality Monitoring/ Temperature Logger Installation/ Benthic Macroinvertebrate Sampling/Channel Morphology Mapping
2009	May 28	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	June 11	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	June 28	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	July 8	SR AS	7.5	Water Quality Monitoring / Temperature Logger Download / Fish Community Sampling
2009	July 30	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	August 18	SD	2.0	Field review of off-site portions of subcatchments – partially completed
2009	August 20	SD	7.0	Field review on-site – (south and west portions of site)
2009	August 21	SD	4.0	Field review on-site – (north and east portions of site)
2009	August 28	SR	6.0	Water Quality Monitoring / Temperature Logger Download / Off-site Fish Habitat review
2009	September 10	SR	2.5	Water Quality Monitoring / Temperature Logger Download

Year	Date	Staff	Level of Effort	Task Description
2009	September 11	SD	4.5	Complete Offsite portions of subcatchments mapping
2009	September 30	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	October 19	SR	4.5	Water Quality Monitoring / Temperature Logger Download / On-Site Fish Habitat Review
2009	October 30	SR	4.5	Water Quality Monitoring / Temperature Logger Download / On-site overview characterization
2010	April 21	DG	3.0	Breeding Amphibian Survey
2010	April 22	SD	4.5	Spring vegetation Surveys, focus on forested units
2010	June 7	AW DG	3.0	Breeding Amphibian Survey
2010	June 25	DG	3.0	Breeding Amphibian Survey
2010	July 13	SD	6.0	Wetland/dripline flagging and summer vegetation surveys/incidental wildlife observations.
2010	July 14	SD	6.0	Wetland/dripline flagging and summer vegetation surveys/incidental wildlife observations.
2010	December 10	SR JS	4.5	Watercourse profile / Cross section measurements in 14W-12, 12A, 13 and 14
2011	May 31	JH	4.0	Breeding bird survey and Bobolink Habitat evaluation; Incidental wildlife documentation
2011	July 4	SR AS	4.0	Installation of Temperature loggers (14W-14A); water quality sampling; Secchi depth measurements
2011	July 27	SD		Wetland staking
2011	August 4	MC RR	-	Site condition/stream survey to note flow regime (14W-12); Photo record
2011	August 19	SR	2.5	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval; Habitat mapping (14W-14A)
2011	August 24	SR	2.5	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval
2011	October 6/7	SR	24	Fish Community Sampling (minnow & pot traps) in 14W-14A

Year	Date	Staff	Level of Effort	Task Description
2011	October 7	SR	3.0	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval
2012	June 8	TP	3.0	Bobolink and Eastern Meadowlark Point Count Survey #1
2012	June 20	TP	2.5	Bobolink and Eastern Meadowlark Point Count Survey #2
2012	July 3	TP	2.5	Bobolink and Eastern Meadowlark Point Count Survey #3
2013	May 31	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #1
2013	June 11	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #2
2013	July 4	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #3
2015	June 4	TP	4.0	Bat Exit Surveys
2015	June 11	TP	4.0	Bat Exit Surveys
2015	June 16	TP	4.0	Bat Exit Surveys
2015	July 13	TP	4.0	Bat Exit Surveys
2016	November 18	AS	3.0	Flow Regime Observations
2017	April 4	AS	4.0	Flow Regime Observations
2017	May 10	AS	2.0	Flow Regime Observations

Table 5.1.2 Environmental Technical Staff List

MMM Environmental Technical Staff	Title
Mark Cece, B.Sc.	Senior Fisheries Biologist & Ecology Manager
Sonia Rankin, B.Sc.	Aquatic Biologist
Alex Stettler, B.Sc.	Aquatic Biologist (Fisheries)
Joel Smith, B.Sc.	Aquatic Biologist (Benthics)
Bill Draper, M.Sc.	Senior Ecologist (Botany)
Steven Dinka, M.Sc.	Ecologist (Botany)
Teresa Piraino H.B.A.	Ecologist (Birds, Wildlife, Reptiles, Amphibians)
Prachi Patel, B.Sc.	Biologist (Botany)
Patricia Mohr, B.Sc.	Ecologist (Birds, Wildlife)

Appendix 5.2 – Wildlife

Appendix 5.2 – Wildlife

Table 5.2.1. Avifauna Observed 2005, 2009, 2010, 2011 and 2012

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Alder Flycatcher	*Empidonax alnorum*	G5	S5B,SZN							E	N								X
American Crow	*Corvus brachyrhynchos*	G5	S5B,SZN							E	N								X
American Goldfinch	*Spinus tristis*	G5	S5B,SZN							E	N		X				X	X	X
American Robin	*Turdus migratorius*	G5	S5B,SZN							E	N		X		X	X	X		X
American Woodcock	*Scolopax minor*	G5	S5B,SZN							E	N								X
Baltimore Oriole	*Icterus galbula*	G5	S5B,SZN							E	N			X					X
Barn Swallow	*Hirundo rustica*	G5	S5B,SZN	THR	THR	No Status	No Schedule				N	X	X	X					X
Black-capped Chickadee	*Poecile atricapillus*	G5	S5							I/E	N							X	X
Black-crowned Night-heron	*Nycticorax nycticorax*	G5	S3B,SZN					U		S/B M/F	Y								X
Blue Jay	*Cyanocitta cristata*	G5	S5							I/E	N		X	X	X				X
Blue-winged Teal	*Anas discors*	G5	S5B,SZN					U		M/F	N								X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Bobolink	*Dolichonyx oryzivorus*	G5	S4B,SZN	THR	THR	No Status	No schedule			E	N							X	X
Brown-headed Cowbird	*Molothrus ater*	G5	S5B,SZN							E	N				X				X
Canada Goose	*Branta canadensis*	G5	S5B,SZN					I		M/F	N	FY							X
Common Grackle	*Quiscalus quiscula*	G5	S5B,SZN							E	N								X
Common Yellowthroat	*Geothlypis trichas*	G5	S5B,SZN							I/E	N			X					X
Downy Woodpecker	*Picoides pubescens*	G5	S5							I/E	N								X
Eastern Kingbird	*Tyrannus tyrannus*	G5	S5B,SZN							E	N							X	X
Eastern Towhee	*Pipilo erythrophthalmus*	G5	S4B,SZN					U		I/E	N								X
European Starling	*Sturnus vulgaris*	G5	SE					I		E	N		X	X					X
Field Sparrow	*Spizella pusilla*	G5	S5B,SZN							E	N		X			X			X
Gadwall	*Anas strepera*	G5	S4B,SZN					U		M/F	N	FY							
Gray Catbird	*Dumetella carolinensis*	G5	S5B,SZN							I/E	N								X
Great Blue Heron	*Ardea herodias*	G5	S5B,SZN							S/B M/F	N							X	X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Herring Gull	*Larus argentatus*	G5	S5B,SZN								N								X
Horned Lark	*Eremophila alpestris*	G5	S5B,SZN					U			N							X	X
House Sparrow	*Passer domesticus*	G5	SE					I		E	N								X
Indigo Bunting	*Passerina cyanea*	G5	S5B,SZN							E	N					X			X
Killdeer	*Charadrius vociferus*	G5	S5B,SZN								N		X					X	X
Mallard	*Anas platyrhynchos*	G5	S5B,SZN							S/B M/F	N	X							X
Mourning Dove	*Zenaida macroura*	G5	S5B,SZN							E	N	X	X					X	X
Northern Harrier	*Circus cyaneus*	G5	S4B,SZN	NAR	NAR			U	X	M/F	N								X
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	G5	S5B,SZN					U		M/F	N	X	X				X		X
Red-tailed Hawk	*Buteo jamaicensis*	G5	S5B,SZN	NAR	NAR					E	N								X
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S5B,SZN							E	N	X	X	X	X		X	X	X
Ring-billed Gull	*Larus delawarensis*	G5	S5B,SZN								N		X	X					
Rock Dove	*Columba livia*	G5	SE					I			N							X	X
Savannah	*Passerculus*	G5	S5B,SZN						X		N	X	X				X	X	X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Sparrow	*sandwichensis*																		
Song Sparrow	*Melospiza melodia*	G5	S5B,SZN							E	N	X	X	X	X	X	X	X	X
Spotted Sandpiper	*Actitis macularia*	G5	S5B,SZN								N							X	X
Tree Swallow	*Tachycineta bicolor*	G5	S5B,SZN							E	N	X							X
Willow Flycatcher	*Empidonax traillii*	G5	S5B,SZN					U			N							X	
Wilson's Snipe	*Gallinago delicata*	G5	S5B,SZN					U			N								X
Yellow Warbler	*Dendroica petechia*	G5	S5B,SZN							E	N		X	X					X
Total No. of Species:	***44***											**10**	**14**	**9**	**5**	**4**	**6**	**14**	**38**

COSEWIC		***SARA* Schedule**		**Habitat Use**	
THR	2	No Schedule	2	Interior	0
				Interior/Edge	6
MNR		**Halton Region**			
THR	2	U=Uncommon (15-35 stations)	9		
		I=Introduced Species	4		
SARA Status					
No Status	2	**MNR Area Sensitive**	2		

Table 5.2.2 – Anuran Survey Results 2010

Survey #	Date	Station	Observations		
			Spp.	Call Code	Count
1	Apr-21-2010 (20:25-22:00)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	AMTO	2	4
		7	NLFR	1	1
		8	Not Surveyed		
2	June -7-2010 (21:02-23:00)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	No Observations		
		7	GRFR	2	4
			GRTR	1	2
		8	GRTR	1	2
3	Jun-25-2010 (20:55-22:05)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	No Observations		
		7	GRFR	2	5
		8	Not Surveyed		

Table 5.2.3 – Bat Exit Survey Results 2015

Survey #	Building #	Date	# of Exiting Bats	# *Myotis spp.*	# Non *Myotis spp.*	# Unknown HiF	# No Recording
1	Building 1	June 4, 2015	8	2	3	2	1
2	Building 1	July 13, 2015	12	0	11	0	1
1	Building 3	June 11, 2015	1	0	1	0	0
2	Building 3	July 13, 2015	1	0	1	0	0

Legend

[1]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

- G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
- G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common - demonstrably secure under present conditions.

[2]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure - Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SAN Non-breeding accidental.
- SE Exotic - not believed to be a native component of Ontario's fauna.
- SZN Non-breeding migrants/vagrants.
- SZB Breeding migrants/vagrants.

[3]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC NOVEMBER 2010)

- EXT Extinct - A species that no longer exists.
- EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
- END Endangered - A species facing imminent extirpation or extinction.
- THR Threatened - A species likely to become endangered if limiting factors are not reversed.

- SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
- DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[4]OMNR (Ontario Ministry of Natural Resources)
(provincial status from MNR September 29 2010)
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

- EXT Extinct - A species that no longer exists anywhere.
- EXP Extirpated - A species that no longer exists in the wild in Ontario but still occurs elsewhere.
- END Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act* (*ESA*) (END-R designations are no longer relevant as species are covered under new *ESA* April 2009)
- THR Threatened - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- SC Special Concern (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.
- NAR Not at Risk - A species that has been evaluated and found to be not at risk.
- DD Data Deficient (formerly Indeterminate) - A species for which there is insufficient information for a provincial status recommendation.

[5]SARA (Species at Risk Act) Status and Schedule
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented. http://www.sararegistry.gc.ca/sar/listing/listing_e.cfm

- EXT Extinct - A wildlife species that no longer exists.
- EXP Extirpated **-** A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- END Endangered - A wildlife species that is facing imminent extirpation or extinction.
- THR Threatened - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- SC Special Concern - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of *SARA*. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm November 3, 2010]

- Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
- Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
- Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

[6] Regional Status

Halton Region
From : Halton Natural Areas Inventory (Dwyer 2006)

- A = Abundant >125 Stations
- C = Common 36-125 Stations
- U = Uncommon 15-35 Stations
- R= Rare < 15 Stations
- E = Extirpated no longer present in Halton Region
- I = Introduced an introduced species not native to Ontario
- Uncertain = Uncertain if species is present in Halton Region
- LS = Locally Significant
- M = Migration

[7] MNR Significant Wildlife Habitat Technical Guide Area Sensitive Species

- Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers
- *From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.*

[8] Habitat Use
I=interior species, I/E=interior edge species, E=edge species (Freemark and Collins, 1989); M/F=Marsh/Fen, S/B=Treed Swamp/Bog. Interior bird species require habitat which is often found 100m from the forest edge while Interior/Edge species are found within both interior and edge habitat. Often Interior and Interior/Edge are more sensitive to urban encroachment as they require these large, relatively undisturbed forest habitats to support viable populations. The increasing urbanization of rural areas often results in increased parasitism and predation as well as disturbance from human recreational activities (e.g. illegal bike trails, dumping and pets.) (Freemark, K. and Collins, B. 1989. *Landscape ecology of birds breeding in temperate forest fragments*. – In: Hagan III, J. M. and Johnston, D. W. (eds), Ecology and conservation of neotropical migrant landbirds. Smithsonian Inst. Press, pp. 443–454)

[9] Dependancy on Wetlands

- Wetlands are home to many species of birds. Wetland birds are determined by the kind of habitat nad the seasonal movement of migrating species.

- Dependant (D) - These species depend on wetlands for their survival. Most nest within wetlands, a few such as the Great Blue Heron, nest elsewhere but feed extensively in wetlands, and other such as the Wood Duck, nest away from wetlands but rear their young in marshes and fens.
- Partially Dependant (P) - These species use wetlands habitats extensively for breeding or feeding, as well as other types of habitat.

[10, 11, 12] Early Nesting Date, Late Migration Date, Late Nesting Date

LePage, Dennis. 2005. Migration and nesting dates for Ontario bird species. Bird Studies Canada: Ontario Breeding Bird Atlas.

This list was created by Dennis LePage of Bird Studies Canada. Breeding dates were provided by Mark Peck, and Charles Francis provided the migration dates based on Long Point Data. It covers the whole Southern Great Lakes region; thus some species do not occur in the Ottawa district. The early and late dates for nesting define the period during which nesting can be expected to occur. (They are the earliest and latest records known for that species in the Southern Great Lakes region) The late migration date is to show that although most birds move through the area before that date, some can be still passing through at that time. Ex: An Osprey can still be passing through until May 30, although that is unusual. Yet the earliest record for this species is May 1. What this means is, be careful about assigning a potential breeding code (possible, probable, confirmed) until after May 30 unless good evidence indicates that the bird is nesting (ie: mating with another Osprey, sitting on a nest etc.).

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

- X Species observed in its breeding season (no breeding evidence).

POSSIBLE

- H Species observed in its breeding season in suitable nesting habitat.
- S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

- P Pair observed in suitable nesting habitat in nesting season.
- T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more appart, at the same place.
- D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
- V Visiting probable nest site
- A Agitated behaviour or anxiety calls of an adult.
- B Brood Patch on adult female or cloacal protuberance on adult male.
- N Nest-building or excavation of nest hole.

CONFIRMED

- DD Distraction display or injury feigning.
- NU Used nest or egg shells found (occupied or laid within the period of the survey).
- FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
- AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
- FS Adult carying fecal sac.
- CF Adult carying food for young.
- NE Nest containing eggs.
- NY Nest with young seen or heard.

Appendix 5.3 – Vascular Plant List

Appendix 5.3 – Vascular Plant List

Table 5.3.1 - Summary of Vascular Plant Species

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Allegheny Blackberry	*Rubus allegheniensis*	ROSACEAE	2	2	G5	S5			X	X	X						x
Alternate-leaf Dogwood	*Cornus alternifolia*	CORNACEAE	6	5	G5	S5			X	X	X	x					
American Basswood	*Tilia americana*	TILIACEAE	4	3	G5	S5			X	X	X		x		x	x	x
American Beech	*Fagus grandifolia*	FAGACEAE	6	3	G5	S5			X	X	X				x		
American Bugleweed	*Lycopus americanus*	LAMIACEAE	4	-5	G5	S5			X	X	X	x	x				
American Elm	*Ulmus americana*	ULMACEAE	3	-2	G5?	S5			X	X	X	x	x	x		x	x
Annual Ragweed	*Ambrosia artemisiifolia*	ASTERACEAE	0	3	G5	S5			X	X	X		x				
Bird's-foot Trefoil	*Lotus corniculatus*	FABACEAE			G?	SE 5			X	X	X		x				
Black Locust	*Robinia pseudo-acacia*	FABACEAE		0	G5	SE 5			X	X	X		x				
Black Walnut	*Juglans nigra*	JUGLANDACEAE	5	3	G5	S4			X	X	X			x			
Blue Vervain	*Verbena hastata*	VERBENACEAE	4	-4	G5	S5			X	X	X	x	x			x	
Broad-leaf Cattail	*Typha latifolia*	TYPHACEAE	3	-5	G5	S5			X	X	X	x	x				
Broad-leaved Water-plantain	*Alisma plantago-aquatica*	ALISMATACEAE	3	-5	G5	S5			X	X	X	x	x	x			
Buckthorn	*Rhamnus cathartica*	RHAMNACEAE		3	G?	SE 5			X	X	X	x	x	x	x		x
Bur Oak	*Quercus macrocarpa*	FAGACEAE	5	1	G5	S5			X	X	X				x		x
Canada Anemone	*Anemone canadensis*	RANUNCULACEAE	3	-3	G5	S5			X	X	X				x		
Canada Thistle	*Cirsium arvense*	ASTERACEAE		3	G?	SE 5			X	X	X	x	x				
Carolina Rose	*Rosa carolina*	ROSACEAE	6	4	G4G5	S4			X	R	R[4]						x
Chicory	*Cichorium intybus*	ASTERACEAE		5	G?	SE 5			X	X	X		x				
Choke Cherry	*Prunus virginiana ssp virginiana*	ROSACEAE	2	1	G5T?	S5			X	X	X				x	x	
Climbing Nightshade	*Solanum dulcamara*	SOLANACEAE		0	G?	SE 5			X	X	X	x	x		x		

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Common Apple	*Malus pumila*	ROSACEAE		5	G5	SE 5			X	X	X	x	x				x
Common Boneset	*Eupatorium perfoliatum*	ASTERACEAE	2	-4	G5	S5			X	X	X		x				
Common Dandelion	*Taraxacum officinale*	ASTERACEAE		3	G5	SE 5			X	X	X		x	x			
Common Milkweed	*Asclepias syriaca*	ASCLEPIADACEAE	0	5	G5	S5			X	X	X	x	x				
Common Pear	*Pyrus communis*	ROSACEAE		5	G5	SE 4			X	X	X						x
Common Reed	*Phragmites australis*	POACEAE	0	-4	G5	S5			X	X	X		x				
Common Teasel	*Dipsacus fullonum ssp sylvestris*	DIPSACACEAE		5	G?T?	SE 5			X	X	X	x	x	x			
Corn-marigold	*Chrysanthemum segetum*	ASTERACEAE			G?	SE 1							x				
Crack Willow	*Salix fragilis*	SALICACEAE		-1	G?	SE 5							x	x			
Crested Sedge	*Carex cristatella*	CYPERACEAE	3	-4	G5	S5			X	X	X	x	x				
Cultivated Wheat	*Triticum aestivum*	POACEAE		5	G?	SE 1			X	X	X		x				
Curly Dock	*Rumex crispus*	POLYGONACEAE		-1	G?	SE 5			X	X	X	x	x			x	
Dame's Rocket	*Hesperis matronalis*	BRASSICACEAE		5	G4G5	SE 5			X	X	X			x			
Devil's Beggar's Ticks	*Bidens frondosa*	ASTERACEAE	3	-3	G5	S5			X	X	X	x	x				
Early Meadowrue	*Thalictrum dioicum*	RANUNCULACEAE	5	2	G5	S5			X	X	X				x		
Eastern Cottonwood	*Populus deltoides ssp. deltoides*	SALICACEAE			G5T?	SU										x	
Eastern Helleborine	*Epipactis helleborine*	ORCHIDACEAE		5	G?	SE 5			X	X	X				x		
Eastern Hop-hornbeam	*Ostrya virginiana*	BETULACEAE	4	4	G5	S5			X	X	X				x	x	
Eastern Red Cedar	*Juniperus virginiana*	CUPRESSACEAE	4	3	G5	S5			R[5]	R	R[8]						x
Eastern White Pine	*Pinus strobus*	PINACEAE	4	3	G5	S5			X	X	X						x
False Solomon's Seal	*Maianthemum racemosum ssp racemosum*	LILIACEAE	4	3	G5T	S5			X	X	X				x		
Field Sowthistle	*Sonchus arvensis ssp arvensis*	ASTERACEAE		1	G?T?	SE 5			X	X	X		x				
Fowl Manna Grass	*Glyceria striata*	POACEAE	3	-5	G5	S5			X	X	X				x	x	

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Fox Sedge	*Carex vulpinoidea*	CYPERACEAE	3	-5	G5	S5			X	X	X	x	x	x			
Fringed Sedge	*Carex crinita*	CYPERACEAE	6	-4	G5	S5			X[U]	X	R[6]				x		
Garlic Mustard	*Alliaria petiolata*	BRASSICACEAE		0	G?	SE5			X	X	X			x	x		
Graceful Sedge	*Carex gracillima*	CYPERACEAE	4	3	G5	S5			X	X	X		x		x	x	
Grass-leaved Goldenrod	*Euthamia graminifolia*	ASTERACEAE	2	-2	G5	S5			X	X	X	x	x				
Gray Dogwood	*Cornus foemina ssp racemosa*	CORNACEAE	2	-2	G5	S5			X	X	X	x	x	x	x	x	
Great-hairy Willow-herb	*Epilobium hirsutum*	ONAGRACEAE		-4	G?	SE5			X	X	X		x				
Green Ash	*Fraxinus pennsylvanica*	OLEACEAE	3	-3	G5	S5			X	X	X	x					
Hawthorn Species	*Crataegus sp*	ROSACEAE											x		x	x	x
Heart-leaved Willow	*Salix eriocephala*	SALICACEAE	4	-3	G5	S5			X	X	X	x	x				
Herb-robert	*Geranium robertianum*	GERANIACEAE		5	G5	SE5			X	X	X				x		
Hooked Crowfoot	*Ranunculus recurvatus var. recurvatus*	RANUNCULACEAE	4	-3	G5	S5			X	X	X					x	
Hop Sedge	*Carex lupulina*	CYPERACEAE	6	-5	G5	S5							x			x	
Jack-in-the-pulpit	*Arisaema triphyllum ssp triphyllum*	ARACEAE	5	-2	G5T5	S5			X	X	X				x		
Kentucky Bluegrass	*Poa pratensis ssp pratensis*	POACEAE	0	1	G5T	S5			X	X	X		x				
Kidney-leaved Buttercup	*Ranunculus abortivus*	RANUNCULACEAE	2	-2	G5	S5			X	X	X					x	
Lady's Thumb	*Polygonum persicaria*	POLYGONACEAE		-3	G?	SE5			X	X	X	x	x				
Large-leaved Aster	*Aster macrophyllus*	ASTERACEAE	5	5	G5	S5			X	X	X				x		
Lesser Burdock	*Arctium minus ssp minus*	ASTERACEAE		5	G?T?	SE5			X	X	X		x				
Lesser Duckweed	*Lemna minor*	LEMNACEAE	2	-5	G5	S5			X	X	X	x					
Manitoba Maple	*Acer negundo*	ACERACEAE		-2	G5	S5			X	X	X	x					
May Apple	*Podophyllum peltatum*	BERBERIDACEAE	5	3	G5	S5			X	X	X				x		
Narrow-leaved Cattail	*Typha angustifolia*	TYPHACEAE	3	-5	G5	S5			X	X	X	x	x				

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Narrow-leaved Spring Beauty	*Claytonia virginica*	PORTULACACEAE	5	3	G5	S5			X	X	X				x	x	
New England Aster	*Aster novae-angliae*	ASTERACEAE	2	-3	G5	S5			X	X	X		x				
Nipple-seed Plantain	*Plantago major*	PLANTAGINACEAE		-1	G5	SE5			X	X	X		x				
Northern Red Oak	*Quercus rubra*	FAGACEAE	6	3	G5	S5			X	X	X				x	x	x
Northern White Cedar	*Thuja occidentalis*	CUPRESSACEAE	4	-3	G5	S5			X	X	X						x
Northern Wild-raisin	*Viburnum cassinoides*	CAPRIFOLIACEAE	7	-3	G5	S5				R	E						x
Norway Maple	*Acer platanoides*	ACERACEAE		5	G?	SE5			X	X	X			x			x
Norway Spruce	*Picea abies*	PINACEAE		5	G?	SE3			X[SR]	X	X						x
Orchard Grass	*Dactylis glomerata*	POACEAE		3	G?	SE5			X	X	X		x				
Panicled Aster	*Aster lanceolatus ssp lanceolatus*	ASTERACEAE	3	-3	G5T?	S5			X[U]	X	X		x	x		x	
Purple Loosestrife	*Lythrum salicaria*	LYTHRACEAE		-5	G5	SE5			X	X	X	x	x	x			
Purple-stemmed Aster	*Aster puniceus var puniceus*	ASTERACEAE	6	-5	G5T?	S5							x				
Queen Anne's Lace	*Daucus carota*	APIACEAE			G?	SE5			X	X	X	x	x				
Red Clover	*Trifolium pratense*	FABACEAE		2	G?	SE5			X	X	X		x				
Red Raspberry	*Rubus idaeus ssp idaeus*	ROSACEAE		0	G5T5	SE1			X	X	X			x		x	
Redtop	*Agrostis gigantea*	POACEAE		0	G4G5	SE5			X	X	X		x	x			
Reed Canary Grass	*Phalaris arundinacea*	POACEAE	0	-4	G5	S5			X	X	X	x	x	x		x	
Rice Cutgrass	*Leersia oryzoides*	POACEAE	3	-5	G5	S5			X[U]	X	X		x	x		x	
Riverbank Grape	*Vitis riparia*	VITACEAE	0	-2	G5	S5			X	X	X	x		x			
Running Strawberry-bush	*Euonymus obovata*	CELASTRACEAE	6	5	G5	S5			X	X	X				x		
Sandbar Willow	*Salix exigua*	SALICACEAE	3	-5	G5	S5			X[U]	X	X		x				
Scotch Pine	*Pinus sylvestris*	PINACEAE		5	G?	SE5			X	X	X						x
Sensitive Fern	*Onoclea sensibilis*	DRYOPTERIDACEAE	4	-3	G5	S5			X	X	X				x		

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Shagbark Hickory	*Carya ovata var ovata*	JUGLANDACEAE	6	3	G5	S5			X[U]	X	U	x	x		x	x	x
Silver Maple	*Acer saccharinum*	ACERACEAE	5	-3	G5	S5			X	X	X	x					
Smooth Brome	*Bromus inermis ssp inermis*	POACEAE		5	G4G5T?	SE5			X	X	X		x	x			
Soft Rush	*Juncus effusus ssp solutus*	JUNCACEAE	4	-5	G5T?	S5			X	X	X	x	x			x	
Soy Bean	*Glycine max*	FABACEAE		5	G?	SE2							x				
Spikerush Species	*Eleocharis sp*	CYPERACEAE											x				
Spotted Jewel-weed	*Impatiens capensis*	BALSAMINACEAE	4	-3	G5	S5			X	X	X		x			x	
Staghorn Sumac	*Rhus typhina*	ANACARDIACEAE	1	5	G5	S5			X	X	X		x				
Sugar Maple	*Acer saccharum ssp. saccharum*	ACERACEAE			G5T?	S5			X	X	X				x		
Tall Goldenrod	*Solidago altissima var altissima*	ASTERACEAE	1	3	G?	S5			X	X	X		x				
Tartarian Honeysuckle	*Lonicera tatarica*	CAPRIFOLIACEAE		3	G?	SE5			X	X	X			x		x	
Thicket Creeper	*Parthenocissus inserta*	VITACEAE	3	3	G5	S5			X	X	X			x		x	
Timothy	*Phleum pratense*	POACEAE		3	G?	SE5			X	X	X		x				
Torrey's Rush	*Juncus torreyi*	JUNCACEAE	3	-3	G5	S5			X[U]	X	X		x	x		x	
True Watercress	*Nasturtium officinale*	BRASSICACEAE		-5	G?	SE							x				
Turtlehead	*Chelone glabra*	SCROPHULARIACEAE	7	-5	G5	S5			X[U]	X	X					x	
Velvet-leaf	*Abutilon theophrasti*	MALVACEAE		4	G?	SE5			X	X	X	x					
Virginia Strawberry	*Fragaria virginiana ssp virginiana*	ROSACEAE	2	1	G5T?	SU			X	X	X		x	x	x		
Western Poison Ivy	*Rhus radicans ssp rydbergii*	ANACARDIACEAE		0	G5T	S5			X	X	X				x		
White Ash	*Fraxinus americana*	OLEACEAE	4	3	G5	S5			X	X	X				x	x	
White Avens	*Geum canadense*	ROSACEAE	3	0	G5	S5			X	X	X	x					
White Clover	*Trifolium repens*	FABACEAE		2	G?	SE5			X	X	X		x				
White Goosefoot	*Chenopodium album var album*	CHENOPODIACEAE		1	G5T5	SE5			X	X	X		x				
White Oak	*Quercus alba*	FAGACEAE	6	3	G5	S5			X	X	X				x	x	x

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
White Trillium	*Trillium grandiflorum*	LILIACEAE	5	5	G5	S5			X	X	X				x		
Wild Black Cherry	*Prunus serotina*	ROSACEAE	3	3	G5	S5			X	X	X				x	x	
Wild Mock-cucumber	*Echinocystis lobata*	CUCURBITACEAE	3	-2	G5	S5			X	X	X	x	x	x			
Wild-rye Species	*Elymus sp*	POACEAE											x				
Winterberry	*Ilex verticillata*	AQUIFOLIACEAE	5	-4	G5	S5			X	X	R[5]				x		
Wood Anemone	*Anemone quinquefolia var quinquefolia*	RANUNCULACEAE	7	0	G5	S5			X	X	X					x	
Woolgrass Bulrush	*Scirpus atrovirens*	CYPERACEAE	3	-5	G5?	S5			X	X	X		x				
Yellow Rocket	*Barbarea vulgaris*	BRASSICACEAE		0	G?	SE5			X	X	X	x		x			
Yellow Trout-lily	*Erythronium americanum ssp americanum*	LILIACEAE	5	5	G5T5	S5			X	X	X				x	x	

Legend

[1]**Coefficient of Conservatism and Coefficient of Wetness** (Oldham et al., 1995).

