NEEGAN BURNSIDE

Appendix B
Location of Site Investigation and Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
401004001802500	Lot 23	Con 18	Stephen	South Huron, Municipality of	Site Investigation
401004001902700	Lot 22	Con 19	Stephen	South Huron, Municipality of	Site Investigation
401004001902800	Lot 23	Con 19	Stephen	South Huron, Municipality of	Site Investigation
401004002401100	Lot 5	Con A	Stephen	South Huron, Municipality of	Site Investigation
401004002401500	Lot 7	Con A	Stephen	South Huron, Municipality of	Site Investigation
401004002601035	Lot 5	E. of Lake Rd.	Stephen	South Huron, Municipality of	Site Investigation
401004002804500	Lot 36	Northern Bdry.	Stephen	South Huron, Municipality of	Site Investigation
401004002804600	Lot 37	Northern Bdry.	Stephen	South Huron, Municipality of	Site Investigation
402009001301825	Lot 15	Con 13	Hay	Bluewater, Municipality of	Site Investigation
402009001400200	Lot 27	Con 14	Hay	Bluewater, Municipality of	Site Investigation
402009001401600	Lot 16	Con 14	Hay	Bluewater, Municipality of	Site Investigation
402009001401700	Lot 15	Con 14	Hay	Bluewater, Municipality of	Site Investigation
402009001401800	Lot 14	Con 14	Hay	Bluewater, Municipality of	Site Investigation
402009001500200	Lot 27	Con 15	Hay	Bluewater, Municipality of	Site Investigation
402009001500300	Lot 26	Con 15	Hay	Bluewater, Municipality of	Site Investigation
402009001500400	Lot 24	Con 15	Hay	Bluewater, Municipality of	Site Investigation
402009001500600	Lot 21	Con 15	Hay	Bluewater, Municipality of	Site Investigation
402009001700300	Lot 6	Con 17	Hay	Bluewater, Municipality of	Site Investigation
402009001800101	Lot 3	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001800700	Lot 5	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001800900	Lot 6	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001801400	Lot 8	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001801600	Lot 8	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001801700	Lot 9	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001804000	Lot 14	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001804300	Lot 16	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001804400	Lot 16	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001804500	Lot 17	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009001804600	Lot 18	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001804700	Lot 19	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001805000	Lot 20	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001805305	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001805400	Lot 22	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001805900	Lot 26	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001806000	Lot 27	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001806100	Lot 28	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001806300	Lot 29	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001806400	Lot 31	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001806401	Lot 30	E. of Lake Rd.	Hay	Bluewater, Municipality of	Site Investigation
402009001905400	Lot 34	Southern Bdry.	Hay	Bluewater, Municipality of	Site Investigation
402009001905500	Lot 36	Southern Bdry.	Hay	Bluewater, Municipality of	Site Investigation
402009001905600	Lot 35	Southern Bdry.	Hay	Bluewater, Municipality of	Site Investigation
402009002000100	Lot 30	Northern Bdry.	Hay	Bluewater, Municipality of	Site Investigation
402019001404500	Lot 28	Southern Bdry.	Stanley	Bluewater, Municipality of	Site Investigation
N/A	Lot 1	Con 13 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
401001000106900	Lot 35	Con 1	Usborne	South Huron, Municipality of	Alternative Investigation
401001000207000	Lot 34	Con 2	Usborne	South Huron, Municipality of	Alternative Investigation
401001000207200	Lot 35	Con 2	Usborne	South Huron, Municipality of	Alternative Investigation
401001000207201	Lot 35	Con 2	Usborne	South Huron, Municipality of	Alternative Investigation
401001000304600	Lot 35	Con 3	Usborne	South Huron, Municipality of	Alternative Investigation
401001000304700	Lot 35	Con 3	Usborne	South Huron, Municipality of	Alternative Investigation
401001000404400	Lot 35	Con 4	Usborne	South Huron, Municipality of	Alternative Investigation
401001001802300	Lot 30	N.E.ern Bdry.	Usborne	South Huron, Municipality of	Alternative Investigation
401004002400700	Lot 4	Con A	Stephen	South Huron, Municipality of	Alternative Investigation
401004002400800	Lot 4	Con A	Stephen	South Huron, Municipality of	Alternative Investigation
401004002401000	Lot 5	Con A	Stephen	South Huron, Municipality of	Alternative Investigation
401004002401200	Lot 6	Con A	Stephen	South Huron, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
401004002401300	Lot 6	Con A	Stephen	South Huron, Municipality of	Alternative Investigation
401004002401400	Lot 6	Con A	Stephen	South Huron, Municipality of	Alternative Investigation
401004002500600	Lot 4	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002500700	Lot 5	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002500705	Lot 5	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002500800	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002500900	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002501000	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002501100	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002501200	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002501300	Lot 7	Con B	Stephen	South Huron, Municipality of	Alternative Investigation
401004002600910	Lot 4	E. of Lake Rd.	Stephen	South Huron, Municipality of	Alternative Investigation
401004002601002	Lot 5	E. of Lake Rd.	Stephen	South Huron, Municipality of	Alternative Investigation
401004002601300	Lot 6	E. of Lake Rd.	Stephen	South Huron, Municipality of	Alternative Investigation
401004002804400	Lot 35	Northern Bdry.	Stephen	South Huron, Municipality of	Alternative Investigation
401004002804700	Lot 38	Northern Bdry.	Stephen	South Huron, Municipality of	Alternative Investigation
402009000103300	Lot 16	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000103650	Lot 16	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000103700	Lot 16	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000103800	Lot 16	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000103900	Lot 15	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000103900	Lot 15	Con 1	Hay	Bluewater, Municipality of	Alternative Investigation
402009000201900	Lot 16	Con 2	Hay	Bluewater, Municipality of	Alternative Investigation
402009000201905	Lot 16	Con 2	Hay	Bluewater, Municipality of	Alternative Investigation
402009000202000	Lot 16	Con 2	Hay	Bluewater, Municipality of	Alternative Investigation
402009000202100	Lot 15	Con 2	Hay	Bluewater, Municipality of	Alternative Investigation
402009000202200	Lot 15	Con 2	Hay	Bluewater, Municipality of	Alternative Investigation
402009000301500	Lot 16	Con 3	Hay	Bluewater, Municipality of	Alternative Investigation
402009000301600	Lot 15	Con 3	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009000401300	Lot 16	Con 4	Hay	Bluewater, Municipality of	Alternative Investigation
402009000401400	Lot 15	Con 4	Hay	Bluewater, Municipality of	Alternative Investigation
402009000501500	Lot 16	Con 5	Hay	Bluewater, Municipality of	Alternative Investigation
402009000501600	Lot 15	Con 5	Hay	Bluewater, Municipality of	Alternative Investigation
402009000601300	Lot 17	Con 6	Hay	Bluewater, Municipality of	Alternative Investigation
402009000601400	Lot 16	Con 6	Hay	Bluewater, Municipality of	Alternative Investigation
402009000601500	Lot 15	Con 6	Hay	Bluewater, Municipality of	Alternative Investigation
402009000701400	Lot 16	Con 7	Hay	Bluewater, Municipality of	Alternative Investigation
402009000701500	Lot 16	Con 7	Hay	Bluewater, Municipality of	Alternative Investigation
402009000701600	Lot 15	Con 7	Hay	Bluewater, Municipality of	Alternative Investigation
402009000701700	Lot 15	Con 7	Hay	Bluewater, Municipality of	Alternative Investigation
402009000801800	Lot 16	Con 8	Hay	Bluewater, Municipality of	Alternative Investigation
402009000801900	Lot 15	Con 8	Hay	Bluewater, Municipality of	Alternative Investigation
402009000802000	Lot 15	Con 8	Hay	Bluewater, Municipality of	Alternative Investigation
402009000802100	Lot 14	Con 8	Hay	Bluewater, Municipality of	Alternative Investigation
402009000901500	Lot 16	Con 9	Hay	Bluewater, Municipality of	Alternative Investigation
402009000901600	Lot 15	Con 9	Hay	Bluewater, Municipality of	Alternative Investigation
402009001004500	Lot 16	Con 10	Hay	Bluewater, Municipality of	Alternative Investigation
402009001004600	Lot 15	Con 10	Hay	Bluewater, Municipality of	Alternative Investigation
402009001102200	Lot 17	Con 11	Hay	Bluewater, Municipality of	Alternative Investigation
402009001102320	Lot 16	Con 11	Hay	Bluewater, Municipality of	Alternative Investigation
402009001102500	Lot 15	Con 11	Hay	Bluewater, Municipality of	Alternative Investigation
402009001201500	Lot 16	Con 12	Hay	Bluewater, Municipality of	Alternative Investigation
402009001201520			Hay	Bluewater, Municipality of	Alternative Investigation
402009001201530			Hay	Bluewater, Municipality of	Alternative Investigation
402009001201535	Lot 15	Con 12	Hay	Bluewater, Municipality of	Alternative Investigation
402009001201600	Lot 15	Con 12	Hay	Bluewater, Municipality of	Alternative Investigation
402009001300100	Lot 28	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001300300	Lot 27	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009001300900	Lot 22	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001301700	Lot 16	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001301800	Lot 16	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001301900	Lot 15	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001302000	Lot 15	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001302200	Lot 14	Con 13	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400100	Lot 28	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400300	Lot 27	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400310	Lot 27	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400400	Lot 26	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400415	Lot 26	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400700	Lot 24	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001400900	Lot 23	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401000	Lot 21	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401100	Lot 20	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401300	Lot 19	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401325	Lot 19	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401400	Lot 18	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401500	Lot 17	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401515	Lot 17	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001401900	Lot 14	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001402000	Lot 13	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001402100	Lot 11	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001402400	Lot 10	Con 14	Hay	Bluewater, Municipality of	Alternative Investigation
402009001500100	Lot 28	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001500305	Lot 26	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001500500	Lot 23	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001500700	Lot 21	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001500800	Lot 21	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009001501100	Lot 20	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501200	Lot 20	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501215	Lot 19	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501230	Lot 18	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501300	Lot 18	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501400	Lot 18	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501500	Lot 17	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501520	Lot 17	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501600	Lot 16	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501605	Lot 16	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501700	Lot 16	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501705	Lot 16	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501800	Lot 15	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501805	Lot 15	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501900	Lot 14	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001501920	Lot 14	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502000	Lot 13	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502100	Lot 13	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502105	Lot 12	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502200	Lot 12	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502300	Lot 11	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502400	Lot 11	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001502600	Lot 10	Con 15	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600001	Lot 4	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600100	Lot 11	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600101	Lot 10	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600105	Lot 10	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600200	Lot 10	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600300	Lot 9	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009001600400	Lot 9	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600500	Lot 8	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001600900	Lot 7	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001601000	Lot 7	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001601100	Lot 7	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001601200	Lot 6	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001601400	Lot 4	Con 16	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700100	Lot 8	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700200	Lot 7	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700400	Lot 6	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700500	Lot 5	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700600	Lot 5	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700700	Lot 4	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001700701	Lot 4	Con 17	Hay	Bluewater, Municipality of	Alternative Investigation
402009001800100	Lot 4	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001800600	Lot 5	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001803700	Lot 13	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001804100	Lot 15	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001804105	Lot 15	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001804200	Lot 15	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001804800	Lot 19	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805001	Lot 20	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805100	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805101	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805105	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805200	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805205	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805300	Lot 21	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805500	Lot 23	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009001805505	Lot 23	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001805705	Lot 25	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001806500	Lot 32	E. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009001905501	Lot 36	Southern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000200	Lot 30	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000300	Lot 29	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000315	Lot 29	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000400	Lot 29	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000500	Lot 28	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002000700	Lot 27	Northern Bdry.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200100	Lot 1	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200300	Lot 2	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200301	Lot 1	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200302	Lot 1	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200400	Lot 2	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200401	Lot 2	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002200500	Lot 2	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002300100	Lot 3	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002300105	Lot 3	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002903000	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002905100	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002905200	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002905400	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002905800	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009002906200	Lot 14	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000100	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000115	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000200	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000300	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009003000400	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000500	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000600	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000605	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000700	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000715	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000800	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000900	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003000905	Lot 15	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003001000	Lot 16	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003001100	Lot 16	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003001200	Lot 16	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003001300	Lot 16	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003103005	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003103200	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003103300	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003103400	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003103500	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104200	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104500	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104600	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104605	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104705	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003104900	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105100	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105200	Lot 18	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105300	Lot 17	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105500	Lot 17	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105600	Lot 17	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
402009003105700	Lot 17	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003105901	Lot 17	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003202400	Lot 20	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003300100	Lot 22	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003300101	Lot 21	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003300108	Lot 22	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402009003308000	Lot 24	W. of Lake Rd.	Hay	Bluewater, Municipality of	Alternative Investigation
402019001404200	Lot 27	Southern Bdry.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019001404400	Lot 30	Southern Bdry.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019001404800	Lot 30	Southern Bdry.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019001404900	Lot 30	Southern Bdry.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019001804700	Lot 23	E. of Lake Rd.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019003700200	Lot 25	W. of Lake Rd.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019003700201	Lot 25	W. of Lake Rd.	Stanley	Bluewater, Municipality of	Alternative Investigation
402019003700202	Lot 25	W. of Lake Rd.	Stanley	Bluewater, Municipality of	Alternative Investigation
404016000300100	Lot 1	Con 3 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000400100	Lot 1	Con 4 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000400105	Lot 1	Con 4 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000500100	Lot 1	Con 5 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000600100	Lot 1	Con 6 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000600200	Lot 1	Con 6 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000700100	Lot 1	Con 7 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000800100	Lot 1	Con 8 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016000900100	Lot 1	Con 9 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
404016001000100	Lot 1	Con 10 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001100100	Lot 1	Con 11 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001200100	Lot 1	Con 12 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001200200	Lot 1	Con 12 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001300200	Lot 1	Con 13 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001300300	Lot 1	Con 13 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001300400	Lot 1	Con 13 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001300405	Lot 1	Con 13 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001400100	Lot 1	Con 14 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001400102	Lot 1	Con 14 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001400105	Lot 1	Con 14 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001500200	Lot 2	Con 15 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001500201	Lot 2	Con 15 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016001500300	Lot 1	Con 15 S. of Huron Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016002100100	Lot 1	Con 1 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016002200100	Lot 2	Con 2 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016002200200	Lot 1	Con 2 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016002300100	Lot 1	Con 3 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
404016002300200	Lot 1	Con 3 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation

Roll Number	Lot	Concession	Township	Municipality	Investigation Type
404016002300300	Lot 1	Con 3 E. of London Road	Tuckersmith	Huron East, Municipality of	Alternative Investigation
N/A	Lot 30	Con 7	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 6	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 13	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 4	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 10	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 12	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 11	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 3	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 5	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 8	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 9	Hibbert	West Perth, Municipality of	Alternative Investigation
N/A	Lot 30	Con 14	Hibbert	West Perth, Municipality of	Alternative Investigation

NEEGAN BURNSIDE

Appendix C
Agency Correspondence

RE: Tundra Swan survey methodology
Boos, John (MNR)
to:
Tricia Radburn
03/22/2012 10:05 AM
Cc:
"Cameron, Amy (MNR)"
Show Details

History: This message has been forwarded.

2 Attachments

image001.gif 019991_Tundra Swan Survey MethodsJBoos.docx

Tricia,

I apologize for not getting back right away, but I was away at a training course at the beginning of this week.

Attached is your method for this habitat with my comments. We may want to talk, I think you missed the assessment period for this habitat for this year due to the very unusual mild conditions for late winter. Also the method you proposed was not consistent with other methods that we have been accepting, therefore as you stated you should have provided the method for acceptance prior to starting.

I think going forward you are going to need to establish if there are areas that hold sheet-water (meltwater) that attract swans or other migrating waterfowl on an annual basis during spring migration, that are.within your project location. This can be done by any drive around work done early enough in March or from talking to landowners.

John Boos
Renewable Energy Field Advisor - Biologist
705-755-1748

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: March 19, 2012 2:55 PM
To: Boos, John (MNR)
Subject: Tundra Swan survey methodology

John,

I am following up on our discussion last Friday regarding Tundra Swans in the vicinity of the Grand Bend Wind Farm project.

We have begun surveys and have been monitoring the observations noted at the Thedford Flats IBA which is to the south of our project. http://www.lclmg.org/lclmg/Default.aspx?tabid=128

I realize we never submitted our methodology to you for approval before surveys began. I have attached our proposed plan.

I apologize for the short notice but if you have any questions or comments about our methodology please let me

know.

Thanks so much.

NEEGAN BURNSIDE

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

Neegan Burnside Ltd.
292 Speedvale Ave. W, Guelph, ON N1H 1C4
tricia.radburn@neeganburnside.com
tel: (519) 823-4995 ext. 479
fax: (519) 836-5477
www.neeganburnside.com

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Thank you.

****

Tundra Swan Survey Methodology

The purpose of spring migration surveys was primarily to confirm the location and significance of candidate waterfowl stopover and staging areas in the vicinity of the turbines and access roads.

The Grand Bend area is located along a Tundra swan migration corridor (Petrie and Wilcox, 2003) and an important and well documented Tundra Swan stopover area is located approximately 6km to the south of the Project Location. This area, known as the Thedford Flats Important Bird Area was documented in the Records Review Report but was not brought forward for further study due to its distance from the Project. On-line reporting of Tundra swan observations from the Thedford Flats area was used to confirm the timing of swan migration through the area (Lambton Heritage Museum, March-April, 2012).

Waterfowl typically use flooding meadows for stopover areas. For Tundra swans, agricultural fields with waste grains can also be important.

A stopover count method will be used to complete six surveys targeting Tundra swans between March 18, 2012 and April 6, 2012 (two surveys each week for three weeks). Stopover counts will involve driving all or most roads slowly at 20 to 30 km/hr with the windows open and watching and listening. Areas containing concentrations of birds will be identified and recorded on a map of the study area along with the date of observation and approximate number of individuals. Once a concentration of tundra swans is located in the study area, an effort will be made to revisit that area to determine if they were being used on multiple occasions. The total number of individual tundra swans in flocks or areas of concentration will be estimated. The direction and height of flight of tundra swan flocks will be estimated whenever possible.

Each survey will consist of an evening component, which will be conducted after 5 pm for 2 to2.5 hours and a day component which will be conducted for 5 to 5.5 hours in the morning and earlyafternoon. (Times are approximated based on an estimated time to cover the study area).

Roadside surveys will take place within the vicinity of turbines, access roads, transformer stations and along the two proposed transmission lines routes.

Comment [jdb1]: The methodology provided here is not consistent with other methods for this habitat that MNR has reviewed recently.

Comment [jdb2]: Grand Bend is also noted in Appendix K of the SWHTG as an important Waterfowl Staging area.

Comment [jdb3]: Note for a tundra swan site to be significant waste grain fields can be used but the fields need to be subject to sheet water flooding, these sites will attract swans annually as seen at the Greenway road site, the criteria from the SWHTG requires annual use of the habitat, without sheet-water/melt-water then this will not occur. Transitional habitats without sheet water will not attract Swans annually.

Comment [jdb4]: For this year this may be too late, due to the mild end of winter Swans showed up early, sheetwater in fields was limited and mostly available in the first weeks of March.

Comment [jdb5]: Driving the roads should be used as an assessment method for determining which fields have sheet water and may hold staging waterfowl, this is best done in late February/Early March, when conditions are unthawing and meltwater is in fields. For determining these habitats it is also recommended to talk to landowners, they may be able to tell you which fields have melt-water and hold swans every year.

Comment [jdb6]: Areas with Sheet-water in pastures or in grain fields should be revisited 3-4 times during migration period and vantage points set-up, these vantage points need to be GPS'd and used on subsequent visits.. If the sheet-water areas are large and follow drainage ditches or stream-ways then numerous vantage points may need to be set-up .

Comment [jdb7]: Surveys for waterfowl should be completed in morning hours as this is the time waterfowl move from roosting habitat to feeding habitat, therefore sun-up to around 10am is recommended.

Comment [jdb8]: These roadside surveys are good for finding the sheet-water areas at the right time of year.

Comment [jdb9]: Mapping of the CSWH is important, CSWH (fields with sheetwater) should have a 100-300m buffer dependant on the sensitivity of the site, therefore mapping these sites will not follow field polygon boundaries but will follow the sheetwaer boundary and surrounding lands within 100-300m.

