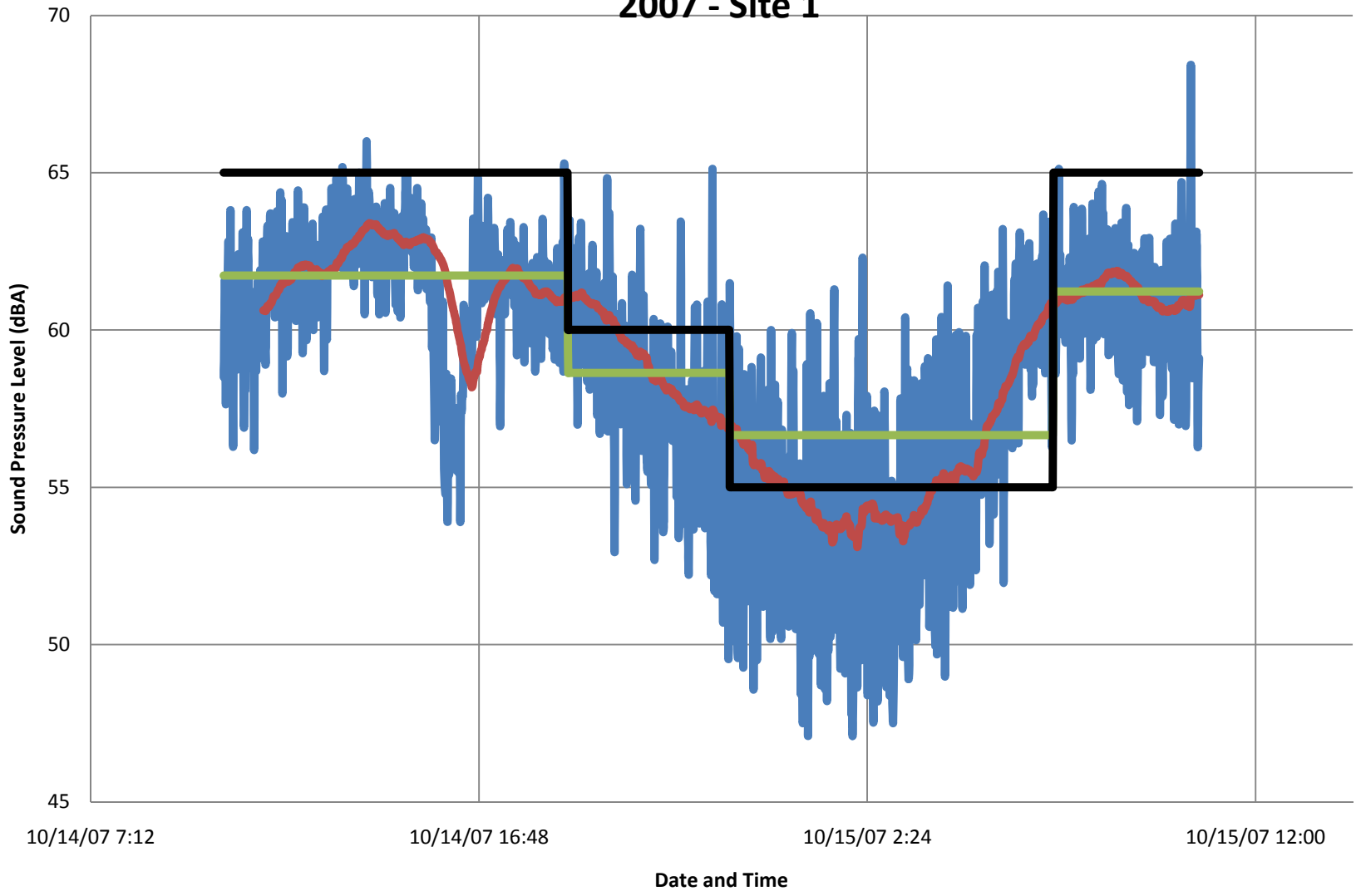


May 2017

APPENDIX A BASELINE NOISE MONITORING RESULTS

Figure 1.1 24- Hour Sound Pressure Level Monitoring , October 14-15, 2007 - Site 1