- CC = Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

- CW = Coefficient of Wetness. -Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

[2]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

- G1 Extremely rare—usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare—usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.

- G3 Rare to uncommon—usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common—usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common—demonstrably secure under present conditions.

[3]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure—Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SX Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
- SE Exotic; not believed to be a native component of Ontario's flora.

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC NOVEMBER 2010)

- EXT Extinct - A species that no longer exists.
- EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
- END Endangered - A species facing imminent extirpation or extinction.
- THR Threatened - A species likely to become endangered if limiting factors are not reversed.
- SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
- DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

***** - Species on Schedule 1 of *Species at Risk Act* (*SARA*)

[5]OMNR (Ontario Ministry of Natural Resources)
(*provincial status from MNR September 2010)*
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

- EXT Extinct—A species that no longer exists anywhere.
- EXP Extirpated—A species that no longer exists in the wild in Ontario but still occurs elsewhere.
- END Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act* (*ESA*).
- THR Threatened—A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- SC Special Concern (formerly Vulnerable) —A species with characteristics that make it sensitive to human activities or natural events.
- NAR Not at Risk—A species that has been evaluated and found to be not at risk.
- DD Data Deficient (formerly Indeterminate) —A species for which there is insufficient information for a provincial status recommendation.

[6] *SARA* (*Species at Risk Act*) Status and Schedule

The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented. http://www.sararegistry.gc.ca/sar/listing/listing_e.cfm

- EXT Extinct - A species that no longer exists.
- EXP Extirpated **-** A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- END Endangered - A species that is facing imminent extirpation or extinction.
- THR Threatened - A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- SC Special Concern - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of *SARA*. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Species at Risk.

- Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm November 3, 2010]
- Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
- Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
- Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

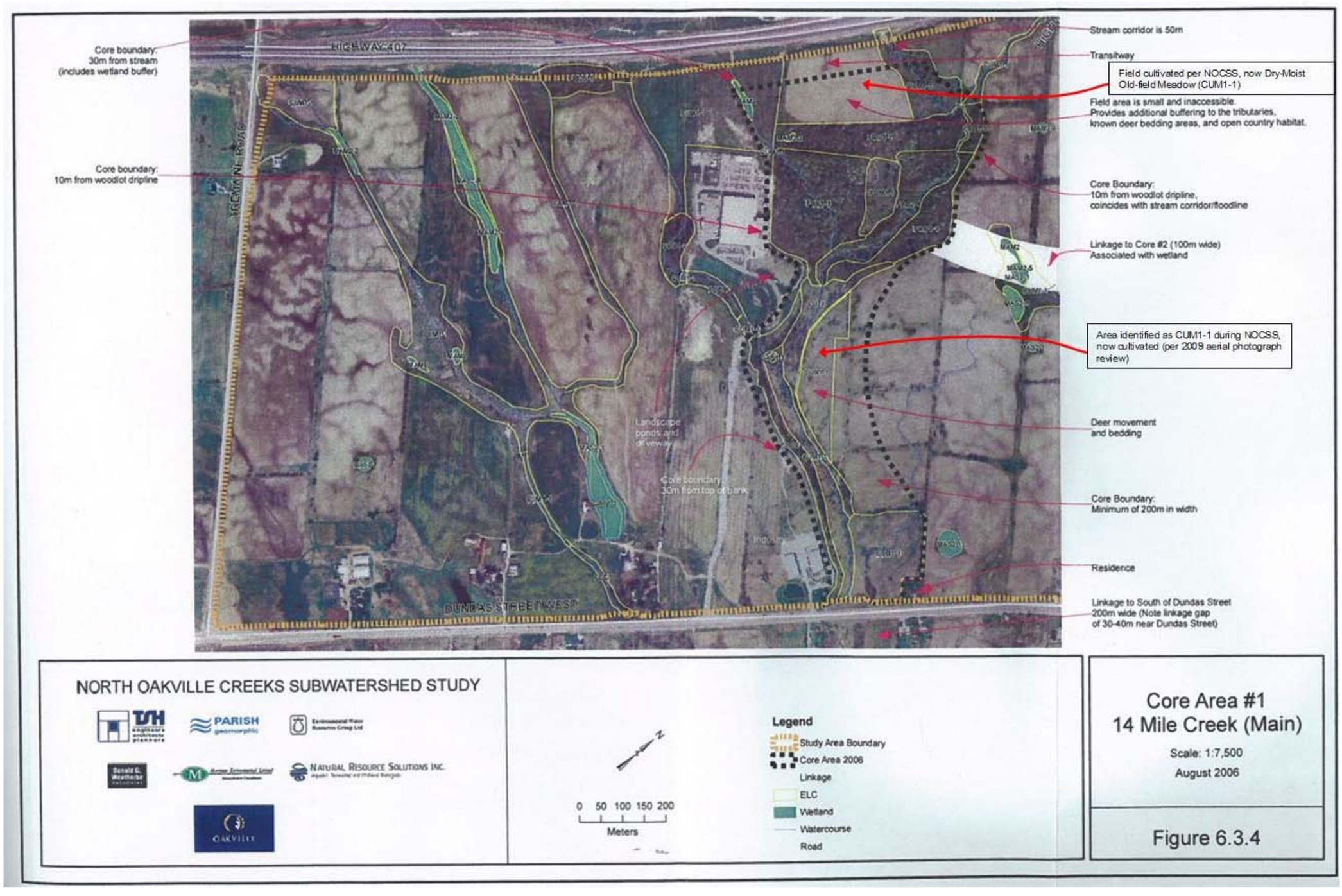
[7] Regional Status

from *The Distribution and Status of the Vascular Plants of the Greater Toronto Area* (Varga et. al. 2000).

"Plant rarity is based on the number of locations for a native plant species" and also takes into account native species restricted to specialized rare habitats. For the Greater Toronto Area column, "A species is considered rare in the Greater Toronto Area if it is rare or uncommon in a least four of... Halton, Peel, Toronto, York, and Durham".

- X - Present
- U - uncommon native species
- R - rare native species
- R# - number of stations for a rare native species
- E - extirpated native species
- + - introduced species
- X+ - introduced in municipality
- SR - sight record
- LR - literature record

Appendix 5.4 – Core #1 and Linkage to Core #2 Vegetation Community Mapping (Modified by MMM from NOCSS)


Core boundary:
30m from stream
(includes wetland buffer)
Core boundary:
10m from woodlot dripline
HIGHWAY 407
TREMAINE ROAD
DUNDAS STREET WEST
Landscape ponds and driveway
Core boundary:
30m from top of bank
Industry
Stream corridor is 50m
Transitway
Field cultivated per NOCSS, now Dry-Moist Old-field Meadow (CUM1-1)
Field area is small and inaccessible.
Provides additional buffering to the tributaries, known deer bedding areas, and open country habitat.
Core Boundary:
10m from woodlot dripline,
coincides with stream corridor/floodline
Linkage to Core #2 (100m wide)
Associated with wetland
Area identified as CUM1-1 during NOCSS, now cultivated (per 2009 aerial photograph review)
Deer movement and bedding
Core Boundary:
Minimum of 200m in width
Residence
Linkage to South of Dundas Street
200m wide (Note linkage gap of 30-40m near Dundas Street)
NORTH OAKVILLE CREEKS SUBWATERSHED STUDY
PARISH geomorphic
Natural Resource Solutions Inc.
0 50 100 150 200
Meters
Legend
Study Area Boundary
Core Area 2006
Linkage
ELC
Wetland
Watercourse
Road
Core Area #1
14 Mile Creek (Main)
Scale: 1:7,500
August 2006
Figure 6.3.4


HIGHWAY 407
REGIONAL ROAD 25
DUNDAS STREET WEST
Connection to 16 Mile Creek (Associated with ORC Lands)
Residence & Church
Linkage to Core #1 (100m)
Core boundary: 10m from woodlot dripline
Residences
Core boundary: At the limit of dense natural vegetation (includes floodline of channel and wetland areas)
Residences and other buildings
Note: Floodlines associated with watercourses
Core boundary to follow stream corridor
Core boundary: 30m from pond/wetland, which equates to 110m floodplain width
Linkage to south of Dundas Street (note the gap along Dundas Street)
NORTH OAKVILLE CREEKS SUBWATERSHED STUDY
TYH engineers architects planners
PARISH geomorphic
Environmental Water Resources Group Ltd
Donald G. Weatherbe Associates
Natural Resource Solutions Inc.
OAKVILLE
0 100
Meters
Legend
Study Area Boundary
Core Area 2006
Linkage
ELC
Wetland
Watercourse
Road
Core Area #2
14 Mile Creek East
(ORC Lands)
Scale: 1:10,000
August 2006
Figure 6.3.5

Appendix 5.5 – ELC Field Data Sheets

• FOD
• Midaged.
• Abrupt mature edge.
• 80% canopy cover

ELC
PLANT SPECIES LIST

SITE: Ol Lazy Pat
POLYGON: 01
DATE: Aug. 18 '09
SURVEYOR(S): SPinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Pinu stro						Rham cat					
Pinu sylv						Frax amer.					
Jug nig											
Tili amer											
Acer Sacc.											
Acer neg.											
Carya											

M'daged Mature FoD
disturbed by constructed
trail for Zenon/GE treatment plant employees.
90+ canopy cover, generally good health of trees.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 02
DATE: Aug. 18/09
SURVEYOR(S): S Dinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	D				
Fraxnat.					
Pinustro.					
Quer alb.					

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 03
DATE: Aug. 18/09
SURVEYOR(S): S Dinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Acer sacc											
Frax amer											

Page .... of ....

ELC PLANT SPECIES LIST

SITE: Lazy Pat 3460

POLYGON: 04

DATE: Sept 11, 2009

SURVEYOR(S): SD

Mid-aged to Mature FOD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.
Quercus sp											
Carya ov.											
Acer sac											

ELC
PLANT SPECIES LIST

SITE: Lazy Cat 3460
POLYGON: 105
DATE: Sept 11 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

FOD, Hickory dominant.

SPECIES CODE	LAYER 1	2	3	4	COL.
Carya ov.	A				
Pinu stro	O				
Frax pen	O				
Acer sac.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of .....

MAM area ~~dang~~ flows thrown middle of forest block, majority is shagbark hickory dominated mid-aged. FOD

ELC
PLANT SPECIES LIST

SITE: Lazy Cat 3460
POLYGON: 06
DATE: Sept. 11, 2009.
SURVEYOR(S): SP

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Corya ova					
Fraxi amer					
Frax pen					
Acer sacc					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

mid-aged FOD, Hickory dominant, residential properties cut out of forest block.

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 07
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER				COL.	SPECIES CODE	LAYER				COL.
	1	2	3	4			1	2	3	4	

Page .... of ....

CUP3 young coniferous trees.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: 08
DATE: Sept. 11 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer Sac.	A				
Pinus Str.	F				
Carya ov	O				
Quercus sp.	O				

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

mid-aged FOD5, FOM2
moderately large pond on south corner

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: ~~09~~ 09
DATE: Sept. 11, 2009
SURVEYOR(S): SD

Mid aged to mature FOD5

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	A				
Pinu stob.	F				
Carya ov.					
Populus ser					
Fax amer					
Quercus sp					

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: 10
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Pinus sp.					
Acer sac.					
Crataegus.					
Quercus sp					
Carya ov.					
Tilia amer.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

FOM 2 -
CUS 1-1 – hawthorn cultural savannah.
FOD 5
several watercourse features + p-n's.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: A / 11
DATE: Sept. 11, 2009.
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	A				
Carya ov.					
Pinus stro					
Quer rub.					
Quer sp.					
Ulm amer					
Frax amer					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

midaged FOD5 transected by watercourse.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 12
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Phalaris arun					
Typha ang					
Typha lat					
Lythrum sal					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

- MAM2-2/CUM
- 2 ponds with ~~Stuff~~ cattail shallow marsh fringe. near 407 ROW Fence.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 13
DATE: Sept. 11 2009
SURVEYOR(S): SD.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Ulm amer					
Phalar arun					
Lythrum sal					
Acer neg.					
Typha sp.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

- MAM/CUM band surrounding watercourse with occasional trees and very small cattail shallow marsh pockets.
- watercourse surrounded by active agriculture.

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: Unit 1 wetland
DATE: Aug 20, 2009
SURVEYOR(S): KD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
(S) Salix sp	O				
Acer sac.	O				
Frax pen.	O				
Ulm amer.	O				
Malus pum	S				
Rhus cat.		O			
Cornus alt.		S			
Salix eric.			O		
Cornus foem			O		
Vitis sp.			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
Typha ang.				D	
Lyth sal.				F	
Phal aru.				F	
lemna minor				A	(1 root)
Spirodela poly				F	(multi root).
Lady's thumb				O	(no bristles on ochrea.)
Bidens frondosa				O	
Rum crisp				O	
(S) Carex vulp.				F	
grass sp.				F	
Taraxacum sp.				O	
Yellow rocket				O	
Lycopus amer				O	
Watercress				O	
Verb hast.				O	
Aster sp.				F	
Echinocystis				O	
Dips ful.				O	
Velvetleaf.				O	
Sola dulc.				O	
small arrowhead				S	→ Alisma plantago-aqu
~~Bur-marigold~~				O	
Grass-like goldenrod.				O	
Juncus effu.				O	
Typha lat.				O	

Page ..... of ....

Description
pond - fringe of cattail MAS + Duckweed floating aquatic
Fring of young trees + shrubs.
- north section beyond MAS appears to include Aster forb meadow marsh, with carex vulp (as singles), Mana sedge, purple loosestrife, grass like goldenrod, + unknown grasses

Wildlife
Black-capped night heron male + female.
Great blue heron
RWBB.
monarch caterpillar (pic), + butterfly.
Barn swallow
Blue jay
Flock of mourning doves.

Notes
* standing water to a 5cm in north channel but no apparent flow

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: ~~X~~ Unit 3 FOD 7-3
DATE: Aug 20, 2009
SURVEYOR(S): SDinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Sali. fragi.	D				
Ulmus amer		O			
Fraxinus nig.		S			
Acer plat.		F			
Parth. ins.				O	
Urtis dio.				F	
Rubus idaeus sp.				O	
Cornus stolon				O	
Lonicera tat.				O	
Rhamnus cat.				O	

SPECIES CODE	LAYER 1	2	3	4	COL.
Carex vulp.				O	
Lythrum sal.				F	
Phal arun.				O	
Dipsacus full.				O	
Leers ory.				O	
grass				A	
small unknown				S	
Alli. ort				O	
yellow rocket				O	
wild mustard				O	
Carex sp				O	
Phal arun.				O	
Aster lae.				F	
watercress				S	
Brom. iner				F	
Hesp mat				O	
Dandelion					
Frag vir.					

Page ..... of ....

near Dundas road only

as sampled unit 1.

as sampled unit 1.

as sampled unit 2.

→ Alisma plantago-aq

broad leaf in channel.

wildlife American goldfinch. Blue jay, water striders in some pools.

Notes

- no flow at time of survey. but small pools of standing water & algae.
- lots of dumping etc. in channel.
- frequent canopy gaps, trees to 50cm dbh.

ELC PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: Unit 4
DATE: Aug. 30
SURVEYOR(S): SDinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.
Com daisy				F	
Lady's thumb.				O	
common mugwort				A	
waterweed.				F	
Poa pat.				F	
redtop				F	
Echin crus.				O	
(5) Polygonum sp.				A	
Plant maj.				F	
Rumex crisp.				F	
Bidens frond				S	
(5) grass sp				F	
hairy willowherb.				S	
Trifo rep.					

* Chrysanthemum leuc.

these 2 abundant.

— Epilobium hir.

wildlife

* leopard frog +++
* 3 mallards in dug pond.

notes

* soils soft, esp. towards Dundas.
* dug pond has apparent overflow outlet to Dundas road ditch.
* north end appears to have been plowed.

ELC
PLANT SPECIES LIST

SITE: Lazy Cat
POLYGON: Northern Portion of Unit 2
DATE: Aug. 20/09
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Crataegus sp		S			
Tili amer.		S			
Carya ovata		S			
Salix eria		S			

SPECIES CODE	LAYER 1	2	3	4	COL.
Brom. ineris				A	
Phalaris arun.				F	
Lyth sal.				F	
Aster pun.				O	
Algae.				F	→ in stagnant pools.
Soli. alt.				O	
Carex vulp.				O	→ as sampled.
Scirp atro.				S	
Leersia oryz				O	
Woolgrass bulrush.				S	
Typ cap-				S	
(S) grass				A	
Juncus torreyii				O	→ Juncus torreyii
as sampled unit					

Page ..... of ....

Brom. inermis

*notes
* narrow CUM - small MAM patches in narrow valley between raised soybean fields.
valley banders and floodplain boarders from past indicated on map.

wildlife
* frogs (none id'd).
* mud crickets.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: ~~unit 1~~ Unit 2 typical MAM2-10
DATE: Aug 20 '09
SURVEYOR(S): SDinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.
Phalaris arun				F	
Aster lanceo				A	
hairy willowherb				F	
Lythrum sal.					
sampled grass from unit 3					
Euth gram.					
annual rag					
lady's thumb.					
Dandelion.					
Bromus inerm.					
sampled herb mash from unit 2.					

as sampled unit 3
Epilobium hir
Juncus tenuis

905

ELC

SOILS ONTARIO

SITE: BENTALL

POLYGON: A - pasture

DATE: Sept 24, 2014

SURVEYOR(S): LJA

UTM WP 449,

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON 8cm 0 75	Ol Ap Too tough/sticks to auger				
A TEXTURE	SC	dk brown			
COURSE FRAGMENTS	2%	stony			
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS	0				
SURFACE ROCKINESS	0				

DEPTH TO / OF

	1	2	3	4	5
MOTTLES	15.5				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	8cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:

POLYGON:

DATE:

SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: B - pasture
DATE: SEPT 24 2014
SURVEYOR(S): LJA

Slope — UTM WP 250

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	O — ae SC 55 stoney	36cm			
A TEXTURE	SC	dk Brown			
COURSE FRAGMENTS	0%				
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	11				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	6				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.	SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: C - 2A CUM1-1
DATE: SEPT 24 2014
SURVEYOR(S): LJA

UTM WP 402

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	0 / SiC / 26 / Sc / 53 / Sc / 61 TO DIFF	Stoney & clay.			
A TEXTURE	SiC	DK Brown			
COURSE FRAGMENTS	<1%				
B TEXTURE	Sc	Or Brown			
COURSE FRAGMENTS	1%				
C TEXTURE	Sc	Med Brown w/ dk Red & grey specks ↳clay. ↳sandstone.			
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	10				
GLEY	53 ?				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES	∞				
DEPTH OF ORGANICS	0				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.	SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
SOILS ONTARIO

SITE: RENTALL
POLYGON: D / 2A - CUMI-1
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

UTM WP 453

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Ol	5cm			
	mScl Ap				
23	Cl B				
55	C				
62	TOO STONEY/TOUGH				
A TEXTURE	mScl	dk brown			
COURSE FRAGMENTS	0				
B TEXTURE	Cl	dk brown & Red brick spots			
COURSE FRAGMENTS	5%	Queenston Shale → Red.			
C TEXTURE	C				
COURSE FRAGMENTS	70%	red & grey stones			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES	12				
GLEY	∞				
BEDROCK	65?				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	5				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: E12A - CUM1-1
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

UTM wp458

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON 0 / 17 / 44	A / B / STONINESS				
A TEXTURE	Si Cl	red (brick)			
COURSE FRAGMENTS	5%				
B TEXTURE	Si L	med (brown)			
COURSE FRAGMENTS	0				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: ~~3B~~ 2B
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	UTM Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON (5 / 0 / 20 / 65)	Of (5–0); SiCl (0–20); C (20–65)	VP4 Med Brown			
A TEXTURE	TOO TOUGH SiCl	Med Brown			
COURSE FRAGMENTS	0				
B TEXTURE	C	Med Brown			
COURSE FRAGMENTS	0				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES	~~[illegible]~~ 3				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	5				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

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ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 2D - MAS2-1
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

UTM WP 454

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Ol	20			
	Oh	15			
0	A				
40	B				
60					
Oh TEXTURE	Oh	dkBrown			
COURSE FRAGMENTS	0				
A TEXTURE	SiC	dk Brown			
COURSE FRAGMENTS	1-2%				
B TEXTURE	C	Red 3 Grey Brown			
COURSE FRAGMENTS	50	Red Queenston Shale			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES	5cm				
GLEY	∞				
BEDROCK	?				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	20cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.	SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 2G
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Ol	10			
0	A				
20	SiCl B				
50	C				
80	STONINESS				
A TEXTURE	SiCl				
COURSE FRAGMENTS	0	Grey Brown			
B TEXTURE	SiCl				
COURSE FRAGMENTS	15	Red Brown			
C TEXTURE	SiCl				
COURSE FRAGMENTS	50%	RED!			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES	20				
GLEY	∞				
BEDROCK	?				
WATER TABLE	15				
CARBONATES					
DEPTH OF ORGANICS	10				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					

SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

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ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: F1SA - FOD2-2
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

UTM WP 460

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON (0 – 20)	0 – SifS; 20 – Too Compacted				
A TEXTURE	SifS				
COURSE FRAGMENTS	0				
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 5B
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

UTM WP 460

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON (8cm O; 17cm)	Ol / A ~~Ah~~ / B				
A TEXTURE	mSL				
COURSE FRAGMENTS	1%				
B TEXTURE	mSCL				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					

DEPTH TO / OF

	1	2	3	4	5
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

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ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: G - Ag.
DATE: SEPT 24 2014
SURVEYOR(S): LJA

	P/A	PP	Dr	Position	Aspect	Slope %	Slope Type	Slope Class	UTM Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	3 Or 0 A 17 B 50 auger refused				
A TEXTURE	SiC	dk brown.			
COURSE FRAGMENTS	0				
B TEXTURE	C	med. brown			
COURSE FRAGMENTS	15%				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	7				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	3				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME	V. moist				
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