RE: bat roosting and wetland evaluation protocol questions
Boos, John (MNR)
to:
Tricia Radburn
01/13/2012 11:14 AM
Cc:
"Cameron, Amy (MNR)"
Show Details

History: This message has been replied to and forwarded.

1 Attachment

image001.gif

Tricia,

I will try and answer your questions:

1) Yes SWD and SWM ecosites should be included, these sites if the trees are older or mature have good potential for high wildlife/tree sang densities.

2) Have you produced a Raptor Winter Roosting Habitat procedure and shared it with us? Visiting sites only 3 times is fairly minimal, I have copied a protocol below from another consultant that you might want to use. This protocol did not have access to land due to landowner permission, if you have access to the CSWH we would expect a transect or transects to be delineated for area searches within each specific CSWH.

3) The defining criteria for the Raptor Winter habitat is a combination of Field and Woodland/Treed habitat >20ha in area, of this >15ha should be field habitat. The field habitat should be meadow, idle/old fields, or low intensity agriculture area (low intensity pasture or haylands). Agriculture fields being heavily pastured, in crop rotation or that are hayed for silage or multiple times during the season should not be included. The intent is fields/meadows that are available annually and have low levels of usage providing long term habitat.

I hope this is helpful,

John Boos
Renewable Energy Field Advisor - Biologist
705-755-1748

Monitoring Frequency and Timing

Through initial discussions with MNR staff, XXX will conduct winter raptor surveys at each of these three locations approximately every 7-10 days throughout January and February 2012. Exact time spent at each habitat will largely be dependent on site access, length of woodland edge, and number of birds observed, however all surveys will occur during daylight hours, between 0900-1600hrs, when raptors are expected to be most visible at potential perching locations.

Based on the guidance provided by the MNR, XXXI proposes to conduct surveys approximately 10 days apart, totaling 3 visits in January and 3 visits in February. Approximate timing of the visits is tentatively scheduled for January 5, 17, 26, and February 7, 16, 28. Despite a tentative monitoring schedule, these dates may be shifted slightly depending on weather conditions. In the event that a survey cannot be completed as planned, all attempts will be made to re-schedule this trip as quickly as possible.

At the end of January 2012, XXX will review the results to determine if surveys should continue for the remaining 4 week survey period in February. In the event that none of the 6 indicator species (as identified by the Draft 2011 SWH 7E Ecoregion Criteria) are observed during any of the first 3 visits, XXX will conclude that these habitats are not significant raptor wintering areas and will discontinue surveys at these locations for the remainder of the monitoring program. In this instance, an email notification to the MNR will be provided to provide initial results and confirm the approach to discontinue studies.

Survey Methods

All three potential raptor wintering habitats are located on properties adjacent to those with infrastructure, without specific access granted. As a result, biologists will conduct behavioural studies from the roadside, adjacent property, or other suitable vantage point. These surveys will be conducted for at least 30 minutes to allow enough time to thoroughly scan the woodland edge and field for indication of raptor perching or foraging. Data collected will be similar to that for standardized area searches, and will include:

- Level of effort (including start and end time, time spent, weather conditions, etc.),
- Complete list of all wildlife species,
- Description of habitats or areas scanned during the survey,
- A GPS point of the survey location will be documented on the first visit to be mapped for consistency between visits.

Evaluation of Significance and Reporting

At the completion of the monitoring program in late February 2012, XXX will review all data collected during the monitoring period and compare it to provincial standards for significant raptor wintering areas. These standards, as observed in the SWH 7E Ecoregion Criteria, include:

- One or more short-eared owls ((*Asio flammeus*), or
- At least 10 individuals and two indicator species, and
- Used regularly for a minimum of 20 days by either of the above number of birds.

Following the review of the data collected during the winter raptor field studies, XXX will prepare a detailed memo that describes the specific methods and presents the results of the 2012 winter raptor surveys. This memo will be prepared in a way that is consistent with appropriate provincial guidelines and recommendations relating to renewable energy projects, including specific details relating to the evaluation of significance of each feature. For each feature, XXX will also outline any potential impacts and appropriate mitigation measures (if necessary). Other appropriate information, including habitat descriptions, photos, and detailed mapping, will also be included as part of the memo submission. This memo will be provided to the MNR for review and comment.

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: January 13, 2012 10:57 AM
To: Boos, John (MNR)
Cc: Cameron, Amy (MNR)
Subject: RE: bat roosting and wetland evaluation protocol questions

John,

I just wanted to clarify a couple of other things before we completed our winter field work:

1. With respect to potential bat maternal habitat, the guideline indicates that the surveys should be done in ELC communities that are mixed or deciduous forest. Should swamps be included in this?

2. For raptor winter feeding and roosting areas, the defining criteria for significance is if the site is used for a

minimum of 20 days annually. Are you looking for each potential habitat to be surveyed for 20 days? We are proposing to visit each area once every 2 weeks for 6 weeks (i.e. 3 visits to each potential habitat). Is that sufficient?

3. Also with respect to raptor winter feeding areas, the defining criteria indicates that a combination of forest and open country habitats (CUM, CUT, CUS, CUW) must be present. Would pasture land and hayfields also be considered significant?

Thanks so much.
Tricia

From: "Boos, John (MNR)" <john.boos@ontario.ca>
To: "Tricia Radburn" <Tricia.Radburn@rjburnside.com>
Cc: "Cameron, Amy (MNR)" <Amy.Cameron@ontario.ca>
Date: 01/09/2012 11:21 AM
Subject: RE: bat roosting and wetland evaluation protocol questions

---

Tricia,

Here are my ideas on how to determine the bat maternity roost habitat at Site Investigation for the area you have access to and for the area with no access.

1) Complete ELC mapping of Vegetation Type (e.g. FOD-06) Polygons for the area that you have access. Complete ELC Polygon mapping (Ecosite if possible) for the area you do not have access using air photo-interpretation and from fence-line/ road side observations. Determine if mapped habitat polygons from accessible area extends into non-accessible area as well as possible.
2) Determine which mapped Vegetation type or Ecosite polygons meet criteria for mixed-wood and deciduous forest. Determine if these forest polygons are older with predominant canopy trees>25cm dbh. If these criteria are met then a determination of snags/cavity trees per ha needs to be estimated, do this within each ELC polygon that you have access to and follow direction for this from Bat Guideline App. A, page 14. For polygons with no access and that do not extend from accessible polygons estimate if snags/cavity trees >25cm dbh are present from fence-line or road-side observation as well as possible.
3) If an accessible polygon meets the habitat criteria, then consider the polygon as CSWH, apply Appendix D of NHAG, if a wind turbine is in adjacent lands then EOS study will be required as outlined within the Bat Guidelines, this will only be able to be completed on the accessible area of the polygon or on cavity trees that are easily observed from the fenceline (when a polygon extends beyond the accessible area).
4) If an ELC polygon is determined to be CSWH that is in the non-accessible area, contact MNR for a potential procedure for EOS. We will determine a procedure based on what is identified, for example if numerous cavity trees are along the fence-line, then the exit surveys may be able to be done on these cavity trees or a visual survey along the fence-line in conjunction with acoustic surveys may be used to come up with a level of bat activity and species using the area or the woodlot.

For Wetlands that are not accessible, complete the assessment using air-photo/ortho-imagery interpretation as well as possible. App. C of NHAG was developed for these instances, therefore a desk top completion of the wetland evaluation can be completed as well as possible using whatever information you have. Any information obtained from fence-line or road-side observation can also be used, this should have been picked up during the ELC polygon mapping done during the Site Investigation. Ensure that it is identified within the completion of the App. C write-up that access to the lands was not available and how the wetland boundary was estimated on these non-accessible adjacent lands.

If you have further questions or want to discuss please feel free to contact me.

Regards,

John Boos
Renewable Energy Field Advisor - Biologist
705-755-1748

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: January 4, 2012 2:22 PM
To: Boos, John (MNR)
Subject: Fw: bat roosting and wetland evaluation protocol questions

John, I am following up on my email below. If I should be contacting someone else instead of you please let me know.

Thanks so much.
Tricia Radburn

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****

----- Forwarded by Tricia Radburn/RJB on 01/04/2012 02:20 PM -----

From: Tricia Radburn/RJB
To: john.boos@ontario.ca
Date: 12/15/2011 03:09 PM
Subject: bat roosting and wetland evaluation protocol questions

---

John,

We met back in September when you visited our Guelph office to discuss the Northland Power Grand Bend Wind Farm. I have two questions that I was hoping you could answer.
1. We are preparing to complete surveys to identify Candidate Bat Maternity Roosts in accordance with the protocol provided in the Bat and Bat Habitat Guidelines (2011). The protocol involves determining the density of snags/cavity trees per hectare. In certain areas we are only able to access a portion of a forested area where we don't have landowner permission to enter adjacent properties (see attached figure for an example). How do we

do the survey and calculations in these cases? Do we just assume the size of the forest to be the size of the forest area that we can access? When we are identifying the number of plots that are needed do we just consider the size of the area we can access?

2.

2. Similarly, I'm wondering how to do the simplified wetland evaluation process described in Appendix C of the Natural Heritage Assessment Guide for adjacent properties that are not accessible? Any guidance you could provide would be much appreciated.

Please note that, in the attached figure, turbine 35 will not be located in the position where it is shown. We have set it back farther fro the wooded areas but we still need to collect habitat info from the woodland shown.

Thanks so much.

NEEGAN BURNSIDE

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

Neegan Burnside Ltd.
292 Speedvale Ave. W, Guelph, ON N1H 1C4
tricia.radburn@neeganburnside.com
tel: (519) 823-4995 ext. 479
fax: (519) 836-5477
www.neeganburnside.com

1.

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----- Forwarded by Tricia Radburn/RJB on 12/15/2011 02:52 PM -----

From: GuelphXerox7655@rjburnside.com
To: "Tricia.Radburn@rjburnside.com " <Tricia.Radburn@rjburnside.com>
Date: 12/15/2011 02:51 PM
Subject: Scan from a Guelph Xerox WorkCentre

Please open the attached document. Please remove this attachment from your mail database and save it into the appropriate network share, and or into Adept.

Attachment File Type: PDF

WorkCentre Location: machine location not set
Device Name: guelphxerox7655

RE: GRAND BEND WIND FARM - MNR COMMNENTS FOR RECORDS REVIEW

Cameron, Amy (MNR) to: Tricia Radburn 04/04/2012 07:58 PM

Tricia,

Here are the answers to your questions below:

1. Woodland Raptor Nesting is >30ha with >10ha interior. Interior habitat is determined by applying a 200m buffer.

2. If you find a nest during Site Investigation you will need to apply the appropriate buffer size around the nest. Once the buffer is mapped you need to determine if your project location is within the habitat or within 120m of the habitat. If you are within the habitat a behavioural survey is still required because you will need to be able to compare post-construction surveys to your pre-construction baseline information to determine if there is an operational impact. If you are within 120m of the habitat you do not need to do any additional surveys because the habitat would be considered "generalized candidate significant wildlife habitat" and be carried forward to the EOS where it will be treated as significant and carried forward to the EIS where general construction mitigation will be applied (see Appendix D of the Natural Heritage Assessment Guide).

3. You are right – for the habitat to be considered "candidate" in the site investigation it must meet the size criteria. If it does not meet the size criteria it will not be carried forward to the EOS Report. You may also come across habitats that meet the size criteria but you didn't find any nests - you wouldn't carry these habitats forward to the EOS Report either (you will have to make sure you did a good search of the habitat to say there were no nests).

Hope this helps!

Amy

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: April 4, 2012 2:26 PM
To: Cameron, Amy (MNR)
Subject: RE: GRAND BEND WIND FARM - MNR COMMNENTS FOR RECORDS REVIEW

Thanks Amy. That leads me to a couple of more questions...

- The criteria for woodland raptor nesting indicates woodland >30 ha with >10ha of interior. Should this still be 10ha interior or should it also be 4ha?
- Also with regard to woodland raptor nesting, previously we were supposed to conduct behavioural observations to determine the extent of habitat around the nest. Do we still need to do that or do we just apply the applicable radius' as noted in the criteria?
- Also, if a nest is present (e.g. sharp-shinned hawk nest) but it is in a forest that does not meet the criteria (i.e. it is less than 30ha in size) is it not significant?

Thanks,
Tricia

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From: "Cameron, Amy (MNR)" <Amy.Cameron@ontario.ca>
To: "Tricia Radburn" <Tricia.Radburn@rjburnside.com>
Date: 04/04/2012 01:23 PM
Subject: RE: GRAND BEND WIND FARM - MNR COMMNENTS FOR RECORDS REVIEW

Tricia - sorry about the confustion - this was an oversight on MNR's part in the draft 6E schedule. It use to be >10ha but was changed to >4ha. Please revise the records review report to include this information. THe final 6E schedule will read >4ha.

Thanks for noticing!!!

Amy Cameron

A/Renewable Energy Field Advisor
Renewable Energy Operations Team
Ministry of Natural Resources
31 Riverside Drive, Pembroke
p. 613-732-5506

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: Wed 04/04/2012 11:47 AM
To: Cameron, Amy (MNR)
Subject: Re: GRAND BEND WIND FARM - MNR COMMNENTS FOR RECORDS REVIEW

Amy,

Thanks for getting back to us so quickly with comments on our Records Review. I just had one quick question regarding woodland area-sensitive bird breeding habitat.

The old criteria identified that there needed to be at least 10ha of interior forest. The new criteria only notes that the entire woodland needs to be at least 30ha but there is no amount of interior forest listed. Do we consider any woodland as a candidate habitat if it has any amount of interior forest (200m from an edge)?

Thanks.
Tricia

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Thank you.

****

RE: Identifying candidate bat maternity roosts
Cameron, Amy (MNR)
to:
Tricia Radburn, Hale, Lesley (MNR)
06/11/2012 04:41 PM
Show Details

1 Attachment


image001.gif

Tricia,

You mention that you conducted snag density counts but then you mention you don't have property access. I'm not sure how you were able to do the density county without access to the lands. However, here is the answer where landowner permission cannot be obtained for access to the property. You will want to make sure that you have documentation that indicates you were denied access in case you are asked for this.

In the case where you cannot get landowner permission to access a property, you will not be able to complete the snag density count to determine if the woodland is candidate significant wildlife habitat for bat maternity colonies. You also won't be able to locate suitable snags/cavity trees within the woodland where you could conduct exit counts.

There is no other option available for completing a survey that would provide MNR with the information necessary to determine if the habitat is significant.

Therefore, the best option in this case is to identify in the SI report that you attempted to get landowner permission but were denied. Indicate that the woodland will be treated as significant but no EOS survey is required because it is not possible. Set the turbine back from the woodland as far as possible and in the EEMP make sure you include this turbine as one of the turbines that is monitored.

Hope this helps!

Amy

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: June 11, 2012 4:28 PM
To: Hale, Lesley (MNR)
Cc: Cameron, Amy (MNR)
Subject: RE: Identifying candidate bat maternity roosts

Leslie/Amy,

Through our cavity/snag density survey, we identified two woodlots within 120m of a turbine which meet the criteria for candidate bat maternal colony habitat. Both woodlots are on properties which are not participating in the project and we do not have permission to enter the lands. Is there a protocol for conducting the Evaluation of Significance in these instances? Can the exist surveys be conducted form the nearest roadside?

Thanks.

NEEGANBURNSIDE

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

Neegan Burnside Ltd.
292 Speedvale Ave. W, Guelph, ON N1H 1C4
tricia.radburn@neeganburnside.com
tel: (519) 823-4995 ext. 479
fax: (519) 836-5477
www.neeganburnside.com

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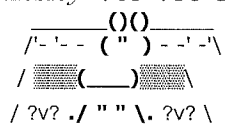
Thank you.

****

From: "Hale, Lesley (MNR)" <Lesley.Hale@ontario.ca>
To: "Cameron, Amy (MNR)" <Amy.Cameron@ontario.ca>, <tricia.radburn@rjburnside.com>
Date: 05/23/2012 10:28 AM
Subject: RE: Identifying candidate bat maternity roosts

Hi Tricia
Please see my responses below...please feel free to call me should you need further clarification.

Lesley 705-755-3247



From: Cameron, Amy (MNR)
Sent: Wednesday, May 23, 2012 10:18 AM
To: Hale, Lesley (MNR); tricia.radburn@rjburnside.com
Subject: FW: Identifying candidate bat maternity roosts
Importance: High

Tricia,

I'm out of the office today and forwarding your email to Lesley Hale who will be able to help you.

Amy Cameron

Southern Region Renewable Energy Operations Team Coordinator
Ministry of Natural Resources

613-732-5506 (Pembroke Office)

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: Wed 23/05/2012 10:03 AM
To: Cameron, Amy (MNR)
Cc: Leah Lefler
Subject: Identifying candidate bat maternity roosts
Amy,

We are in the process of calculating the density of snags/cavity trees in order to identify candidate maternity roosts and were hoping you could clarify a couple of items.

- What is the definition of a snag/cavity tree? Does this mean a snag or a tree with cavities or is it a snag with cavities? In other words, do we include all trees that have cavities even if they are alive? Yes
- We're also wondering if the guideline might be missing some information. On page 14 at the bottom it says, "Within mixed forests or deciduous forest, determine the density of snags/cavity trees (decay class) >=25cm dbh.... Should this have actually specified which decay class we should be considering? The decay class is relevant in the next section but no need to worry about it for determining the snag density
- Also the guideline states that "if snag/cavity tree density is >= 10 snags per hectare...." Do we count just snags per hectare? Or do we count cavity trees as well and, again, would this include any tree with a cavity, even if it was alive? Cavity trees and snags with cavities. As you can see from the decay class literature (Watt and Caceres 1999), it is the live trees that are preferred by bats (Class 1-3). As such it is important to survey live trees for cavities. The guidelines recommend doing these surveys during leaf-off as it becomes much more difficult to see cavities with foliage present.

Thanks

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

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fax: (519) 836-5477
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Thank you.

****

RE: Request for fish records - Grand Bend Wind Farm

Godwin, Chris (MNR) to: Tricia Radburn 05/28/2012 03:24 PM

History: This message has been forwarded.

Hello Tricia,

Kading Drain: Brook Stickleback, Bluntnose, White sucker, creek chub, rainbow darter, northern redbelly dace, blacknose, Johnny darter, common shiner, brook trout.
St Joseph: No Data
Hay G: No data
Hay E: No data
Hay B: northern redbelly dace, blacknose, creek chub.

Let me know if you need more information.

Cheers,

Chris Godwin, M.Sc.
A/Area Biologist
Ministry of Natural Resources
Guelph District - Clinton Area Office
Phone: 519-482-3601
Email: chris.godwin@ontario.ca

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: May 25, 2012 11:47 AM
To: Godwin, Chris (MNR)
Subject: Request for fish records- Grand Bend Wind Farm

Chris,

My apologies for the earlier confusion regarding our crossing locations. We have now confirmed the layout shown in the attached mapbook. The attached table provides more information about the type of watercourse crossings proposed. Essentially, there will only be six new culverts that will require work within a channel. Most of these are F class drains and attempts will be made to do any necessary work in the dry.

Could you please let us know if you have any fish records for any of the six watercourses where in-water work may occur?

Kind Regards,

NEEGAN BURNSIDE

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

Neegan Burnside Ltd.
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tricia.radburn@neeganburnside.com
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Thank you.

****

RE: Woodland Raptor Nesting question

Gryck, Emily (MNR) to: Tricia Radburn 07/10/2012 04:13 PM

Cc: "Cameron, Amy (MNR)"

History: This message has been replied to.

Hi Tricia,

It has been brought to my attention that I didn't quite directly answer your question, I apologize for that. Goshawk: As long as the size criteria for habitat (>30ha with >10ha of interior) is met and within the woodlot there is at least 28ha of suitable habitat, that suitable habitat would be the boundary of this cSWH. Barred Owl: As long as the size criteria for habitat is met, the boundary will be the woodland boundary.

Emily

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: July 10, 2012 1:15 PM
To: Gryck, Emily (MNR)
Subject: RE: Woodland Raptor Nesting question

Thanks so much.

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Thank you.

****

From: "Gryck, Emily (MNR)" <emily.gryck@ontario.ca>
To: <Tricia.Radburn@rjburnside.com>
Cc: "Cameron, Amy (MNR)" <Amy.Cameron@ontario.ca>
Date: 07/10/2012 12:03 PM
Subject: RE: Woodland Raptor Nesting question

Hi Tricia,

In answer to your questions below...