— 1 Min Leq — 1 Hr Leq — Day Evening Night Leq — NS Guideline

Figure 1.2 24-Hour Sound Pressure Level Monitoring , October 15-16, 2007 - Site 2

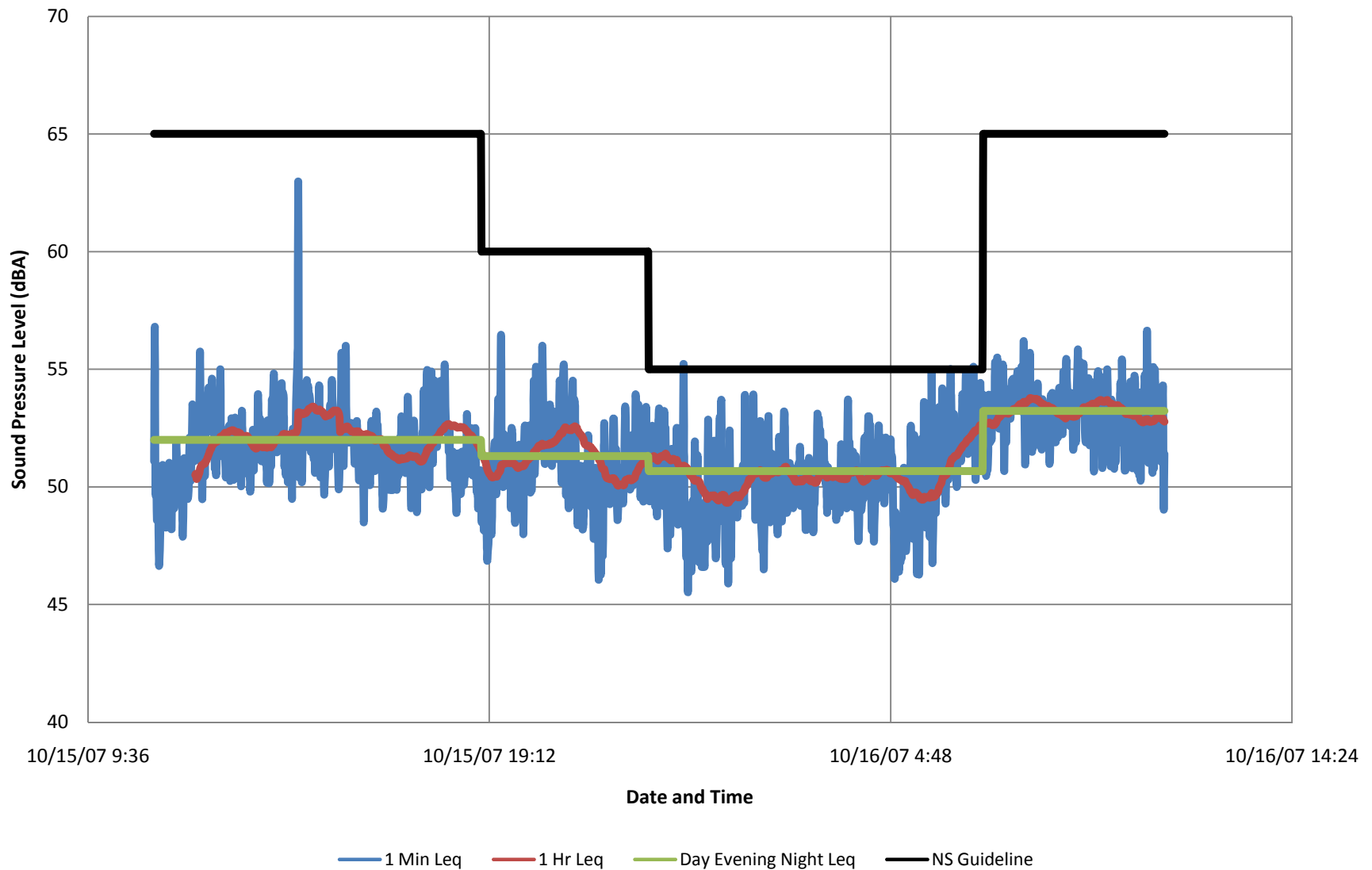
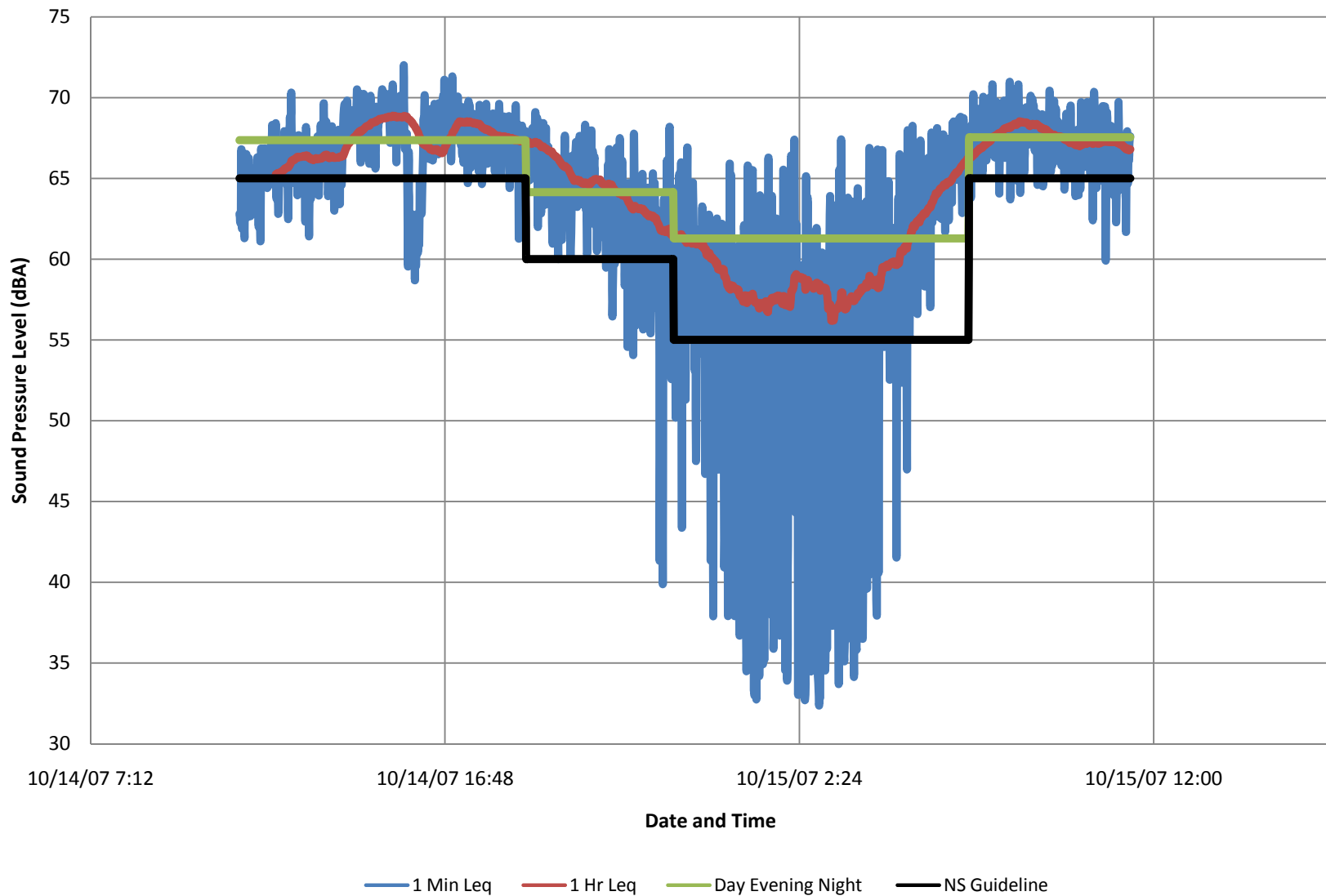


Figure 1.3 24-Hour Sound Pressure Level Monitoring , October 14-15, 2007 - Site 3