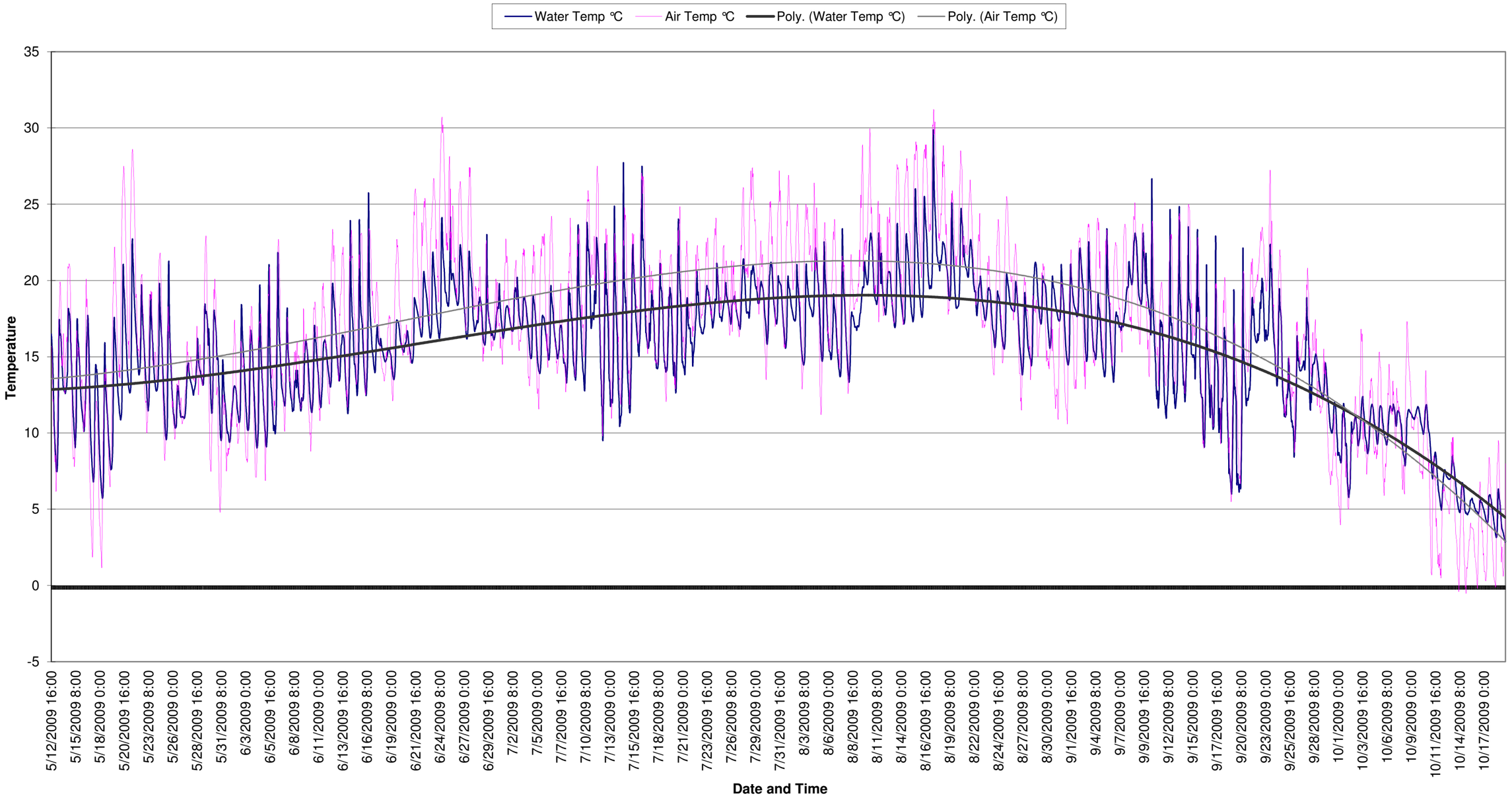
SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

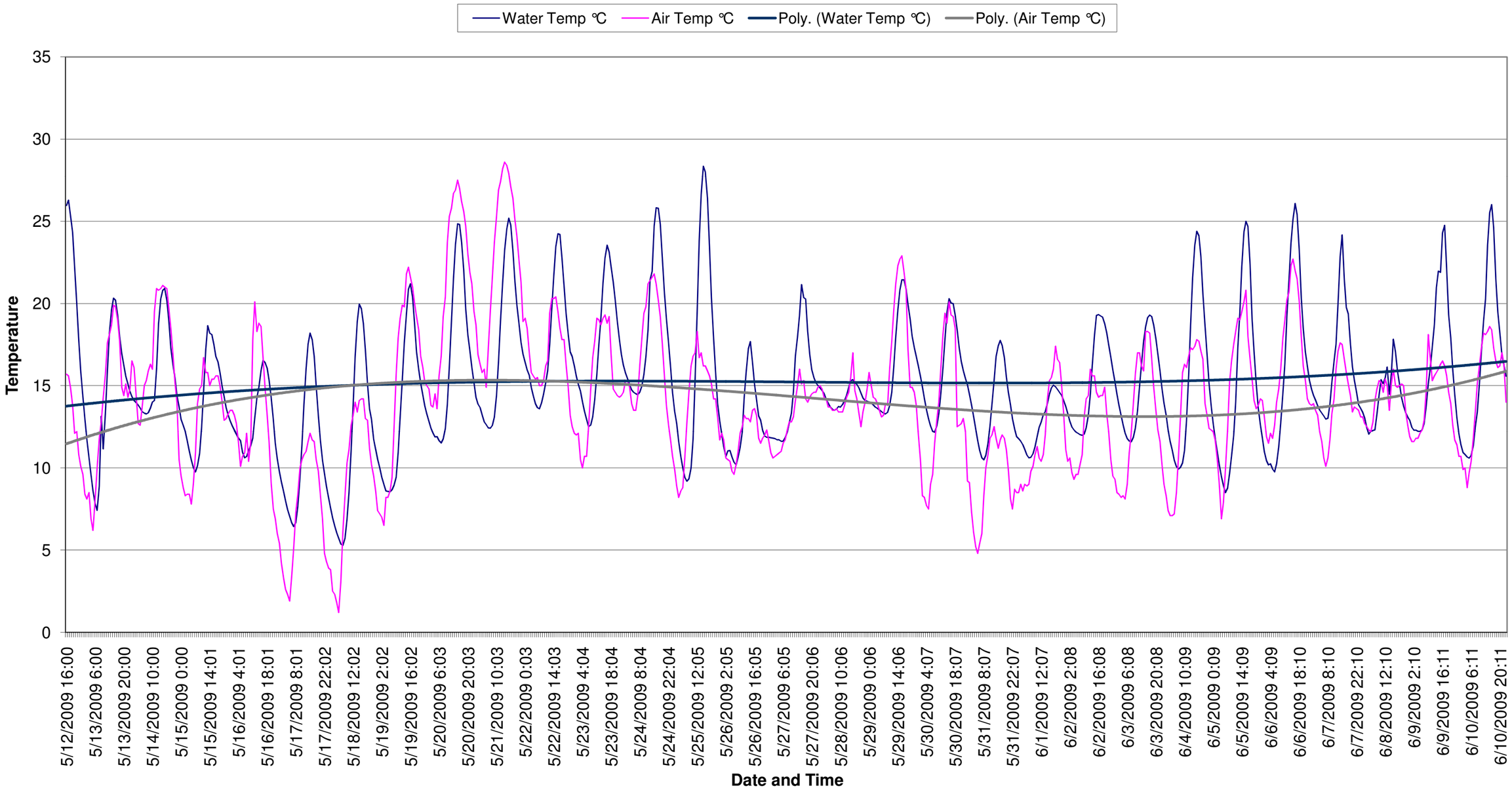
SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.	SPECIES CODE	LAYER 1	LAYER 2	LAYER 3	LAYER 4	COL.

Appendix 5.6 – Water Temperature Monitoring Data

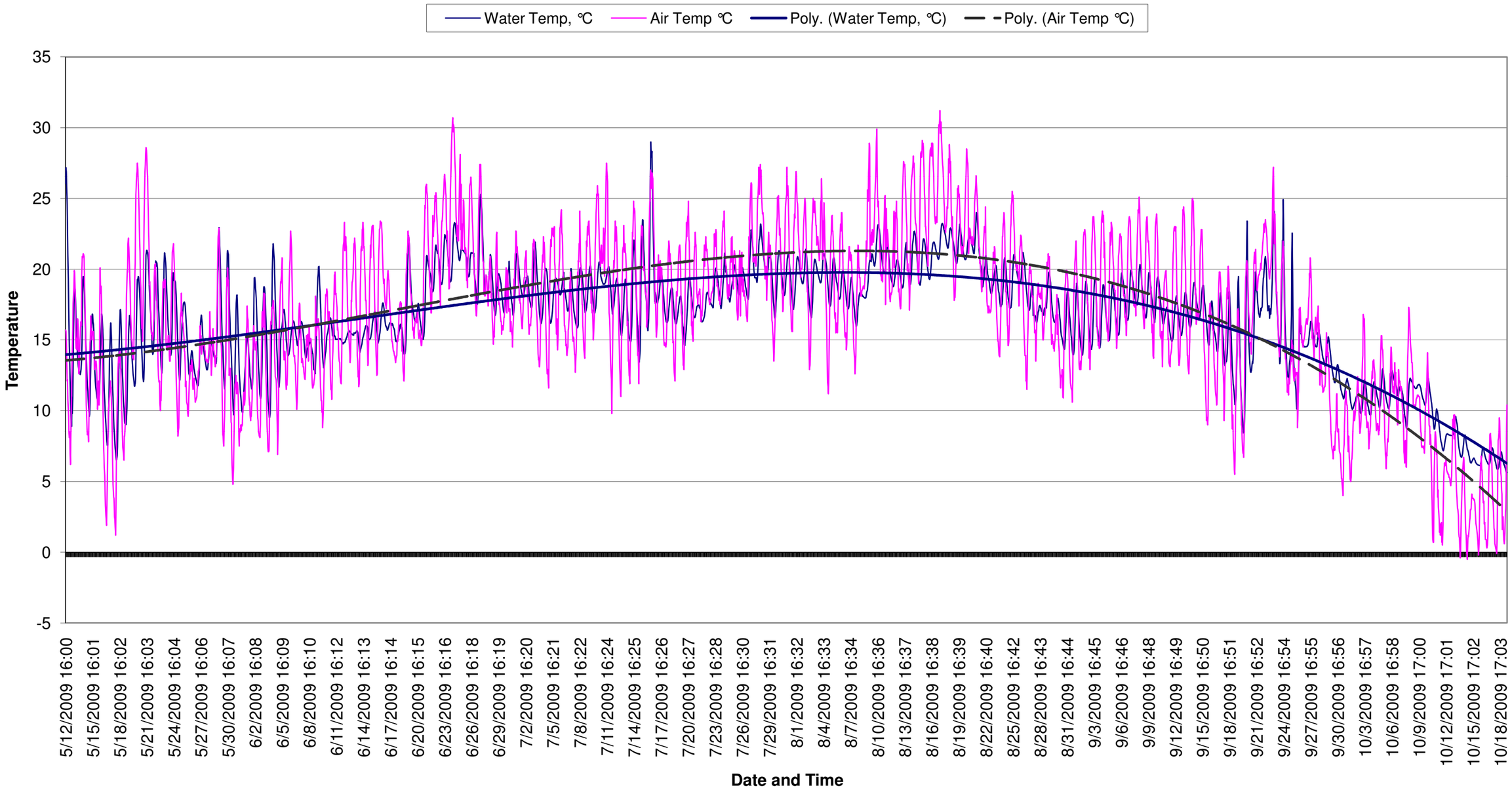
14W-11A


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 8:00
5/18/2009 0:00
5/20/2009 16:00
5/23/2009 8:00
5/26/2009 0:00
5/28/2009 16:00
5/31/2009 8:00
6/3/2009 0:00
6/5/2009 16:00
6/8/2009 8:00
6/11/2009 0:00
6/13/2009 16:00
6/16/2009 8:00
6/19/2009 0:00
6/21/2009 16:00
6/24/2009 8:00
6/27/2009 0:00
6/29/2009 16:00
7/2/2009 8:00
7/5/2009 0:00
7/7/2009 16:00
7/10/2009 8:00
7/13/2009 0:00
7/15/2009 16:00
7/18/2009 8:00
7/21/2009 0:00
7/23/2009 16:00
7/26/2009 8:00
7/29/2009 0:00
7/31/2009 16:00
8/3/2009 8:00
8/6/2009 0:00
8/8/2009 16:00
8/11/2009 8:00
8/14/2009 0:00
8/16/2009 16:00
8/19/2009 8:00
8/22/2009 0:00
8/24/2009 16:00
8/27/2009 8:00
8/30/2009 0:00
9/1/2009 16:00
9/4/2009 8:00
9/7/2009 0:00
9/9/2009 16:00
9/12/2009 8:00
9/15/2009 0:00
9/17/2009 16:00
9/20/2009 8:00
9/23/2009 0:00
9/25/2009 16:00
9/28/2009 8:00
10/1/2009 0:00
10/3/2009 16:00
10/6/2009 8:00
10/9/2009 0:00
10/11/2009 16:00
10/14/2009 8:00
10/17/2009 0:00
Date and Time

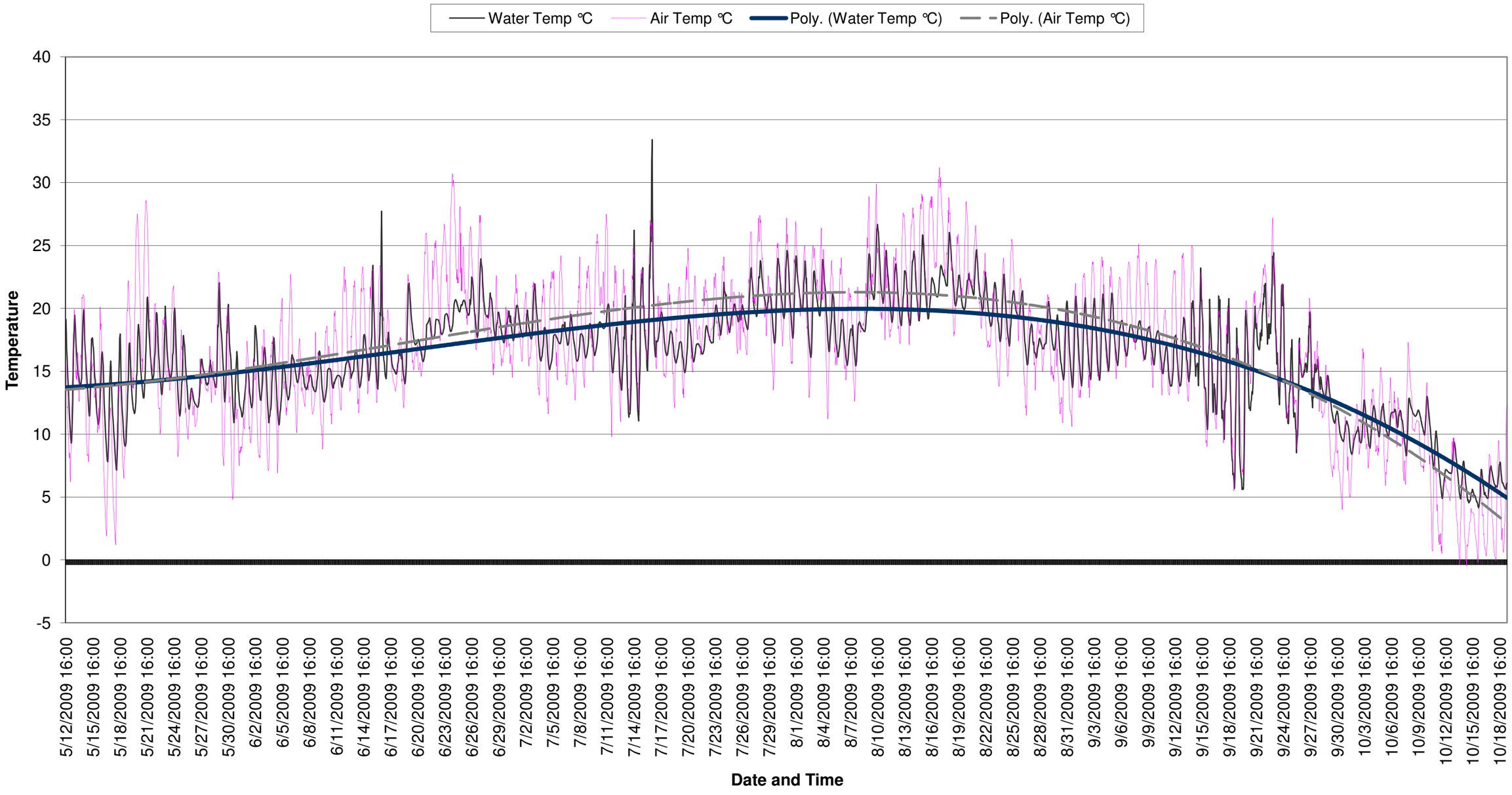
14W-12A


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
5/12/2009 16:00
5/13/2009 6:00
5/13/2009 20:00
5/14/2009 10:00
5/15/2009 0:00
5/15/2009 14:01
5/16/2009 4:01
5/16/2009 18:01
5/17/2009 8:01
5/17/2009 22:02
5/18/2009 12:02
5/19/2009 2:02
5/19/2009 16:02
5/20/2009 6:03
5/20/2009 20:03
5/21/2009 10:03
5/22/2009 0:03
5/22/2009 14:03
5/23/2009 4:04
5/23/2009 18:04
5/24/2009 8:04
5/24/2009 22:04
5/25/2009 12:05
5/26/2009 2:05
5/26/2009 16:05
5/27/2009 6:05
5/27/2009 20:06
5/28/2009 10:06
5/29/2009 0:06
5/29/2009 14:06
5/30/2009 4:07
5/30/2009 18:07
5/31/2009 8:07
5/31/2009 22:07
6/1/2009 12:07
6/2/2009 2:08
6/2/2009 16:08
6/3/2009 6:08
6/3/2009 20:08
6/4/2009 10:09
6/5/2009 0:09
6/5/2009 14:09
6/6/2009 4:09
6/6/2009 18:10
6/7/2009 8:10
6/7/2009 22:10
6/8/2009 12:10
6/9/2009 2:10
6/9/2009 16:11
6/10/2009 6:11
6/10/2009 20:11
Date and Time

14W-16


Water Temp, ℃
Air Temp ℃
Poly. (Water Temp, ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 16:01
5/18/2009 16:02
5/21/2009 16:03
5/24/2009 16:04
5/27/2009 16:06
5/30/2009 16:07
6/2/2009 16:08
6/5/2009 16:09
6/8/2009 16:10
6/11/2009 16:12
6/14/2009 16:13
6/17/2009 16:14
6/20/2009 16:15
6/23/2009 16:16
6/26/2009 16:18
6/29/2009 16:19
7/2/2009 16:20
7/5/2009 16:21
7/8/2009 16:22
7/11/2009 16:24
7/14/2009 16:25
7/17/2009 16:26
7/20/2009 16:27
7/23/2009 16:28
7/26/2009 16:30
7/29/2009 16:31
8/1/2009 16:32
8/4/2009 16:33
8/7/2009 16:34
8/10/2009 16:36
8/13/2009 16:37
8/16/2009 16:38
8/19/2009 16:39
8/22/2009 16:40
8/25/2009 16:42
8/28/2009 16:43
8/31/2009 16:44
9/3/2009 16:45
9/6/2009 16:46
9/9/2009 16:48
9/12/2009 16:49
9/15/2009 16:50
9/18/2009 16:51
9/21/2009 16:52
9/24/2009 16:54
9/27/2009 16:55
9/30/2009 16:56
10/3/2009 16:57
10/6/2009 16:58
10/9/2009 17:00
10/12/2009 17:01
10/15/2009 17:02
10/18/2009 17:03
Date and Time

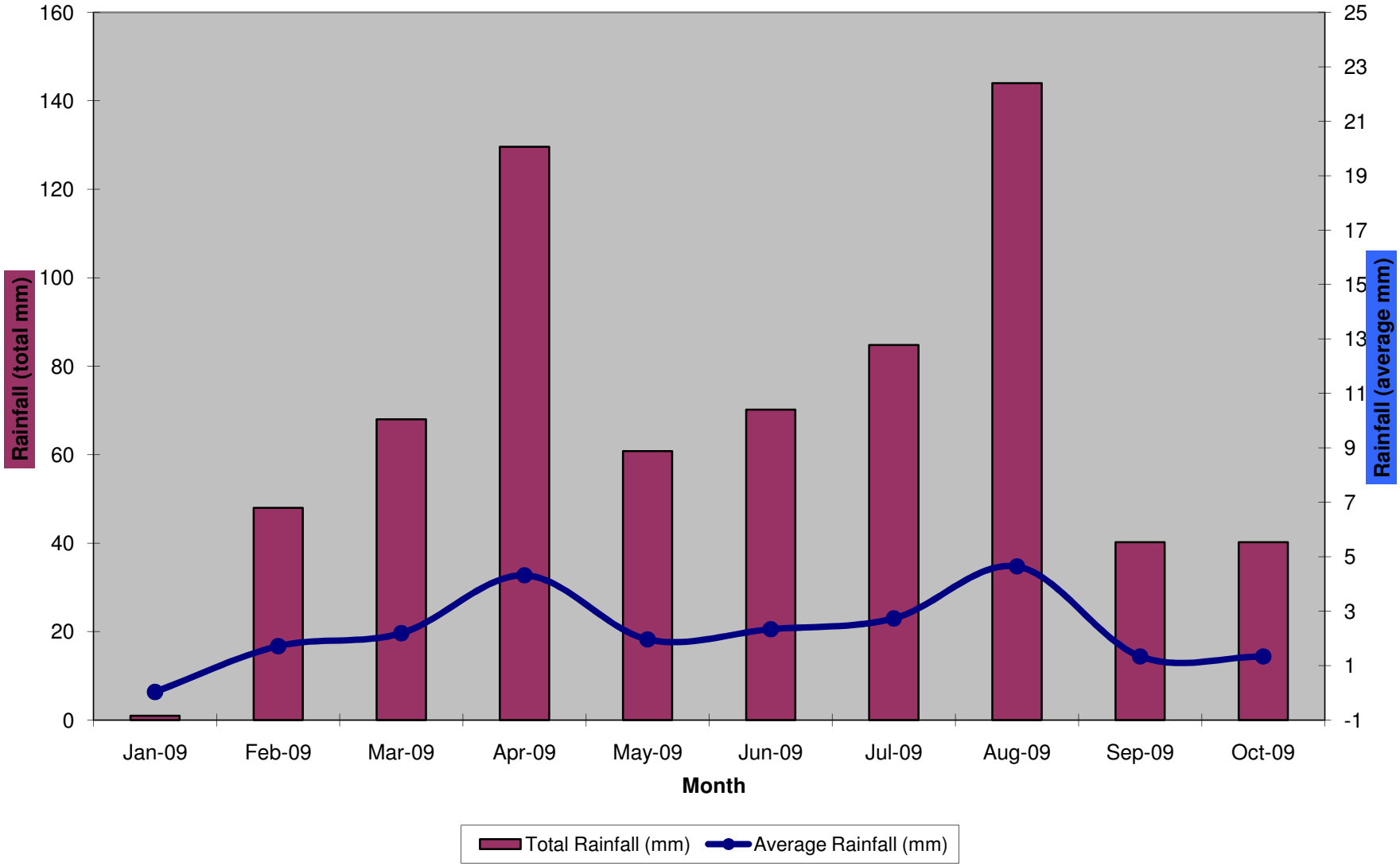
14W-12


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
40
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 16:00
5/18/2009 16:00
5/21/2009 16:00
5/24/2009 16:00
5/27/2009 16:00
5/30/2009 16:00
6/2/2009 16:00
6/5/2009 16:00
6/8/2009 16:00
6/11/2009 16:00
6/14/2009 16:00
6/17/2009 16:00
6/20/2009 16:00
6/23/2009 16:00
6/26/2009 16:00
6/29/2009 16:00
7/2/2009 16:00
7/5/2009 16:00
7/8/2009 16:00
7/11/2009 16:00
7/14/2009 16:00
7/17/2009 16:00
7/20/2009 16:00
7/23/2009 16:00
7/26/2009 16:00
7/29/2009 16:00
8/1/2009 16:00
8/4/2009 16:00
8/7/2009 16:00
8/10/2009 16:00
8/13/2009 16:00
8/16/2009 16:00
8/19/2009 16:00
8/22/2009 16:00
8/25/2009 16:00
8/28/2009 16:00
8/31/2009 16:00
9/3/2009 16:00
9/6/2009 16:00
9/9/2009 16:00
9/12/2009 16:00
9/15/2009 16:00
9/18/2009 16:00
9/21/2009 16:00
9/24/2009 16:00
9/27/2009 16:00
9/30/2009 16:00
10/3/2009 16:00
10/6/2009 16:00
10/9/2009 16:00
10/12/2009 16:00
10/15/2009 16:00
10/18/2009 16:00
Date and Time

Dissolved Oxygen	Result	Meaning
	<= 3	Biotic Crisis
	<4	Minimum limit in many states
	5	USEPA minimum limit
	>5	Adequate for fish
	9.8	Median of US Sites
	8.7 - 10.5	Middle 50% US Sites
DO Saturation	<80%	Evidence of elevated Oxy use
	>90%	High saturation of DO
TDS	**Result**	**Meaning**
	250	USEPA Maximum for water supply
	500	New York state Maximum
	<100	Low Concentration
	100-500	Medium Concentration
	500-1000	High Concentration
	>1000	Very High Concentration
pH	**Result**	**Meaning**
	<4	Stressed
	6.5 - 9.0	Suitable for biota
	6.5 - 8.5	Most Productive
	7.8	Median for US Sites
	7.3 - 8.1	Middle 50% US Sites
Temperature	**Result**	**Meaning**
	<18	Coldwater
	>18 to 25	Coolwater
	>25	Warmwater
Conductivity	k-value	TDS - k * SC
	0.65	Average k value
	0.55	Minimum variation of k
	0.75	Maximum variation of k