N. goshawk: The key significance criteria for this cSWH is 'one or more active nests' and '400m or 28ha of suitable habitat'. Delineate the habitat within the woodland based on suitability for the N. Goshawk, and

if there is a least one active nest and 28ha of suitable habitat, it would be considered significant. The 28 ha area would be determined within the 400m radius from the nest when the suitable habitat is irregularly shaped based on suitable nesting habitat, this would be done during an EOS type assessment of the habitat. The stand and site guide describes suitable nesting habitat as being mature forest with uniform canopy closure >=70%, see page 78 of S&S guide. For all raptor nests in suitable nesting habitat, the radius from the nest would not extend beyond the woodland, as long as the woodland meets the meets the area criteria in 6E and 7E (this isn't part of the criteria in the north with contiguous forest cover).

Barred Owl: The only significance criteria is 'presence of 1 or more active nest'. If there is an active Barred Owl nest, a 200m radius is considered the SWH. As mentioned above, the radius for the nest would not extend beyond the woodland as long as the woodland meets the area criteria in the schedule.

I hope this is helpful.

Take Care,

Emily Gryck
Project Manager
Southern Region Renewable Energy Operations Team
Ministry of Natural Resources
(705) 755-5595

From: Cameron, Amy (MNR)
Sent: July 4, 2012 6:50 PM
To: Gryck, Emily (MNR)
Subject: FW: Woodland Raptor Nesting question
Importance: High

Amy Cameron
Southern Region Renewable Energy Operations Team Coordinator
Ministry of Natural Resources

m. 705-875-7481

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: July 4, 2012 2:31 PM
To: Cameron, Amy (MNR)
Subject: Woodland Raptor Nesting question

Amy,

We have a large woodland is inaccessible due to property access restrictions but meets the size criteria for Candidate Woodland Raptor Nesting. It will be identified as generalized candidate SWH. Do we just ID the woodland as the habitat or do we need to have a radius around the woodlot identified as well (i.e. 400m for N. Goshawk, 200m for barred owl)? Would I just pick the largest radius and use that or can I limit the feature to just the woodland?

Thanks.

Tricia Radburn
Environmental Planner
RJ Burnside & Associates Ltd.
292 Speedvale Ave. W, Guelph, ON N1H 1C4
tradburn@rjburnside.com
Ph: (519) 823-4995 ext. 479
F: (519) 836-5477

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Thank you.

****

RE: Grand Bend Wind Farm whippoorwill surveys
Gryck, Emily (MNR)
to:
Cameron, Amy (MNR), Tricia.Radburn
07/06/2012 04:14 PM
Cc:
"Buck, Graham (MNR)", "Cotnam, Erin (MNR)"
Show Details

History: This message has been replied to and forwarded.

1 Attachment

Whip-poor-will_Common Nighthawk Survey Protocol May 2012.doc

Hi Tricia,

I was able to make contact with the SAR Bio and he has indicated that a second survey should be completed. Generally, Guelph District recommends that two surveys be completed during the primary lunar phase and three if using the secondary. However if you have done one survey in the primary and another survey during the secondary lunar phase, he has indicated that should be adequate.

I have attached the survey protocol that Guelph recommends for Whip-poor-will and Common Nighthawk.

I hope this helps! Have a great weekend.

Emily

From: Cameron, Amy (MNR)
Sent: July 6, 2012 2:04 PM
To: 'Tricia.Radburn@rjburnside.com'; Gryck, Emily (MNR)
Subject: Re: Grand Bend Wind Farm whippoorwill surveys

I've asked Emily Gryck to follow up on this ASAP for you. She is trying to get u a response from the SAR bio in Guelph District.

Amy

From: Tricia Radburn <Tricia.Radburn@rjburnside.com>
To: Cameron, Amy (MNR)
Sent: Fri Jul 06 13:54:19 2012
Subject: Fw: Grand Bend Wind Farm whippoorwill surveys

Amy,

Would you be able to answer our question below regarding the need for additional whippoorwill surveys? We have had correspondence with Erin but she is away at the moment and we have not received an answer. The second round of surveys would need to be conducted in the next few days if they are required.

Thanks.
Tricia

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Thank you.

****

----- Forwarded by Tricia Radburn/RJB on 07/06/2012 01:51 PM -----

From: "Sarah Mainguy" <smainguy@nsenvironmental.com>
To: "Tricia Radburn" <Tricia.Radburn@rjburnside.com>, <erin.cotnam@ontario.ca>
Date: 07/04/2012 02:56 PM
Subject: RE: Grand Bend Wind Farm whippoorwill surveys

Hi Erin,

We were uncertain whether there was any Whippoorwill or Common Nighthawk habitat in the study area -we didn't see any suitable habitat (openings in dry forest) in the ELC surveys. However, there were three areas of forest that were large enough to provide interior habitat for area-sensitive species (as Whippoorwill is), that seemed to be very diverse based on the portions we saw on the participating properties. We had to do Common Nighthawk surveys on the participating properties in any case so we decided to combine surveys for both species where we had permission, adjacent to the largest forest blocks.

Much of these large forests extended off the participating properties so we couldn't determine whether there was suitable habitat and we wanted to cover our bases. Therefore we did 10 minute point counts adjacent to these large forest blocks just to make sure we hadn't missed Whippoorwills or Common Nighthawk.

I don't have the exact date as I'm not in the office but we did the surveys on a clear night when the moon was near full in late May or early June, in low wind conditions. We didn't hear Whippoorwill or Common Nighthawk. I just wondered whether we needed to go out again during this suitable moon period (before it waxes to the quarter)?

Thank you,

Sarah Mainguy

-----Original Message-----
From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: Mon 6/25/2012 4:33 PM
To: Sarah Mainguy
Subject: Fw: Grand Bend Wind Farm whippoorwill surveys

Sarah, could you answer Erin's question below regarding whippoorwill survey protocols and coordinate directly with her to determine if another survey is required?

Thanks.

Tricia

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**********----- Forwarded by Tricia Radburn/RJB on 06/25/2012 04:31 PM -----

From: "Cotnam, Erin (MNR)" <erin.cotnam@ontario.ca>
To: <Tricia.Radburn@rjburnside.com>
Date: 06/25/2012 04:12 PM
Subject: FW: Grand Bend Wind Farm whippoorwill surveys

Hi Tricia,

I am the Project Manager for all APRD related inquiries for projects in the Guelph district so will work with you and the SAR bio in Guelph on your request. Are you able to quickly provide me the methods for the WPWi surveys done to date? I understand these were discussed with Graham in the Guelph office.

Thanks,

Erin

From: Cameron, Amy (MNR)
Sent: June 25, 2012 2:54 PM
To: Cotnam, Erin (MNR)
Subject: FW: Grand Bend Wind Farm whippoorwill surveys
Importance: High

Amy Cameron
Southern Region Renewable Energy Operations Team Coordinator
Ministry of Natural Resources

m. 705-875-7481

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: June 25, 2012 9:17 AM
To: Cameron, Amy (MNR)
Subject: Grand Bend Wind Farm whippoorwill surveys

Amy,

Could you please advise as to whether two surveys should be conducted for whippoorwill or if one is sufficient? We did complete one survey and no whippoorwills were identified.

Thanks.
Tricia

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Thank you.
****

----- Forwarded by Tricia Radburn/RJB on 06/25/2012 09:10 AM -----

From: "Sarah Mainguy" <smainguy@nsenvironmental.com>
To: "Tricia Radburn" <Tricia.Radburn@rjburnside.com>
Date: 06/24/2012 10:52 AM
Subject: whippoorwill surveys

Hi Tricia,

Could you find out from John Boos whether we need to conduct two Whippoorwill surveys (early and late)? We conducted one round of surveys at the Northland site but a second window is coming up where the moon phase will be appropriate and I wondered if we have to do another survey then.

Thanks,

Sarah

Sarah Mainguy, B.Sc., M.Sc.
North-South Environmental,
35 Crawford Crescent
Campbellville, ON
L0P 1B0
Tel: 905-854-1112
Cell: 519-803-4266

Eastern Whip-poor-will (*Caprimulgus vociferous*) and Common Nighthawk (*Chordeiles minor*)
Survey Protocol- MNR Guelph District
(Current May 2012; Protocol may change over time if new information becomes available)

Habitat for each species should be identified using a two-step process:

1. Prior to site visits, identify potential habitat using aerial photographs, ortho photos or other available land cover information (such as Ecological Land Classification maps).
2. A site visit should be carried out to assess potential habitat identified in step 1 and to confirm the presence of suitable habitat. If detailed maps or other habitat information is not available for a site, the entire site should be thoroughly searched to identify suitable habitat.

Both species should be surveyed for by listening for their vocalizations at dusk (times specified below). Visual observations should be noted, but there is generally not enough light to make accurate visual identifications. Calling rates are influenced by the date, time of night, moon phase, and weather conditions.

A. Survey Technique: Auditory/ Visual 3-minute point counts

1. Select listening stations that you think may be near suitable habitat for the target species. Record the location of each station on a map.
The number of locations should be sufficient to comprehensively survey all suitable habitats within the study area. Suitable listening stations are:
- within 500 m of known or potential habitat,
- at least 400 m from any other listening station,
- can be safely accessed at night, and
- in a quiet location (little traffic, not close to noisy streams, industrial facilities, or houses with barking dogs, at least 20 metres away from vehicle, etc.).

2. Arrive at the first listening station a few minutes before your planned start time (e.g., arrive just after sunset if you are going to start your survey 30 minutes after sunset).

3. Check that the GPS coordinates of your location match the coordinates of the listening station.

4. Record the date, time, coordinates, weather conditions, and noise level at the station (only conduct the surveys during the appropriate period and weather conditions- see below).

5. Set your timer for 3 minutes and start it as soon as your ears have adjusted. Record the total number of individuals heard (or seen) during the 3-minute listening period.

7. When you hear an individual calling, try to determine the approximate distance from the listening station (within 100 m, or farther away), and the direction **to** the bird(s). If there are several birds calling you may spend a few minutes after the 3-minute listening period to determine direction and distance to each bird. Before you leave each stop, make sure you have filled in all the necessary information.

B. Survey Period:

D. Search Effort Required Determining Probable Absence:

During the recommended survey windows, each listening station should be visited on two different nights; if conducted during the secondary survey windows, there should be three visits to each station. It is not appropriate to draw conclusions about the absence of the species from a site if surveys occur outside of the specified survey period outlined above.

E. Required Authorizations:

Conducting the above survey protocol does not require authorizations under the *Ontario Endangered Species Act, 2007* or the *Ontario Fish and Wildlife Conservation Act.*

REFERENCES

Atlassing for Species at Risk in the Maritime Provinces 2nd Edition, 2008, Maritimes Breeding Bird Atlas, pp.16-18.

Inventory methods for nighthawk and poorwill, 1998, Standards for Components of British Columbia's Biodiversity No. 9 Version 2.0, Ministry of Environment, Lands and Parks, Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee, 20p.

"Where in the Square?" Whip-poor-will Pilot Project Participant's Guide. 2012. Bird Studies Canada, 12pp.

RE: Identifying candidate bat maternity roosts
Hale, Lesley (MNR)
to:
Cameron, Amy (MNR), tricia.radburn
05/23/2012 10:28 AM
Show Details

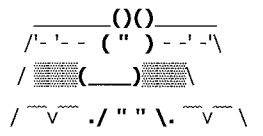
Security:

To ensure privacy, images from remote sites were prevented from downloading. Show Images

History: This message has been replied to and forwarded.

Hi Tricia
Please see my responses below...please feel free to call me should you need further clarification.

Lesley 705-755-3247



From: Cameron, Amy (MNR)
Sent: Wednesday, May 23, 2012 10:18 AM
To: Hale, Lesley (MNR); tricia.radburn@rjburnside.com
Subject: FW: Identifying candidate bat maternity roosts
Importance: High

Tricia,

I'm out of the office today and forwarding your email to Lesley Hale who will be able to help you.

Amy Cameron

Southern Region Renewable Energy Operations Team Coordinator
Ministry of Natural Resources

613-732-5506 (Pembroke Office)

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: Wed 23/05/2012 10:03 AM
To: Cameron, Amy (MNR)
Cc: Leah Lefler
Subject: Identifying candidate bat maternity roosts

Amy,

We are in the process of calculating the density of snags/cavity trees in order to identify candidate maternity roosts and were hoping you could clarify a couple of items.

- What is the definition of a snag/cavity tree? Does this mean a snag or a tree with cavities or is it a snag with cavities? In other words, do we include all trees that have cavities even if they are alive? Yes
- We're also wondering if the guideline might be missing some information. On page 14 at the bottom it says, "Within mixed forests or deciduous forest, determine the density of snags/cavity trees (decay class) >=25cm dbh.... Should this have actually specified which decay class we should be considering? The decay class is relevant in the next section but no need to worry about it for determining the snag density
- Also the guideline states that "if snag/cavity tree density is >= 10 snags per hectare...." Do we count just snags per hectare? Or do we count cavity trees as well and, again, would this include any tree with a cavity, even if it was alive? Cavity trees and snags with cavities. As you can see from the decay class literature (Watt and Caceres 1999), it is the live trees that are preferred by bats (Class 1-3). As such it is important to survey live trees for cavities. The guidelines recommend doing these surveys during leaf-off as it becomes much more difficult to see cavities with foliage present.

Thanks

Tricia Radburn, M.Sc.(Pl), MCIP, RPP
Environmental Planner

Neegan Burnside Ltd.
292 Speedvale Ave. W, Guelph, ON N1H 1C4
tricia.radburn@neeganburnside.com
tel: (519) 823-4995 ext. 479
fax: (519) 836-5477
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NEEGAN BURNSIDE

Appendix D

Tundra Swan Landowner Survey

Neegan Burnside Ltd. 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 Canada
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.neeganburnside.com

NEEGAN BURNSIDE

Barn Owl and Tundra Swan Survey

Project:	Grand Bend Wind Farm	
Landowner Name:		**Lease No.:**

PURPOSE OF THE SURVEY

The purpose of this survey is to help Neegan Burnside Ltd. and the Grand Bend Wind Farm project ecologists identify potentially significant habitats associated with Barn Owls and Tundra Swans.

Please answer the following questions to the best of your ability:

BARN OWLS

Do you have any old barns on your property that are not currently in use or are rarely used?

☐ Yes ☐ No

If yes, please indicate the lot and concession_____
Please <u>mark and label</u> the location(s) on the attached map.

Have you ever seen a Barn Owl in or around your barns? (see attached photo for identification)

☐ Yes ☐ No ☐ Unsure

If yes, please indicate the lot and concession_____
Please <u>mark and label</u> the location(s) on the attached map.

TUNDRA SWANS

1. Does your property contain agricultural fields where waste grains are present in the spring (i.e. where fallen corn, soybeans, wheat is left on the field after harvest)?

☐ Yes ☐ No

2. Do any of the above-noted fields flood regularly in the spring (i.e. is there shallow standing water for several days)?

☐ Yes ☐ No

If yes, which lot and concession_____
Please <u>mark and label</u> the location(s) on the attached map.

3. Have you observed Tundra Swans in these fields in the springtime? (see attached photos for identification

☐ Yes ☐ No ☐ Unsure

If yes, which lot and concession_____
Please <u>mark and label</u> the location(s) on the attached map.

4. Please describe the typical number of Tundra Swans you observe each spring in your fields:

   ☐ None. I have never seen a Tundra Swan in my fields.

   ☐ Very Few. Occasionally I see groups of 1-30 Tundra Swans in my fields.

   ☐ Small Groups. I regularly see groups of 30-80 Tundra Swans in my fields.

   ☐ Large Groups. I regularly see groups of over 100 Tundra Swans in my fields.

Please <u>mark and label</u> any areas where you regularly see large groups (over 100 individuals) each spring on the attached map.

5. Are there any other areas in the vicinity of the Grand Bend Wind Farm beyond your own property where you regularly observed large groups of Tundra Swans each spring?

   ☐ Yes ☐ No

If yes, please mark and label these areas on the attached map.

Thank you for your assistance with this survey.

_____ _____
Name (Please Print) Date

_____
Signature

Please Return to:
Tricia Radburn, Neegan Burnside Ltd.
Fax: (519) 836-5477
Email: tricia.radburn@neeganburnside.com

WHAT IS A BARN OWL?

WHAT IS A TUNDRA SWAN?

NEEGAN BURNSIDE

Appendix E
Staff Qualifications

NEEGAN BURNSIDE

Profession

Environmental Planner,
Ecological Restoration Specialist

Education

M.Sc. (Pl), University of Guelph, 2010

Diploma, Ecosystem Restoration, Niagara College, 2001

B.Sc. (Env.), University of Guelph, 2000

Certificates

Ontario Wetland Evaluation for Southern Ontario, 2006

Ecological Land Classification, 2004

Low Complexity Prescribed Burn Workers Course, 2004

Electrofishing, 2001

BioMAP, 2000

Employment Record

Environmental Planner, R.J. Burnside & Associates Limited (2006-Present)

Generic Regulations Assistant, Upper Thames River Conservation Authority (2005-2006)

Stewardship Assistant, Ontario Ministry of Natural Resources (2003-2004)

Surface Water Monitoring Officer, Ontario Ministry of Natural Resources (2002-2003)

Eco-Tourism Consultant, CIDA/ Cerro Blanco Protected Forest, Ecuador (2001)

Citizenship

Canadian

Languages

English

Tricia Radburn, M.Sc.(Pl), MCIP, RPP

Tricia is experienced in assessing and analyzing development impacts on environmental and natural heritage features. Certified in Ecological Land Classification and Wetland Evaluation, Tricia has conducted field studies and analyzed environmental conditions for Environmental Impact Studies under the *Planning Act*, Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan and a variety of class environmental assessment processes. She is knowledgeable of a wide variety of permitting processes and has experience with approvals under the *Public Lands Act*, *Endangered Species Act*, *Species at Risk Act*, *Fisheries Act* and Conservation Authority regulations. Prior to working at Burnside, Tricia worked for the Upper Thames River Conservation Authority where she helped to incorporate *Ontario Regulation 97/04 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* into UTRCA policies and guidelines.

She recently completed a Masters degree in First Nation Energy Planning under Ontario's new Green Energy Act, Renewable Energy Approval Regulation and various incentive programs.

Energy Projects and Renewable Energy Approvals

Grand Bend Wind Farm 100 MW Renewable Energy Approval, Northland Power Inc., Grand Bend, Ontario (2011-Ongoing)

Coordinated all fieldwork and prepared documentation for all components of the Natural Heritage Assessment portion of the Renewable Energy Approval as well as Endangered Species Act permitting. Worked closely with the Ministry of Natural Resources and coordinated changes in the work program to correspond with ongoing updates and amendments to the provincial guidelines as the project progressed. Attended Public Information Centres to answer questions about the project and its potential impacts on the environment with local landowners.

Uxbridge Goodwood 20 MW Solar Farm Renewable Energy Approval, Pacific Power Inc., Uxbridge, Ontario (2011-Ongoing)

Coordinated fieldwork associated with the Natural Heritage Assessment and identified preliminary environmental constraints which could affect the feasibility of the project.

Aboriginal Renewable Energy Fund Pre-Feasibility Studies for Various First Nation Communities, Ontario (2011-Ongoing)

Assisted in coordinating funding applications. Prepared a questionnaire for communities to address Aboriginal Traditional Knowledge and Interested Person portions of the pre-feasibility studies. Provided QA/QC for the pre-feasibility reports.

Festival Hydro Transformer Station Class Environmental Assessment for Minor Transmission Facilities, Stratford, Ontario (2010-2011)

Prepared a Class EA for a new transformer station in the City of Stratford. Conducted all required public notifications and assessments potential impacts associated with noise, construction and operation of the facility.

Westerhout Class 2 Wind Facilities Renewable Energy Approval Applications, Huron County, Ontario (2009-2010)

Consulted with agencies to confirm approval application requirements under the new Renewable Energy Approval Regulation, O. Reg. 359/09 for two wind facilities. In particular, discussions were held regarding the need for archaeological assessments. Different agencies interpreted the new regulations in different ways. Ensured that a consensus was achieved and all parties agreed to the same conclusion. Ensured that all consultation requirements with agencies and stakeholders were completed.

Elgin Grovlea Class 2 Wind Facility Renewable Energy Approval Application, Elgin County, Ontario (2010)

Prepared a Renewable Energy Approval Application under O. Reg. 359/09 for a Class 2 wind facility. Considered how the construction and operation of turbines could impact adjacent natural heritage features. Ensured that all neighbours, stakeholders and agencies were consulted as required under the regulation.