Sampling Date/Time	Temperature	TDS Value	Dissolved Oxygen	pH	Conductivity	Evaluation of TDS	Evaluation of DO	Evaluation of pH	Thermal Category	Evaluation of DO Saturation	Calculated TDS from Conductivity	Evaulation of Calculated TDS	Notes
14W-11A													
May 12, 2009 - 1015	20.2	587	10.31	8.38	1158	High	Adequate for Fish	Suitable for biota	Potential Coolwater	High Saturation Value	752.7	High	
May 28, 2009 - 0845	15.7	896	7.28	7.75	1801	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1170.65	VERY HIGH	
June 11, 2009 - 0850	14	926	4.58	7.31	1848	High	Poor for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1201.2	VERY HIGH	
June 26, 2009 - 1108	22	1141	5.3	7.42	2285	VERY HIGH	Adequate for Fish	Suitable for biota	Potential Coolwater	Oxygen Usage	1485.25	VERY HIGH	
July 8, 2009 - 0915													
July 30, 2009 - 0938	17.5	475	7.65	7.95	930	Medium	Adequate for Fish	Suitable for biota	Potential Coldwater	High Saturation Value	604.5	High	
August 28, 2009 - 1027	16.4	830	5.98	7.33	1637	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1064.05	VERY HIGH	
September 10, 2009 - 0913													No data for this location on this date. Site was dry with very wet soils. No flowing or standing water u/s or d/s.
September 30, 2009 - 0932	11	855	8.4	7.8	1679	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1091.35	VERY HIGH	
October 19, 2009 - 0910	3	848	6.14	7.46	1700	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1105	VERY HIGH	
October 30, 2009 - 0939	10	796	7.11	7.85	1588	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1032.2	VERY HIGH	
Upstream from Logger													
July 8, 2009 - 0915	22.5		4.84	8.4	2530		Poor for Fish	Suitable for biota	Potential Coolwater	Oxygen Usage	1644.5	VERY HIGH	Shocking Site at Field Crossing
14W-12													
May 28, 2009 - 0900	13.9	815	7.57	7.9	1630	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1059.5	VERY HIGH	
June 11, 2009 - 0930	15.3	813	5.67	7.54	1634	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1062.1	VERY HIGH	
June 26, 2009 - 1157	22	858	5.2	7.74	1880	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1222	VERY HIGH	
July 8, 2009 - 1420	21	1036	5.4	8.32	2062	VERY HIGH	Adequate for Fish	Suitable for biota	Potential Coolwater		1340.3	VERY HIGH	
July 30, 2009 - 1042	19	444	7.77	7.79	882	Medium	Adequate for Fish	Suitable for biota	Potential Coolwater		573.3	High	Highest volume of flowing water observed to date on site.
August 28, 2009 - 1135	20.9	899	7.28	7.89	1797	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1168.05	VERY HIGH	
September 10, 2009 - 1025	16.3	740	4.88	7.72	1489	High	Poor for Fish	Suitable for biota	Potential Coldwater		967.85	High	
September 30, 2009 - 1038	10.5	896	7.25	7.57	1752	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1138.8	VERY HIGH	
October 19, 2009 - 1255	8	639	8.93	7.83	1280	High	Adequate for Fish	Suitable for biota	Potential Coldwater		832	High	
October 30, 2009 - 1200	10.4	795	8.43	8	1591	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1034.15	VERY HIGH	
14W-12A													
May 28, 2009 - 0900	13.8	639	3.38	7.53	1276	High	Very poor for Fish	Suitable for biota	Potential Coldwater		829.4	High	
October 30, 2009 - 1136	10.5	726	6.7	7.91	1454	High	Adequate for Fish	Suitable for biota	Potential Coldwater		945.1	High	
14W-16													
May 12, 2009 - 1400	19	731	14	8.38	1434	High	Adequate for Fish	Suitable for biota	Potential Coolwater		932.1	High	
May 28, 2009 - 0900	13.1	862	8.62	7.89	1714	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1114.1	VERY HIGH	
June 11, 2009 - 0905	16	660	10.82	7.92	1317	High	Adequate for Fish	Suitable for biota	Potential Coldwater		856.05	High	
June 26, 2009 - 1130	22.6	687	8.58	8.04	1384	High	Adequate for Fish	Suitable for biota	Potential Coolwater		899.6	High	
July 8, 2009 - 1230	22	988	6.35	8.45	1971	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1281.15	VERY HIGH	
July 30, 2009 - 1012	17	586	7.89	7.77	1174	High	Adequate for Fish	Suitable for biota	Potential Coldwater		763.1	High	
August 28, 2009 - 1100	18.5	917	7.95	7.86	1807	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1174.55	VERY HIGH	
September 10, 2009 - 0945	16.5	676	7.5	7.86	1350	High	Adequate for Fish	Suitable for biota	Potential Coldwater		877.5	High	
September 30, 2009 - 1007	11.5	918	8.89	7.83	1795	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1166.75	VERY HIGH	
October 19, 2009 - 1156	5.5	815	9.95	8.09	1621	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1053.65	VERY HIGH	
October 30, 2009 -1129	10.7	935	9.35	8.05	1875	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1218.75	VERY HIGH	
Small and Large Pond													
Small Pond - July 8, 2009	26.3	189	5.3	9.3	380	Medium	Adequate for Fish	Alkaline	Potential Warmwater		247	Medium	
Large Pond - July 8, 2009	26	371	4.51	8.58	745	Medium	Poor for Fish	Suitable for biota	Potential Warmwater		484.25	Medium	

Recorded Rainfall



Bentall - Lazy Pat Lands Water Temperature Monitoring 2009 (Chu et.al. Method)

Water Temperature

Maximum Air Temperature

40.00
35.00
30.00
25.00
20.00
15.00
10.00

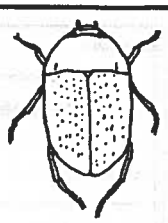
20
22
24
26
28
30
32

14W-12
14W-11A
14W-16
Linear (14W-12)
Linear (14W-11A)
Linear (14W-16)

y = 0.7143x + 2.7511
y = 0.7258x + 1.6491
y = 0.6501x + 3.9636

Appendix 5.7 – Field Survey Collection Sheets

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS



Date: May 12/ 2009
Time 10:15am
Agency: Aurora
Investigators: SR3 JS

Stream name:
Site #: HW-11A1
Location: centroid of 3 replicates; Lat/Long or UTM
Elevation (m asl):
Datum/zone:

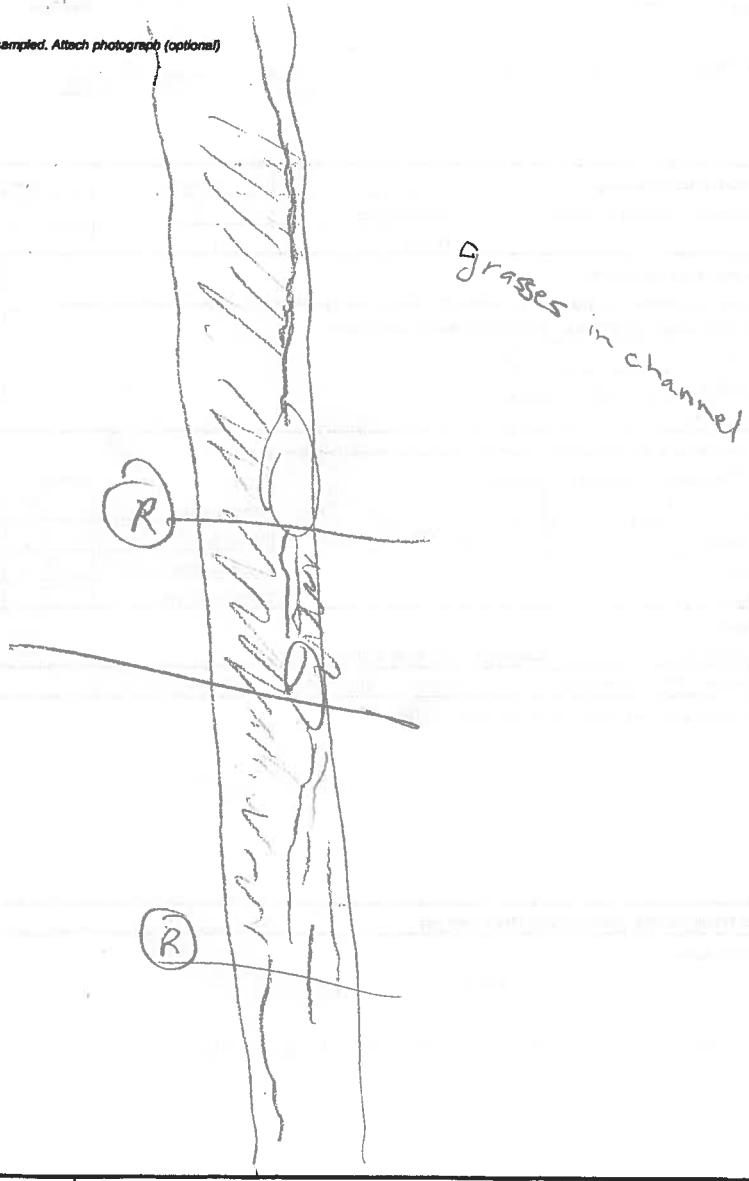
Water Quality

Water Temperature (°C): 20.2
DO (mg/l): 10.31
Conductivity (uS/cm): 1158
pH: 8.38
~~Alkalinity (mg/l as $CaCO_3$)~~: TDS 587

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):

- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)

- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)				1.8		
Sample 2: Pool						
Sample 3: Riffle (cross-over)						

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	1		
2nd Dominant	2		

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes - clay then silt continues into fields

Organic Matter-Areal Coverage		Sample 1	Sample 2	Sample 3
Use 1: Abundant, 2: Present, 3: Absent	Woody Debris	3		
	Detritis	1		

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	3	3
10-30 m	2	2
30-100 m	1	2

% Canopy Cover (circle one)

0-24 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	1		
Rooted Floating	2	Pond weed (x1)	
Submergent	3		
Free Floating	3		

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3		
Filaments	1		
Attached Algae	3		
Slimes or Crusts	3		

Stream Size/Flow

Bank Full Width (m): Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) Perennial (Intermittent) Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

Candidate reference Site - Minimally Impacted? (circle one) Yes (No)

General Comments

Flows through Agri. fields

Highway run off contributes flow

Site Identification Form

Stream Name	Stream Code (Unique Code)	Site Code	Year	Sample
Tributary Fourteen Mile Creek	FOR	14W-11A	2009	1

Uncorrected Grid (XX) UTM Coordinates	Easting (XXX,XXX)	Northing (X,XXX,XXX)	OR	Lati-tude	Deg (15-60)	Min (0-60)	Sec (0-60)	Long-ilude	Deg (50-75)	Min (0-60)	Sec (0-60)

Corrected Grid (XXX) UTM Coordinates	Easting (XXX,XXX)	Northing (X,XXX,XXX)	Source of GIS Stream Layer used to correct UTM coordinate data (e.g. NRVIS 2)

Source of Coordinates (OBM Map, GPS Unit, Differential GPS)	Datum of Coordinate Source: (NAD 27, NAD 83, WGS 84) (This can be found on the legends of maps or in set-up of GP3 units)
GPS Unit	

Township/Municipality	Lot	Concession	MNR District	Watershed Code
Oakville	32	2S	Aurora	

Access Route

Exit from Dundas Street onto farm access driveway. Drive north to the end of the gravel road. Follow GPS point, northeast of the access road

Site Description

The watercourse flows between two active agricultural fields with minimal buffer veg to either side of the watercouse. Small treed stands u/s & immediately d/s of site. The channel appears to be straightened to accommodate the agricultural fields

Site Marker Description

Downstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description: No permanent site marker; marked with flagging tape & GPS point

Upstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description: No permanent site marker; tree on left u/s bank has been flagged; GPS point

Crew S. Rankin/J. Smith Recorder S. Rankin Date (YYYY/MM/DD) 2009/05/12

Comments

Limited locations within the property limit where a 40m section of watercourse could be located in order to complete OSAP.

Site Length (m.) 40

Enter dates and initials when data entered in Computer.

	Date	Init.
Entered	05/05/21	
Verified		
Corrected		

Site Sketch Draw two sketches on the back of this sheet. First draw a map to the area of the site then draw a sketch of the site. Be sure to include enough detail to ensure that someone could find the site again, including a north arrow and the locations of all markers, as well as the locations of any noted features. The artist should also sign the sketches.

Site Features Form

Stream Name:	Stream Code:	Site Code:	Year:	Sample:	Date (YYYY/MM/DD):
		14W-11A	2009	1	2009/05/12

For each landuse, check off all boxes which apply. Be sure to include comments explaining the particulars, including names and numbers of contacts.

Site Features	Ongoing and Active	Historical Evidence	No Evidence but Reported	No Evidence	Unknown	Comments
Potential Point or Non-point Source Contaminant Sources	☐	☐	☐	☐	☒	
Major Nutrient Sources Upstream	☐	☐	☐	☒	☐	
Channel Hardening or Straightening	☒	☐	☐	☐	☐	channel realignment
Adjacent Landuses That Destabilize Banks	☒	☐	☐	☐	☐	Field crossing u/s of site
Sediment Loading or Deprivation	☐	☐	☐	☐	☒	
Instream Habitat Modifications	☐	☐	☐	☒	☐	
Barriers and/or Dams in the Vicinity of the Site	☐	☐	☐	☒	☐	
High Fishing Pressure	☐	☐	☐	☒	☐	
Log Jam Deflectors	☐	☐	☐	☒	☐	
Springs or Seeps at the Site	☐	☐	☐	☒	☐	
Impervious Substrate Limiting Burrowing Depth of Fish	☐	☐	☐	☒	☐	
Other Activities That Could Influence Biota or Habitat	☐	☐	☐	☒	☐	

Temperatures

Water Temperature(°C): ° Date: Time: Air Temperature At Same Time (°C): °

Maximum Air Temperature (°C): ° Source of Maximum Air Temp: Maximum Water Temperature(°C):: °

Crew: J. Smith & S. Rankin Recorder: S. Rankin

Comments:

Sources of Information: ☒ Visual Immediate ☐ Visual Extended ☐ Interview ☒ Maps/Photos

Riparian Vegetation Community — Only Check one box for each bank and zone

Riparian Zone	Dominant Vegetation Type: Left Bank None	Left Bank Cultivated	Left Bank Meadow	Left Bank Scrubland	Left Bank Forest	Right Bank None	Right Bank Cultivated	Right Bank Meadow	Right Bank Scrubland	Right Bank Forest
1.5-10m.	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐
10-30m.	☐	☒	☐	☐	☐	☐	☒	☐	☐	☐
30-100m.	☐	☒	☐	☐	☐	☐	☒	☐	☐	☐

Entered dates and initial when data entered in computer

	Date	Init.
Entered	8/06	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name	Stream Code: (Unique Code)	Site Code	Year	Sample #:	Date: (YYYY/MM/DD)	Transect #
Trib of 14mile Creek	FOR	14W-11A	2009		2009/05/12	1 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0 | Site Length (m.) 40

Number of Transects 15 | Transect Spacing (m.) 2.85

Number of Points/ Transect (N) 3

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 2.4 (3.9 / 0.4)

Point Spacing (m.) .98

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 282

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	RR ooucnkd	Floatk	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.90	30	0	Si	Si	0										X		X	
2	2.7	40	0	Si	Si	2										X		X	
3	3.5	35	0	Si	Si	2										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		200	155	100	0		6			X		
Right		190	180	100	0		6			X		
Bank Particle Median Diameters (mm.)		Si	Si	C1	C1							
		Si	Si	C1	C1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	SR
Verified		
Corrected		

Data entered.

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: MW-11A	Year: 2009	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 2 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length (m.) 40

Transect Spacing (m.) 2.85 = Site Length / (Number of Transects – 1)

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.9 3.4

Point Spacing (m.) 0.63 0.32

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 279

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.82	30	⊗	5;	5;	2				X						X		X	
2	2.45	50	⊗	"	"	"				X						X		X	
3	3.08	40	⊗	"	"	⊗										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		230	220	135	0	X	4			X		
Right		220	150	170	0	X	11			X		
Bank Particle Median Diameters (mm.)		5;	5;	<1	<1							
		5;	5;	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	06/05	AK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14WM11A	Year: 2009	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 3 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 — Site Length (m.) 40

Number of Points/ Transect (N) 3 — Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.8 3.3

Point Spacing (m.) 0.6 0.3

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 279

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Root	Fish	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.80	40	0	S;	S;	2					X						X		X	
2	2.40	40	0	S;	S;	0											X		X	
3	3.00	30	0	S;	S;	0											X		X	
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; if a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		165	120	120	0	X	4		X			
Right		200	180	110	90	X	4			X		
Bank Particle Median Diameters (mm.)		S;	S;	C1	C1							
		S;	S;	C1	C1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 4 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 2.00 3.5

Point Spacing (m.) 0.66 0.33

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 278

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.83	40	0	5	5	0										X		X	
2	2.49	35	0	5	5	0										X		X	
3	3.15	75	0	5	5	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		245	220	200	0	X	3		X			
Right		170	160	80	0	X	5		X			
Bank Particle Median Diameters (mm.)		5	5	<1	<1							
		5	5	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W2-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 5 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.7 3.2

Point Spacing (m.) 0.57 0.28

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 290

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.78	35	Ø	S;	S,	Ø										X		X	
2	2.35	85	Ø	S;	S,	Ø												X	
3	2.92	60	Ø	S;	S,	2				X						X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		240	190	155	0	X	10					X
Right		160	110	140	100	X	3		X			
Bank Particle Median Diameters (mm.)		S;	C1	C1	C1							
		S;	S;	C1	C1							

Comments: 1 tree = Forest

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	SR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: MW-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 6 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.2 2.7

Point Spacing (m.) 0.4 0.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.70	65	0	5;	5;	0										X		X	
2	2.10	70		5;	5;	0										X		X	
3	2.50	30		5;	5;	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		265	220	210	0	X	8		X			
Right		210	170	110	0	X	7		X			
Bank Particle Median Diameters (mm.)		5;	<1	<1	<1							
		5;	5;	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14WJ-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 7 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 14
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3 2.8

Point Spacing (m.) 0.43 2.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 284

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock Rounded	Rock Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.72	55	0	Si	Si	0										X		X	
2	2.15	50	0	Si	Si	0										X		X	
3	2.58	50	0	Si	Si	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		240	225	140	0	X	5		X			
Right		220	120	100	50	X	6	X	X			
Bank Particle Median Diameters (mm.)		Si	Si	C1	C1							
		Si	Si	C1	C1							

Comments: Pondweed?

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 8 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.4 — 2.9

Point Spacing (m.) 0.47 — 2.3

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.73	30	Ø	Si	Si	Ø										X		X	
2	2.20	40	Ø	Si	Si	Ø										X		X	
3	2.67	20	Ø	Si	Si	Ø										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		265	120	105	Ø	X	7		X			
Right		200	130	100	Ø	X	5		X			
Bank Particle Median Diameters (mm.)		Si	Cl	Cl	Cl							
		Si	Si	<1	<1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	AP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 9 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40m
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.5

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.10 2.6

Point Spacing (m.) 0.37 0.18

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 290

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm.		Particle Sizes (mm.)		Cover	Cover Types Present						Aquatic Vegetation Types Present (Put X in box if present, Put – if not.)						
		Depth (mm.)	Hydraulic Head (mm.)	Point	Maximum In Ring	Quality (-99, 0, 1, 2)	Wood	RR ou nd ck	Flat	Mac	Bank	Oth	FL	AL	SS	MC	WC	GR	TR
1	1.68	40	Ø	5;	5;	Ø												X	
2	2.05	50	Ø	5;	5;	Ø												X	
3	2.42	40	Ø	5;	5;	Ø												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points					Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.				
	> 2m	0 mm.	250 mm.	750 mm.	1500 mm.			None	Cultivated	Meadow	Scrubland	Forest
Left		210	160	80	Ø	X	4		X			
Right		180	130	160	Ø	X	3		X			
Bank Particle Median Diameters (mm.)		5;	5;	C1	C1							
		5;	5;	C1	C1							

Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	TR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2004	Sample #: 1	Date: (YYYY/MM/DD): 2004/05/12	Transect # 10 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 (2.5)

Point Spacing (m.) 0.33 (0.17)

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 189

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	120	Ø	Si	Si	Ø							X						
2	2.00	160	Ø	Si	Si	Ø							X						
3	2.33	160	Ø	Si	Si	Ø												X	X
4																			
5																			
6																			

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		260	230	165	Ø	X	5		X			
Right		245	110	170	Ø	X	6		X			
Bank Particle Median Diameters (mm.)		Si	Si	Cl	Cl							
		Si	Cl	Cl	Cl							

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/05	AL
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 11 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.5

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 2.5

Point Spacing (m.) 0.33 1.0

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 286

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	40	0	5;	5;	0										X		X	
2	2.00	40	0	5;	5;	0										X		X	
3	2.33	20	0	5;	5;	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left		190	200	125	0	X	5
Right		180	160	60	0	X	7
Bank Particle Median Diameters (mm.)		5;	5;	<1	<1		
		5;	5;	<1	<1		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

None	Cultivated	Meadow	Scrubland	Forest
	X			
	X			

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	9/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 12 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3 2.8

Point Spacing (m.) 0.43 0.22

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.72	40	Ø	5;	5;	Ø										X		X	
2	2.15	30	Ø	5;	5;	Ø												X	
3	2.58	20	Ø	5;	5;	Ø										X		✓	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		210	170	120	Ø	X	3		X			
Right		190	120	130	Ø	X	7		X			
Bank Particle Median Diameters (mm.)		5;	C1	C1	C1							
		5;	5.	C1	C1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	AR
Verified		
Corrected		

Diagnostic Indicators of Channel Stability

@13/15

Stream Name:	Stream Code (Unique Code)	Site Code: 14W-11A	Year 2009	Sample #: 1	Date (YYYY/MM/DD) 2009/05/12	Transect # 13 of 15

Record these values only on the first transect — Site Length (m): 40 | Transect Spacing (m): 2.85

Crew: SR J J S

Comments

Obstructions to Flow (If none present, check "None Present" Otherwise check the applicable types.)

- [x] None Present
- [ ] Trampled Banks
- [ ] Wood Deflectors
- [ ] Inorganic Deflectors
- [ ] Armouring
- [ ] Inlets
- [ ] Others (List Types)

DISCHARGE APPROXIMATES BASEFLOW YES [x] NO [ ]

Indicators Used to Locate Bankfull Level

	Left Bank	Right Bank
Inflection Point	[x]	[x]
Bank Material	[ ]	[ ]
Top of Point Bar	[ ]	[ ]
Vegetation	[x]	[x]
Minimum Width:Depth	[ ]	[ ]
Others (List Types)		

Entrenchment

Entrenchment Height = 2 X Maximum Channel Depth

Entrenchment Width = Horizontal distance from the location of the Maximum Channel Depth to the bank at the Entrenchment Height

Record either the Left and Right widths, or the Total Width

Left Entrenchment Width (m):

Right Entrenchment Width (m):

Total Entrenchment Width (m): >40

Channel Profile

Feature	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements: Water Depth (mm)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
Left BFD	0.8	125					
Right BFD	4.0	90					
Max Channel Depth	2.65	345					
Left Active Channel	1.5	220					
Right Active Channel	3.1	220					
Measurement 1	1.33	185					
2	2.4	300					
3	3.47	145					
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

* This column is for recording data when the minimum width:depth ratio indicator is used and the bankfull level is NOT identified in the field.

Channel Profile (continued)

Measurement	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements: Water Depth (mm.)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Transect and Point Layout

Use this table to provide guidance for selecting how many points per transect to measure, given the minimum width of the stream.

Minimum Width (m.)	Low variance in velocity or depth	High variance in velocity or depth
> 3.0	8 + 1 every 2 metre	10 + 1 every 1 metre
1.5 – 3.0	5	8
1.0 – 1.49	3	6
< 1.0	2	4

1.07
0.53

Active Width (W) (m.) 3.2

Point Spacing (S) (m.) = Active Width (W) (m.) / # Points per transect (N) 3

1.06

Point Spacing (S) (m.) 1.06

0.53

First point is S/2 from the left bank

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 13 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.)	1.6 (3.1)
Point Spacing (m.)	0.53 (0.27)
Point Spacing, S = Active Width W (m.) / # Points per Transect	
First point is S/2 from the left bank	
Compass Bearing:	288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.77	50	Ø	Si	Si	2				X						X		X	
2	2.30	50	Ø	Si	Si	2				X								X	
3	2.83	45	Ø	Si	Si	Ø												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		250	170	130	Ø	X	8		X			
Right		230	170	120	Ø	X	9		X			
Bank Particle Median Diameters (mm.)		Si	Si	Cl	Cl							
		Cl	Cl	Cl	Cl							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/03	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 12W-11A	Year:	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 14 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.8

Point Spacing (m.) 0.6

Point Spacing, S = Active Width W (m.) / # Points per Transect

3.3 / 0.3

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.4	15	⊗	S;	S.	⊗												X	
2	2.4	120	⊗	S;	S;	⊗												X	
3	3.0	60	⊗	Cl	S;	⊗										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		270	190	145	⊗	X	2		X			
Right		250	150	90	⊗	X	6		X			
Bank Particle Median Diameters (mm.)		S.	Cl	Cl	Cl							
		S.	Cl	Cl	Cl							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: 1 tree.

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 15 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.2 2.7

Point Spacing (m.) 0.4 0.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Wood	Round Rock	Flat Rock	Mac	Bank	Oth	FL	AL	SS	MC	WC	GR	TR
1	1.7	40	0	Si	Si	2				X								X	
2	2.1	80	0	Si	Si	0	–	–	–	–	–	–						X	
3	2.5	60	0	Si	Si	0	–	–	–	–	–	–				X		X	
4																			
5																			
6																			

Measure depth and hydraulic head to nearest 5 mm. Cover: Types Present. Aquatic Vegetation Types Present: Put X in box if present, Put – if not.

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points

Bank	> 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	None	Cultivated	Meadow	Scrubland	Forest
Left		230	230	190	0	+	9		X			
Right		250	170	40	0	X	7		X			
Bank Particle Median Diameters (mm.)		Si	Si	Si	C1							
		Si	C1	C1	C1							

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

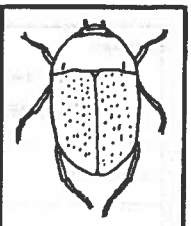
Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/9	AK
Verified		
Corrected		

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS



Date: May 12/2009
Time 2.8m
Agency: Aurora
Investigators: JS, SR

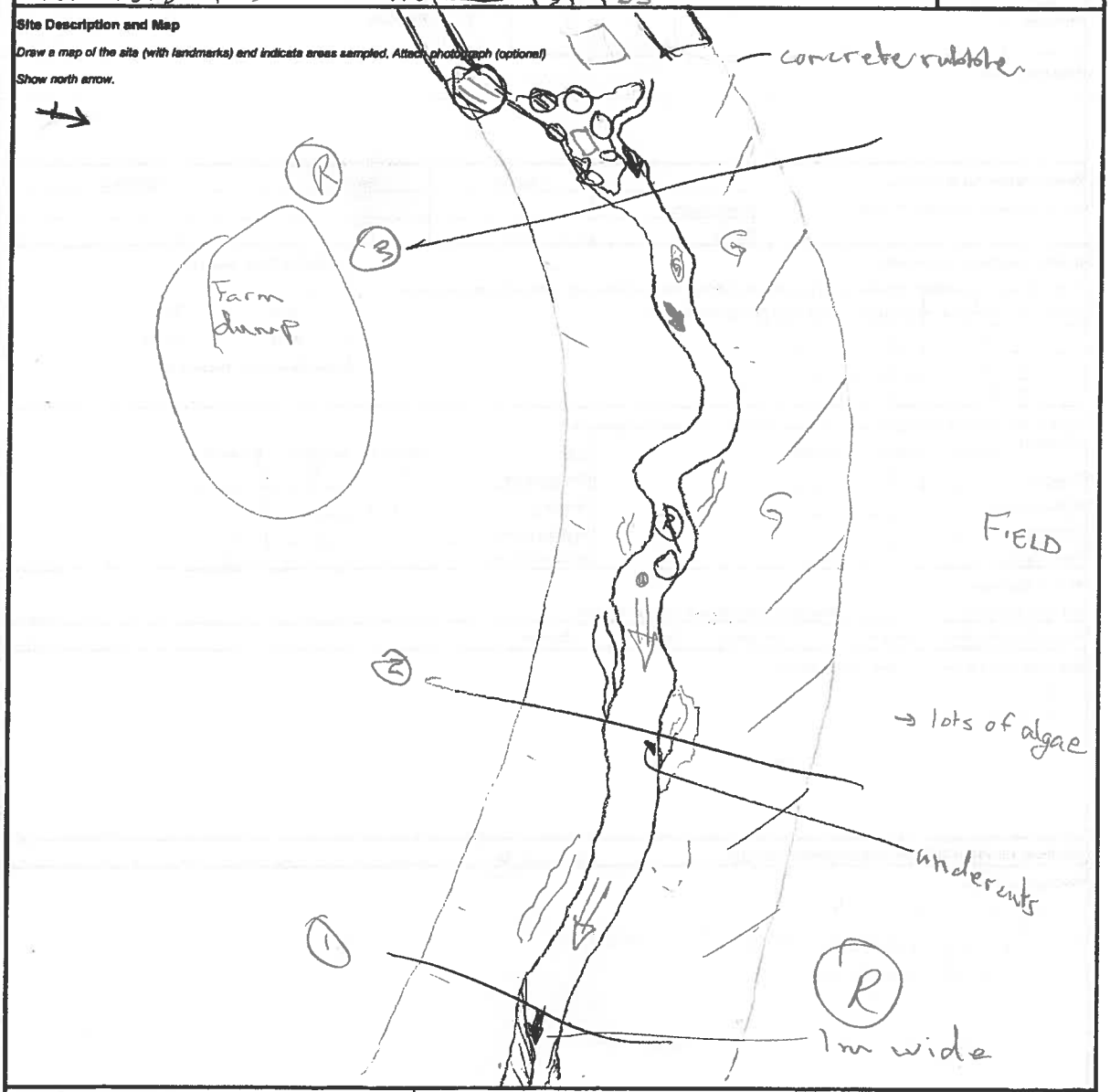
Stream name:
Site #: 14W-16
Location: centroid of 3 replicates; Lat/Long or UTM
Elevation (m asl):
Datum/zone:

Water Quality
Water Temperature (°C): 19
DO (mg/l): 13.8 - 14.5
Conductivity (uS/cm): 1434
pH: 8.38
Alkalinity (mg/l as $CaCO_3$): 731 TDS

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):
- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)
- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)		3.00	0.21	1.00	~~0~~	
Sample 2: Pool		3.00	0.31	1.1	~~0~~	
Sample 3: Riffle (cross-over)		3.00	0.08	0.4	10	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	2	2	2
2nd Dominant	1	1	4

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage		Sample 1	Sample 2	Sample 3
Use 1: Abundant, 2: Present, 3: Absent	Woody Debris	2	2	2
	Detritis	2	2	2

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	3	3
10-30 m	2	
30-100 m	2	

% Canopy Cover (circle one)

0-24 (circled) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	3	2
Rooted Floating	3	3	3
Submergent	3	3	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	1	1	1
Attached Algae	3	3	3
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial)? Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- slow flow
- lots of algae

Candidate reference Site - Minimally Impacted? (circle one) Yes (No)

General Comments

- veg islands
- overflow pockets along the banks
- incised channel

Blacknose Dace
Stickleback

Data Entered

Site Identification Form

Stream Name	Stream Code (Unique Code)	Site Code	Year	Sample
Tributary of Fourteen Mile Creek		14W-16	2009	1

Uncorrected Grid (XX)	Easting (XXX,XXX)	Northing (X,XXX,XXX)	OR	Lati-tude	Deg (15-60)	Min (0-60)	Sec (0-60)	Long-itude	Deg (50-75)	Min (0-60)	Sec (0-60)
UTM Coordinates 17T	597842	4809170									

Corrected Grid (XXX)	Easting (XXX,XXX)	Northing (X,XXX,XXX)	Source of GIS Stream Layer used to correct UTM coordinate data (e.g. NRVIS 2)
UTM Coordinates 17T	597813	4809146	

Source of Coordinates (OBM Map, GPS Unit, Differential GPS)	Datum of Coordinate Source: (NAD 27, NAD 83, WGS 84) (This can be found on the legends of maps or in set-up of GP3 units)
GPS Unit	

Township/Municipality	Lot	Concession	MNR District	Watershed Code
Oakville	32	2S?	Aurora	

Access Route
North on Farm road from Dundas Rd. Walk west across the field (north of the large pond). Follow watercourse northwest to GPS point. (Downstream of historic crossing)

Site Description
within an entrenched valley between agricultural fields. Upstream from the confluence of the large pond outlet channel and main tributary that flows southerly to Dundas Street W.

Site Marker Description

Downstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:
			✓	✓

Description:

Upstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:
			✓	✓

Description: The upstream limit extended to an abandoned/historic field crossing

Crew S. Rankin/T. Smith Recorder J. Smith Date (YYYY/MM/DD) 2009/05/13

Comments: Upstream from convergence of watercourses.

Site Length (m.)

Site Sketch: Draw two sketches on the back of this sheet. First draw a map to the area of the site then draw a sketch of the site. Be sure to include enough detail to ensure that someone could find the site again, including a north arrow and the locations of all markers, as well as the locations of any noted features. The artist should also sign the sketches.

Enter dates and initials when data entered in Computer.

	Date	Init.
Entered	6/05	KR
Verified		
Corrected		

Site Features Form

Stream Name:	Stream Code:	Site Code:	Year:	Sample:	Date: (YYYY/MM/DD)
Trib 14-Mile Creek		14W-16	2009	1	2009/05/13

For each landuse, check off all boxes which apply. Be sure to include comments explaining the particulars, including names and numbers of contacts.

Site Features	Ongoing and Active	Historical Evidence	No Evidence but Reported	No Evidence	Unknown	Comments
Potential Point or Non-point Source Contaminant Sources	☒	☐	☐	☐	☐	- abandoned equipment refuse
Major Nutrient Sources Upstream	☐	☐	☐	☐	☐	
Channel Hardening or Straightening	☒	☐	☐	☐	☐	- concrete abutments of old crossing.
Adjacent Landuses That Destabilize Banks	☐	☐	☐	☒	☐	
Sediment Loading or Deprivation	☐	☐	☐	☐	☐	
Instream Habitat Modifications	☐	☒	☐	☐	☐	Field crossing.
Barriers and/or Dams in the Vicinity of the Site	☒	☐	☐	☐	☐	- rubble at old crossing.
High Fishing Pressure	☐	☐	☐	☐	☐	
Log Jam Deflectors	☐	☐	☐	☐	☐	
Springs or Seeps at the Site	☐	☐	☐	☐	☐	
Impervious Substrate Limiting Burrowing Depth of Fish	☐	☐	☐	☐	☐	
Other Activities That Could Influence Biota or Habitat	☐	☐	☐	☐	☐	

Temperatures

Water Temperature(°C): ° Date: Time: Air Temperature At Same Time (°C): °

Maximum Air Temperature (°C): ° Source of Maximum Air Temp: Maximum Water Temperature(°C):: °

Crew: J. Smith & S. Rankin. Recorder: S. Rankin.

Comments:

Sources of Information:
- ☒ Visual Immediate
- ☐ Visual Extended
- ☐ Interview
- ☒ Maps/Photos

Riparian Vegetation Community — Only Check one box for each bank and zone

Riparian Zone	Dominant Vegetation Type: Left Bank None	Left Bank Cultivated	Left Bank Meadow	Left Bank Scrubland	Left Bank Forest	Right Bank None	Right Bank Cultivated	Right Bank Meadow	Right Bank Scrubland	Right Bank Forest
1.5-10m.	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐
10-30m.	☐	☐	☒	☐	☐	☐	☒	☐	☐	☐
30-100m.	☐	☒	☐	☐	☐	☐	☒	☐	☐	☐

Entered dates and initial when data entered in computer

	Date	Init.
Entered		
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code:	Year:	Sample #:	Date: (YYYY/MM/DD):	Transect #
Trib. 14-mile Creek		14W-16	09	1	2009/05/13	1 of 20

23

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.82

Site Length / (Number of Transects – 1)

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.8m

Point Spacing (m.) 0.4

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.2

First point is S/2 from the left bank

Compass Bearing: 244

425
34m

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth
1	1.70	-85	0	uc	105	1		X				
2	2.10	40	0	20	20	0						
3												
4												
5												
6												

Aquatic Vegetation Types Present (Put X in box if present, Put – if not.)	FL	AL	SS	MC	WC	GR	TR
Point 1	X					X	
Point 2	X					X	
Point 3							
Point 4							
Point 5							
Point 6							

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left		440	150	170	0	0	13
Right		380	60	40	0	0	9
Bank Particle Median Diameters (mm.)		Sa	uc	uc	uc		
		Sa	uc	uc	uc		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.	None	Cultivated	Meadow	Scrubland	Forest
Left			X		
Right			X		

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code:	Year:	Sample #:	Date: (YYYY/MM/DD):	Transect #
Trib. 14-mile creek		14W-16	09	1	2009/05/13	2 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length = Minimum Width (m.) 0.32 × (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.05

Point Spacing (m.) 0.53

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.26

First point is S/2 from the left bank

Compass Bearing: 259

2.55

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.76	195	0	Sa	120	1		X					X						
2	2.29	160	0	Sa	110	2					X		X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		435	350	280	0	0	8			X		
Right		100	90	220	0	210	5			X		
Bank Particle Median Diameters (mm.)		Si	Si	uc	uc							
		uc	uc	uc	uc							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code:	Year:	Sample #:	Date: (YYYY/MM/DD):	Transect #
Trib to Mile Creek		HW-16	09	1	2009/05/13	3 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) ~~0.1~~ 0.32 Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.10

Point Spacing (m.) 0.55

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect 0.28

First point is S/2 from the left bank

Compass Bearing: 270

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X In box If present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.78	240	~~0~~	Sa	Sa	~~0~~							X						
2	2.33	220	~~0~~	Sa	Sa	~~0~~							X						
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		300	260	130	~~0~~	~~0~~	9			X		
Right		220	100	320	~~0~~	~~0~~	8			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/08	AR
Verified		
Corrected		

Channel Morphology Data Form

268

Stream Name	Stream Code: (Unique Code)	Site Code	Year	Sample #	Date: (YYYY/MM/DD)	Transect #
Trib 14-Mile Crk		14W-16	09	1	2009/05/13	4 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.18

Point Spacing (m.) 0.59

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.3

First point is S/2 from the left bank

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.80	220	0	uc	sa	2					X		X				X		
2	2.39	250	0	uc	60	0							X						
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		160	140	170	0	190	13			X		
Right		180	180	280	0	0	7			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	sa	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/08	
Verified		
Corrected		

Channel Morphology Data Form

2.92

Stream Name	Stream Code: (Unique Code)	Site Code	Year	Sample #	Date: (YYYY/MM/DD)	Transect #
Trib to 14-mile Creek		14W-16	09	1	2009/05/13	5 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) [illegible] 0.32 Site Length / (Number of Transects – 1)

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.42

Point Spacing (m.) 0.71

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.36

First point is S/2 from the left bank

Compass Bearing: 259

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.86	220	0	Sa	Sa	0							X						
2	2.57	250	0	Sa	70	0							X						
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		380	190	180	0	0	12			X		
Right		200	220	110	0	170	9			X		
Bank Particle Median Diameters (mm.)		UC	UC	UC	UC							
		UC	UC	UC	UC							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	[illegible]
Verified		
Corrected		

Channel Morphology Data Form

Stream Name	Stream Code: (Unique Code)	Site Code	Year	Sample #	Date: (YYYY/MM/DD)	Transect #
Trib 14-mile Creek		14W-16	09	1	2009/05/13	6 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) N/A

0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.50

Point Spacing (m.) 0.75

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

0.38

First point is S/2 from the left bank

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, t, 2)	Cover Types Present: Wood	Rock	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.88	260	0	uc	20	0								X						
2	2.63	110	0	Sa	Sa	0								X					X	
3																				
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		340	175	90	0	0	6			X		
Right		500	250	120	0	0	3			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/08	MR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code:	Year:	Sample #:	Date: (YYYY/MM/DD):	Transect #
Trib 14-mile Creek		14W-16	09	1	2009/05/13	7 of 20

2.65

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 684 × 0.32 = Site Length (Number of Transects – 1)

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.15

Point Spacing (m.) 0.58

Point Spacing, S = Active Width W (m.) / # Points per Transect = 0.29

First point is S/2 from the left bank

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.79	140	0	uc	Sa	2						X	X	X					X	
2	2.37	220	0	uc	Sa	2							X	X						
3																				
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		190	110	120	0	170	11			X		
Right		420	230	100	470	0	11			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: Other Cover = FL

Enter dates and initials when data entered in computer

	Date	Init.
Entered	9/08	SR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14w-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 8 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) DRY 0.32 Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.96

Point Spacing (m.) 0.48

Point Spacing, S = Active Width W (m.) / # Points per Transect = 0.24

First point is S/2 from the left bank

Compass Bearing: 310

2.46

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.74	120	0	20	60	0							X						
2	2.22	220	0	uc	50	2						X	X						
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left		110	120	150	0	0	0
Right		250	150	80	0	0	12
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc		
		uc	uc	uc	uc		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

None	Cultivated	Meadow	Scrubland	Forest
		X		

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: Other cover = FL

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD) 2009/05/13	Transect # 9 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.97 × 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.85

Point Spacing (m.) 0.43

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.21

First point is S/2 from the left bank

1.95
2.80

Compass Bearing: 242

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rrounckd	Fl Rock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	2.15	100	0	UC	30	2					X		X					X	
2	2.58	150	0	125	125	2					X		X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left		180	120	230	120	150	8
Right		250	170	310	0	100	9
Bank Particle Median Diameters (mm.)		UC	UC	UC	UC		
		UC	UC	UC	UC		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

None	Cultivated	Meadow	Scrubland	Forest
		X		

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 10 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.44 → 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.25

Point Spacing (m.) 0.63

Point Spacing, S = Active Width W (m.) / # Points per Transect

0.31

First point is S/2 from the left bank

Compass Bearing: 290

Point Number	Location (m.)*	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rrock	Fract	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.81	90	0	Sa	100	2			X				X						
2	2.44	180	0	uc	50	2						X	X						
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; if a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		220	120	110	0	0	11			X		
Right		330	200	140	0	0	14			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: other Cover = FL

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/28	MK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 11 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.4 → 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.65

Point Spacing (m.) 0.32

Point Spacing, S = Active Width W (m.) / # Points per Transect

0.16

First point is S/2 from the left bank

2.15

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rrock	Flact	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.66	110	0	uc	140	2			X				X					X	
2	1.98	50	0	uc	60	2					X		X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left	\	480	380	180	0	0	8
Right		240	220	140	0	150	7
Bank Particle Median Diameters (mm.)	\	uc	uc	uc	uc		
	\	uc	uc	uc	uc		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

None	Cultivated	Meadow	Scrubland	Forest
		X		
		X		

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD):	Transect # 12 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) ~~0.24~~ 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.60

2.1

Point Spacing (m.) 0.30

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.15

First point is S/2 from the left bank

Compass Bearing: 230

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	RR ooc kd	Float	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.65	30	0	10	440	2		X					X					X	
2	1.95	100	0	20	440	2		X					X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; if a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		530	340	300	0	0	12			X		
Right		580	540	380	0	0	5			X		
Bank Particle Median Diameters (mm.)		Sa	uc	uc	uc							
		Si	Si	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/6	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 13 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32 = Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.60

Point Spacing (m.) 0.30

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

0.15

First point is S/2 from the left bank

2.1

Compass Bearing: 222

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.65	110	0	Sa	90	0							X					X	–
2	1.95	50	0	Si	60	0							X					X	–
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		480	450	430	0	0	4				X	
Right		570	270	150	0	0	6			X		
Bank Particle Median Diameters (mm.)		Sa	uc	Si	uc							
		Si	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	5/13	AP
Verified		
Corrected		

Diagnostic Indicators of Channel Stability

Stream Name:	Stream Code (Unique Code)	Site Code: 14W-16	Year 09	Sample #: 1	Date (YYYY/MM/DD) 2009/05/13	Transect # 14 of 20

Record these values only on the first transect — Site Length (m): 40 | Transect Spacing (m): 2.1 | Crew: JS, SR | Comments

Obstructions to Flow (If none present, check "None Present" Otherwise check the applicable types.)

- [x] None Present
- [ ] Trampled Banks
- [ ] Wood Deflectors
- [ ] Inorganic Deflectors
- [ ] Armouring
- [ ] Inlets
- [ ] Others (List Types)

Indicators Used to Locate Bankfull Level

	Left Bank	Right Bank
Inflection Point	[x]	[x]
Bank Material	[ ]	[ ]
Top of Point Bar	[ ]	[ ]
Vegetation	[x]	[x]
Minimum Width:Depth	[ ]	[ ]
Others (List Types)		

Entrenchment

Entrenchment Height = 2 X Maximum Channel Depth

Entrenchment Width = Horizontal distance from the location of the Maximum Channel Depth to the bank at the Entrenchment Height

Record either the Left and Right widths, or the Total Width

Left Entrenchment Width (m): 7.2

Right Entrenchment Width (m): 2.8

Total Entrenchment Width (m):

DISCHARGE APPROXIMATES BASEFLOW YES [x] NO [ ]

Channel Profile

Feature	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)
Left BFD	0.4	0	
Right BFD	3.2	0	
Max Channel Depth	2.03	660	
Left Active Channel	1.5	430	
Right Active Channel	2.38	520	
Measurement 1	1.4	250	
2	2.8	370	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

* This column is for recording data when the minimum width:depth ratio indicator is used and the bankfull level is NOT identified in the field.

Velocity Measurements (Recommended depth ratio from stream bottom is 0.4)

Water Depth (mm)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)

Channel Profile (continued)

Measurement	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements: Water Depth (mm.)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments

Transect and Point Layout

Use this table to provide guidance for selecting how many points per transect to measure, given the minimum width of the stream.

Minimum Width (m.) 0.32	Low variance in velocity or depth	High variance in velocity or depth
> 3.0	8 + 1 every 2 metre	10 + 1 every 1 metre
1.5 – 3.0	5	8
1.0 – 1.49	3	6
(<1.0)	(2)	4

Active Width (W) (m.) 2.8

Point Spacing (S) (m.) = Active Width (W) (m.) / # Points per transect (N)

Point Spacing (S) (m.) 1.4

First point is S/2 from the left bank 0.7

Enter dates and initials when data entered in computer

	Date	Init.
Entered		
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 14 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32

Site Length (m.) 40 / (Number of Transects – 1)

Number of Transects 20

Site Length (m.) 40

Number of Points/ Transect (N) 2

Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.8

Point Spacing (m.) 0.4

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.2

First point is S/2 from the left bank

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Root wad	Rock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.70	100	0	uc	70	0							X						
2	2.10	120	0	10	40	2					X		X					X	
3																			
4																			
5																			
6																			

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		560	290	320	0	0	9			X		
Right		290	410	230	0	120	3			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	10	uc	uc							

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	5/08	VP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 15 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32

Site Length / (Number of Transects – 1)

Number of Transects 20 | Site Length (m.) 40

Number of Points/ Transect (N) 2 | Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.55

Point Spacing (m.) 0.28

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

0.14

First point is S/2 from the left bank

2.05

Compass Bearing: 237

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rr Boulder	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.64	110	0	uc	80	0													X	
2	1.92	130	0	sa	80	2							X	X					X	
3																				
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		230	250	160	0	80	11			X		
Right		420	290	150	0	0	13			X		
Bank Particle Median Diameters (mm.)		uc	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: Other Cover = FL

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	TK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 16 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 0.32	
Number of Transects 20	Site Length (m.) 40
Number of Points/ Transect (N) 2	Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.95

Point Spacing (m.) 0.48

Point Spacing, S = Active Width W (m.) / # Points per Transect = 0.24

First point is S/2 from the left bank

Compass Bearing: 230

2.45

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.74	30	0	8	150	1			X				X	X				X	
2	2.22	40	0	Sa	30	0							X	X				X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		520	320	240	0	0	12			X		
Right		530	240	370	0	0	5			X		
Bank Particle Median Diameters (mm.)		Sa	uc	uc	uc							
		30	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 17 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 0.4	
Number of Transects 20	Site Length (m.) 40
Number of Points/ Transect (N) 2	Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.45

Point Spacing (m.) 0.23

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect = 0.11

First point is S/2 from the left bank

Compass Bearing: 228

1.95

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.61	65	0	uc	70	0							X					X	
2	1.84	90	0	70	70	2						X	X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		440	350	290	0	0	4			X		
Right		380	270	230	0	0	2			X		
Bank Particle Median Diameters (mm.)		Si	uc	uc	uc							
		uc	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: other cover = FL

Enter dates and initials when data entered in computer

	Date	Init.
Entered	2/6/8	HP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 18 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32

Site Length / (Number of Transects – 1)

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.32

Point Spacing (m.) 0.16

Point Spacing, S = Active Width W (m.) / # Points per Transect

0.08

First point is S/2 from the left bank

Compass Bearing: 218

1.82

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Fish	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.58	70	0	Sa	110	1		X	X				X					X	
2	1.74	50	0	uc	170	1		X					X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		310	220	90	0	0	6			X		
Right		350	310	340	0	0	2			X		
Bank Particle Median Diameters (mm.)		Sa	Sa	uc	uc							
		Si	Si	Si	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	BP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD)	Transect # 19 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 0.32

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 0.85

Point Spacing (m.) 0.43

Point Spacing, S = Active Width W (m.) / # Points per Transect = 0.21

First point is S/2 from the left bank

Compass Bearing: 200

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rounded Rock	Flat Rock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.71	50	0	Si	230	2			X				X					X	
2	2.14	80	0	10	140	2			X				X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		370	200	230	560	0	8			X		
Right		390	350	110	250	0	6			X		
Bank Particle Median Diameters (mm.)		Si	uc	uc	uc							
		Si	uc	uc	uc							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	AP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16	Year: 09	Sample #: 1	Date: 2009/07/13 (YYYY/MM/DD)	Transect # 20 of 20

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 0.32

Site Length / (Number of Transects – 1)

Number of Transects 20 — Site Length (m.) 40

Number of Points/ Transect (N) 2 — Transect Spacing (m.) 2.1

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.00

Point Spacing (m.) 0.50

Point Spacing, S = Active Width W (m.) / # Points per Transect = 0.25

First point is S/2 from the left bank

Compass Bearing: 240

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Rock Bedrock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.75	60	0	10	135	1						X	X					X	
2	2.25	15	5	450	450	1			X				X					X	
3																			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		460	280	100	0	0	0			X		
Right		430	310	410	60	0	3			X		
Bank Particle Median Diameters (mm.)		100	620	140	uc							
		uc	uc	sa	uc							

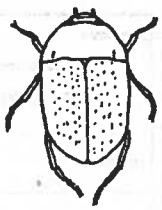
Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: other cover = concrete Chunk

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/8	
Verified		
Corrected		

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS



Date: May 13 2009
Time 2:00 pm
Agency:
Investigators: SR ? JS

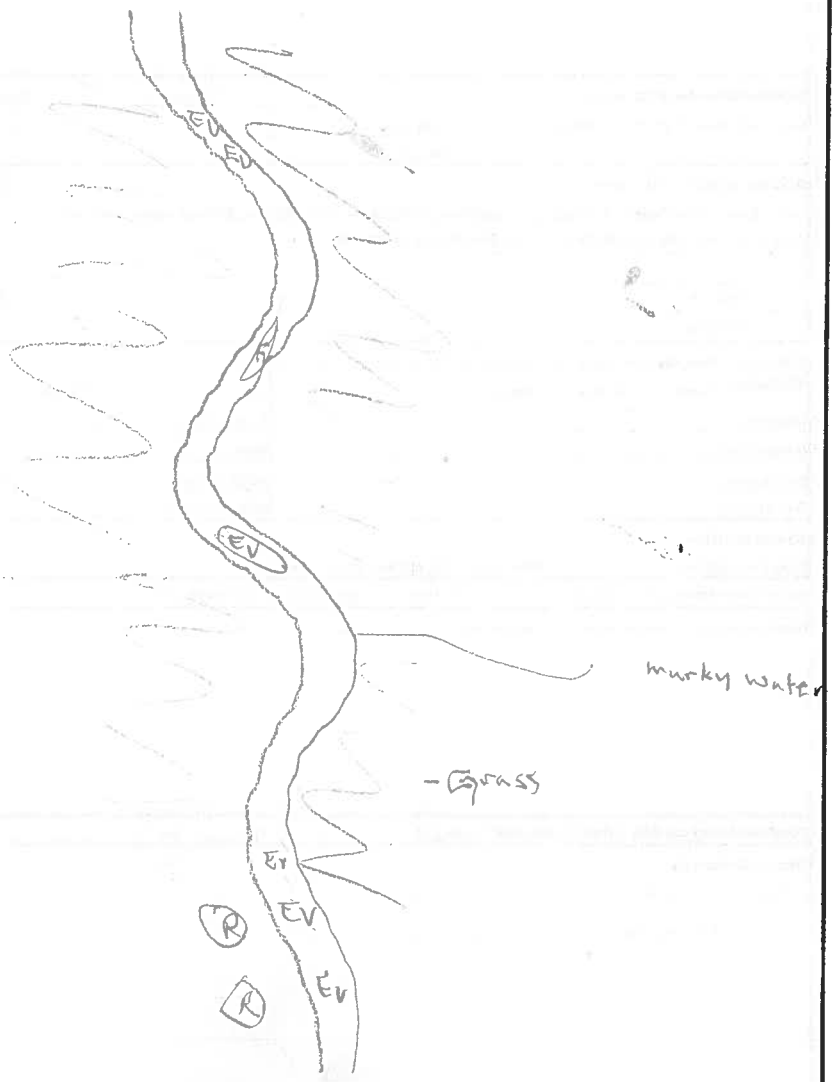
Stream name:
Site #: HW-16A
Location: centroid of 3 replicates; Lat/Long or UTM
North of small pond.
Elevation (m asl):
Datum/zone:

Water Quality
Water Temperature (°C): 14.5
DO (mg/l): 7.79
Conductivity (uS/cm): 1525
pH: 7.75
Alkalinity ~~(mg/l as $CaCO_3$)~~: TDS 770

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):
- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)
- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)	10	3	0.12	2.0	Ø	
Sample 2: Pool	10	3	0.24	1.1	Ø	
Sample 3: Riffle (cross-over)					Ø	

~ similar substrate / habitat

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	1	1	
2nd Dominant	2	2	

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage		Sample 1	Sample 2	Sample 3
Use 1: Abundant, 2: Present, 3: Absent	Woody Debris	3	3	
	Detritis	1	1	

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	3	3
10-30 m	3	3
30-100 m	3	2

% Canopy Cover (circle one)

(0-24) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	1	1	
Rooted Floating	3	3	
Submergent	3	3	
Free Floating	3	3	

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	
Filaments	3	3	
Attached Algae	3	3	
Slimes or Crusts	3	3	

Stream Size/Flow

Bank Full Width (m): 2'00 Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial) Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

Candidate reference Site - Minimally Impacted? (circle one) Yes (No)

General Comments

- Stagnant, very low flow
- Uniform habitat throughout

Site Identification Form

Stream Name	Stream Code (Unique Code)	Site Code	Year	Sample
		14W-16A	2009	1

Uncorrected Grid (XX)	Easting (XXX,XXX)	Northing (X,XXX,XXX)	OR	Lati-tude	Deg (15-60)	Min (0-60)	Sec (0-60)	Long-itude	Deg (50-75)	Min (0-60)	Sec (0-60)
UTM Coordinates 17T	597549	4809146									
Corrected Grid (XXX)	Easting (XXX,XXX)	Northing (X,XXX,XXX)	Source of GIS Stream Layer used to correct UTM coordinate data (e.g. NRVIS 2)								
UTM Coordinates 17T	597509	4809154									
Source of Coordinates (OBM Map, GPS Unit, Differential GPS)			Datum of Coordinate Source: (NAD 27, NAD 83, WGS 84) (This can be found on the legends of maps or in set-up of GP3 units)								

Township/Municipality	Lot	Concession	MNR District	Watershed Code
Oakville			Aurora	

Access Route

North on Farm road from Dundas Rd. Walk west across the field (north of the large pond). Follow watercourse north-west to GPS point. (Pass small pond located west of watercourse

Site Description

watercourse flows through open meadow between a large gap in the property-line hedgerow.