Preliminary Wind Farm Planning, Wabaseemoong and Ginoogaming First Nations, Whitedog and Longlac, Ontario (2009-Present)

Conducted a preliminary assessment of environmental constraints associated with proposed wind farms in the Ginoogaming and Wabaseemoong First Nations. Conducted initial interviews with community leaders to identify concerns, resources and areas of importance within the communities that will require additional study and discussion as the projects progress.

South River Wind Farms Environmental and Regulatory Constraints Screening, Nipissing and Parry Sound Districts, Ontario (2007)

Four proposed wind farm sites were assessed for environmental and regulatory constraints that could limit energy development. Sites spanned organized and unorganized municipalities which included Crown and private lands. Results allowed the client to make an informed decision about whether to proceed with wind farm development on the sites.

Honeywood Wind Power Constraints Analysis and Environmental Assessment, Mulmur Township, Ontario (2006-2008)

The first stage of this project was to prepare preliminary environmental constraints analysis, including a compilation of all relevant municipal, provincial and federal policies in effect in the study area. A search of background data sources was conducted to identify potential environmental constraints and list all the necessary approvals required for the project. Based on this review, the project moved forward into the Environmental Assessment process. Conducted fieldwork and data reviews to document natural heritage features to support the EA and requirements of the Niagara Escarpment Commission.

East Garafraxa and Marsville Wind Farm Environmental and Regulatory Constraints Screening, East Garafraxa, Ontario (2006-2007)

Environmental and regulatory constraints were assessed for two potential wind farm sites. Natural heritage features were identified through a desktop review and consultation with applicable agencies. The report was used by the client to assist in making a decision about whether to proceed with the project.

Captus Energy Wind Farm Environmental Assessment, Huron County, Ontario (2006)

Initiated preparation of a natural heritage report to supplement the Environmental Assessment. Identified natural heritage features and described preliminary protection measures to minimize impacts. Project did not move forward due to constraints in transmission line capacity.

Advisory Services

Peer Review of the Duntroon Quarry Natural Environment Report, Clearview Township, Ontario (2006-Present)

Reviewed the Natural Environment Report prepared in support of the proposed Duntroon Quarry expansion on behalf of the Township of Clearview. Consulted the PPS, Township of Clearview, County of Simcoe and Niagara Escarpment Plan to determine if a proposed quarry expansion conformed to all applicable natural heritage and aggregate resources policies. Advised the Township on how to proceed with the application and requirements for additional information and detailed studies.

Peer Review of the Sargeant-Waverley Pits #1 and 2 Natural Environment Report, Tiny Township, Ontario (2006)

Reviewed the Natural Environment Report relative to the policies of the PPS, Aggregate Resources Act, Township of Tiny and County of Simcoe Official Plans to determine if two new proposed aggregate extraction pits, one involving below water table extraction, met natural heritage and aggregate resource policies.

Peer Review of Amaranth Estates Environmental Impact Assessment, Amaranth Township, Ontario (2006)

Provided advisory services to the Township of Amaranth with respect to an Environmental Impact Assessment for a proposed subdivision. Recommended an approach to appropriately resolve concerns with a wetland on the property that had inadvertently been left off Greenlands mapping in a recent update to the Township's Official Plan.

First Nations Planning and Advisory Services

Sheshatshiu Innu Community Commercial Zoning and CEAA Screening, North West River, Labrador (2010-Ongoing)

The community is interested in designating a portion of its reserve lands for leasing to non-First Nation commercial development. I prepared materials for, and assisted in organizing and facilitating a community workshop to help the community identify where commercial development should be located. The workshop was used to help community members consider types of existing development are compatible or incompatible with the proposed commercial development. Reviewed Indian and Northern Affairs Canada's land use policies to understand the process for designating reserve lands and writing a Head Lease to allow reserve lands to be leased to non-First Nation developers and business owners. Coordinated with land surveyors and land appraisers and staff associated with a Phase 1 Environmental Site Assessment.

Cape Croker Recreational and Cultural Master Plan, Chippewas of Nawash Unceded First Nation, ON (2010-2012)

Undertook consultation with the community to identify a "wish list" for improvements to community recreational and cultural facilities. Lead focus groups with representative sample of community groups an segments, including youth, Elders, parents, participants in cultural arts and recreation programs. Managed a local youth who was hired to assist with community consultation. Summarized findings from focus groups, comment cards and long questionnaires. Identified community priorities and recommended measures for implementation.

Territorial Planning Concepts, Grand Council Treaty #3, Kenora, Ontario (2010).

The overall goal of the project was to initiate discussions that may eventually lead to a consultation agreement between the Grand Council Treaty #3 ("GCT3"), Ministry of Natural Resources and Ministry of Northern Development, Mines and Forests that will clarify how the GCT3 wishes to be consulted on land use and resource management applications and how the GCT3 may use consultation opportunities to create new economic partnerships and economic development opportunities. Summarized legislation associated with land use and resource management in Northern Ontario. Identified policies in the Public Lands Act, Mining Act, Crown Forest Sustainability Act that allow for participation of the Grand Council Treaty #3 ("GCT3") and its member communities in land use planning decisions. The Proposed Growth Plan for Northern Ontario was also reviewed for strategies and objectives that could provide new economic opportunities for the GCT3. Surveyed member communities by phone to understand community concerns with their relationship with the MNR and MNDMF. Prepared materials for, organized and assisted in delivering a presentation and community workshop to further understand the GCT3's interests in land use planning. Suggestions were made to resolve misunderstandings and challenges that were limiting the current relationship between all parties.

Land Use Planning Guide for Northern Ontario for the Métis Nation of Ontario (2010)

Created a planning guide for the Métis Nation of Ontario ("MNO"). The guide included summaries of planning legislation and policies including the Planning Act, Public Lands Act and Crown Forests Sustainability Act among others. Particular attention was paid to new ore recently updated legislation such as the Mining Act, Proposed Growth Plan for Northern Ontario and Bill 191, draft Far North Act. Recommendations were then made to increase the MNO's involvement in planning and resource management in Northern Ontario.

Review of Amendments to the Township of Pelee Official Plan on behalf of the Walpole Island First Nation (2010)

Reviewed draft updates to the Township of Pelee Official Plan. Identified which were relevant to the rights and interests of the Walpole Island First Nation ("WIFN"), including policies for the identification and protection of natural and cultural resources. It

was found that the Official Plan did not appropriately identify the WIFN's existing land claim to portions of the Township or known WIFN archaeological sites on Pelee Island. Recommended appropriate responses for the WIFN to ensure that their rights and interests are considered and incorporated.

Review of Amendments to the Bruce County Official Plan on behalf of the Saugeen Ojibway First Nations, Wiarton, Ontario (2009-Present)

Reviewed major amendments proposed to the Bruce County Official Plan. Identified which were relevant to the rights and interests of the Saugeen Ojibway First Nation ("SON"), including policies for the identification and protection of cultural resources, policies for shoreline areas with the potential to affect water quality and fisheries resources as well as polices for large scale wind power developments and boundary mapping of significant natural heritage features. Recommended appropriate responses for the SON to ensure that their rights and interests are considered and incorporated into planning documents.

Review of Coast Guard Proposal to Store Dredged Material from the St. Clair River at the Walpole Island High Banks Pit Site, Walpole Island First Nation, Ontario (2007)

Provided review and analysis of existing documentation, inventories and previous studies documenting the significance and sensitivity of natural heritage features on, and adjacent to, the Walpole Island High Banks lands. Prepared a community questionnaire to identify the cultural uses of plants, recreational opportunities and cultural significance of the property. Assisted with organization of a Public Information Centre to provide information and collect community opinion on the project. Provided advise to the community regarding the suitability of the borrow pit to store the dredged material. Identify the permitting requirements needed to proceed with the project ie. Environmental Assessment, Fisheries Act authorization and Species at Risk Act permits.

Matawa First Nation Winter Road Realignment Preliminary Environmental Assessment (2007)

Prepared a preliminary INAC CEAA Screening to identify opportunities and constraints related to the realignment and potential upgrading to all-season roads for the winter road system servicing five First Nation communities in northern Ontario.

Species at Risk Surveys and Permitting

Species at Risk Project Biologist, XTEC, Former Camp Ipperwash, Ipperwash, Ontario (2007-2009)

Worked in conjunction with the unexploded ordnance clearing team and the Stony and Kettle Point First Nation on the Former Camp Ipperwash, Military Training Center. Ensured adherence to the Canadian Wildlife Services ("CWS") Species at Risk Permit required for vegetation clearing. Worked with the local community for several months over two field seasons to identify and avoid Federal and Provincial Species at Risk and culturally important species and sites during site operations. Attended an Aboriginal Cultural Awareness Training sessions presented by the Stony and Kettle Point First Nation.

Detroit River International Crossing Individual Environmental Assessment and Endangered Species Act Permit Review, Windsor, Ontario (2008-Present)

Reviewed Natural Heritage background reports, Environmental Assessment documents, *Endangered Species Act* permits and Management Plans for Rare Species on behalf of the Walpole Island First Nation ("WIFN") to determine if Aboriginal interests and rights associated with traditional use of the area were appropriately addressed. WIFN's primary interests related to rare tallgrass prairie habitat and species, given the presence of similar habitats on Walpole Island.

Species at Risk Act and Endangered Species Act Permitting, Moose Deer Point First Nation, Mactier, Ontario (2009)

Prepared and coordinated permit applications under provincial and federal species at risk legislation in association with construction of a new water treatment and distribution system in proximity to the habitat of several protected reptiles and amphibians. Developed mitigation and monitoring plans to ensure potential impacts were minimized.

Environmental Impact Studies

Winifred Woods Trail Environmental Impact Study, City of Kitchener, Ontario (2011-2012)

Coordinated Ecological Land Classification, breeding bird surveys and wetland delineations for an Environmental Impact Study of a proposed trail joining the Pioneer Park subdivision with the Walter Bean Trail through the Winifred Woods Environmentally

Sensitive Policy Area. The trail traversed lands owned by the City of Kitchener and Grand River Conservation Authority ("GRCA") and included a number of Significant Wildlife Habitats and natural hazard lands. Various trail routes and trail designs were assessed. Undertook negotiations with the GRCA regarding portions of the trail on their lands.

Lake Simcoe Aeropark Environmental Impact Study, Oro-Medonte, Ontario (2008-Present)

Identified impacts to natural heritage features associated with a proposed industrial subdivision located adjacent to the Lake Simcoe Regional Airport. Work involved staking boundaries of natural features with the local Conservation Authority and coordinating a number of sub consultants to conduct detailed vegetation and wildlife inventories, including a study of bird hazards to aviation safety at the airport in relation to habitat areas on the subject lands.

Preliminary Environmental Constraints Analysis of the Proposed YMCA Cedar Glen Camp Expansion and Redevelopment, King Township, Ontario (2010- Ongoing)

The YMCA was interested in preparing a Master Plan for the Cedar Glen camp to plan future expansion and redevelopment of the site. Met with the client to clarify their needs and the scope of work required. Identified all applicable natural heritage policies and identified potential development constraints associated with the Natural Heritage System of the Greenbelt Plan and Natural Linkage policies of the Oak Ridges Moraine Conservation Plan. Identified and recommended future study and work requirements in order to move the development forward.

Environmental Impact Study of the Balzer Creek Trail, Kitchener, Ontario (2009-2010)

An Environmental Impact Study was prepared at the request of the Grand River Conservation Authority ("GRCA") because the proposed trail was located within the GRCA's regulation limit. The EIS considered how the trail would be constructed, where it was to be located and how it would be used in order to assess potential impacts on the adjacent Balzer Creek. During the EIS several Butternut trees, and endangered species, were identified in close proximity to the trail. Discussions were held with the Ministry of Natural Resources to determine how to proceed, including the process under the Endangered Species Act. Negotiations were successful in avoiding the need for a permit based on trail routing.

Humber College Orangeville Campus Environmental Impact Study, Town of Orangeville, Ontario (2006-2008)

Identified natural heritage features, analyzed potential impacts and recommended mitigation measures for the proposed Humber College Orangeville Campus in the Town of Orangeville. Field studies including Ecological Land Classification and amphibian monitoring were conducted in order to determine the significance and sensitivity of environmental features. The analysis included implications of the development on wildlife corridors, valleylands, wetlands and a coldwater stream.

Veteran's Way Residential Subdivision Environmental Impact Study, Town of Orangeville, Ontario (2006-2008)

Identified natural heritage features, analyzed potential impacts and recommended mitigation measures for a proposed residential subdivision and commercial development in the Town of Orangeville. Field studies including Ecological Land Classification and amphibian monitoring were conducted in order to determine the significance and sensitivity of environmental features. The analysis included implications of the development and stormwater management proposal.

Secondary and Master Servicing Plans

Community of Colgan Master Servicing Plan, Township of Adjala-Tosorontio, County of Simcoe, Ontario (2008-Present)

Identified land use and natural heritage policies of relevance to infrastructure planning and recommended measures to incorporate natural heritage protection into the Master Servicing Plan.

Churchville Planning and Heritage Study, City of Brampton, Ontario (2007)

Inventoried existing natural heritage and natural hazard conditions and reviewed land use policies in the City and Regional Official Plans, PPS, Secondary Plan and Subwatershed Study. Developed comprehensive land use guidelines for the Churchville planning area to protect natural heritage features and provide clarity with respect to natural hazard lands.

North West Fergus Secondary Plan Environmental Impact Assessment, Fergus, Ontario (2007)

Identified all natural heritage and hazard land constraints, recommended lands for protection, recreation and trail development as part of the West Fergus Secondary Plan.

Environmental Assessments

Rumble Pond Stormwater Management Pond Retrofits, Schedule B Municipal Class Environmental Assessment, Town of Richmond Hill, Ontario (2010-2011)

Completed an Environmental Assessment to evaluate a number of alternatives associated with upgrades to a stormwater management pond. The preferred alternative included measures to improve passage for Redside Dace, an Endangered species which are known to be present in the area.

Creemore Drainage Project File Report, Schedule B Municipal Class Environmental Assessment, Clearview Township, Ontario (2009-2010)

Prepared an Environmental Assessment to identify and assess alternative solutions to improve drainage and resolve ongoing flooding issues in the Creemore Village Core as well as on lands designated for future development. The preferred solution was identified based on environmental impacts, effectiveness in managing flooding, economics and its consistency with the Official Plan.

GO Transit Hamilton to Niagara Rail Expansion Environmental Assessment, Ontario (2009-Ongoing)

Reviewed Official Plan policies for all municipalities along the proposed rail line route. Identified environmental and land use constraints in areas proposed for new GO transit rail stations as part of the Environmental Assessment for the proposed expansion.

Detroit River International Crossing Individual Environmental Assessment Review, Windsor, Ontario (2008-Ongoing)

Reviewed Natural Heritage background reports and Environmental Assessment documents on behalf of the Walpole Island First Nation ("WIFN") to determine if their interests and rights associated with traditional use of the area were appropriately addressed.

Dissette Street Schedule C Municipal Class Environmental Assessment, Bradford-West Gwillimbury, Ontario (2008-2010)

Reviewed Official Plan policies and Conservation Authority policies with respect to their impact on wetland, floodplain and woodlots being affected by the proposed road widening of 8th Line and Dissette Street, Bradford. Consulted with the Conservation Authority and proposed a compensation strategy to deal with features lost, partially or entirely during construction. Attended a Public Information Centre, summarized public comments associated with land acquisitions, encroachment into a natural area and increased traffic and noise.

GO Transit Georgetown to Kitchener Rail Expansion Environmental Assessment, Ontario (2008-2009)

Reviewed Official Plan policies for all municipalities along the proposed rail line route. Identified environmental and land use constraints in areas proposed for new GO transit train stations and layover sites.

Policy Planning and Strategy Development

Comprehensive Review and Overhaul of Barbados' Groundwater Protection Zoning Policy and System, Barbados (2007-Present)

Reviewed zoning bylaws, land use restrictions and incentive programs designed to protect groundwater resources in four jurisdictions including the Regional Municipality of Waterloo; Miami-Dade County, Florida; the US Virgin Islands; and the State of Western Australia. Analyzed policies for their relevance and applicability to environmental, economic and social conditions in Barbados. Recommended policies, including legal and incentive-based instruments that could be used by Barbados to protect groundwater resources.

Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation Development, London, Ontario (2005-2006)

Assisted with the incorporation of *Ontario Regulation 97/04 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* into Upper Thames River Conservation Authority policies and guidelines. Included preparation of a submission for approval of the regulation by the Province of Ontario, public information documents and public consultation

materials.

Review and Updates to Ontario's Low Water Response Program, Peterborough, Ontario (2002-2003)

Coordinated and facilitated a workshop to evaluate the success and challenges associated with the first version of Ontario's Low Water Response Program. Updated the program document to reflect new policies and clarify protocols. Coordinated posting of the program changes on Ontario's Environmental Bill of Rights Registry.

Eco-Tourism and Park Planning Strategy, Cerro Blanco Protected Forest, Guayaquil, Ecuador (2001)

Developed a park planning strategy to increase tourism potential for a 6000 ha protected forest while protecting significant natural features and rare species. Identified locations for a new trail systems, butterfly garden, aviary and tourist accommodations as well as areas requiring environmental protection, restoration and enhancement.

NEEGAN BURNSIDE

Christopher Pfohl, C.E.T.

Christopher has a broad range of experience in Canada and internationally, with 13 years of professional experience in Aquatic Resources including environmental assessment, existing condition studies, habitat restoration, environmental monitoring and protection, determination of fish habitat, Species at Risk, hydrology, hydrogeology and contaminated sites. He has extensive knowledge of the *Fisheries Act*, as it pertains to the protection of fish and fish habitat. Christopher is responsible for obtaining permits from various government agencies, environmental impact assessment, environmental and construction monitoring, developing and conducting sampling programs for fisheries and aquatic habitat inventories, and the preparation of technical reports based on project requirements. He has coordinated and conducted numerous sampling programs for fish, amphibians, invertebrates and sediment, surface and ground water. He is responsible for liaison with government agencies, First Nations, large corporations, and stakeholders.

Christopher has undertaken projects for a wide range of clients throughout the energy, development, transportation and mining sectors in local and remote areas of Canada and overseas. This requires the development and coordination of extensive aquatic investigations and includes the management of logistics, field staff and sub-consultants, data analysis, report and proposal preparation.

Christopher is also a former member of the Canadian Fly Fishing Team (2007 to 2010) and has competed in numerous events across North America and internationally.

Biological Resources

Coves ESA Master Plan and Rehabilitation of the East Pond, City of London, London, Ontario (2011-Ongoing)

Mr. Pfohl was subcontracted by North South Environmental to provide aquatic support for development of the Coves ESA Master Plan located in an urban environment. He was responsible for background review, confirmation of existing conditions and input to rehabilitation of the Coves ponds and watercourses as it pertains to aquatic resources. A rehabilitation matrix was developed by Mr. Pfohl to determine the best options for improvements to the aquatic conditions in the Coves ponds and watercourses. A rehabilitation concept and plan has been provided for funding approval.

Bronte Creek Rehabilitation and Natural Channel Design, Trout Unlimited, Lowville, Ontario (2011)

Aquatic Resources Specialist responsible for natural channel design options and prescriptions for areas that have been impacted by erosion, heavy pedestrian use, and areas of channel widening. Christopher conducted spawning surveys for rainbow trout (steelhead) and Chinook salmon to determine critical habitat areas to be protected during construction. Habitat prescriptions included spawning areas, riffle sections, boulder clusters, large

Profession

Aquatic Resource Specialist

Education

Terrain and Water Resources Technologist, Sir Sandford Fleming College, School of Natural Resources, 1996

Certificates

CISEC-Certified Inspector for Sediment and Erosion Control, Aug 2011

MNR/TRCA Ontario Stream Assessment Protocol (OSAP), June 2010.