Groundwater monitoring well at site; flag on small/mod Buckthorn.

Site Marker Description

Downstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description: Buckthorn on left/west bank.

Upstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description:

Crew	Recorder	Date (YYYY/MM/DD)
S. Rankin / J. Smith	S. Rankin	2009/05/13

Comments

Site adjacent to property line.

Site Length (m.)

Enter dates and initials when data entered in Computer.

	Date	Init.
Entered		
Verified		
Corrected		

Site Sketch Draw two sketches on the back of this sheet. First draw a map to the area of the site then draw a sketch of the site. Be sure to include enough detail to ensure that someone could find the site again, including a north arrow and the locations of all markers, as well as the locations of any noted features. The artist should also sign the sketches.

Site Features Form

Stream Name:	Stream Code:	Site Code:	Year:	Sample:	Date: (YYYY/MM/DD)
		14M1-16A	2009	1	2009/05/13

For each landuse, check off all boxes which apply. Be sure to include comments explaining the particulars, including names and numbers of contacts.

Site Features	Ongoing and Active	Historical Evidence	No Evidence but Reported	No Evidence	Unknown	Comments
Potential Point or Non-point Source Contaminant Sources	☐	☐	☐	☐	☒	
Major Nutrient Sources Upstream	☐	☐	☐	☐	☒	
Channel Hardening or Straightening	☐	☐	☐	☒	☐	
Adjacent Landuses That Destabilize Banks	☐	☐	☐	☒	☐	
Sediment Loading or Deprivation	☐	☐	☐	☐	☐	
Instream Habitat Modifications	☐	☐	☐	☒	☐	
Barriers and/or Dams in the Vicinity of the Site	☐	☐	☐	☒	☐	
High Fishing Pressure	☐	☐	☐	☒	☐	
Log Jam Deflectors	☐	☐	☐	☒	☐	
Springs or Seeps at the Site	☐	☐	☐	☒	☐	
Impervious Substrate Limiting Burrowing Depth of Fish	☐	☐	☐	☒	☐	
Other Activities That Could Influence Biota or Habitat	☐	☐	☐	☐	☐	

Temperatures

Water Temperature(°C): ° Date: 2009/05/13 Time: Air Temperature At Same Time (°C): °

Maximum Air Temperature (°C): ° Source of Maximum Air Temp: Maximum Water Temperature(°C):: °

Crew: S. Rankin / J. Smith Recorder: S. Rankin

Comments:

Sources of Information: ☒ Visual Immediate ☒ Visual Extended ☐ Interview ☒ Maps/Photos

Riparian Vegetation Community Only Check one box for each bank and zone

Riparian Zone	Dominant Vegetation Type: Left Bank None	Cultivated	Meadow	Scrubland	Forest	Right Bank None	Cultivated	Meadow	Scrubland	Forest
1.5-10m.	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐
10-30m.	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐
30-100m.	☐	☐	☒	☐	☐	☐	☒	☐	☐	☐

Entered dates and initial when data entered in computer

	Date	Init.
Entered		
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16-A	Year: 2004	Sample #: 1	Date: 2004/05/13 (YYYY/MM/DD):	Transect # 1 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.4

2.9

Point Spacing (m.) 0.47

0.23

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 314

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm.		Particle Sizes (mm.)		Cover Quality (-99, 0, t, 2)	Types Present						Aquatic Vegetation Types Present (Put X in box if present, Put – if not.)						
		Depth (mm.)	Hydraulic Head (mm.)	Point	Maximum In Ring		Wood	Rock	Rock	Mac	Bank	Oth	FL	AL	SS	MC	WC	GR	TR
1	1.73	105	⊗	C1	S1	2	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☒	☐
2	2.2	~190	⊗	1	11	2	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☒	☐
3	2.67	70	⊗	11	11	2	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☒	☐
4							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points					Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.				
	> 2m	0 mm.	250 mm.	750 mm.	1500 mm.			None	Cultivated	Meadow	Scrubland	Forest
Left		305	185	180	0	X	4	☐	☐	☒	☐	☐
Right		275	200	200	⊗	X	7	☐	☐	☒	☐	☐
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 2 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 2.3 3.8

Point Spacing (m.) 0.77 0.38

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 314

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flack	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.88	40	∅	C1	5	2				X								X	
2	2.65	35	∅	C1	5	∅												X	
3	3.42	40	∅	C1	5	2				X								X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		240	175	170	0	X	3			X		
Right		310	285	170	0	X	5			X		
Bank Particle Median Diameters (mm.)		C1										
		C1										

Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	VR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 3 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.5 — 3.0

Point Spacing (m.) 0.5 — 0.25

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 310

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.75	70	ø	Cl	Si	2				X								X	
2	2.25	50	ø	Cl	Si	ø												X	
3	2.75	30	ø	Cl	Si	2				X								X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		330	115	215	0	X	4			X		
Right		320	290	170	0	X	3			X		
Bank Particle Median Diameters (mm.)		Cl										
		Cl										

Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	TR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 4 of 15

3.6
230
0.72

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 14
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3

Point Spacing (m.) 0.43

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 350

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flack	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	2.52	200	⊘	C1	51	⊘													
2	2.95	210		1	1	1													
3	3.38	130		1	1	1												X	
4																			
5																			
6																			

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		365	150	130	190	X	6			X		
Right		310	110	140	0	X	3			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	SR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 5 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.9

3.4

Point Spacing (m.) 0.63

0.32

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 310

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.82	⊘	⊘	cl	Si	⊘												X	
2	2.45	40		cl	Si	2				X								X	
3	3.08	40		cl	Si	⊘												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		330	195	170	0	X	7			X		
Right		310	170	240	⊘	X	3			X		
Bank Particle Median Diameters (mm.)		cl	cl	cl	cl							
		cl	cl	cl	cl							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/02	SR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 6 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0	Site Length / (Number of Transects – 1)
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 (2.5)

Point Spacing (m.) 0.33 (0.17)

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 320

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Fiact	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	30	↓	C1	5i	2				X								X	
2	2.00	50	↓	↓	↓	↓												X	
3	2.33	20	↓	↓	↓	↓												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		230	230	140	110	X	1			X		
Right		245	170	150	100	X	3			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 7 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0

Point Spacing (m.) 0.37

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 342

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	150	⊘	C1	S1	⊘												X	
2	2.00	220	↓	↓	↓	⊘													→
3	2.33	140	↓			⊘												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		385	210	230	100	X	5			X		
Right		310	155	110	125	X	1			X		
Bank Particle Median Diameters (mm.)		C1	C1	C1	C1							
		C1	C1	C1	C1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/01	AK
Verified		
Corrected		

Diagnostic Indicators of Channel Stability

Stream Name:	Stream Code (Unique Code)	Site Code:	Year	Sample #:	Date (YYYY/MM/DD)	Transect # of
Tributary of 14-mile Crk		14W-16A	2009	1	2009/05/13	8 of 15

Record these values only on the first transect — Site Length (m): 40 | Transect Spacing (m): 2.9

Crew: S. RANKIN, J. Smith

Comments

Obstructions to Flow (If none present, check "None Present" Otherwise check the applicable types.)

- [X] None Present
- [ ] Trampled Banks
- [ ] Wood Deflectors
- [ ] Inorganic Deflectors
- [ ] Armouring
- [ ] Inlets
- [ ] Others (List Types)

DISCHARGE APPROXIMATES BASEFLOW YES [X] NO [ ]

Channel Profile

Feature	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)
Left BFD	⊘	⊘	
Right BFD	6.9	60	
Max Channel Depth	2.5	510	
Left Active Channel	1.9	360	
Right Active Channel	3.3	360	
Measurement 1	1.15	205	
2	3.45	270	
3	5.75	200	
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

* This column is for recording data when the minimum width:depth ratio indicator is used and the bankfull level is NOT identified in the field.

Velocity Measurements (Recommended depth ratio from stream bottom is 0.4)

Water Depth (mm)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)

Indicators Used to Locate Bankfull Level

	Left Bank	Right Bank
Inflection Point	[X]	[X]
Bank Material	[ ]	[ ]
Top of Point Bar	[ ]	[ ]
Vegetation	[X]	[X]
Minimum Width:Depth	[ ]	[ ]
Others (List Types)		

Entrenchment

Entrenchment Height = 2 X Maximum Channel Depth

Entrenchment Width = Horizontal distance from the location of the Maximum Channel Depth to the bank at the Entrenchment Height

Record either the Left and Right widths, or the Total Width

Left Entrenchment Width (m):	
Right Entrenchment Width (m):	
Total Entrenchment Width (m):	>40

Channel Profile (continued)

Measurement	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements: Water Depth (mm.)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Transect and Point Layout

Use this table to provide guidance for selecting how many points per transect to measure, given the minimum width of the stream.

Minimum Width (m.)	Low variance in velocity or depth	High variance in velocity or depth
> 3.0	8 + 1 every 2 metre	10 + 1 every 1 metre
1.5 – 3.0	5	8
1.0 – 1.49	(3)	6
< 1.0	2	4

Active Width (W) (m.) 2.3

Point Spacing (S) (m.) = Active Width (W) (m.) 2.3 / # Points per transect (N)

Point Spacing (S) (m.)

First point is S/2 from the left bank

Enter dates and initials when data entered in computer

	Date	Init.
Entered		
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/19 (YYYY/MM/DD):	Transect # 8 of 15

3.3 · 9

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.4

Point Spacing (m.) 0.476

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 300

0.83

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rrock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	2.23	105	⊘	C1	5	⊘													
2	2.59	110	⊘	↓	↓	⊘													
3	3.05	110	⊘	↓	↓	2				X								X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		365	265	205	165	X	6			X		
Right		340	240	250	230	X	4			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 9 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length = (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 (2.5)

Point Spacing (m.) 0.33 (0.17)

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 310

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, t, 2)	Types Present: Wood	Rock	Bedrock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	80	⊗	C1	5.	2				X								X	
2	2.00	80	⊗	C1	5.	2				X						X		X	
3	2.33	40	⊗	C1	5.	⊗	—												
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the t x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		300	200	150	⊗	X	3			X		
Right		310	180	200	⊗	X	3			X		
Bank Particle Median Diameters (mm.)		C1	→	→								
		C1	→	→								

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/15 (YYYY/MM/DD):	Transect # 10 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 — Site Length (m.) 40

Number of Points/ Transect (N) 3 — Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.1 2.6

Point Spacing (m.) 0.37 1.8

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 310

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.68	60	X	C1	5;	0													
2	2.05	175	X	C1	5;	0													
3	2.42	80	X	C1	5;	2				X						X			
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		390	250	175	0	X	5			X		
Right		330	170	150	90	X	7			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	5/08	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 11 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.1 2.6

Point Spacing (m.) 0.37 0.18

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 294

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Bedrock	Macrophytes	Bank	Other	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.75	75	Ø	01	45	Ø												X	
2	2.15	50	Ø	01	51	2				X								X	
3	2.52	75	Ø	01	51	2				X								X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		460	130	110	0	110	8			X		
Right		350	155	170	100	X	6			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/08	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 12 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.55 3.05

Point Spacing (m.) 0.52 0.26

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 296

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rrock	Flack	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.76	130	∅	C1	5	∅													
2	2.28	30	∅	C1	5	2				X								X	
3	2.80	130	∅	C1	5	∅												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		520	190	90	0	60	8			X		
Right		390	210	210	∅	X	9			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	9/08	dp
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 13 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.)	Site Length / (Number of Transects – 1)
Number of Transects	Site Length (m.)
Number of Points/ Transect (N)	Transect Spacing (m.)

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3 — 2.8

Point Spacing (m.) 0.43 — 0.22

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 330

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Bedrock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.72	200	⊘	C1	Si	⊘													
2	2.15	240	⊘	C1	Si	⊘													
3	2.58	120	⊘	C1	Si	2				X									
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		450	275	190	⊘	X	10			X		
Right		420	150	125	⊘	X	2			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/09	TH
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: 2009/05/13 (YYYY/MM/DD):	Transect # 14 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.2 2.7

Point Spacing (m.) 0.4 0.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 308

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Bedrock	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.70	85	⊗	Cl	S.	2				X								X	
2	2.10	190	⊗	Cl	Si	⊗													
3	2.50	115	⊗	Cl	Si	⊗												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		440	430	200	0	X	3			X		
Right		400	185	160	0	L	8			X		
Bank Particle Median Diameters (mm.)		Cl	→	→	→							
		Cl	→	→	→							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/08	MH
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-16A	Year: 2009	Sample #: 1	Date: (YYYY/MM/DD): 2009/05/13	Transect # 15 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0	Site Length / (Number of Transects – 1)
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.9

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 — 2.5

Point Spacing (m.) 0.33 — 0.17

Point Spacing Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 320

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rr Ock nd	Flat k	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	150	⊘	C1	5.	0													
2	2.00	160	⊘	C1	5.	⊘													
3	2.33	30	⊘	C1	5i	0												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		375	60	105	⊘	X	3			X		
Right		350	255	190	⊘	X	6			X		
Bank Particle Median Diameters (mm.)		C1	→	→	→							
		C1	→	→	→							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/08	AM
Verified		
Corrected		

Station:	Project Number:	MMM GROUP
3, 4, 5	14.09222.001.EN2	Streams Sampling Form

Stream/Waterbody Name:	Stream Type:
14W-13 / 14W-14	Permanent ☐ Intermittent ☒
Watershed/Drainage: 14 mile creek.	

Easting:	Waterbody Type:	Station Length (m)	Date:
see note	Agricultural swale/tributary.	—	December 10, 2010
Northing: —	**Access Route:** Private laneway from Dundas Street, follow to GPS points north of pond.		**Time:**

Riparian Vegetation Community (facing upstream)

Distance from Water's Edge	*Left Bank*	*Right Bank*	*Comments*
1.5 – 10 m	Meadow/ Agri	Meadow/ Agri	
10 – 30 m	Agriculture	Agriculture	
30 – 100 m	Agriculture	Agriculture	

Water Clarity (Colourless) Turbid Blue/Green Yellow/Brown Other:

Instream Cover Present	*None*	*Sparse*	*Moderate*	*Dense*	*Comments*
Undercut banks	☒	☐	☐	☐	
Overhanging bank vegetation	☐	☐	☐	☒	
Woody debris	☒	☐	☐	☐	
Rocks/boulders	☒	☐	☐	☐	

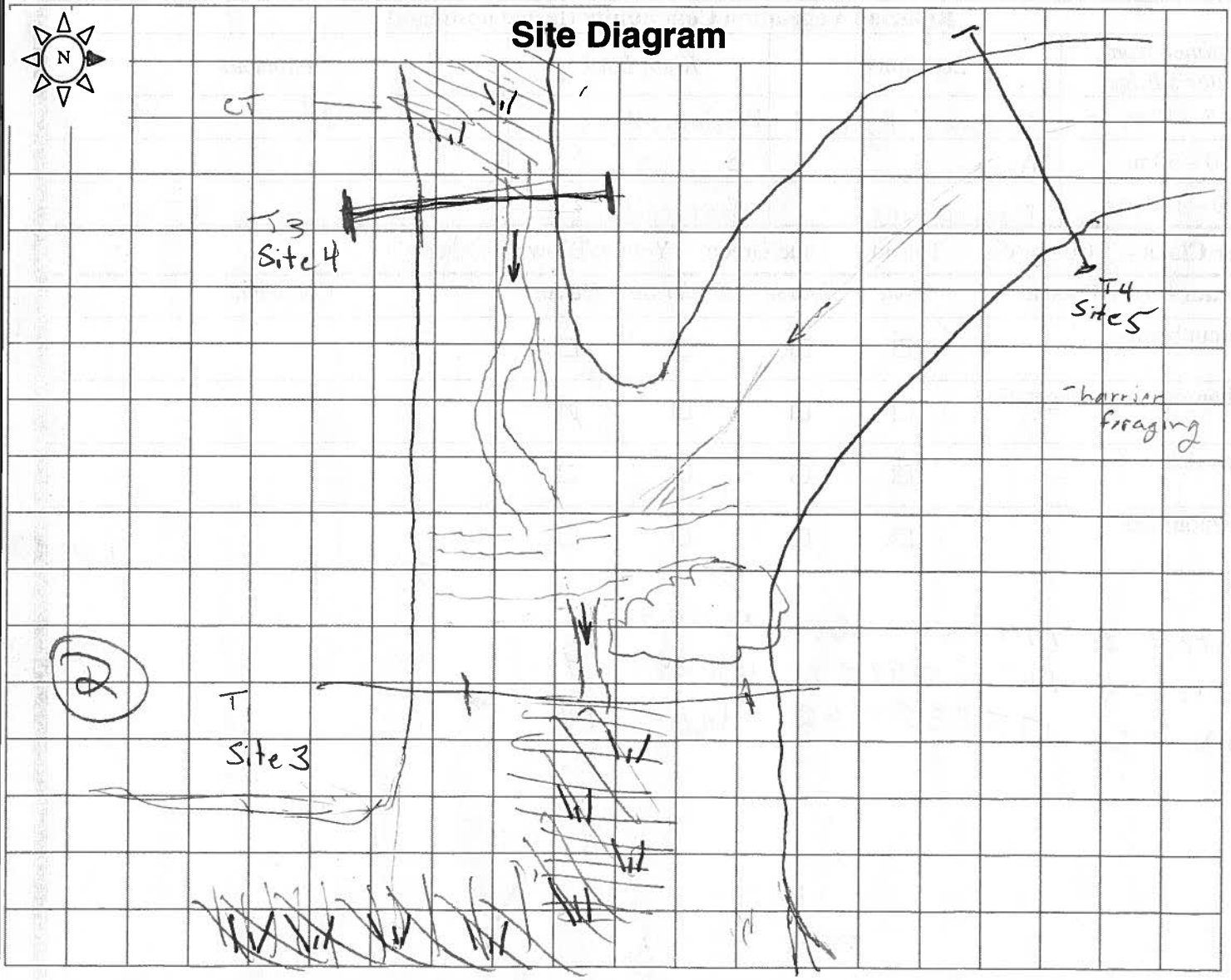
Notes:

Site #3 17T 597882 4809256
Site #4 17T 597856 4809257
Site #5 17T 597862 4809278

Cross Section Transects (Left to Right facing upstream)

Transect	Spacing	Bankfull Width	HT 1	HT 2	HT 3	HT 4	HT 5	Left Wetted	Right Wetted	Wetted Width	D 1	D 2	D 3
T1 Site 3	1.1	5.5	0.56	1.65	2.75	3.85	4.95	1.8	4.3	2.5	Max 410		
			180	250	230	230	125						
T2													
T3 Site 4	0.9	4.5	0.45	1.35	2.25	3.15	4.05	2.90	3.70	0.80	Max 3.5		
			150	165	180	180	210					400	
T4 Site 5	1.08	5.4	0.54	1.62	2.70	3.78	4.86	—	—	—			
			160	180	225	230	130	no channel		no water			
T5													

Site Diagram



Station:	Project Number:	MMM GROUP
1	14.09222.001.EN2	Streams Sampling Form

Stream/Waterbody Name:	Stream Type:
14W-12	Permanent ☒ Intermittent ☐
Watershed/Drainage: 14 Mile Creek.	

Easting: 17T 597891	Waterbody Type: Stream.	Station Length (m)	Date: Dec 10/2010
Northing: 4809142	Access Route: Private laneway from Dundas Street, walk upstream from field crossing culvert to GPS point.		Time:

Riparian Vegetation Community (facing upstream)

Distance from Water's Edge	*Left Bank*	*Right Bank*	*Comments*
1.5 – 10 m			
10 – 30 m			
30 – 100 m			

Water Clarity: (Colourless) Turbid Blue/Green Yellow/Brown Other:

Instream Cover Present	*None*	*Sparse*	*Moderate*	*Dense*	*Comments*
Undercut banks	☒	☐	☐	☐	- eroding banks.
Overhanging bank vegetation	☐	☐	☒	☐	
Woody debris	☒	☐	☐	☐	
Rocks/boulders	☒	☐	☐	☐	

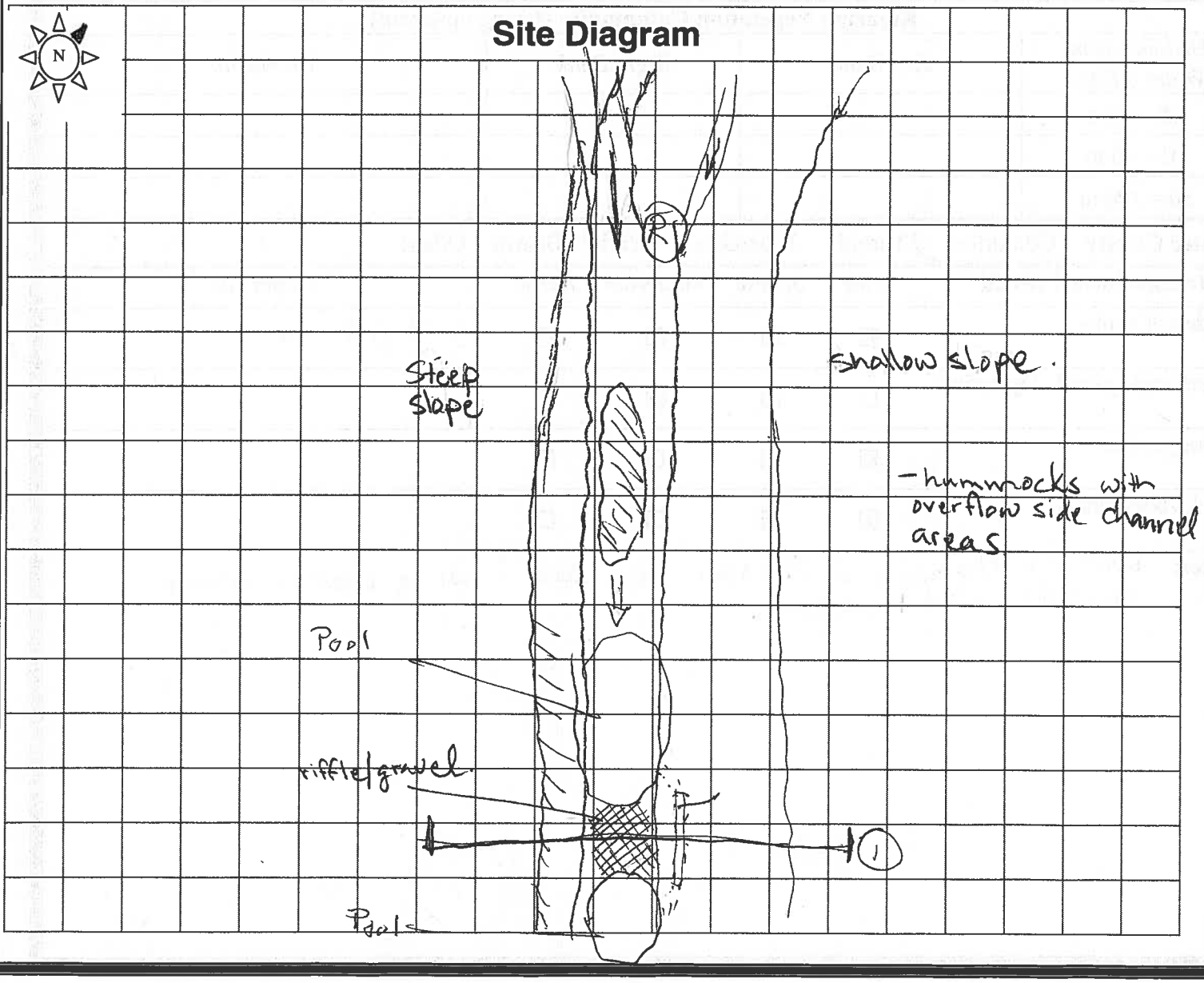
Notes: Water in channel is frozen. Limited flowing water when surface was broken.

6.10

Cross Section Transects (Left to Right facing upstream)

Transect	Spacing	Bankfull Width	HT 1	HT 2	HT 3	HT 4	HT 5	Left Wetted	Right Wetted	Wetted Width	D 1	D 2	D 3
T1 Site #1	1.22 +0.5	6.1	0.61	1.83	3.05	4.27	5.49	0.95	1.75	0.8	Max 1.80		
			330	500	530	250	180					740	
T2													
T3													
T4													
T5													

Site Diagram



Station:	Project Number:	MMM GROUP
2	14.09222.001.EN2.	Streams Sampling Form

Stream/Waterbody Name:	Stream Type:
MW-12A	Permanent ☐
Watershed/Drainage:	Intermittent ☒
14 Mile Creek.	