OBBN-Ontario Benthos Biomonitoring Network Certification, June 2010

DFO, Ontario Freshwater Mussel Identification Course, 2007

MTO/DFO/MNR Fisheries Protocol, Fisheries Assessment Specialist, Fisheries Contract Specialist (RAQs Certified), 2006

MNR Class 1 Electrofishing Certification and Trainer, 2006

ROM, Ontario Freshwater Fishes Identification Course, 2005

Professional Societies

Ontario Association of Certified Engineering Technicians and Technologists (OACETT)

Employment Record

Aquatic Resource Specialist, R.J. Burnside & Associates Limited (2007-Present)

Aquatic Resources Technologist, AMEC Earth and Environmental, Mississauga, Ontario (2003-2006)

Environmental Technologist, AMEC Earth and Environmental, Vancouver, British Columbia (1998-2003)

Citizenship

Canadian

Languages

English

woody debris, pool creation, juvenile habitat and retrofit of existing riffle structures. He conducted swim-up counts for steelhead fry and determination of prescription success based on the contractor's rehabilitation works. Trout Unlimited has been overwhelmed with the positive feedback on the construction and design.

Barrier Mitigation for Redside Dace, Don Head West, Town of Richmond Hill, Ontario (2011-Ongoing)

Aquatic Resource Specialist responsible for collection of Endangered Species (Redside dace) based on the conditions of the Endangered Species Act (ESA) permit. Mr. Pfohl provided support during the application for the ESA permit along with the appropriate animal care protocols. He was required to salvage all aquatic life from a work area planned for barrier mitigation under the conditions set-out in the ESA permit. A "rocky ramp" was constructed to mitigate the impassable barrier for fish movement. A Scientific Collectors Report has been submitted to MNR on behalf of the client and the conditions of the ESA permit. Ongoing monitoring for habitat success is required during 2012.

Siloam Pond Natural Channel Design, Mill Run Golf and Country Club, Uxbridge, Ontario (2010-Ongoing)

Mr. Pfohl provided aquatic resource input into the final design of more than 350m of brook trout habitat in Uxbridge, Ontario. The Siloam Pond was taken off-line to reduce thermal impacts to a cold water fishery and provide a constant water source for the golf club. Christopher provided suitable habitat designs for large woody debris, riffle sections and over-wintering habitat in strategic locations along the channel and as part of the compensation required for the DFO Authorization. He was also responsible for obtaining the Scientific Collectors Permit from MNR, fish salvage, construction monitoring, and submission of fish collection records as part of the condition of the MNR permit. Mr. Pfohl will be monitoring the new channel for habitat use, substrate movement and naturalization of the riparian corridor as part of the permit conditions provided in the DFO Authorization.

Colgan Well, Determination of Surface Water Impacts, Township of Adjala-Tosorontio, Colgan, Ontario (2011-Ongoing)

Aquatic Resources Specialist responsible for determination of groundwater areas that may be impacted from a production well located in Colgan, Ontario. Groundwater upwelling and seepage areas were documented to determine potential impacts to receiving watercourses from groundwater extraction and potential effects to the fishery.

Endangered Species Act Approval, King Street Reconstruction, Region of Peel, Bolton, Ontario (2011)

Mr. Pfohl was responsible for acquiring approval from MNR for an outlet to Cold Creek, a tributary of the Humber River. Cold Creek is designated as potential Redside dace habitat and a Letter of Advice (LOA) was obtained from MNR for the construction works associated with an outlet structure to the watercourse. The LOA was provided by MNR based using approved Best Management Practices and Mitigation measures associated with the construction works.

Erosion and Aquatic Assessment, Upper Rouge River and Beaver Creek, Town of Richmond Hill, Ontario (2010-2011)

Aquatic Resources Specialist responsible for erosion and aquatic conditions assessment for 18km of the Upper Rouge River, and Beaver Creek, a tributary of the Rouge River, Richmond Hill. Required to identify areas of erosion that may cause impacts to municipal infrastructure, public and private land. Aquatic conditions were assessed in conjunction with erosion areas that may be improved during future works. Collected information was used to determine a level of potential hazard.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Toronto to Milton, GO Transit, Ontario (2011-Ongoing)

Aquatic Resource Specialist responsible for coordinating existing conditions surveys for all watercourse crossings from Union west to Milton Station. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Environmental Monitoring, Richmond Hill Community Environmental Center, Region of Peel, Richmond Hill, Ontario (2010-2011)

Environmental Monitor responsible for inspecting erosion and sediment controls required for the construction of the Richmond Hill Community Environmental Center. Receiving waters from the site connect to protect Redside dace habitat that is highly sensitive. Stringent monitoring was required during construction along with weekly reporting.

Species at Risk Monitor, Water Treatment and Distribution System, Moose Deer Point First Nations Reserve, MacTier, Ontario (2009-2011)

Species at Risk and Environmental monitor for construction of a water treatment and distribution system along the eastern shore of Georgian Bay. Protected Species at Risk include endangered and threatened turtles and snakes. Required to

facilitate and conduct Species at Risk training for First Nations and construction workers based on mandatory requirements from the Environment Canada, Species at Risk permit.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Hamilton to Niagara Falls, GO Transit, Ontario (2010)

Aquatic Resource Specialist responsible for coordinating existing conditions surveys for all watercourse crossings in the Hamilton to Niagara region. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Erosion and Aquatic Assessment, German Mills Creek, Town of Richmond Hill, Ontario (2009-2010)

Aquatic Resources Specialist responsible for erosion and aquatic conditions assessment for 10km of German Mills Creek, a tributary of the East Don River, Richmond Hill. Required to identify areas of erosion that may cause impacts to municipal infrastructure, public and private land. Aquatic conditions were assessed in conjunction with erosion areas that may be improved during future works. Collected information was used to determine a level of potential hazard.

Stream Realignment, Upper Nottawasaga River, Township of Mono, Ontario (2009-2010)

Project Coordinator responsible for stream realignment of 105 linear metres of coldwater habitat in the Upper Nottawasaga River watershed. Project required coordination of contractors, reporting to the Township of Mono and Nottawasaga Valley Conservation Authority and liaison with landowners. Realignment involved creation of suitable habitat for coldwater species (brook trout and migratory rainbow trout) including riffle structures, large woody debris placement, native substrate loading, vegetative mats for undercuts and riparian plantings. Responsible for salvage efforts and compliance with the Department of Fisheries and Oceans (DFO) authorization for the "Harmful alteration, disruption or destruction" (HADD) of fish habitat and future monitoring requirements.

Ribb Dam Supplemental EA, World Bank, Ethiopia (2008-2009)

Project Coordinator/Aquatic Resource Specialist on a World Bank funded project to undertake a series of studies to update the existing EA in compliance with World Bank guidelines. Assisted in the development of Habitat Suitability Curves for Physical Habitat Simulation (PHABSIM) model to determine potential impacts to habitat for African barbs, Nile tilapia, and African catfish of the Ribb River. Studies focused primarily on aquatic and wetland baseline information, potential hydrological effects, and impacts and mitigation measures related to the construction of a large water supply dam.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Georgetown to Kitchener, GO Transit, Ontario (2008-2009)

Aquatic Resource Specialist responsible for coordinating existing conditions surveys for over 50 watercourse crossings in the Credit Valley and Grand River watersheds. Efforts included site visits to watercourses to document existing and critical fish habitat and determination for potential Fisheries Act Authorizations. Responsible for reporting information under the requirements for Municipal Class Environmental Assessment Projects for the preparation of the Environmental Study Report (ESR).

Unexploded Ordnance Clearing, Species at Risk Biologist, XTEC, Former Camp Ipperwash, Ipperwash, Ontario (2007-2009)

Biologist Team member responsible for adherence to the Environment Canada (EC) Species at Risk Permit required for vegetation clearing on the Former Camp Ipperwash, Military Training Center. EC issued a permit under the Species at Risk Act to protect threatened and endangered species known to exist on site based on previous observations during biological inventories required under the Canadian Environmental Assessment Act. Vegetation clearing was required to conduct electromagnetic (EM) surveys to determine unexploded ordnance locations. The Biologist Team was responsible for identification and avoidance of Federal and Provincial Species at Risk during site operations.

Fixed Link Project CEAA Screening, Chippewas of Georgina Island First Nation, Sutton West, Ontario (2007-2008)

Responsible for the preparation of an aquatic existing conditions report for the study area and made recommendations on a preferred alternative route based on potential effects to the aquatic environment. Information prepared was included in the Preliminary Evaluation of Engineering and Environmental Alternatives Study and CEAA Screening Report for the proposed Fixed Link. The proposed Fixed Link is to be a reliable all-weather transportation (vehicle and passenger) link from Georgina Island to the mainland.

Water Intake Repair, CEAA Screening, Six Nations, Ontario (2007-2008)

Preparation of a Letter of Intent (LOI) to the Department of Fisheries and Oceans (DFO) for work within hazard lands to repair a communal water intake structure. The intake structure, which is built into the bank of the Grand River, is experiencing erosion around the sheet pile facing walls, as well as movement of the sheet pile walls. The repair must alleviate the sheet pile movement, and erosion around the structure.

Natural Gas Pipeline Construction, Senior Environmental Monitor, Union Gas, Strathroy, Ontario (2007)

Lead Environmental Monitor reporting to Union Gas for the construction of an 18km, 48" Natural Gas pipeline loop from Strathroy to Lobo Station. Responsible for all environmental aspects of the project including; protection of Cultural resource sites, fish and wildlife, sediment and erosion control, spill clean-up, and selection of discharge sites for dewatering applications. Also responsible for maintaining adherence to Water Take Permits (MOE), Protection of Fish and Fish Habitat (DFO), Flood/Fill Regulation for St. Clair Regional Conservation Authority (SCRCA), and the reporting requirements based on the conditions of each permit. A total of seven watercourse crossings were completed in the dry, following proper mitigation measures required for sediment and erosion control and fish and wildlife salvage. Also responsible for bank stabilization, riparian area planting, and pipeline cover project on the adjacent 28" pipeline, including associated meetings with DFO and SCRCA.

Peer Review of MAQ Quarry Natural Environment Report, Township of Grey Highlands, Ontario (June 2008-Ongoing)

Mr. Pfohl provided a peer review of aquatic existing conditions report to determine if potential impacts to aquatic life was determined and appropriately addressed. He provided a review of the field program for suitable sampling methods and determination of fish habitat. Significant environmental resources were present on, and adjacent to, the proposed below- water table quarry, including a provincially significant wetland, habitat of endangered species and other provincially-rare species. Proponents challenged the identification of Significant Wildlife Habitat and Significant Woodlands on the site. The proposal also created debate over the protection of environmental resources and whether the provision of a supply of aggregate material close to markets should take precedence. Proponents have yet to address outstanding comments.

Fish Habitat Assessments, Road Crossings, Various Clients across Ontario (2007-Ongoing)

Responsible for collecting and mapping fish habitat information for over 70 various road crossing and highway twinning projects in Ontario. Habitat Assessments (MTO Protocol 2006) were completed as part of the information requirements based on the Environmental Assessment Act. Information has been presented at Public Information Centers, in Environmental Study Reports and various Environmental Assessment documents for regulatory review.

Municipal Class Environmental Assessment, Schedule C for the Dissette Street Widening, Town of Bradford West Gwillimbury, Ontario (2007-2010)

Aquatic Resource Specialist responsible for coordinating the aquatic existing conditions survey to determine potential for fish habitat as defined under the Fisheries Act for future road widening. Consultation with the Lake Simcoe Region Conservation Authority (LSRCA) to develop a program which included sampling of local watercourses, habitat mapping (MTO Protocol 2006) and background review for reporting EA requirements. Submission of a Letter of Intent (LOI) to LSRCA to provide watercourse improvements in conjunction with mitigation and monitoring efforts to avoid a HADD to fish habitat was facilitated.

Municipal Class Environmental Assessment, Brook Trout Spawning Surveys, Credit River, Orangeville Waste Water Treatment Plant Expansion, Town of Orangeville, Ontario (2007-Ongoing)

Aquatic Resources Specialist responsible for conducting Brook trout spawning surveys with the Credit Valley Conservation Authority (CVC) on the upper Credit River. Spawning Surveys were required to determine presence/absence of critical habitat for Brook trout in sections of the Credit River downstream from the Orangeville Waste Water Treatment Plant. Concerns from CVC on the proposed expansion of the plant triggered more intense investigations of the Credit River immediately downstream of the outfall.

Various Wind Energy Projects, Amphibian Monitoring, Confidential Clients, Southern Ontario (2007-Ongoing)

Responsible for developing and conducting Amphibian Monitoring programs for spring breeding surveys. Breeding surveys were developed based on the Marsh Monitoring program for Ontario. Survey results were reported for each study area and included in the Provincial and Federal Environmental Assessment documents.

Victor Diamond EIA/Baseline Study, Annual Fisheries Surveys, DeBeers Canada, Attawapiskat, Ontario (2004-2006)

Field project manager responsible for baseline studies and annual fisheries surveys to quantify Whitefish and Brook trout abundance in potential groundwater drawdown areas for a proposed diamond mine in northern Ontario. Required to obtain

Fish and Wildlife Act "Scientific Collection Permits" and Public Lands Act "Work Permits" from Ministry of Natural Resources (MNR) to conduct annual surveys. Construction of a full span fish fence to determine fall migratory species and abundance in the Nayshkootayow River. Trained First Nations field staff to monitor water quality and fish abundance in potential groundwater drawdown areas. Obtained "Permit to Take Water" from MOE for waterway crossings and provided environmental monitoring during construction. Collection of tissue samples analyzed for the "Sportfish Eating Guide of Ontario" and future reference for Brook trout DNA. Collection of aging structures (otilith and scale) for Lake whitefish, Lake ciscoe and Brook trout. Initiated the first round of benthic collections and water sampling for the Environmental Effects Monitoring (EEM) program based on specific discharge locations. Information collected from baseline studies was included in the EIA and the Comprehensive Study Report for Government Agencies, Public, and First Nations review.

Aquatic Baseline Study, Howell's River, Lab Mag Services, Schefferville, Quebec (2006)

Field project manager responsible for baseline aquatic studies pertaining to the construction of an iron ore mine in northern Labrador. Responsible for locating last remaining stocks of *Ounaniche* (land locked Atlantic salmon) on the Howell's River system for a satellite based telemetry program. Conducted morphometrics, anaesthesia and surgical placement of transmitters in adult *Ounaniche*. Responsible for field crew logistics, aquatic data collection, health and safety in remote locations, and client liaison.

Redhill Creek By-Pass, Environmental Monitor, UMA and Dufferin Construction, City of Hamilton, Ontario (2006)

Environmental Monitor responsible for compliance to the Environmental Protection and Sediment and Erosion Control Plan related to highway construction works. Required to submit daily environmental monitoring reports to determine non-compliance issues related to contractor performance. Protection of significant habitat adjacent to project construction limits. MTO project number.

Goreway Road Expansion, Fisheries Assessment, Brampton, Ontario (2006)

Responsible for collecting field data for fish habitat assessments of approximately 7 water crossings along the proposed ROW using the new MTO/DFO/MNR protocol for future expansion of Goreway Road.

Lakes and Rivers Improvement Act (LRIA), Permit Application for Dam Construction, Confidential Client, Uxbridge Township, Ontario (2006)

Project coordinator responsible for the submission of a LRIA permit application to construct a dam on a tributary of Duffins creek. Required to coordinate and fulfill the information requirements set out in the LRIA guidelines for MNR permit applications.

Hwy 410 Extension, Fisheries Assessment, Brampton, Ontario (2005)

Responsible for conducting fish habitat assessments and fish inventories for a section of Etobicoke Creek for the Hwy 410 extension. The aquatic ecosystems inventory and assessment was carried out to meet the established criteria set forth by the Ontario Ministry of Transportation (MTO), "*Environmental Reference for Highway Design*", November 2002 (ERD).

Hwy 5 West of Hwy 6 and East of Hwy 8, Preliminary Design, Hamilton, Ontario (2005)

Aquatic ecosystem and existing conditions assessment for watercourses along Hwy 5, West of Hwy 6 and East of Hwy 8. The aquatic ecosystems inventory and assessment was carried out to meet the established criteria set forth by the Ontario Ministry of Transportation (MTO), "Environmental Reference for Highway Design", November 2002 (ERD).

GO Transit Rail Line Expansion, URS Corporation, Hamilton to Burlington, Ontario (2005)

Responsible for determining all waterway crossings and potential impacts to fish habitat associated with the expansion of an existing rail line from Hamilton to Burlington.

Parry Sound Power Generation, Seguin River Water Management Plan, Fisheries Impacts Associated with Historical Dam Manipulation, Parry Sound, Ontario (2005)

Responsible for determining potential fisheries habitat impacts for the Seguin River System based on historical information on dam manipulation provided by Parry Sound Power Generation.

Environmental/Construction Monitoring, Montcalm Mine, Falcon Bridge, Timmins, Ontario (2005)

Environmental monitor responsible for environmental and construction monitoring for the installation of a pipeline diffuser in the Groundhog river, Timmins, ON. Responsible for contractor supervision, fish and wildlife monitoring, water quality monitoring and the implementation of the Sediment and Erosion Control Plan.

Walleye Spawning Survey, Parry Sound Power Generation, Parry Sound, Ontario (2005)

Responsible for enumeration of spawning Walleye *(Sander vitreus vitreus)* in the Seguin River downstream of the Parry Sound Power Generation, Hydroelectric Dam in Parry Sound. Information collected was presented to stakeholders and public interest groups in conjunction with the Ministry of Natural Resources (MNR) and Department of Fisheries and Oceans (DFO).

Habitat Suitability for Walleye, Three Nations Lake, Pamour Mine Expansion Project, Porcupine Joint Venture, Timmins, Ontario (2004)

Conducted an extensive literature review of Suitable Habitat for Walleye *(Sander vitreus vitreus)*. The information was used to determine suitable habitat, substrate, depths, and spawning shoal design for a compensation plan for Three Nations Lake. The lake was dyked to provide access to subsurface gold deposits and a new section of the lake was flooded to provide a "no net loss" of fish habitat.

Site Reconnaissance of the Pembina Pipeline Oil Spill, Pine River, District of Chetwynd, British Columbia (2000-2003)

Field project manager responsible for coordinating and conducting the 2000-2002 site reconnaissance of the Pine River Oil Spill, the largest oil spill to a fresh water environment in North America which occurred on August 1, 2000. Responsible for coordinating and conducting a fingerprinting program with BC Research to determine the original source of hydrocarbons present in the Pine River. Accessed depositional areas along the river using a canoe, and video documented sampling locations for future legal evidence. Reviewed analytical data for report preparation and submission to regulatory agencies. Information regarding observations, sampling techniques, and analytical data were presented to the District council members, residents of Chetwynd, and Government Officials at public information sessions.

Kokanee Stranding Assessment, BC Hydro, Duncan River, Nelson, British Columbia (2003)

Field team member responsible for a Kokanee stranding assessment during a reduction in water flows at a BC Hydro generating dam on the Duncan River in Nelson, BC. Stranded fish were captured using electro-fishing methods for identification and enumeration. Data collected will be used to determine effects on fish during future flow reductions.

Environmental Monitoring and Fish Salvage, Stanley Park Seawall Undermining Repair, Vancouver Board of Parks and Recreation, Vancouver, British Columbia (2003)

Environmental monitor required to inspect construction activities including shotcrete applications in a marine environment for the Stanley Park Seawall. Responsible for obtaining specific fish collection permits and approval of work permit extensions from the DFO on behalf of the client. Selected tidal pools were bailed and marine life collected and transported to the Burrard Inlet for release prior to the preparation of undermined locations. An environmental monitoring report including fish collection details was submitted to the DFO for review.

Environmental Protection Plan, Stanley Park Seawall Undermining Repair, Vancouver Board of Parks and Recreation, Vancouver, British Columbia (2003)

Responsible for the preparation of an Environmental Protection Plan that was reviewed by DFO prior to gaining approval for the repair works along the Stanley Park Seawall.

Environmental Monitoring, BC Hydro Substation Construction, Alltec Corporation, Langley, British Columbia (2003)

Environmental monitor responsible for environmental and construction monitoring for a BC Hydro Substation adjacent to a Restrictive Covenant zone. Responsible for water quality testing and sampling, client liaison, and reporting any infractions to the provincial regulations. A final monitoring report was sent to the Ministry of Water Land and Air Protection, Habitat Protection Branch for final review.

Fisheries Habitat Overview, Aurora South, Syncrude, Fort MacMurray, Alberta (2003)

Responsible for conducting a reach break analysis for the Regional Study Area (RSA) selected for future Oil Sands mining in north-eastern Alberta. Potential fisheries and wildlife values have been determined and documented using background information and an aerial photography of the RSA. Information gathered was used for the Environmental Impact Assessment (EIA) for future development.

Natural Gas Well Feasibility Study, Rosetta Exploration, Hudson's Hope, British Columbia (2002)

Project manager and coordinator required to determine the feasibility of an exploration well for natural gas. Site investigations were conducted in a remote location in north-eastern BC to determine if previous occupants have impacted an area used for previous oil and gas exploration. Information collected was used to determine future impacts on the local ecology. Information

presented to the client was reviewed by the Oil and Gas Commission prior to gaining permits for future exploration.

Environmental Effects Monitoring, Equity Mine, Placer Dome, Houston, British Columbia (2002)

Responsible for conducting and coordinating fieldwork and an Environmental Effects Monitoring (EEM) program for Silver mine in northern BC. A release of tailings effluent into the local watershed from previous spring runoff was investigated using biological indicators and water and sediment quality. Installation of periphyton blocks and invertebrate baskets used were used to monitor downstream conditions. A sediment-sampling program in a lake near the mine was also incorporated into the effects monitoring program to determine concentrations and toxicity to invertebrates from possible metals contamination.

Environmental Protection Plan/Environmental Monitoring for a Culvert Removal and Habitat Restoration, Innovative Housing, Surrey, British Columbia (2002)

Responsible for final submission of the Environmental Protection Plan to the Ministry of Water Land and Air Protection, Habitat Protection Section, for review and approval for "Working in and about a stream". Christopher was the on-site Environmental monitor for the construction work related to the removal of a culvert to daylight an existing creek and substrate placement to provide habitat restoration. Responsible for documenting construction activities, water quality monitoring, client liaison and final reporting required by Ministry of Water Land and Air Protection.

2000 Follow-up Studies to the Stewart Creek Oil Spill, Confidential Client, Stewart Creek, British Columbia (2000)

Responsible for conducting sediment and benthic invertebrate sampling program at seven sites in the fall of 2000, five years after a crude oil spill in the Stewart Creek watershed. The project involved comparisons of the hydrocarbon and benthic invertebrate data collected in 1995, 1997, and 2000.

Fish Collection and Sediment Sampling, Translink, Richmond, British Columbia (2000)

Conducted fish collection and sediment sampling to determine and compare Polycyclic Aromatic Hydrocarbons (PAHs) in fish tissue and sediment samples. Analytical results of the sediment were compared to the fish tissue and the consumption levels presented in the "Guide to Eating Sportfish, 2001", Ministry of Environment, Ontario.

Biological Inventory

Christopher has been certified by MNR/TRCA under the Ontario Stream Assessment Protocol (OSAP) with addition certification by the Ontario Benthos Biomonitoring Network (OBBN). He has completed the Ontario Fishes Identification Course presented by the Royal Ontario Museum, and is certified by MNR as a Class 1 Electrofishing Crew Leader and trainer. Christopher has been certified under the MTO/DFO/MNR Fisheries Protocol, Fisheries Assessment Specialist, Fisheries Contract Specialist presented by MTO/DFO/MNR in November 2006, and is RAQS certified by MTO. Christopher has completed the Ontario Freshwater Mussel Identification Workshop (DFO), the Marsh Monitoring protocol for Amphibian Breeding surveys and egg mass surveys for breeding salamanders (Species at Risk). He has conducted numerous aquatic inventories in Ontario, Labrador and British Columbia, in local watersheds to very remote areas in northern climates.

Health and Safety

Christopher has been a Health and Safety Committee member and employee representative for the last 6 years and has completed numerous Health and Safety Plans for a variety of projects.

NEEGAN BURNSIDE

Profession

Environmental Technologist

Education

Forestry Technician, Sir Sandford Fleming College, School of Natural Resources, 2000

Environmental Technologist, Sir Sandford Fleming College, School of Natural Resources, 2002

Certificates

Ecological Land Classification for Southern Ontario, 2011

Ontario Wetland Evaluation System, 2011

Butternut Health Assessor, 2010

MNR Class 2 Electrofishing Certification (Backpack Crew Leader), 2010

Employment Record

Environmental Technologist, R.J. Burnside & Associates Limited (2009-Present)

Environmental Technologist, AMEC Earth and Environmental, Mississauga, Ontario (2003-2009)

Environmental Specialist (Secondment), Toyota Motor Manufacturing Canada, Cambridge, Ontario (2000-2003)

Forestry Technician, Grand River Conservation Authority, Cambridge, Ontario (1999-2002)

Citizenship

Canadian

Languages

English

Dominique Evans

Dominique Evans has been responsible for the collection, management and analysis of a broad range of environmental data associated with various project assignments. These projects have included infrastructure development in municipal, mining, industrial, power, transportation and municipal sectors as well as natural resource based studies. Undertakings have involved technical support with and application of: the Forest Ecosystems Classification (FEC) and Ecological Land Classification (ELC) as well as, air photo interpretation and, database management and maintenance. Ms. Evans has also been involved with the coordination of public awareness meetings, Rural Water Quality Programs and land owner liaison, forest inventory, planting survival census, and tree planting restoration programs

Dominique has been involved in various aspects of natural resource inventory over the past ten years. This has principally included the inventory of forest resources through the application of the Ecological Land Classification. Responsibilities included the air photo interpretation of vegetation units, the assessment of units including field identification of vegetation communities, stand delineation, field inventory records, database management, and mapping. She is also conversant with the Ecological Land Classification, providing support to senior ecologists in field inventory programs and management of resulting databases.

Ms. Evans has been involved in the critical aspects of database management. Her responsibilities have included the organization of field data, the creation of appropriate databases, management and maintenance of the databases and quality assurance/quality control. The database management has also involved the integration with Geographic Information Systems (GIS) in order to efficiently apply the inventory data for assessment and graphic representation. Dominique is familiar with ArcView for such GIS applications.

Environmental Assessment and Database Management / Geographic Information Systems

Municipal Class Environmental Assessment (Schedule B) for Mono Sideroad #7 culvert replacement, Town of Mono, Orangeville, Ontario (Ongoing)

Assisted with the completion of the environmental, and approvals and permitting processes associated with the design and construction of the Mono Sideroad #7 culvert replacement.

Municipal Class Environmental Assessment Addendum (Schedule C) for County Road 90 Improvements, County of Simcoe, Midhurst, Ontario (2011-2012)

Aided the Environmental Assessment co-coordinator with the preparation of the EA Addendum report. Ms. Evans completed the Ecological Land Classification for the proposed improvements.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Hamilton to Niagara Region, GO Transit, Ontario (2009-2011)

EA Coordinator responsible for managing EA efforts including public consultation,

inventories of the existing natural, social and economic environmental conditions within the study area, and studies by environmental sub consultants.

Erosion and Aquatic Assessment, Upper Rouge River and Beaver Creek, Town of Richmond Hill, Ontario (2010-2011)

Preparation of mapping of site and baseline study data using ArcView GIS. Involved in mapping various levels of watershed delineation, aquatic erosion areas and field survey data,

Municipal Class Environmental Assessment (Schedule B) for South Arterial Road, County of Dufferin, Ontario (2010-2011)

Aided the Environmental Assessment co-coordinator with the preparation of the Project file Report (MEA 2000, as amended 2007) for the proposed extension of the South Arterial Road.

Municipal Class Environmental Assessment (Schedule B) for 27th Sideroad Structure, Town of Halton Hills, Ontario (2009-2011)

Assisted the Environmental Assessment co-coordinator with the finalization of the Project File Report for the proposed improvements to the 27th Sideroad Structure.

Master Servicing Plan, Town of Beeton, Ontario (2009-2011)

Assisted the Project Manager in the completion of the Master Servicing Plan (MSP) for water, wastewater, transportation and storm water management.

Master Servicing Study for Planned Service Area, Town of Bradford West Gwillimbury, Ontario (2009-2011)

Assisted the Project coordinator with the Bradford West Gwillimbury Master Servicing Study (MSS) for water distribution and sewage collection. Serviced lands will require appropriate connection to the Town's existing sanitary sewer and water supply system (the Town is considering the optimal design and location for these facilities.

Walter Bean Trail and Pedestrian Footbridge Design and Approvals, City of Kitchener, Ontario (2009-2011)

Assisted with the completion of the environmental, and approvals and permitting processes associated with the design and construction of the Walter Bean Trail and Pedestrian Footbridge over the Grand River in Kitchener. Facilitated and organized public consultation regarding the construction of the Project. Responsible for coordinating the agency consultation and completing the Public Information Centre Summary Report for the project.

Erosion and Aquatic Assessment, German Mills Creek, Town of Richmond Hill, Ontario (2009-2010)

Assisted the Aquatic Resources with the erosion and aquatic conditions assessment for 10km of German Mills Creek. Assisted in identifying areas of erosion that may cause impacts to municipal infrastructure, public and private land. Collected information was used to determine a level of potential hazard.

GO Transit Class Environmental Assessment, Group B for the Proposed Rail Expansion from Georgetown to Kitchener, GO Transit, Ontario (2009-2010)

Environmental Assessment Support - Assisted with the Public Information Centres (PIC), and finalization of reporting.

Municipal Class Environmental Assessment, Schedule B for the Creemore Sewage Treatment Plant Equalization Tank, Clearview Township, Ontario (2009-2010)

Assisted the EA Coordinator, while being responsible for the public consultation program, communications with stakeholders, and coordination of sub-consultants.

Victor Diamond EA/Baseline Study, DeBeers Canada, Attawapiskat, Ontario (2003-2009)

Preparation of mapping of site and baseline study data using ArcView GIS. Utilized GIS for radio collard caribou tracking and monitoring. Involved with mapping of Important Bird Areas for the James Bay Region, muskeg monitoring well location mapping, noise monitoring mapping, site plan analysis and various levels of watershed delineation. Also provided support for environmental permits and approval applications with appropriate graphics.

Young-Davidson Project, Northgate Minerals Corp., Matachewan, Ontario (2007-2009)

Preparation of mapping of site and baseline study data using ArcView GIS. Involved in mapping various levels of watershed delineation, aquatic and terrestrial field survey data, and FEC classifications.

Hollinger Project, Porcupine Joint Venture (PJV), Timmins, Ontario (2007-2009)

Preparation of mapping, using ArcView GIS, for the baseline study data. Includes mapping of vegetation units, bedrock outcrops, and potential waste rock storage sites.

PJV Pamour Pit Expansion, Timmins, Ontario (2006-2009)

Assisted in the transfer of data from vegetation field studies to graphic plans for the purpose of existing conditions reporting and environmental effects assessment.

Detour Gold, Detour Lake Project, Northern Ontario (2007-2009)

Preparation of graphics and delineation mapping of baseline study data using ArcView GIS. Involved with well location mapping, noise monitoring mapping, site plan analysis and various levels of watershed delineation. Also provided support for environmental permits and approval applications with appropriate graphics.

PhosCan Chemical Corp., Martison Site, Hearst, Ontario (2008-2009)
Preparation of site mapping and baseline study data using ArcView GIS. Involved in mapping various levels of watershed delineation, aquatic and terrestrial field survey data, and site plan analysis.

Competitive Power Ventures Inc., Multiple Projects within Ontario (2006-2009)

Assisted in the mapping of data from vegetation and aquatic field studies for the purpose of existing conditions reporting and environmental effects assessment. Ms. Evans also prepared all relevant materials for a number of public consultations and public notices.

Toyota Motor Manufacturing Canada, Cambridge, Ontario (2004-2009)

Assisted with the collection and processing of data for the National Pollutant Release Inventory. This included the acquisition of the data, data entry, spreadsheet creation, linking data from Excel and Access and summarizing the final tabulations for entry into the official NPRI online database. This is the fifth year Ms. Evans has been involved with the NPRI process.

Atomic Energy Canada Limited (AECL), Low Level Radio Active Waste Management Office Port Hope Area Initiative: Terrestrial Assessment Study, Port Hope and Port Granby, Ontario (2003-2006)

Using aerial photography Ms. Evans assisted in the delineation of vegetation units for preliminary reporting and field program development. Once completed the data was summarized as per ELC methodology, transposed for GIS application and queried using ArcView Spatial Analyst.

Ms. Evans assisted in the preparation and execution of two terrestrial environmental baseline characterization studies and confirmatory vegetation unit mapping based on Ecological Land Classification data.

Energy Projects and Renewable Energy Approvals (for Renewable Energy

Northland Power, Grand Bend Wind Farm, Grand Bend, Ontario (2011-Present)

Using aerial photography, Ontario Base mapping and other publicly available data Ms. Evans assisted in the delineation of vegetation units for preliminary reporting and field program development. Once Ms. Evans completed the field observations, the data was summarized as per ELC methodology, transposed for GIS application and queried using ArcView Spatial Analyst.

Festival Hydro Transformer Station Class Environmental Assessment for Minor Transmission Facilities, Stratford, Ontario (2010-2011)

Assisted in the preparation a Class EA for a new transformer station in the City of Stratford. Conducted all required public notifications and assessments potential impacts associated with noise, construction and operation of the facility.

LEAH E. LEFLER, B.Sc., M.E.S.

PERSONAL DATA
Citizenship: Canadian
Language: English

EDUCATION
B.Sc. Dalhousie University (2003). Bachelor of Science, Honours Biology.
M.E.S. University of Waterloo (2006). Master of Environmental Studies.

CERTIFICATION
Ecological Land Classification training (2008). Ministry of Natural Resources.
Ontario Wetland Evaluation System training (2009). Ministry of Natural Resources.

PROFESSIONAL AFFILIATIONS
Field Botanists of Ontario (member and volunteer)
Global Restoration Network (member and volunteer)
Guelph Field Naturalists (member)
Waterloo Wellington Wildflower Society (member)

CAREER SUMMARY
North - South Environmental Inc. (January 2009-present) – Ecologist
Responsible for project management, field studies, client liaison, evaluation of findings and preparation of final reports.

Credit Valley Conservation (May 2007-December 2008) – Natural Heritage Technician
Responsible for species of conservation concern ranking, field protocol development, natural heritage fieldwork, report writing and database queries.

University of Guelph, Environmental Biology Department, Global Ecological Change Group (January 2007-May2007) – Ecological Research Technician
Responsible for data management and analysis, lichen identification and research related to responses in vegetation to ecological change.

University of Waterloo (September 2004-April 2006) – Teaching Assistant
Responsible for assisting in the delivery of numerous university courses, grading assignments, leading tutorials and holding office hours.

City of Kitchener, Parks Operations, Forestry Section (January-April 2006) – Research Assistant
Responsible for preparing an Urban Natural Area Management Plan, management templates and guidelines for the City of Kitchener.

Parks Research Forum of Ontario, University of Waterloo (May-August 2005) – Editor and Administrative Assistant
Responsible for coordinating and editing conference proceedings from Parks Research Forum of Ontario's 2005 Annual General Meeting.

Dalhousie University, Canadian Environmental Literacy Project (May-August 2003) – Project Developer
Responsible for developing an environmental literacy project, writing environmental education modules and compiling resources.

A SHORT SELECTION OF PROJECT EXPERIENCE IS PROVIDED ON THE FOLLOWING PAGES.

LEAH E. LEFLER, B.Sc., M.E.S.

Credit Valley Conservation Sub-watershed 19 NHS Study
This study involved testing and refining a draft Natural Heritage System developed by CVC staff, and developing recommendations for implementation of the NHS. As the majority of the NHS falls within privately owned lands, much of the implementation will be through stewardship and outreach programs. The project tasks included collecting all existing mapped natural heritage data to confirm/refine NHS boundaries; reviewing existing municipal policies to determine the extent of the NHS currently recognized in protective designations; reviewing a range of existing stewardship programs to identify opportunities for implementation; identifying restoration and remediation opportunities to improve NHS function; extensive consultation with CVC staff; and identifying high priority areas in the NHS to target limited stewardship resources.

Credit River Parks Strategy
NSE's role on this project focused on collecting and evaluating natural heritage data to determine sensitive and/or significant features within the Credit River valley in the City of Mississauga. A sensitivity map was produced that categorized all areas within the valley in one of three categories, each with different ecological sensitivities, and thus varying opportunities and constraints for use within a parks system. The sensitivity mapping will inform a Master Plan for the valley which is being developed by Schollen & Company Inc.

Fostering Collaboration in Sustainable Landscape Planning Discussion Paper
This discussion paper, prepared for the Stewardship Network of Ontario, synthesized existing information on the topic of sustainable landscape planning with the view to improve collaboration and social-learning among stakeholder groups in the southern Ontario context. A number of different discussion topics were reviewed as they relate to sustainable landscape planning, such as the use of targets and thresholds in sustainable landscape planning, agriculture as part of the rural landscape, rural communities, stewardship approaches and planning considerations. Targets and thresholds literature was reviewed, as well as selected ecological and agricultural initiatives. Lastly, summarize of six case studies that highlight collaborative approaches to stewardship across southern Ontario were provided.

Stavebank Tree Survey and Restoration Strategy
A tree inventory and hazard tree assessment was completed at a property in Mississauga in preparation for conveying a portion of natural area to the City. A scoped Environmental Impact Study (EIS) was completed for the property, which included an assessment of natural features on site. A detailed restoration strategy, including the removal of invasive species present on site as well as a list of recommended species for planting, was prepared. A tree preservation plan was also prepared to determine potential tree loss and preservation opportunities within the developable portion of the property. Impacts were reviewed and mitigation measures were recommended.

City of Toronto ESA and ANSI Updates
These projects involved updating information pertaining to the Environmentally Sensitive Areas (ESA) and Areas of Natural and Scientific Interest (ANSI) within the City of Toronto. Field tasks for this project included checking ESA and ANSI boundaries, searching for seepage areas and other significant wildlife habitat, significant species, as well as a general inventory of flora and fauna at each site. The Ecological Land Classification System was used to classify vegetation communities within each natural area.

LEAH E. LEFLER, B.Sc., M.E.S.

Township of Wainfleet Official Plan Review
This project is currently ongoing. NSE is a sub-consultant, working with Sorensen Gravely Lowes, Planning Associates to refine and update the Township of Wainfleet's Official Plan. For this project, we relied on existing information and limited field-truthing to identify natural heritage features in the Township. Background data were collected from Niagara Region, Niagara Peninsula Conservation Authority, the local District MNR Office and the Natural Heritage Information Centre. This information was used to prepare an Issues and Opportunities report which will eventually be used to refine the Niagara Regional natural heritage system (NHS), develop a local NHS for the Township, and develop Official Plan policies to protect natural heritage features in conformity with Provincial and Regional policy documents.

Survey and Habitat Assessment of Branched Bartonia in The Massasauga Provincial Park
Potentially suitable habitat for branched bartonia (*Bartonia paniculata* ssp. *paniculata*) was initially identified and sites worth searching were prioritized using aerial photographs and a set of criteria. A total of 29 wetlands were identified as potential sites for branched bartonia to be searched within the park. Fieldwork was completed within prioritized wetlands. Flora inventories, incidental wildlife observations and habitat assessment were completed. A report was prepared summarizing the findings of the fieldwork and recommendations were made for future search efforts.

Credit River Watershed Species of Conservation Concern Project
This project provides an assessment of the local conservation status of the natural species found in the Credit River Watershed. Rarity rankings were assigned to the species found in the Credit River Watershed using various criteria. A ranking system and inventory method was developed for taxa groups inventoried on a regular basis (i.e., plants, birds, mammals, amphibians, reptiles and fish). Protocols were development for mapping and tracking species of conservation concern for the purposes of updating rarity ranks based on spatial and quantitative data and for maintaining a record of locations of rare species in the watershed. Species of Conservation Concern lists are updated on a continual basis based on information collected in the field to reflect continual changes in what is known about rare species in the area. The purpose of this project was to provide a local context to rare species protection and management.

Plant Ecology of Industrially-Damaged Forests
Vegetation surveys were completed in the vicinity of decommissioned smokestacks in Sudbury, Ontario to determine the recovery rate of plant and lichen communities at varying distances from sources of air-borne pollution. Unknown lichen specimens were identified in a laboratory setting using taxonomic keys and required reagents. A large data set comprised of 5 years worth of data was organized for the purpose of statistical analysis and modeling ecological change. This work was part of an ongoing research program at the University of Guelph in the Global Ecological Change Research Group. Data continues to be collected and added to the analysis to determine long-term trends and changes in the response of vegetation to varying levels of disturbance.

LEAH E. LEFLER, B.Sc., M.E.S.