Easting: 17 T	Waterbody Type:	Station Length (m)	Date:
597878	Agricultural tributary.		December 10, 2010.
Northing:	**Access Route:**		**Time:**
4809219	Private laneway from Dundas St. Walk to GPS point		

Riparian Vegetation Community (facing upstream)

Distance from Water's Edge	*Left Bank*	*Right Bank*	*Comments*
1.5 – 10 m	Meadow	Meadow.	
10 – 30 m	Agriculture	Agriculture.	
30 – 100 m	Agriculture	Agriculture	

Water Clarity (Colourless) Turbid Blue/Green Yellow/Brown Other:

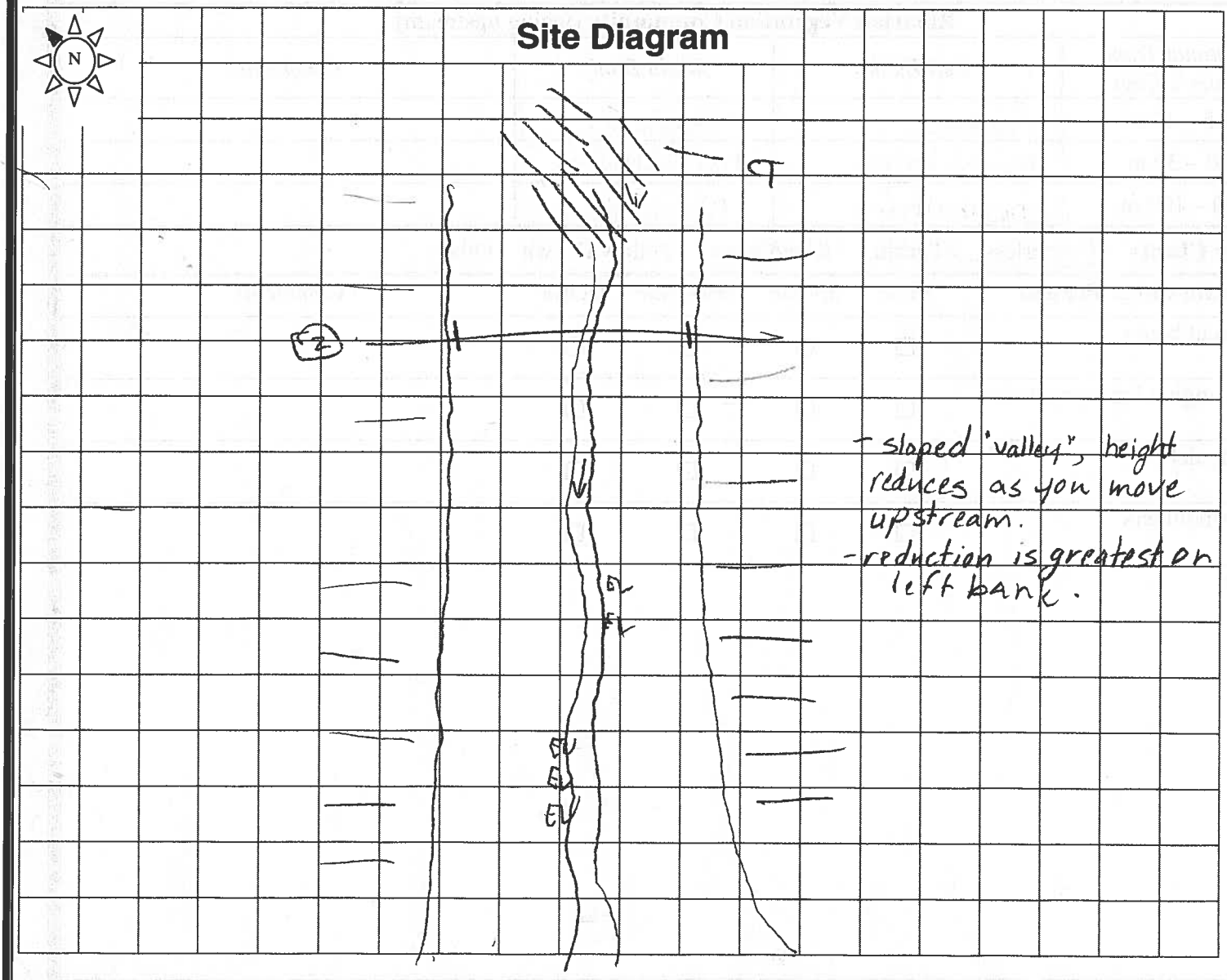
Instream Cover Present	*None*	*Sparse*	*Moderate*	*Dense*	*Comments*
Undercut banks	☐	☐	☐	☐	
Overhanging bank vegetation	☐	☐	☐	☐	
Woody debris	☐	☐	☐	☐	
Rocks/boulders	☐	☐	☐	☐	

Notes:

Cross Section Transects (Left to Right facing upstream)

Transect	Spacing	Bankfull Width	HT 1	HT 2	HT 3	HT 4	HT 5	Left Wetted	Right Wetted	Wetted Width	D 1	D 2	D 3
T1 Site #2	1.1	5.5	0.55	1.65	2.75	3.85	4.95	2.5	3.1	0.6	Max	3.80	
			160	155	381	90	1.48				(93.3		
T2													
T3													
T4													
T5													

Site Diagram



- sloped "valley", height reduces as you move upstream.
- reduction is greatest on left bank.

- 4/5 Heron
- dead C. Goose

Bentall July 30th

	14W-11A	MW-16	14W-13
TDS	475	586	444
Cond	980	1174	882
pH	7.95	7.77	7.79
D.O.	7.65	7.89	7.77
Temp	17.5	17.0	19.0
Time	9:38	10:12	10:42

Notes: standing water in lane way; puddles.

14W-11A: lots of water (ankle depth in pool)

14W-13 = mud calf
- algae has greatly reduced
- water is very silty!

MW-13/14W-14 - water in channel, flowing - ground very saturated.
- pools at field crossings
- no fish observed

Junell

	14W-11A	14W-16	14W-12TL1	14W-TL55
Cond	1949	1317	1634	Removed
TDS	926	660	813	@ 0905
pH	7.31	7.12	7.54	Junell
DO	4.58	10.82	5.67	- channel dry. Logger was in the muck, which was slightly saturated
Temp	14.0	16.0	15.3	
Time		- choked with algae	- logger is in isolated pool - no flow and no connection	
- puddles		- WQ taken in open water over top of algae mat		

pupaies — [illegible] taken in open water over top of algae mat — connection

Bentall — June 20

176241

	14W-11A	14W-16	14W-12TL1
Cond	2285	1384	1850
TDS	1141	687	858
pH	7.42	8.04	7.74
DO	5.30	8.58	5.20
Temp	22.0	22.6	22.0
Time	11:08	11:30am	11:57am
	10:47am - no flow isolated pool post heavy rain	- abundant algae - not as dense as previous visit - lowered water levels - turbid - no apparent flow	- temp logger becoming exposed.

2

us of OSAR

W1-1 Temp → 13.9 Cond → 985

DO → 6.89 pH → 7.83 TDS → 493

DS @ 80m

(8) US - channel

(9) DS - channel

(10) US - marsh — west side

(11) DS - willow overview

(12) Inlet - DS

(13) Outlet - US

(14) DS from culvert

Bentall May 28

	14-11A-TL6	14W-TL5	MW-12-TL1	14W-16TL2	
DO	7.28	3.38	7.57	8.62	Algae!
TDS	896	639	815	862	
COND	1801	1286	1630	1714	-Higher
PH	7.75	7.53	7.90	789	water
T	15.7	13.8	13.9	13.1	-turbid

July 8 - Bentall
- Fish Community
  - pond 1
  - pond 2
  - 14W-11A
  - 14W-16

Culvert
- 14W-11A
- 14W-13
- 14W-14 - pooling d/s

Water Quality

	14W-11A	14W-16	14W-12
cond	—	1971	2062
pH	—	8.45	8.32
DO	—	6.35 ~~7.88~~	5.40
temp	—	22.0	21.0
TDS	—	988	1036
Time	0910	1240	2:20
	- dry - in mud	Remove to shock	- some flow from u/s & d/s
	- left in		- logger fully submerged

Sh1 - 2530 cond / 22.5°C / 8.40 pH / DO 4.84
40 Hz @ 150V 138 sec.
Y&Y - smaller than mesh size

110 100 90 80 - Creek

70 65 - Fathead Pik

70 65 - Blunt

65-60 ~~Fathead~~ - [illegible] (shiner) anal < dorsal slightly.

Sh2 - culvert 1m wide 20/150 Hz/ 100

cond ~~390~~ 3950 µs
Temp 19.2°C
pH 8.51
DO 2.5 mg/L
TDS 1987 ppm

YOY BSb

CC 70 75 90 - 70 BN -
Shiner 55 60 - 45 43 SHB - 1
FH 75 - 1
70 65
YOY - SB - 1

Sh3 (culvert) - no fish
- pooling in culvert
- check dam/ rock d/s ft to mountain
H_2O u/s
< 4 pix > 3 w/s 1 d/s
- roadside drainage contributes @ culvert outlet
- clay/muck, silt, algae.

Narrow CT dense
40/150 (33s)

Sh4
Cond 1228 us
TDS 613 ppm
pH 8.75
Temp. 26.4 °C
DO 4.60 mg/L

40/150
sec 203

- possible wash down
- same size as earlier visit

30 to 62/70 Brook - FH - 1
30

Lots of YOY Brook
Brook/FH

Small pond
Temp - 26.3°C
DO - 530 mg/L
Cond - 380 us
TDS - 189 ppm
pH - 9.3

40 LgM Bass

- deep centre
- clay, gravel sloped shoreline

settings
60/250 Hz ✓ 211 sec.

- shock perimeter of pond
- very dense mat of algae
- shocking poorly effective
- large bass congregate in centre of pond @ surface

2 pix concrete culvert u/s of OSAP site
- active field crossing.
@ burn pile east of creek.

exceed length

Lg Pond

Cond	745	
TDS	371	
DO	4.51	
pH	8.58	
Temp.	26.0	

60/250
West shore 368 sec
55-45 LMBass
31-36 Stickle

Pix @ the pond.

	14W-11A	14W-16	14W-12	14W-15
pH	7.85	8.05	8.00	7.97
TDS	796	935	795	726
Cond	1588	1875	1591	1454
DO	7.11	9.35	8.43	6.70
Temp	10.0	11.7	10.4	10.5
Logger Pulled	941	11:31	12:02	—
Time	9:39	11:29	12:00	11:36
Note.	1.8m W 13cm D	1.0m 24cm	2.33 27cm	

Photos — 21cm drop / debris base left

① 14W-11A outlet from forest N 407

②③ 14W-14 N of 407 - water flowing to west of 3 culverts.

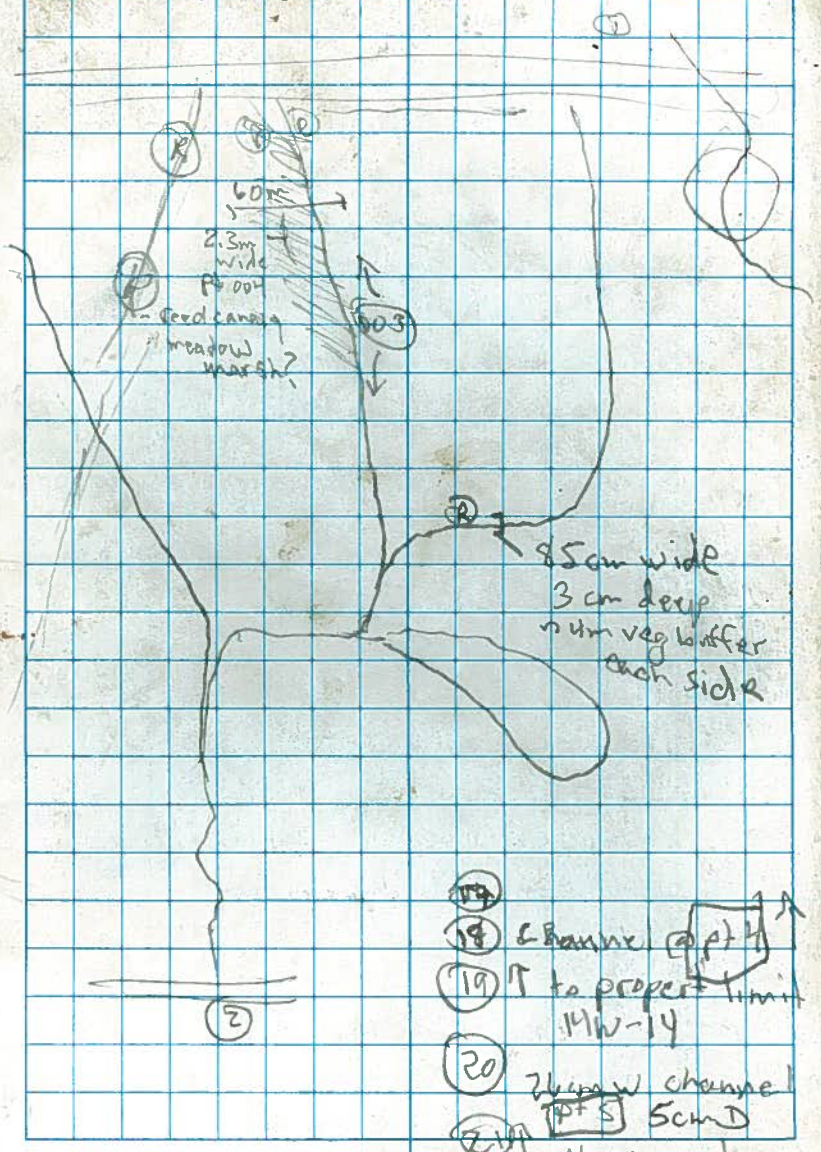
④-⑬ ↳ D/S of 14W-12 S of Dundas.
perch 18cm
pool 29 cm deep / 4m wide
outlet of pool @ riffle 1.5m wide
20 cm deep.

⑭ Filler.

⑮ 14W-14 - N from pt 003 } overview.
16 " - S " "

Oct 30/09

overcast - drizzle. crop harvested



(22) u/s to triple culvert
EN ⊙ CI, Phrag., RCG
→ → → →
- pooling u/s of pt 5
- silt / clay.
- turbid.

@ property 17cm deep } RCG
60cm wide }

(23) - Filler
24-27 - Overview from west prop limit @ pt (6) N → S.

w/s OSNP2 site.
(24) ↑ @ bend in HW-16 @ property.
pt [7] - clay silt CRG
Goldenrod.
dec hedgerow cluster
1.5m w / 14cm dp.

(25) 34cm wide / 4cm d. pt [8]
- One channel - main discontinues thru CRG, Goldenrod
- Flow observed.

- 1.29m w/ 11cm d. - flow (in OSAP).
- 4cm wide - silt / clay
11cm dp.
- 29cm w (BF) vertical banks.
25cm D (BF) - riffle
- detritus
- clay.
- defined single flowing channel d/s of HW-16(2) OSAP
- abundance of gravel increases
- detritus ↓
- algae
in thalweg bordered by clay.
- pt 9 cattails w/ defined channel. rightshades w/s of small pond
(26) - sm pond outlet @ confluence
10cm wide 2cm deep.
shale rock
- juvenile washdown
- u/s migration

pt ID - Fish shrub lined section 14W-16
d/s of sm pond.
W-1.4m; 12cm d (27) X

28 ↓ Field X'ing culvert to
29 ↑ " " " From ~~Depth~~ 116cm
30 ↓ " " " From ↓21cm

- cobble/debris @ Field X culvert

X raptor white rump patch
bar mark @ eye. Harrier?

(31) 14W-15 - water
14cm - 84cm W
4cm deep

pool old logger spot?
22cm deep
1m wider

14W-13/14 12cm D partially defined
24cm W

@log

⇒ 11 - 2pm w/ 30 min lunch
$16.96

- Blocked inlet of culvert
- kicked ? sweep for fish = NONE
- Blocked d/s of dig site
- re-kicked. = no fish.

* Saturated soils.

Bentall Aug 28 2009

overcast, windy.

	14W-11A	14W-16	14W-12
TDS	836	917	899
COND	1637	1808	1797
pH	7.33	7.86	7.89
D.O.	5.98	7.95	7.28
Temp.	16.4	18.5	20.9
Time	10:27	11:00am	11:35

photos

(1) - South/DS to 14W-11A culvert
- rock lined embankment
- roadside drainage / parallel 407

(2) - u/s @ culvert inlet - grasses, jewel weed.
Movie [1] surrounding ~360° u/s 14W-11A

(3) East parallel 407 u/s @ culvert

(4) West parallel 407 d/s inlet
↳ 51 cm eroded drop.

(5) D/S East roadside ditch @ exit to station w/ cattail patch 15 cm dry shovel chann

(6) cattail channel facing west to truck station.

(7) 14W-13 @ us culvert view of inlet bed ↑

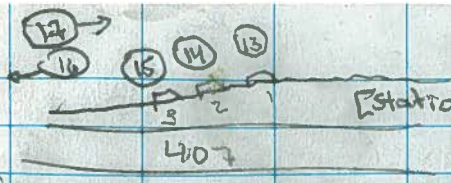
(8) west along ditch u/s to truck station

(9) East " " u/s away from station

(10) to forest area u/s from culvert

(11) d/s into culvert. ← Truck
- same H2O w/ rock debris.
Movie [2] 180° 14W-13 culvert u/s inlet.

(12) 14W-14 3 culverts - u/s - agri field.
- veg on one side



- 3 d/s photos through culverts.

(18) - u/s from culv 3 pool 25cm deep.
- flow obstructed by old silt fencing? resembles a large rock, but is "squishy" 86cm wide

(19) (20) @ fence (with ruler)
- 15 cm - 30 cm narrow channel with abundant overhanging veg.
- likely lowflow channel.
- bankfull @ fence ~ 2m - 7m

(21) d/s from fence to triple culverts

(22) East to station N-L cattail (sparse) lined ditch w/ 6 cm depth H2O

Movie [3] 360° overview of 14W-14.

(23) roadside ditch Truck station on ramp to 407 (u/s.

(24) - Filler/car mailbox.

(25) - along Tremaine to culvert and 407 @ #3287 driveway

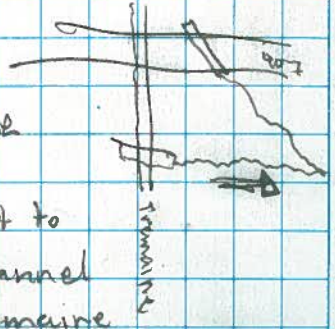
14W/14

(26) u/s into 10ft Ø culvert

(27) u/s outlet 12cm perch. -algae
- pool 2m d/s of culvert rock rip rap 48 cm deep.

(28) d/s of culvert outlet.

(29) overview from top of culvert (d/s)



Movie [4] - 14W-14 tremaine ~ 360°

(30) from tremaine outlet to 407 crossing input channel

(31) - confluence from tremaine

(32) - 407 outlet overview from tremaine

(33) - d/s overview

(34) - u/s overview @ tremain

(35) - " " @ " to 407

(36) - parallel Tremain on u/s side (away from 407)

37-38-39 14W-14 logger (@/u/s/d/s)

(40) - East to wetland/woodlot } u/s outlet

(41) - East to neighbour } d/s

(42) - u/s 14W/16 - water flowing
(43) - @ 14W - 16 - algae collected around
(44) - D/S 14W - 16 re-bar
- sparse/isolated algae growth.

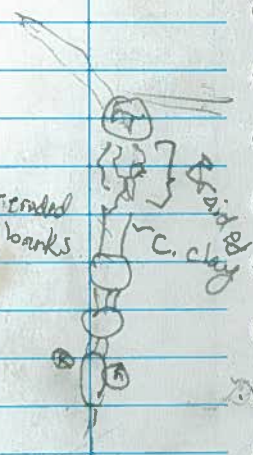
(45) D/S - confluence
(46) (47) 2 plant photos - wet soils.

Bentall Sept 10 WQ – transferred from loose sheet (Sept 14) – scanned.

Site	14W-11A	14W-16	14W-12
pH		7.86	7.72
Cond		1350	1484
TDS		676	740
D.O.		7.50	4.88
Temp		16.5	16.3
Time	9:13am	9:45am	10:25am
Note	- silty mud - No standing water @ logger	- H_2O levels lower - algae on crebar - algae covers bottom w/ silt cover - grasses overhang	- standing water - no flow or connection

Bentall Sept 30

	14W-11A	14W-16	14W-12
pH	7.80	7.83	7.57
Cond	1679	1795	1753
TDS	855	918	896
D.O.	8.40	8.89	7.25
Temp.	11.0	11.5	10.5
Time	9:32	10.07	10:38
Note	pooled water @ logger only	- water clear - algae died - silty sub. - no flow	



- disconnected pools
- possible refuge ← No fish observed
- algae causes silt to deposit at outlet of pools.

- 20m+ pool under bridge – trashes
- change in reach d/s of bridge / more tree cover ie willow
- at barn – woody debris

Location Lazy Pat Lands 14W-14A Date July 4/2011

Project / Client Bentall

Large pond monitoring

- several photos taken from south end of pond - by staff gage pt 015

Eckman
- 2 samples
  - pt 016 (A)
  - pt 018 (B)
- abundant "muck"
- pooled samples.

3 temp logger strings - bottom / middle / top
1, 2, 3 - 1.5 m

4, 5, 6 - 2 m

7, 8, 9 - 3 m.

- each location mark with GPS.

- underwater camera - video, transect attempted; water extremely turbid - video quality poor/bad.

- no water quality sample obtained - equipment malfunction.

Location Oakville Dundas + Boonte Date Aug 19 '11

Project / Client Bentall

Lazy Pat Lands 14W-14A

South Logger — Logger Set 3 South End.

D.O.		
1	6.89	23.3
2	6.23	21.4
3	5.88	20.7

	Secchi Depth		
3/4			
(1)	75 cm	60	(S)
(2)	60 cm	50	(Middle)
(3)	60	40	(N)

- swallows (shore/bank Barn)
- R.T. Hawk - calling circling
- Killdeer X

14W-14A Oakvill Date 19-08-2011
Client Bentall.
...mp / WQ / Habitat

logger near surface

Logger Set 2

(Middle)

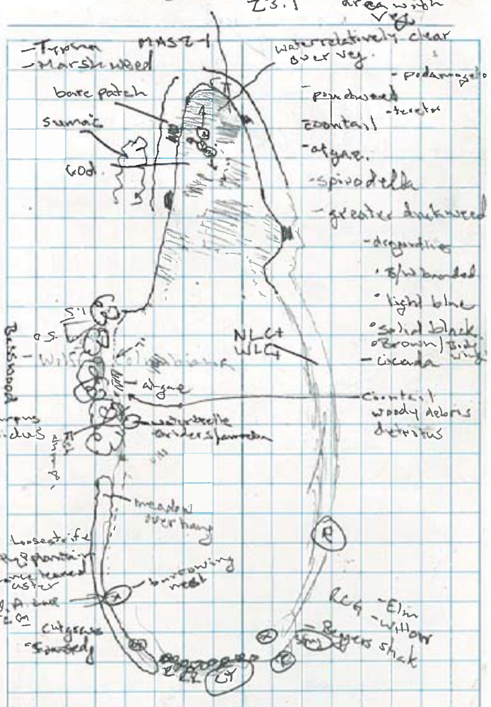
D.O	T
...36	26.9
...18	25.7
~~..70~~	24.3
...55	

Logger Set 1 — logger near surface

(North)

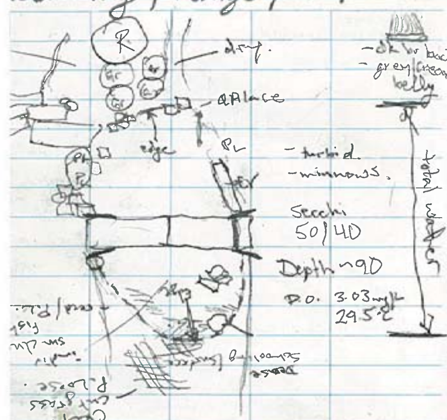
D.O	T
.92	25.0
~~7.09~~	24.0
7.16	
6.86	23.3

Location Oakville 14W-14A Date 19-08-2011
Project / Client D.O. 10.02 23.1 — surface — in open area with veg.



- algae None pond perimeter.

14W-12 Oakville Date 19-08-2011
Client Bentall
...ield x'ing; refuge pool.



- dk br back
- grey / cream belly

- turbid.
- minnows.

total water

Secchi 50/40

Depth ~90

D.O. 3.03 mg/L 29.5°C

Location Cozy Pat, Oakville Date 29-08-11
Project / Client Bentall - Monitoring 14W-14A

Windy; overcast; rain air 23°C

South ⟷ Middle North

	South D.O.	South T	Middle D.O.	Middle T	North D.O.	North T
T -	85.7%	23.9	83.5	22.9	65.9	22.
M -	83.5	23.3	71.8 - 80.9		-	
B -	81.7	23.2	79.7	22.9	-	

Secchi (cm)

South	Middle	North
D 60	D 70	D 55
U 40	U 50	U 45

- No rain on-site between 10 AM -
- no fish observed.
- relocated ~~N~~ north logger due to insufficient depths.
- modified positioning of loggers on line to better stratify position

- King fisher (1)
- Green Heron (3)
- R.T. Hawk

sandpiper (spotted)

14W-14A Date 6-10-2011

Client Bentall.

hrs Air 9.8 °C

, cold, light breeze

lands

ain on Oct 5, 2011

photo ①

op Set 0915 - staff gauge

<25%

- 15cm drop.

minnow ⇒ 0924

branches SW of staff gauge.

- moderate size fish

surfaced 1/2 way between shore and south boom.

3

rap — 0932 @ path attached to young tree

- scum along South shoreline

4

ck minnow - 0938

woody debris

- no veg.

Location Date 6-10-2011 57

Project / Client

2

DO. ~~2.60~~ T 14.5 pt 0055

pH 10.31 photo ② holes in bank

cond 1492

TDS 2416 ③ waterline

- holes are 91cm from waterline

- Heron's @ north / shallow end

pt 006 ⇒ 1001 - no cover

Black minnow - algae adjacent

pt 007 — 1016

Black minnow - no cover

- shallow

pt 008

- Silver minnow - in the algae mats

— 1027 photo ④ west to trap.

pt 009 - 46cm wide - CT

0.065m deep

Date

Client

- 45cm wide - meandering.

- 0.05 m deep - grasses.

- 1155 1259

- Black in algae

- attached to CT stump.