Urban Natural Areas Management Plan for City of Kitchener
Current issues in urban ecology, urban park management and urban park planning were reviewed to inform the development of an Urban Natural Areas Management Plan for the City of Kitchener. This work was completed in correspondence with the University of Waterloo and Forestry Section of Parks Operations at the City of Kitchener. Management templates and guidelines for specific classifications of urban natural areas were created to guide park planning and management decisions. The Urban Natural Areas Management Plan was summarized into a working document to guide the overall management of the City of Kitchener's urban natural areas.

Assessment of Forest Restoration Outcomes in the Region of Waterloo, Southern Ontario
As part of a Masters research thesis, this project examined the progress of early-stage forest restoration projects within the Regional Municipality of Waterloo, Southern Ontario to determine the variables that affect early successional trajectories and provide a method for evaluating the progress of early-stage forest restoration projects. The responses of (1) herbaceous vegetation; (2) regenerating woody vegetation; and (3) mature trees at 7 forest restoration sites were measured. Site location, restoration technique and restoration transect all appeared to significantly affect restoration progress for some structural metrics. Results showed that 4 out of 7 restoration sites were moving towards a predetermined restoration goal. The remaining 3 restoration sites may recover over time, but likely require additional restoration measures to achieve a desirable long-term outcome. Management recommendations were prepared for sites that showed poor signs of recovery.

Environmental Inspections
Environmental Inspections are carried out on a number of residential development sites within the City of Guelph. These inspections are completed to ensure that the developments are complying with recommendations made in the environmental impact reports and to ensure that proper sediment erosion control measures are maintained. Reports are completed monthly and submitted to the City of Guelph for review.

Sal P. Spitale, B.Sc., M.E.S.

PERSONAL DATA
Citizenship: Canadian
Language: English

EDUCATION
B.Sc., Honours, Biology. University of Western Ontario (2006). Bachelor of Science
M.E.S., University of Waterloo (2011). Master of Environmental Studies.

CERTIFICATION
Ecological Land Classification training (2009). Ministry of Natural Resources.
Ontario Wetland Evaluation System Training (2012). Ministry of Natural Resources.

PROFESSIONAL AFFILIATIONS
Society for Ecological Restoration, Ontario Chapter (Chair)
Bruce Trail Conservancy (member and volunteer)
Field Botanists of Ontario (member)

CAREER SUMMARY

North - South Environmental Inc. (July 2010-present) – Ecologist
Responsible for field studies, report writing, peer review, client liaison, data input and analysis, evaluation of findings and input into final reports.

Ecological Consultant (September 2005-2010) – Ecologist
Responsible for field studies, writing and implementing restoration plans, writing land stewardship reports, monitoring and implementing control measures for invasive species.

University of Waterloo (September 2008-September 2009) – Teaching Assistant
Responsible for assisting in the delivery of numerous university courses, grading assignments, leading tutorials and holding office hours.

University of Western Ontario (May 2007-September 2007) – Field Technician
Responsible for collecting lake water samples and determining gas efflux from soils in central Ontario.

Bruce Trail Conservancy (April - September 2006) – Ecologist Intern
Responsible for field studies, writing land stewardship reports, and assisting with writing a baseline data report for conifer plantation restoration on the Bruce Trial.

Environment Canada, Centre for Inland Waters (October 2005 -March 2006) – Intern
Responsible for coordinating the science writers conference and maintaining the Environment Canada, Centre for Inland Waters website.

A SHORT SELECTION OF PROJECT EXPERIENCE IS PROVIDED ON THE FOLLOWING PAGES.

Sal P. Spitale, B.Sc., M.E.S.

Environmental Impact Studies
Environmental impact studies (*e.g.* Environmental Impact Statements/Assessments) have been completed for several municipalities including the Municipality of Clarington, City of Guelph, City of Mississauga, City of St. Catharines, City of Hamilton, Township of Stone Mills, and the Town of Aurora. These studies were completed in order to evaluate the potential impact of proposed developments on natural features and their functions. Ecological Land Classification was completed and the features and ecological functions were described in order to report on possible impacts from proposed developments. Wildlife surveys (*e.g.* birds, amphibians, reptiles, mammals) were completed and significant wildlife habitat was assessed. Further, policies related to conservation authorities and provincial and municipal governments were reviewed and applied. Consultation with stakeholder groups was conducted in order to ensure all aspects of the natural environment and the development were considered.

Natural Heritage Evaluations
Proposed developable lands were evaluated in order to assess the natural heritage features and the applicable policies restricting the development of the land within the Oak Ridges Moraine Planning Area. Environmental data was collected including vegetation from field inventories, ELC mapping, and surrounding land use in order to apply the specific policies from the Oak Ridges Moraine Conservation Plan. Theses reports provided recommendations for minimizing impact and utilizing specific development practices that could retain surface water infiltration.

Peer Review of Environmental Reports
A thorough review of environmental reports (*e.g.* environmental impact statements) submitted in support of development in the Alcona planning area was conducted. This review included field reconnaissance of natural areas in order to evaluate any deficiencies in data and reporting. Relevant environmental policies were screened at the provincial and municipal level to ensure conformity. On going consultation with the landowners, consultants, and the Town of Innisfil were required to produce a report highlighting candidate natural areas excluded from alteration and significant natural areas excluded from the developable lands.

Species at Risk and Significant Wildlife Surveys
Species at Risk and significant wildlife surveys were conducted in the Township of Melancthon, and in the Grand Bend area in order to assess the impact of proposed windfarms on wildlife and their habitat. Breeding bird surveys were completed for grassland species at risk in addition to surveys of natural features in order to identify potential significant wildlife habitat (*e.g.* bat and snake hibernacula, wildlife concentration areas).

Ecological Land Classification
Ecological Land Classification (ELC) of natural features has been completed for numerous projects. These surveys include recording all vegetation and mapping the communities within the specified study area, and assessing soils using the methods described in the Ontario Institute of Pedology (1985) soils manual.

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Amphibian Survey
Evening amphibian surveys and egg mass surveys were conducted in the Township of Melancthon in order to assess the impact of a proposed windfarm. Roadside frog surveys were completed in the evening following the Marsh Monitoring Protocol. Egg mass surveys were completed in order to identify breeding habitat for frogs and salamanders

Rouge Park Trails Environmental Areas Sensitivity Analysis
The Rouge Park was analyzed to determine areas potentially sensitive to disturbance. The analysis was based on a number of criteria including rare flora and fauna, area sensitive and ground-nesting bird species, interior forest habitat, and sensitive habitat features (e.g., wetlands). These criteria were used to identify highly and moderately sensitive areas that may inform trail types and usage in order to prevent negative impacts and preserve the ecological integrity of the natural areas. The final product was used to assist develop a master trail plan for the Rouge Park.

Natural Heritage Evaluation
Proposed developable lands were evaluated in order to assess the natural heritage features and the applicable policies restricting the development of the land. Environmental data were collected including vegetation from field inventories, ELC mapping, and surrounding land use in order to apply the specific policies from the Oak Ridges Moraine Conservation Plan. The report provided recommendations for minimizing impact and utilizing specific development practices that could retain surface water infiltration.

Land Stewardship Plans
Land Stewardship reports were written for the Bruce Trail Conservancy through the Natural Spaces Land Acquisition and Stewardship program. This involved liaising with the Bruce Trail and volunteers about property management and trail issue, conducting seasonal site flora and fauna inventories, mapping features using GIS software, and producing a report to be used by the land stewards and the Bruce trail for property management.

Simcoe County Red Pine Plantation Ecological Study
Red pine plantations were examined in Simcoe County. The investigation included identifying vegetation, measuring understory tree recruitment and growth, measuring light penetration, and collecting soil samples for nutrient, chemical, and biological analysis. The results from the investigation can be used by forest managers to make more informed decisions about forest health and diversity.

Huron Natural Area Conifer Plantation Understory Plant Inventory
The understory vegetation was examined in the Huron Natural Area in Kitchener, Ontario. The methods included examining the vegetation in evenly spaced quadrats located along transects through the conifer plantations in the natural area. The results of the survey are to be used by the City ecologist in order to improve the ecological integrity of the plantations and identify the locations of invasive species.

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Environmental Inspections
Environmental Inspections are carried out on a number of residential development sites within the City of Guelph and Town of Aurora. These inspections are completed to ensure that the developments are complying with recommendations made in the environmental impact reports and to ensure that proper sediment erosion control measures are maintained. Reports are completed monthly and submitted to the Municipality for review and to ensure conformity with development conditions.

Tree Inventory
Tree surveys have been completed as a component of several environmental studies including Environmental Impacts Statements and Environmental Assessments. These surveys include identifying trees in the study area, assessing their health and condition, and marking their location for mapping purposes. The locations of trees are assessed with respect to development proposals and impacts from development activities are reported and discussed.

SARAH K. MAINGUY B.Sc. M.Sc.

EDUCATION

M.Sc., Zoology, University of Guelph, 1982
B.Sc., Honours Biology, Acadia University, 1978

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Society for Conservation Biology
Society of Wetlands Scientists
Ontario Field Ornithologists
Federation of Ontario Naturalists
Bird Studies Canada
Field Botanists of Ontario (Past President)

CAREER SUMMARY

North - South Environmental Inc. (2000 to present) – Senior Ecologist
Responsible for project management and completion including proposal writing, client liaison, project supervision, field studies, data analysis, evaluation of findings and production of final reports.

University of Toronto: John H. Daniels School of Architecture, Landscape and Design (2010) - Sessional Lecturer
Integrated Ecological Studies, Master of Landscape Architecture program

Gore and Storrie Limited /CH2MHill Limited. (1990 to 2000) - Environmental Scientist
Biologist providing consulting services for a complete range of environmental projects, particularly Class Environmental Assessment projects.

The Landplan Collaborative Ltd. (1988 to 1992) - Environmental Biologist
Conducted environmental studies and provided input into landscape planning and design projects.

University of Guelph, Ontario Veterinary College (1983-1988) - Research Technician, Research Assistant
Primarily responsible for laboratory studies of stress and hormone synthesis in pigs, in live cultures and *in situ.*

University of Guelph Master's Thesis Research (1980-1982)
Conducted research in physiology of egg-laying and incubation, comparing fat and protein use in urban and non-urban subspecies of Canada Geese.

Canadian Crossroads International (May-December 1979) - Volunteer Service
Volunteered as a cultural exchange student in Lochinvar National Park, Zambia, Central Africa, re-designing educational materials and assisting with scientific projects on parasite loads in ungulates.

Canadian Wildlife Service and Acadia University (1977-1979) - Field Assistant and Honours Thesis
Seasonal field assistant on a variety of projects: banding shorebirds on the James Bay coast, Ontario; studying behaviour of great blue herons in the Bay of Fundy; studying behaviour of wintering bald eagles in the Gaspereau Valley of Nova Scotia; banding and recording white-throated sparrow songs to study effects of spruce budworm spraying along the Miramichi River, New Brunswick.

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Additional Training

- 5-Day southern Ontario Ecological Land Classification Training Course, Ministry of Natural Resources and Gartner-Lee Limited, May 13-17, 2002
- The Ontario 5-Day Wetland Evaluation System Training Course (combined northern and southern courses), Ontario Ministry of Natural Resources, 1996
- OSHA 40-Hour Hazardous Site Worker training, DAS Environmental, Waterloo, Ontario, 2000.
- Short course on phytoremediation technology, CH2MHill Limited, 1999.
- Training seminar for Ecological Land Classification protocol, Ministry of Natural Resources, Guelph, Ontario; 1998
- Training session for the use of Natural Heritage Training Manual (and other manuals) in developing Impact Assessment and otherwise implementing the Provincial Policy Statement, 1997
- The Environmental Impact Statement (EIS) Training Session, Ontario Ministry of Natural Resources, 1995
- Training workshop on the Revised Class Environmental Assessment, Ontario Ministry of Environment and Energy, 1993
- Taxonomy of Seed Plants, University of Guelph, 1990

Representative Projects

Species at Risk

- Field researcher, project manager and report author for a project mapping significant habitat for Eastern Massasauga (rattlesnake) and other reptile Species at Risk in O'Donnell Point Provincial Nature Reserve, Ontario.
- Field researcher, project manager and report co-author for designing and implementing a monitoring program for Branched Bartonia (a flora Species at Risk) at O'Donnell Point Provincial Nature Reserve, Ontario.
- Senior biologist identifying Species at Risk, and providing supervision and reporting of biological constraints, during surveys for unexploded ordnance at Ipperwash Former Army Base, Ontario.
- Field researcher, report author and project manager for a study identifying significant plant communities and Species at Risk on Middle Island, part of Point Pelee-Middle Island National Park in Lake Erie. GPS locations of flora Species at Risk were obtained by a team of botanists, and detailed mapping was produced showing each species' distribution.
- Researcher and principal report author for a study of impacts on plant Species at Risk related to white-tailed deer in Point Pelee National Park, Ontario.
- Researcher and principal report author for a literature review following COSEWIC format of the status and distribution of the West Virginia White butterfly (*Pieris virginiensis*), formerly considered an endangered species, in Ontario. The recommendation to downlist this species, to a status of Special Concern, was adopted by the Ontario Ministry of Natural Resources.
- Field biologist and principal report author for a two-year field study to confirm the downlisted status of the West Virginia White butterfly, formerly considered an endangered species, in Ontario.
- Researcher and principal report author for a review of methods to control deer populations that were threatening Species at Risk at Point Pelee National Park of Canada, Ontario.

Evaluation of Significant Vegetation and Wildlife Habitat

- Project manager, field researcher and report author for review of candidate and existing Environmentally Significant Areas, Provincially Significant Wetlands and Areas of Natural and Scientific Interest in the City of Toronto, Ontario.
- Project manager, field researcher and report author for a Significant Species/ Significant Habitat audit in support of silvicultural activities, Skunks Misery Forest Tracts, Middlesex, Ontario

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- Task manager and field researcher for projects evaluating potential significant wildlife habitat and habitat for Species at Risk at proposed wind and solar power sites in Ontario.
- Task manager, field researcher and report author for a project providing Natural Heritage System mapping, delineation of core habitat and a Comprehensive Environmental Impact Study, in the 80 km^2 Alder and Upper Strasburg Creek watersheds, Region of Waterloo.
- Project manager, field researcher and report author responsible for classification, mapping and discussion of significant species, vegetation classification, mapping of habitat for significant wildlife and plant species and management recommendations for the Limehouse Conservation Area in Halton Region.
- Field researcher and report co-author for studies of significant plant and wildlife communities (according to ELC protocols), delineation of habitat for significant species and trail management in Hungry Hollow, near Georgetown, Region of Halton.
- Field researcher, report author and project manager for a study documenting wildlife and vegetation features (using ELC protocols) at the Mississauga Garden-Park site on the Credit River in Mississauga.
- Field biologist, report author and project manager for a study of wildlife and habitat in the Credit Valley, for the City of Mississauga. The study entailed extensive wildlife inventories throughout the valley and use of indicator species to map priority wildlife habitats for protection.
- Field biologist (botany and wildlife) and principal report author for an Environmental Impact Summary of the Victoria Road residential development in Guelph, Ontario.
- Biologist responsible for plant community classification, botany and wildlife inventories of a wide area proposed for residential development in Holland Landing, Ontario. Tasks included assessment of opportunities and constraints, delineation of significant features and assistance with public consultation.
- Wildlife biologist, botanist and principal report author for botanical and faunal inventory and vegetation classification and mapping of a 10-km^2 area of riparian woodlands, wetlands and agricultural land proposed for residential development near Bolton, Ontario. Floristic quality analysis was used to compare vegetation quality in areas along Cold Creek and in isolated wetlands west of Cold Creek, in the area of the Oak Ridges Moraine. Also included was determination of the use of ephemeral pools on agricultural land by pond-spawning frogs and recommendations for conservation.
- Biologist and report co-author for wildlife inventories of natural areas and development of priorities to conserve important natural features for the Town of Richmond Hill's natural areas inventory in the North Urban Area.
- Biologist for wildlife inventories of natural areas within the Sawmill Creek watershed in the Region of Ottawa-Carleton and developing a master drainage plan aimed at conserving important natural features.
- Field biologist and report co-author for an inventory and analysis of wildlife populations for the Markham Natural Features Study and development of priorities for the conservation of important natural features.
- Field biologist and report co-author for a detailed breeding bird inventory using modified point counts to determine numbers and densities of breeding birds and the potential effects of a condominium development proposing to recreate habitat for wildlife in Victoria Point, Orillia.
- Field biologist and report co-author for a detailed breeding bird inventory and evaluation of runway and development options for the Lester B. Pearson International Airport Redevelopment.
- Field biologist and report co-author for faunal and botanical inventories and discussion of significant features associated with a development adjacent to a variety of watercourses and wetland features. Locations have included Kingston, Kitchener, Brantford, Peterborough, and Belleville.

Ecological Issues Review

SARAH K. MAINGUY B.Sc. M.Sc.

- Co-author on studies for all-bird conservation plans for Canadian Wildlife Service of Environment Canada: including evaluation of threats to priority bird species in the Hudson Bay Lowlands and Lower Great Lakes/St.Lawrence Plain regions, preparation of threat reports for these regions, preparation of Conservation Framework report for the Hudson Bay Lowlands region.
- Co-author of a study on the threats to the Métis Way of life in the Hudson Bay Lowlands.
- Co-author of a literature study on the state of the environment of the Great Slave Lake aquatic ecosystem. The report assessed a diverse range of topics related to both the aquatic ecosystem and the land-water interface of Great Slave Lake.
- Author of a review of the benefits of upland buffers to tidal marshes on the Delaware River in New Jersey and Delaware. Topics reviewed included the function of various types and widths of buffers for attenuation of excess nutrients, storage of flood waters, provision of adjunct habitat for marsh species, provision of corridors and improvement of natural cover in the landscape, and provision of habitat for terrestrial species.
- Biologist for collecting and summarizing information on natural features, fisheries, and benthic invertebrates for creeks in the City of Mississauga, as part of a stormwater quality control study.

Ontario Provincial Park Evaluation of Life Science Features

- Project manager, field team leader and report author for a detailed life science inventory of Lower Madawaska River Provincial Park, Ontario.
- Project manager, field team leader and principal author for a study of the Grand River and Whiteman's Creek Candidate ANSI in Brant County, Ontario. Comprehensive inventories of flora and fauna were conducted to obtain information that could be compared to the criteria used for ANSI designation. Provincially significant species and Species at Risk were located with a GPS receiver and mapped. Prairie and savannah indicators were also mapped.
- Project manager, field team leader and principal author for Life Science Inventory of Wasaga Beach Provincial Park. The park was evaluated in terms of representation, condition, diversity, ecological functions and special features. Provincially significant plant communities and species were identified and mapped throughout the park. Recommendations promoted active management of these disturbance-dependent communities with fire.
- Project manager, field team leader, biologist and principal author for life science inventories of the Killarney Signature Site, recently proposed in Ontario's Living Legacy Land Use Strategy. Over 60,000 ha of wetland, forest and rock barren were initially scoped with the aid of aerial photographs, and then over 170 sample inventories were conducted in order to determine representation and significance of wetlands, forests and rock barrens. Findings and recommendations from this report will be used as the initial step in park management planning.
- Field team leader and principal report author for Life Science Evaluation of the Lingham Lake, Mount Moriah and Elzevir Peatland Conservation Reserves and intervening lands near Madoc, Ontario, proposed for Ontario's Living Legacy Land Use Strategy. Over 100 inventories were conducted in polygons throughout the three areas.
- Project manager, field team leader, biologist and principal author for life science inventories of the Algoma Headwaters and Spanish River Signature Sites, two protected areas recently proposed in Ontario's Living Legacy Land Use Strategy. Over 150 sample inventories were conducted in 110,000 ha of wetland, forest and rock barren to determine significant features, in order to evaluate representation and recommend protection.
- Wildlife biologist and principal report author for a study identifying and summarizing life science features in the Nipigon Basin, determining their significance and representation and principal stressors, and recommending further studies.
- Wildlife biologist and report co-author for a reconnaissance life and earth science inventory of the Nipigon River, which involved wildlife surveys and the assessment of important habitat.

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- Researcher and principal report author for a study of impacts of white-tailed deer on rare plants, specialty crop farming and vehicle collisions, and recommendations for control of deer, at the Pinery Provincial Park, Ontario.