2 - 1206

- Black • AM shade from tree,

• Algae mat on shore

Location Date Oct 7 59

Project / Client

Secchi (2m)

58-52

1235 hr

D.O. 1

1 - T 23.9 2 - 86.8% 3 ~~32.9~~°

D.O. 91.5% 18.2 16.0

- Loggers pulled

Secchi - 52-51

1 - 98.8 2 91.2% 3 - 78.0%

16.7 16.2 15.5

South end

1 100% 2. 1134.5

17.9 °C 16.9

Top near bottom

Date Oct 7/2017

Client

11
hmpkin
-75

pt#6 1305
80
lbs - 70
Pumpkin

7 1310
ayfish
mpkin
65

pt#12 1315
1-crayfish
1-LMB 1325
1-P.S. - 70,
70

1325 pt #1 77cm depth
1320
ayfish (2)
mpkin (6)
55-75
P.S. - 150 100 130
B-Bull 165/150
1 crayfish

1345
2 1330
7cm - in tree
45-75
P.S.
pt 003 d-86
P.S. -
130, 120, 110, 140

B-Bull -
75, 100

C. Chub - 170/215
160

Location

Date Oct 7

61

Project / Client

pt #4
1350
1- cray Kept
P.S -
55-65

observed flow d/s of x'ing - Brn D - Sh/nens
- pools 12cm / 2'3cm
- refuge pool clear

Small
9.72 pH cond 505 d.o. 109.9
21.7°C 7 TDS 252 22.2

D -
3m (left
- 8.2 ft 9.5 north
South

Date Oct 7

Client

pt 015
0.09 max w

25.0 50.0 75.0 100.0 102.5
15.0 27.5 26.0 21.0 11.5

016 no water
2.05
- (S) 29 No water
- (N) 32 no water
25.0 50.0 75.0 1.00 1.25
21.0 18.0 9.5 7.5 18.0

1.50 1.75
20.0 8.0

- 1.95 Max - 7cm
- 64cm

25 50 75 1.0 1.25
21.5 25.6 31 29.5 16.5

Location

Date Oct 7

63

Project / Client

1.50 / 1.75
10 / 10
dry

pt 014
95 BF no water
w 49cm -12cm

25 50 75 95
12 12.5 9 0

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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Pointail - Kennedy Project Number: 1409222001-ENV

Date: May 31/13 Start Time: 7:15 Observer: Pat Mahr

shifted to corner field

PC Number 1 Photo No.: 0419 UTMs: Easting 597524 Northing 4809851

Temp 22 Visibility clear km Cloud 15 % Precip yes (no)

Sky Code 1 Wind speed none Wind Direction none

General Habitat type: (Field) Hedgerow Fenceline Other:

Mostly forbs

General Vegetation Type: 80% Forb + 20% rcg white mustard, thistle, clover, ragweed

Vegetation Height (cm): 15-30 Presence of Litter?: yes / (no) Describe:

Estimated % Grass vs. Broad-leaved plants: 20 % grass 80 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None				

Other Bird Species Observed: Brown Cowbird

Breeding Evidence Level:
Possible --- SH = Suitable Habitat SM = Singing Male
Probable --- T=Territory. A=Anxiety Behaviour. D=Display. P=Pair. N=Nest building. V=Visiting nest
Confirmed--- DD= Distraction. NE=Eggs. AE=Nest entry. NU=Used Nest. NY=Young. FY=Fledged young. FS=Food/Faecal Sack

NAAMP/ Beaufort Sky Codes
0 = clear (no cloud cover)
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7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

Beaufort Wind Scale
0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30);
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409 222 001-ENS

Date: May 31/13 Start Time: 7:35 Observer: Pat Mohr

PC Number 2 Photo No.: — UTMs: Easting 597461 Northing 4809408

Temp 22 Visibility clear km Cloud 15 % Precip yes (no)

Sky Code 2 Wind speed Grass moves Wind Direction from West

General Habitat type: (Field) Hedgerow Fenceline Other: wet meadow

Grass

General Vegetation Type: All reed canary grass

Vegetation Height (cm): 90 Presence of Litter?: (yes) / no Describe: grass stems

Estimated % Grass vs. Broad-leaved plants: 95 % grass 5 % plants teasel

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None				

Other Bird Species Observed: Horned lark, Red-winged BB, Ring-billed Gull, Tree Swallow

Breeding Evidence Level:
Possible --- SH = Suitable Habitat SM = Singing Male
Probable --- T=Territory, A=Anxiety Behaviour, D=Display, P=Pair, N=Nest building, V=Visiting nest
Confirmed--- DD= Distraction, NE=Eggs, AE=Nest entry, NU=Used Nest, NY=Young, FY=Fledged young, FS=Food/Faecal Sack

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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409 222001-ENS

Date: May 31/13 Start Time: 7:50 Observer: Pat Mather

PC Number 3 Photo No.: 414-5 UTMs: Easting 597830 Northing 4809190

Temp 22 Visibility clear km Cloud 15 % Precip yes (no)

Sky Code 2 Wind speed grass moves Wind Direction from west

General Habitat type: (Field) Hedgerow Fenceline Other:

Grass

General Vegetation Type: Poa, Teasel, goldenrod

Vegetation Height (cm): 60 Presence of Litter?: (yes) / no Describe: Poa stalks

Estimated % Grass vs. Broad-leaved plants: 95 % grass 5 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None				

Other Bird Species Observed: Red winged BB, Spotted Sandpiper

Breeding Evidence Level:
Possible --- SH = Suitable Habitat SM = Singing Male
Probable --- T=Territory, A=Anxiety Behaviour, D=Display, P=Pair, N=Nest building, V=Visiting nest
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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall- Kennedy Project Number: 1409222001-EN3

Date: June 11/13 Start Time: 8:50 Observer: P. Mohr

PC Number MMPC1 Photo No.: 0670-2 UTMs: Easting 597448 Northing 4809834

Temp 19°C Visibility 2 km Cloud 60 % Precip yes no

Sky Code 1 Wind speed 4 in gusts Wind Direction from northeast

General Habitat type: (Field) Hedgerow Fenceline Other:
Forbs

General Vegetation Type: Mostly mustard

Vegetation Height (cm): 30 Presence of Litter?: (yes) / no Describe: dead stalks

Estimated % Grass vs. Broad-leaved plants: 5 % grass 95 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None.				

Other Bird Species Observed:
European Starling, Red-winged Blackbird, American Woodcock
Cedar Waxwing

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
Confirmed--- **DD**= Distraction, **NE**=Eggs, **AE**=Nest entry, **NU**=Used Nest, **NY**=Young, **FY**=Fledged young, **FS**=Food/Faecal Sack

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Beaufort Wind Scale
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6= Strong breeze, large branches in motion (40-50)

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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409222001-ENS

Date: June 11/13 Start Time: 9:20 Observer: Pat Mohr

PC Number 2 Photo No.: 624 UTMs: Easting 597502 Northing 4809347

Temp 19°C Visibility 2 km Cloud 70 % Precip yes (no)

Sky Code 1 Wind speed 4 gusts Wind Direction from east

General Habitat type: (Field) Hedgerow Fenceline Other:

Grass with few forbs

General Vegetation Type: Reed Canary Grass, teasel, rumex

Vegetation Height (cm): 30-60 Presence of Litter?: (yes) / no Describe: dead grass

Estimated % Grass vs. Broad-leaved plants: 80 % grass 20 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None				

Other Bird Species Observed:

Red winged Blackbird, European Starling, (Also White-tailed deer)

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
Confirmed--- **DD**= Distraction, **NE**=Eggs, **AE**=Nest entry, **NU**=Used Nest, **NY**=Young, **FY**=Fledged young, **FS**=Food/Faecal Sack

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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409222001 ENV

Date: June 11/13 Start Time: 9:45 Observer: Pat Mohr

PC Number 3 - corn sprigs (p27) This is adjacent meadow Photo No.: 678 UTMs: Easting 597846 Northing 4809196

Temp 19°C Visibility 2 km Cloud 95 % Precip yes (no)

Sky Code 1 Wind speed 4 in gusts Wind Direction from northeast

General Habitat type: (Field) Hedgerow Fenceline Other:

Grass

General Vegetation Type: Fescue + Brome; Vetch + Goldenrod

Vegetation Height (cm): 60 Presence of Litter?: (yes) / no Describe: grasses

Estimated % Grass vs. Broad-leaved plants: 95 % grass 5 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
None.				

Other Bird Species Observed: Song Sparrow, Red-winged Blackbird, Great Blue Heron, Wood Duck ♀ with young in pond (p31)

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall - Kennedy Project Number: 1409222001 - EN3

Date: July 4/31 Start Time: 7:45 Observer: Pat Mohr

PC Number 1 Photo No.: 1334 UTMs: Easting 597524 Northing 4809851

Temp 22°C Visibility 0.1 km Cloud 100 % Precip (yes) no ~~spotting~~ sporadic very light rain

Sky Code 2 Wind speed 2 gusts Wind Direction _____

General Habitat type: (Field) Hedgerow Fenceline Other: _____

General Vegetation Type: Forbs - mustard + tansy

Vegetation Height (cm): 40 Presence of Litter?: yes / no Describe: _____

Estimated % Grass vs. Broad-leaved plants: 5 % grass 95 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
NONE				

Other Bird Species Observed:
SOSP singing, deer tracks, MODO flyover

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409222001-EN3

Date: July 4/13 Start Time: 8:10 Observer: Pat Mohr

PC Number 2 Photo No.: 1136-7 UTMs: Easting 597461 Northing 4809408

Temp 22°C Visibility 0.1 km Cloud 100 % Precip yes (no)

Sky Code 2 Wind speed 2 gusts Wind Direction _____

General Habitat type: (Field) Hedgerow Fenceline Other:

Between crop fields - depression. Plowed field to east

General Vegetation Type: Reed canary grass, teasel, vetch

Vegetation Height (cm): 90 Presence of Litter?: yes / no Describe: _____

Estimated % Grass vs. Broad-leaved plants: 60 % grass 40 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
NONE				

Other Bird Species Observed:
SONG SPARROW sang; 10 killdeer; GBHE flew along 407

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
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BOBO / EAME POINT COUNT (10 MINUTES)

Project Name: Bentall-Kennedy Project Number: 1409 222 001 - ENB

Date: July 4/13 Start Time: 8:30 Observer: Pat Mohr

PC Number 3 Photo No.: 1339-41 UTMs: Easting 597830 Northing 4809190

Temp 22°C Visibility 0.1 km Cloud 100 % Precip yes (no)

Sky Code 2 Wind speed 2 gusts Wind Direction _____

General Habitat type: (Field) Hedgerow Fenceline Other:

General Vegetation Type: Brome, Milkweed, vetch

Vegetation Height (cm): 60 Presence of Litter?: yes / no Describe: _____

Estimated % Grass vs. Broad-leaved plants: 40 % grass 60 % plants

Species	Age	Sex	Behaviour	Breeding Evidence Level Codes
NONE				

Other Bird Species Observed:
RWBB, BRSW

Breeding Evidence Level:
Possible --- **SH** = Suitable Habitat **SM** = Singing Male
Probable --- **T**=Territory, **A**=Anxiety Behaviour, **D**=Display, **P**=Pair, **N**=Nest building, **V**=Visiting nest
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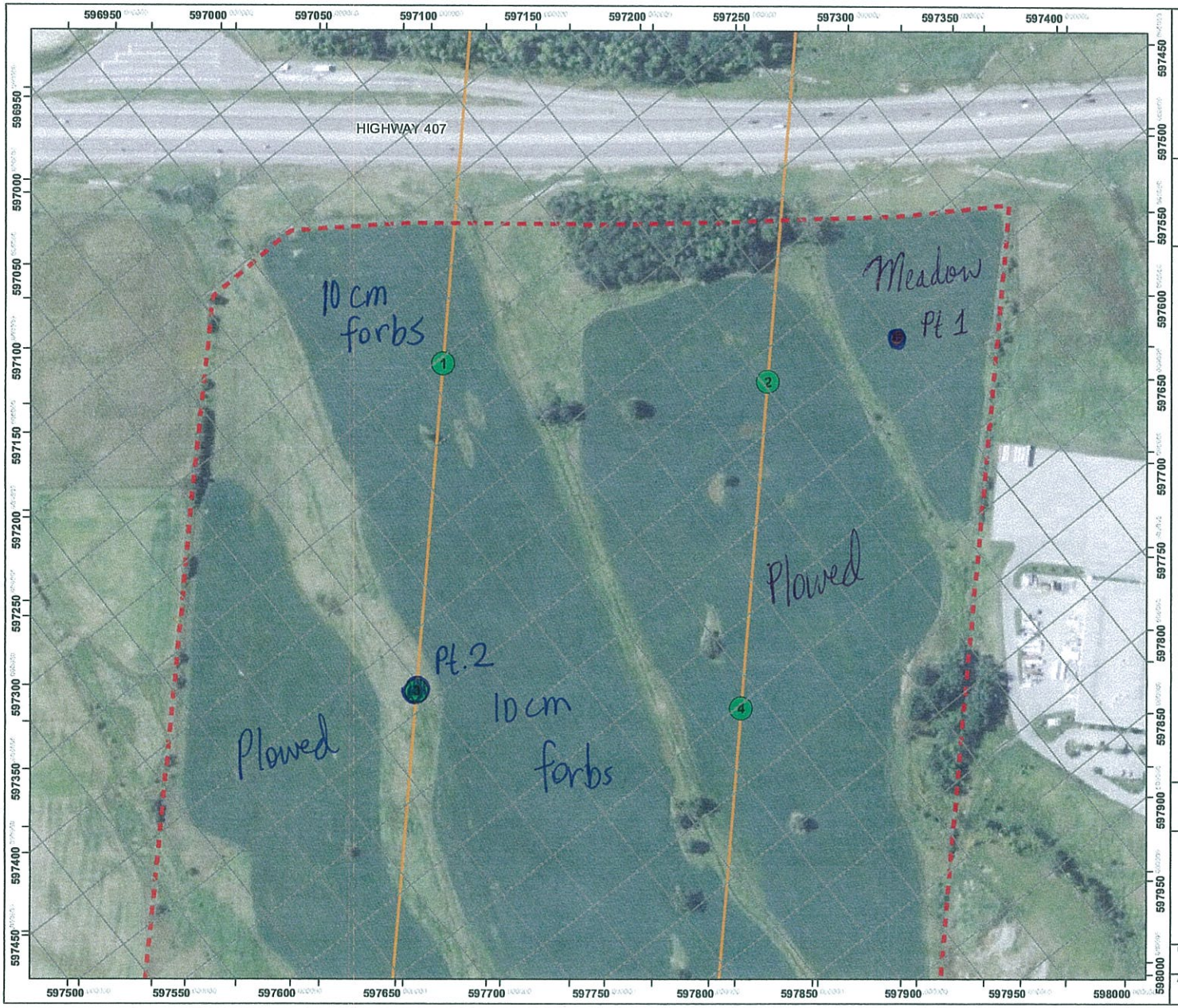

Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Bobolink Transects (North)

LEGEND

- Subject Property
- Transect Lines
- Point Count Location

Point	X	Y
1	597304	4809570
2	597470	4809750
3	597487	4809400
4	597653	4809580

Scale: 0 25 50 100 150 200 m

Client: Bentall Kennedy

Prepared by: MMM GROUP

Date: May 29, 2012

Project No.: 1409222001

Aerial Photo: © DigitalGlobe, 2010, Google, 2009

Figure:

M:\Jobs\2009\14122222\01_P01 - 407 West Employment Area\mxd\2012 05\Bobolink Transects (North).mxd

Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Bobolink Transects (South)

LEGEND

- Subject Property
- Transect Lines
- Point Count Location

Point	X	Y
5	597656	4809240
6	597822	4809420
7	597852	4809050
8	598018	4809240
9	598035	4808880
10	598201	4809070

Scale: 0 25 50 100 150 200 m

Client: Bentall Kennedy

Prepared by: MMM GROUP

Date: May 29, 2012

Project No.: 1409222001

Aerial Photo: © DigitalGlobe, 2010, Google, 2009

Figure:

Figure 1. Bat Survey Approach

1 Building

Survey station

Survey No.	Buildling No.
1	1
2	2, 3
3	4, 5
4	1
5	6, 2
6	3, 4
7	5, 6

Aerial Image Source: http://maps.oakville.ca/gxmaps/

hole in roof

Figure 1. Bat Survey Approach

1 Building

Survey station

Survey No.	Buildling No.
1	1
2	2, 3
3	4, 5
4	1
5	6, 2
6	3, 4
7	5, 6

Aerial Image Source: http://maps.oakville.ca/gxmaps/

- hole in roof

Nicki
channel 1 4 East
5430331

Figure 1. Bat Survey Approach

1 Building

Survey station

Survey No.	Buildling No.
1	1
2	2, 3
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5	6, 2
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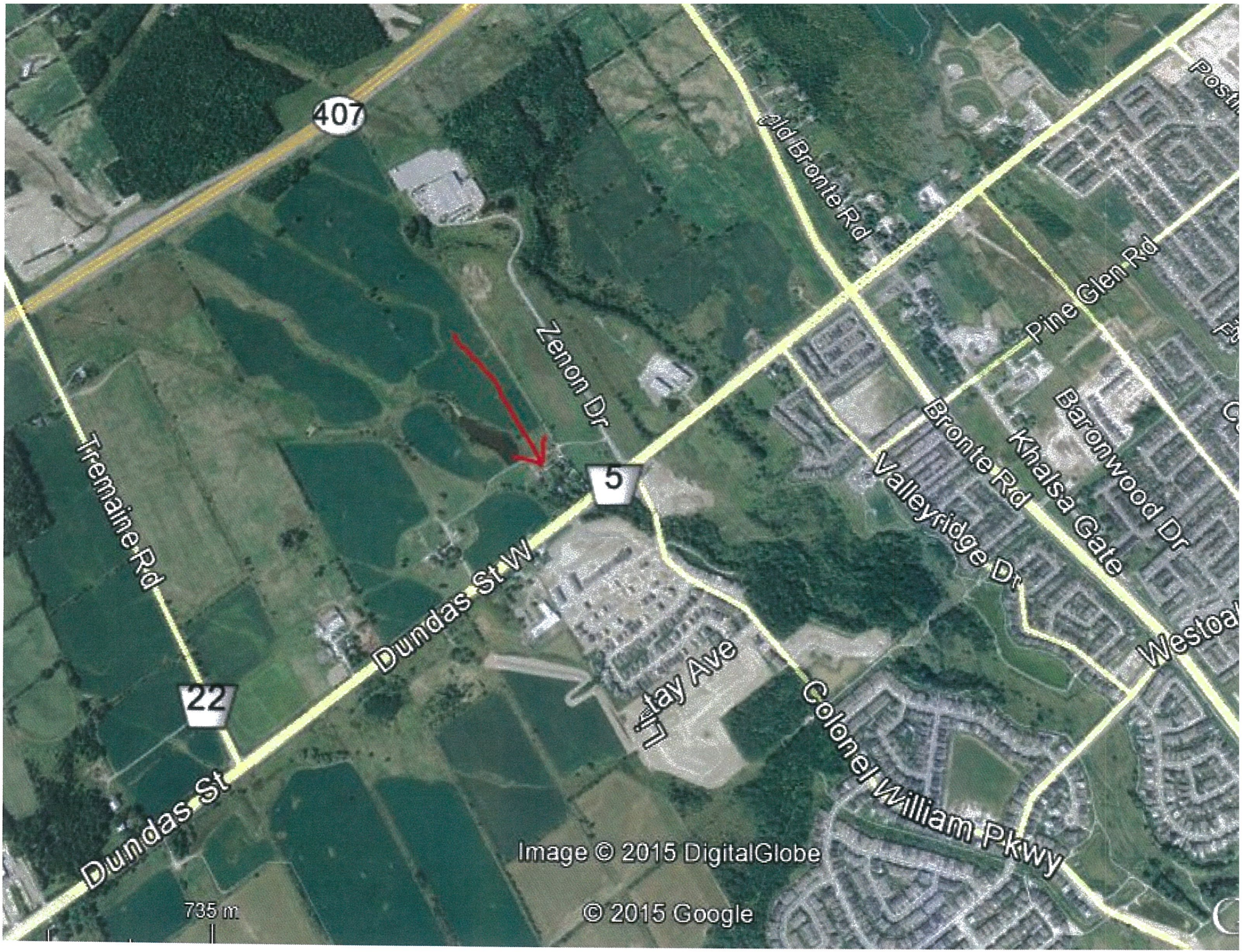
Aerial Image Source: http://maps.oakville.ca/gxmaps/


407
Old Bronte Rd
Pine Glen Rd
Zenon Dr
Tremaine Rd
5
Bronte Rd
Valleyridge Dr
Khalsa Gate
Baronwood Dr
Dundas St W
22
Dundas St
Lytay Ave
Colonel William Pkwy
Image © 2015 DigitalGlobe
© 2015 Google
735 m

MMM GROUP

Maternity Roost Exit Survey

Project Number: 1490222 Observers: NC Date: June 5, 2015

Survey Start Time (HH:MM): 18:57 Survey End Time (HH:MM) 22:30

WEATHER CONDITIONS

Sky Code*	Start: 1	End: 1	Wind Code*	Start: 2	End: 2	Temperature (C)	Start: 16	End: 14

OBSERVATIONS OF EXITING BATS

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour
West	1	21:36	appeared at centre of barn and flew out to N side

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

tally or #	Time of observation (hh:mm)	Notes on flight path and behaviour
1	21:26	flying across face towards Dundas / swamp

*Beaufort weather codes are provided on reverse

Observations continued on reverse

MMM GROUP

Maternity Roost Exit Survey

Project Number: _____ Observers: _____ Date: _____

OBSERVATIONS OF EXITING BATS (continued)

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

(tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

Notes: moderate amount of highway noise

Beaufort Wind Scale
0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30);
5= Fresh breeze, small trees begin to sway (31-39)
6= Strong breeze, large branches in motion (40-50)

Beaufort Sky Codes
0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, duststorm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms

MMM GROUP **Maternity Roost Exit Survey** Page 1 of 1

Project Number: 1490222 Lazy Pat **Observers:** C. Malcolm **Date:** June 4/15

Survey Start Time (HH:MM): 20:57 **Survey End Time (HH:MM)** 22:27

WEATHER CONDITIONS

Sky Code*	Start: 2	End: 2	Wind Code*	Start: 2	End: 2	Temperature (C)	Start: 16	End: 14

OBSERVATIONS OF EXITING BATS

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour
S	1	21:07	Flew S, Exited Top Window
S	1	21:12	Flew dan from Top Window, entered into doorway w wood pile
S	1	21:18	Flew out of top window to peak of barn, then flew South.
S	1	21:26	Exited Top window, flew South
S	1	21:31	Exited door w firewood pile, flew South

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

tally or #	Time of observation (hh:mm)	Notes on flight path and behaviour
1	21:24	Circled mic,
1	21:37	Bat flew around mic
1	21:43	Bat flew from E to West at 5 feet above ground

*Beaufort weather codes are provided on reverse

Observations continued on reverse

Project Number: 1490222 Observers: C. Malcolm Date: June 4

OBSERVATIONS OF EXITING BATS (continued)

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

(tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

Notes: - High level of traffic to the south.
- Many birds flying around, 1 landed on Mic/setup @ 21:27
- 5 bats observed exiting the barn with 3 observed flying around.
- most bats exiting from Top Window

ECO 041A
MIC-CH 1

Beaufort Wind Scale
0 = calm, smoke rises vertically (0-2km/hr)
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8 = showers
9 = thunderstorms

MMM GROUP

Maternity Roost Exit Survey

Project Number: 1490222 **Observers:** JM, NC, EM, JE **Date:** June 4

Bentall/Lazy Pat, 20:57 CH.0

Survey Start Time (HH:MM): ~~[illegible]~~ **Survey End Time (HH:MM)** 22:27

N S truck

WEATHER CONDITIONS

Sky Code*	Start: 4	End: 2	Wind Code*	Start: 2	End: 2	Temperature (C)	Start: 16°C	End: 14°C

OBSERVATIONS OF EXITING BATS

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

tally or #	Time of observation (hh:mm)	Notes on flight path and behaviour
1	20:25	Flew east from south side of the barn

*Beaufort weather codes are provided on reverse

Observations continued on reverse

MMM GROUP

Maternity Roost Exit Survey

Project Number: 14902a **Observers:** JM, CM, NC, JE **Date:** June 4

OBSERVATIONS OF EXITING BATS (continued)

Target cavity / opening #	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

(tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour

Notes: - Barn cat present
- Grey tree frogs ~~present~~ in area east of the barn

Beaufort Wind Scale
0 = calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3= Gentle breeze, leaves & twigs in constant motion (12-19)
4= Moderate breeze, small branches moving, raises dust & loose paper (20-30);
5= Fresh breeze, small trees begin to sway (31-39)
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5 = drizzle or light rain
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8 = showers
9 = thunderstorms

MMM GROUP

Maternity Roost Exit Survey

Project Number: 1409 0222 Lazy-Pat **Observers:** JE **Date:** June 4, 2015

Survey Start Time (HH:MM): 20:57 **Survey End Time (HH:MM)** 22:37

WEATHER CONDITIONS

Sky Code*	Start: 4	End: 0	Wind Code*	Start: 2	End: 1	Temperature (C)	Start: 16°C	End: 14°C

OBSERVATIONS OF EXITING BATS

Target cavity / opening # (N-W)	bats observed exiting (tally or #)	Time of observation (hh:mm)	Notes on flight path and behaviour
N	1	21:26	-headed west -exited large barn door
N	1	21:37	-headed north -from small barn.

BATS OBSERVED IN GENERAL AREA (NOT SEEN EXITING)

tally or #	Time of observation (hh:mm)	Notes on flight path and behaviour

*Beaufort weather codes are provided on reverse

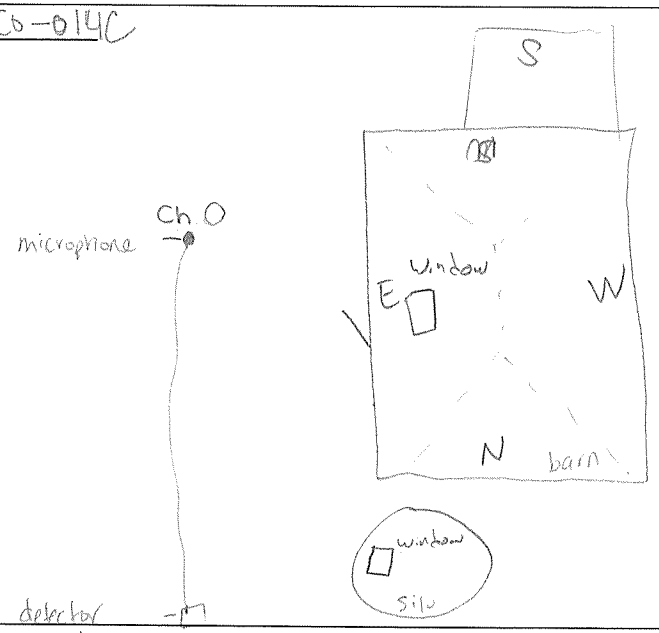
Observations continued on reverse

MMM GROUP

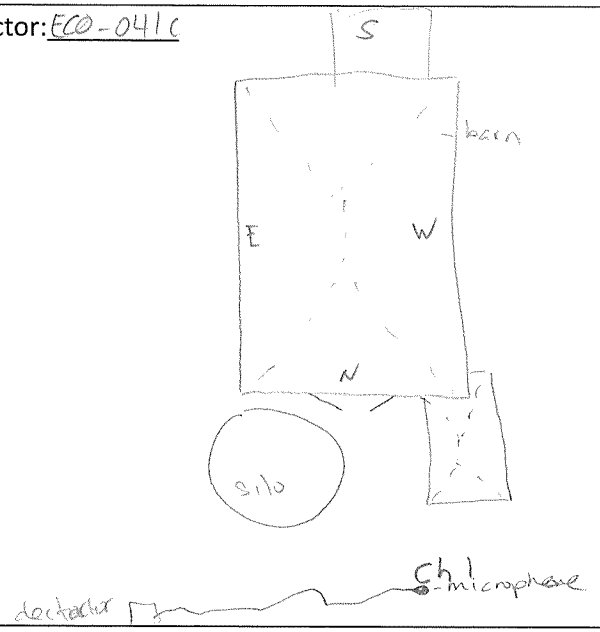
BAT DETECTOR DEPLOYMENT SUMMARY DATASHEET

Site Sketches – show the position of each deployed detector and its microphone(s) relative to target trees/cavities and surroundings

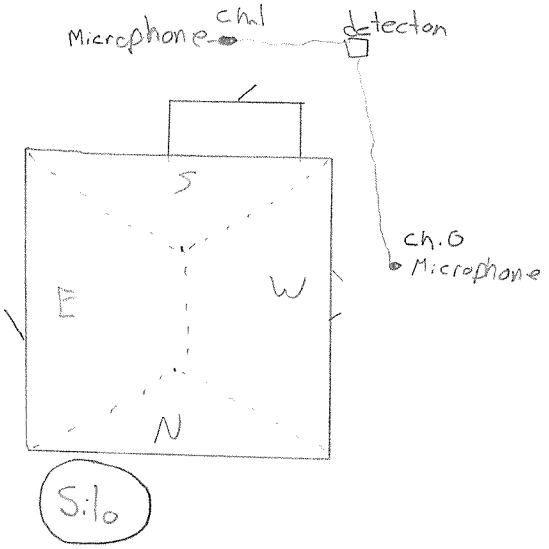
Detector: ECO-014C



Detector: ECO-041C



Detector: ECO_041A



Detector: _____

Bentall - Barn monitoring locations

Figure 1. Bat Survey Approach

Aerial Image Source: http://maps.oakville.ca/gxmaps/