Contaminated Site Assessment

- Field biologist and report author for botanical and wildlife inventories and mapping of communities around an abandoned gold mine and arsenic treatment plant owned by the Ministry of the Environment in Deloro, Ontario, as part of planning for remediation at the site. Floristic quality analysis was used to compare plant communities affected by mine tailings or leachate with uncontaminated areas, and to provide a baseline for future monitoring and restoration following remediation. Sarah provided expert witness testimony at a provincial court case involving site remediation, which contributed to a decision in favour of the Ministry of the Environment.
- Biologist for botanical and wildlife inventory of a contaminated site in Ohio; responsible for determining potential pathways for contaminants to enter significant natural systems.
- Report writer, editor and reviewer for a series of quarterly and final monitoring reports on the movement and characterization of contaminated groundwater at three plasticiser plants in Ontario and Quebec.

Evaluation of Mine Sites

- Field researcher, team leader and report author for a baseline inventory of flora and fauna in the vicinity of the Victor Mine Site in the James Bay Lowlands, Ontario.
- Field researcher, team leader and report author for an evaluation of vegetation and wildlife for the powerline expansion from Kapuskasing to Hearst, Ontario, in support of the Environmental Assessment for the Victor Mine Site in the James Bay Lowlands.
- Field researcher, team leader and report author for an evaluation of vegetation and wildlife for the expansion of the Northgate Mine Site in Matachewan, Ontario
- Principal field researcher for an evaluation of vegetation and wildlife for an expansion of the Black Fox Mine Site in Matheson, Ontario

Sewer and Water Class Environmental Assessment Projects

- Task manager, field biologist and report author for evaluation of natural features and significance of habitat for breeding waterfowl and passerines at a sewage lagoon in Muskoka District, for a class EA evaluating alternatives for improved sewage treatment. The site is renowned throughout Ontario for its value for bird watching, and the report included recommendations for ways to mitigate loss of sewage lagoon area.
- Botanist and wildlife biologist for the Devil's Creek Enhancement and Restoration Study. A route for a sanitary trunk sewer was proposed through a Provincially Significant Wetland, as there were no feasible alternatives. Initial inventories of the mosaic of fen, marsh, swamp, and woodland west of Cambridge included determining their foundations in groundwater discharge and surface water patterns. Floristic quality analysis was used to compare vegetation quality in wetlands of different origin. These analyses were used to develop a comprehensive plan for the conservation and restoration of vegetation and wildlife along the route. Impacts of sewer construction were evaluated, and recommendations for mitigation of impacts, construction supervision, restoration and post-construction monitoring of restoration conducted after installation was complete.
- Wildlife biologist, botanist and report co-author for three years of inventory and evaluation of impacts from residential and sanitary sewer route development that potentially affected a Provincially Significant Wetland and Environmentally Sensitive Area in Ajax, Ontario. Responsibilities included determining impacts from alternative sewer construction techniques (directional drilling and open cut) and alternative routes through the wetland.

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- Biologist and planner for an evaluation of alternatives for improving drinking water quality for residents of the village of Freelton, Ontario. Residents opted to build a water tower to provide safe drinking water and increased flow for fire control, instead of relying on private wells.
- Biologist responsible for evaluating environmental impacts related to alternatives for installation of a forcemain route (including directional drilling and open cut) near Sudbury, Ontario.
- Biologist responsible for evaluating alternatives for providing sewage treatment to residents of Azilda, Ontario.
- Biologist and report co-author assisting in assessing impacts and writing an environmental study report for the pipeline crossing of the Rideau River, Gloucester.
- Biologist for a study of the environmental setting of four sewage treatment plants, including the Main Treatment Plant, as part of an Environmental Assessment of treatment options for the City of Toronto.

Wetland Evaluation and Delineation

- Review of Provincially Significant Wetlands (including review of criteria and verification of sites) in the City of Toronto.
- Botanist, Wildlife biologist, report co-author and project manager for two years of wetland evaluations (using Ministry of Natural Resources protocols), including comprehensive baseline wildlife, fisheries, and botanical inventories of nine wetlands and intervening uplands, in radioisotope-contaminated terrain at the Atomic Energy of Canada Limited Chalk River property. Findings included a Provincially Significant Wetland and several provincially significant upland plant species. Findings were used as the basis for ecological risk assessment by AECL.
- Botanist, wildlife biologist and report author for wetland evaluations (using Ministry of Natural Resources protocols) and Natural Heritage Ecosystem mapping and planning within the Upper Strasburg Creek watershed in the Regional Municipality of Waterloo, Ontario.
- Biologist for delineation of wetlands within a pipeline easement using U.S. Army Corps of Engineers protocols along a 300 mile pipeline route through northern Ohio and Pennsylvania.

Road Impact Assessment

- Conducted an evaluation of vegetation and habitat features in the area of a proposed intersection improvement in Holland Landing, Simcoe County.
- Assisted in evaluating a highway re-route in central Illinois. Tasks included botanical inventories of both floodplains and uplands, floristic quality analysis and identification of state-listed Illinois Sand Prairie plant communities.
- Field biologist and principal report author for an impact assessment of a highway re-route near Detroit, Michigan.
- Responsible for developing a habitat matrix for Ontario wetland birds, reptiles, amphibians and mammals and a set of scoring criteria for determining their vulnerability to road construction, for the Ministry of Transportation.

Impacts of Trail Development

- Field biologist, report author and task manager for evaluation of several alternate routes along the Thames River in London, Ontario, to determine suitability as a recreational trail, based on floristic quality analysis of various plant communities and wildlife habitat value.

SARAH K. MAINGUY B.Sc. M.Sc.

Restoration

- Field biologist and report co-author responsible for pre-construction inventories, restoration, and post-construction evaluation of restored vegetation quality (using FQI) and wildlife along a restored constructed sanitary sewer route through a provincially significant wetland and Environmentally Significant Area in Cambridge, Ontario.
- Biologist assisting in developing appropriate lists of native restoration materials for wetlands and uplands in Cambridge, Shelburne, and Ottawa, Ontario.
- Author for sections of two manuals of restoration guidelines for the Waterfront Regeneration Trust.

Ecological Evaluation of Solid Waste Sites

- Conducted an evaluation of the vegetation in an area of proposed expansion for the Barrie Landfill.
- Botanist, wildlife biologist, principal report author and project manager for environmental studies of a municipal solid waste facility on Manitoulin Island. Constraints included wetlands and regionally significant wildlife. Studies conducted by other team members included noise and dust and visual analyses.
- Biologist for botanical and wildlife inventories in the vicinity of landfills or proposed landfill sites in Huron County, Welland, and Brockville. These studies included evaluation and recommendations for mitigation of impacts from proposed developments on surrounding ecological features, including provincially significant wetlands and plant species.
- Biologist for wildlife inventories for a proposed solid waste management area, which included an incinerator. Surveys included detection of amphibians and breeding birds and live-trapping snakes and mammals for Enviromax and the Regional Municipality of Haldimand-Norfolk.

Natural Treatment Technology

- Biologist responsible for ecological assessment of alternatives, including constructed wetlands, for providing stormwater treatment for flows on the west side of High Park, Toronto.
- Botanist and wildlife biologist for assessment of potential impacts to provincially significant vegetation from a proposed treatment wetland on Spring Creek in High Park, Toronto.
- Biologist for a project to develop a set of guidelines for evaluating significant features and functions in natural areas proposed for constructed treatment wetlands in Alberta. The guidelines were in the form of questionnaires that suggested habitat functions and values for both vegetation and wildlife to be evaluated before proceeding with treatment wetland construction. Extensive appendices included an annotated bibliography of government documents relating to wetlands and habitat, lists of significant plant and animal species and communities, and a table identifying potential direct and indirect impacts to natural features from effluent.
- Biologist for evaluation of potential impacts to a marl wetland in Peter Lougheed Provincial Park in Alberta from a proposed sewage outlet.
- Botanist and wildlife biologist for assessment of potential impacts to the Provincially Significant Presqu'ile Wetland Complex from a proposed treatment wetland in Brighton, Ontario.
- Biologist and modeller assessing the feasibility of installing, and then implementing, poplar plantations for reducing infiltration (and consequent leachate production) on closed landfills in Muskoka and Simcoe.
- Biologist responsible for selection of appropriate plant material for dewatering and stabilization of lime sludge at ICI Canada, Sarnia, Ontario. A list of native calciphiles was prepared to help predict whether there were native plants that could thrive in the highly alkaline conditions of the sludge. Other options examined were hybrid poplar and other fast-growing, adaptable non-native species.

Nuisance Wildlife Evaluation

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- Biologist for an evaluation of the Essex Stormwater Pond, a newly constructed stormwater retention facility/wildlife habitat area, for its potential to attract large numbers of waterfowl and gulls, which could become a hazard to the Windsor Airport. The report included recommendations for plantings that would reduce the use of the wetlands by gulls and geese.
- Biologist responsible for advising on methods to deter waterfowl and gulls from proposed stormwater treatment wetlands at Pearson International Airport.
- Biologist responsible for conducting inventories of species and number of gulls at a proposed landfill site expansion in Welland. Analysis included the evaluation of the potential for the expanded landfill to attract greater numbers of gulls, which could become a hazard at the Welland Airport.

Ecological Risk Assessment

- Researcher, field biologist and principal report author for an ecological risk assessment of a PAH-contaminated property in Guelph, Ontario.
- Biologist responsible for review of risk assessment of an arsenic-contaminated wetland in Minden, Ontario.
- Researcher, field biologist and principal report author for an ecological risk assessment of a lead- and PAH- contaminated property in Ottawa, Ontario.
- Researcher, field biologist and principal report author for an ecological risk assessment of a TPH-contaminated property on the Industrial Lands on the Toronto, Ontario waterfront.
- Researcher, field biologist and principal report author for an ecological risk assessment of the potential effects of smoke on adjacent Environmentally Sensitive Areas from a fire-training facility proposed in Waterloo, Ontario.
- Field biologist, researcher and report co-author responsible for screening the potential for ecological risk associated with radionuclide-contaminated groundwater at Pickering Nuclear Generating Station.
- Researcher, field biologist, principal report author and project manager for a study of valued ecosystem components in the vicinity of Gentilly-2 Nuclear Generating Station, Quebec and Point Lepreau Nuclear Generating Station, New Brunswick.
- Biologist responsible for evaluating risk to vegetation and wildlife from contaminated groundwater near Brantford.

Selected Publications and Presentations

Sarah Mainguy, Karu Chinniah and John Pries. Practicality of Guidelines for the Approval and Design of Natural and Treatment Wetlands for Water Quality Improvement. In *Treatment Wetlands for Water Quality Improvement, Proceedings of the Quebec 2000 Conference,* pp 151-159. CH2MHill Canada Limited, Waterloo, Ontario .

A. Fausto, Sarah Mainguy and E. Pastrik. Mitigating Impacts of Sewer Construction through Wetland Restoration and Habitat Creation: the Devil's Creek Trunk Sewer Project. *Proceedings of the 1998 Society of Ecological Restoration Conference*, Markham, Ontario, 1998.

Sarah Mainguy, Karu Chinniah and John Pries. Guidelines for the Approval and Design of Natural and Treatment Wetlands for Water Quality Improvement. Report for Standards and Guidelines Branch, Environmental Assessment Division, Environmental Service, Alberta Environmental Protection. March 2000. Website: http://www.gov.ab.ca/env/protenf/publications/GuidelinesforNaturalConstructedTreatmentWetlandsMar00.pdf

With ESG International and Hough-Stansbury, Limited. *Restoring Natural Habitats.* Toronto: The Waterfront Regeneration Trust. Ontario. 1995. 179 pp.

SARAH K. MAINGUY B.Sc. M.Sc.

With Gore and Storrie Limited. Reconnaissance Life and Earth Science Inventory of the Nipigon River. Report for the Ontario Ministry of Natural Resources, Nipigon District. 1994.

With The Landplan Collaborative Limited. The Effects of Browsing and Trampling by White-tailed Deer on Pinery Provincial Park and its Environs. Report for the Ontario Ministry of Natural Resources, Wingham. 1991.

With The Landplan Collaborative Limited. Distribution of the West Virginia White Butterfly in Ontario (Final Report). Report for Ontario Ministry of Natural Resources, Central Region, Cambridge, Ontario. 1991.

Sarah Mainguy and V.G. Thomas. "Comparisons of Body Reserve Build-up and Use in Several Groups of Canada Geese." *Canadian Journal of Zoology*. 63(1985):1765-1772.

V.G. Thomas, Sarah Mainguy and P. Prevett. "Predicting Fat Content of Lesser Snow and Canada Geese from Abdominal Fat Depot Weights." *Journal of Wildlife Management*. 47(1983):1115-1119.

Comparison of Body Reserve Build-up and Use in Several Groups of Canada Geese. Guelph, Ontario. M.Sc. Thesis, University of Guelph Press. 1982.

Sarah Mainguy and V.G. Thomas. Pre-breeding fat and protein reserves in northern- and southern-nesting Canada Geese. Presented at 43rd Midwest Fish and Wildlife Conference, Wichita, Kansas, USA. 1981.

Sarah Mainguy and V.G. Thomas. Pre-breeding fat reserves of two races of Canada Geese. Presented at the Canadian Society for Zoologists 20th Annual Meeting, University of Waterloo, Waterloo, Ontario. 1981.

SARAH E. PIETT, B.Sc.(Env)

PERSONAL DATA
Citizenship: Canadian
Language: English

EDUCATION
B.Sc.(Env) University of Guelph (2006). Bachelor of Environmental Science, Honours.

CERTIFICATION
Ecological Land Classification certification (2004). Ministry of Natural Resources.
Ontario Wetland Evaluation Training Course (2007). Ministry of Natural Resources.

PROFESSIONAL AFFILIATIONS
Field Botanists of Ontario (member and former Newsletter Editor)

CAREER SUMMARY
North - South Environmental Inc. (2006 to present) - Ecologist
Responsible for field studies, client liaison, data input and analysis, evaluation of findings and input into final reports.

Natural Resource Solutions Inc. (September 2006) – Terrestrial Biologist
Responsible for vegetation inventories, bat monitoring, raptor surveys, fall migration surveys, and bat mortality surveys.

The Nature Conservancy of Canada (May-August 2005 and 2006) – Shell Conservation Intern, Summer Field Technician
Primarily responsible for field studies, natural area stewardship, and the preparation of management plans. Involved in the management of volunteers during special events and stewardship activities. Implementing stewardship and restoration initiatives, as outlined in the management plan for the property. Aided in the completion of breeding bird surveys.

Hamilton Conservation Authority (May-August 2004) – Ecological Land Classification Technician, Crew Leader
Responsible for completing Ecological Land Classifications within the City of Hamilton. Organized and lead a team of technicians to perform this task. This position mainly involved inventorying the flora and fauna located in natural areas within the City of Hamilton municipal boundaries. This process required thorough flora and fauna identification skills, aerial photograph interpretation, as well as orientation, organization, and leadership skills.

Hamilton Conservation Authority (May-August 2003) - Ecological Land Classification Technician
Primarily responsible for completing Ecological Land Classifications within the City of Hamilton.

A SHORT SELECTION OF PROJECT EXPERIENCE IS PROVIDED ON THE FOLLOWING PAGES.

SARAH E. PIETT, B.Sc.(Env)

Madawaska Provincial Park Life Science Inventory 2007

The major tasks in providing a life science inventory in Madawaska Provincial Park were to provide an understanding of the habitat (landform/vegetation associations) represented in the protected area as well as the associated wildlife. During the field phase, an assessment of the overall character of the landform/vegetation associations was completed using the central Ontario Forest Ecosystem Classification (FEC) system. The southern Ontario Ecological Land Classification System was used for wetlands, rock barrens etc. where the FEC did not apply. Wildlife was inventoried wherever possible. Evening surveys to detect owls and other nocturnal wildlife were completed. Breeding evidence was collected for birds and amphibians according to vocalization and behaviour, using protocols recommended by Bird Studies Canada and the Canadian Wildlife Service Marsh Monitoring Program. Dragonflies and butterflies were identified whenever feasible. Small mammal traps were set out in various habitats in the evening and checked the following morning. After the field work was completed, vegetation communities and significant features were mapped using the aerial photography of the park. A database was created to manage the information collected. Stemming from these findings an analysis (and recommendations) for the best methods for management of these areas.

O'Donnell Point Provincial Nature Reserve Reptile Survey 2007

The purpose of this study was to identify significant habitat for reptile species at risk in O'Donnell Point Provincial Park, with a focus on Massasauga (*Sistrurus catenatus*). Before going into the field background research was completed to determine the most appropriate habitat for Massasaugas as well as other reptiles and amphibians. Following that, aerial photographs of the Park were used to map out potential habitat. The field component of the project was completed in two phases: one in August to search for appropriate snake gestation habitat and another visit in September to search for hibernaculum. After the field visits data was entered into a database, significant habitat was mapped, movement corridors were identified, and management implications were discussed in the report.

Oak Ridges Moraine Conformity 2007
A tree survey was completed to determine the effects of additional structures being added to a residential property located on the Oak Ridges Moraine. The development was thoroughly examined to ensure conformity with the Oak Ridges Moraine Conservation Plan. Recommendations were made to decrease the amount of trees lost and mitigate negative impacts on the surrounding natural environment.

Environmental Inspections - Ongoing
Environmental Inspections are carried out on a number of residential development sites within the City of Guelph. These inspections are completed to ensure that the developments are complying with recommendations made in the environmental impact reports and to ensure that proper sediment erosion control measures are maintained. Reports are completed monthly and submitted to the City of Guelph for review.

Toronto ESA and PSW Updates 2007
This project involved updating information pertaining to the Environmentally Sensitive Areas (ESA) and the Provincially Significant Wetlands (PSW) within the City of Toronto. Field tasks for this project included checking wetland boundaries, searching for seepage areas and significant species, as well as a general inventory of flora and fauna at each site. As well, the wetlands were evaluated according to the Wetland Evaluation System for Southern Ontario to determine the overall score for the wetland communities.

SARAH E. PIETT, B.Sc.(Env)

Sault Ste. Marie Wind Turbine Monitoring 2006
Sarah has been involved in a variety of monitoring efforts to determine the effects or potential effects of wind turbine farms. This survey consisted of walking transects on the graded turbine pad and the surrounding forest, as required to reach the set radius from the base of the turbine. This radius was determined as the distance to which mortalities can be found around a turbine, as established through reviewing current literature on the subject. A trained dog was also used to search for bird and bat mortalities under the turbines. Searcher efficiency tests were performed to determine the probability of a technician locating a dead bird or bat within the specified search area. In addition, scavenger surveys were performed to determine the rate of predation on dead birds and bats under the turbines. Both the searcher efficiency test and the scavenger surveys were performed to determine the likelihood of finding mortalities, and the likelihood of mortalities being available to be found, respectively such that accuracy of results could be determined.

Manitoulin Island Wind Turbine Environmental Impact Assessment 2006
This purpose of this project was to determine the potential impacts of developing a wind turbine farm on a property on Manitoulin Island. Raptor surveys were performed in the Fall. During these raptor surveys, incidental bird observations were also recorded. In addition, radar and acoustic bat surveys were performed in the evening to monitor bat movement in the area.

Nichol Drain Sub-watershed Study 2006
This study involved inventorying natural areas within the Nichol Drain Sub-watershed. The flora and fauna were inventoried within the woodlots. Soil samples were taken and analyzed in the field to determine the soil structure and composition of each community. The communities were each classified according to the Ecological Land Classification system for Southern Ontario. Other notes pertaining to disturbance and anthropogenic effects were also noted in the field. A database was created and the data was analyzed to determine the quality of the flora and fauna identified in each community type. Recommendations were made pertaining to the maintenance, significance, or improvement of the natural areas.

Northern Bruce Peninsula Natural Area Management Plan – Davis Property 2006.
This study involved an inventory of a natural area to identify significant and sensitive features on a property owned by the Nature Conservancy of Canada. This information was used to identify conservation targets and threats, develop management recommendations that included permitted uses and environmental restoration priorities. This project included a public participation component where the public was involved in the stewardship of the property.

Northern Bruce Peninsula Natural Area Management Plan – Corisande Bay Property 2006
This study involved an inventory of a natural area to identify significant and sensitive features on a property owned by the Nature Conservancy of Canada. This information was used to identify conservation targets and threats, develop management recommendations that included permitted uses and environmental restoration priorities.

City of Hamilton Natural Area Study 2003-2004.
This project consisted primarily of classifying natural areas within the City of Hamilton using Ecological Land Classification methods. In addition, landowner contact and relations were an important component to this task.