**Figure 1.4 24-Hour Sound Pressure Level Monitoring
October 14-15, 2007 - Site 4**

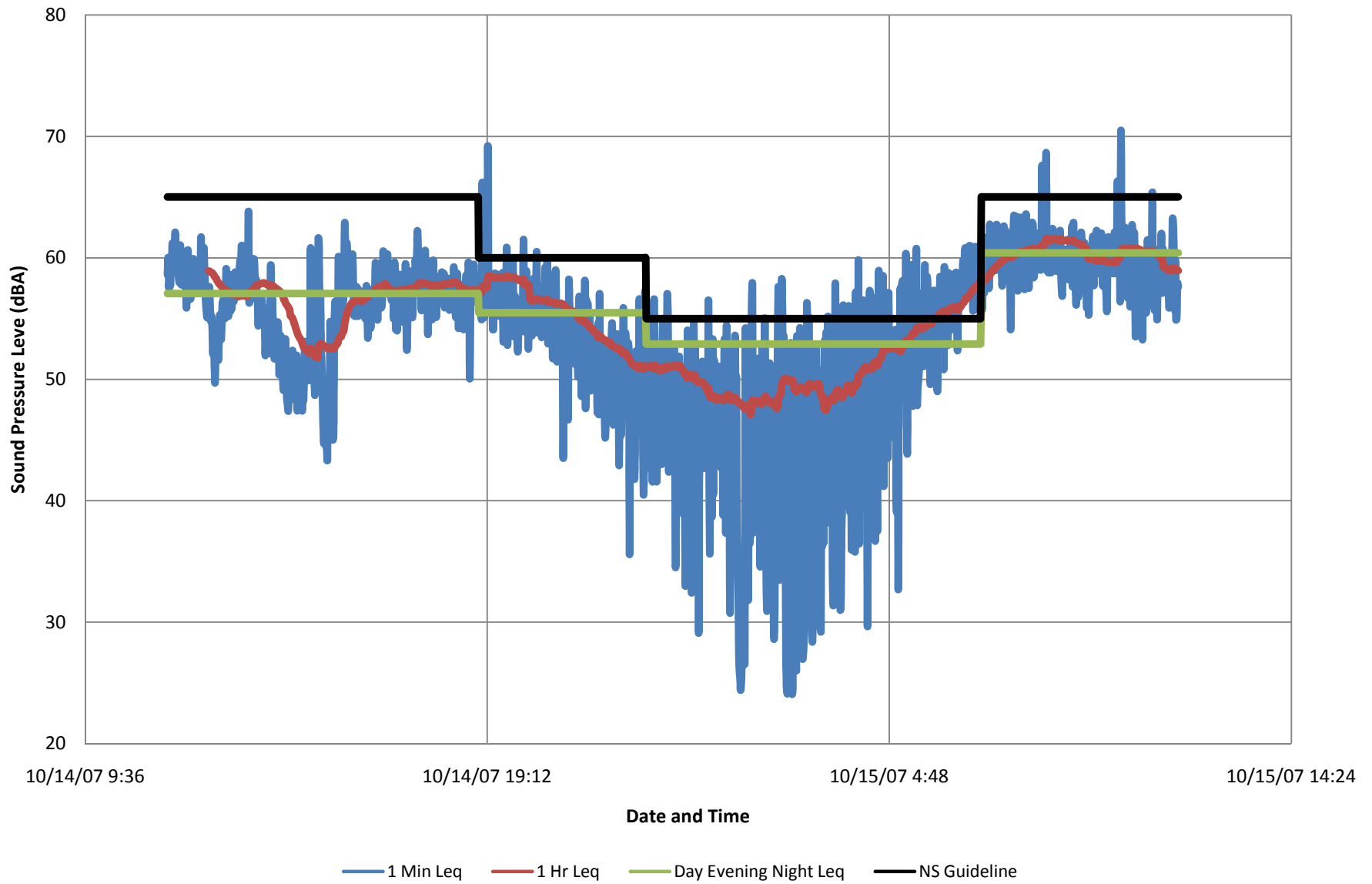


Figure 1.5A 24-Hour Sound Pressure Level Monitoring, October 15-16, 2007 - Site 5A

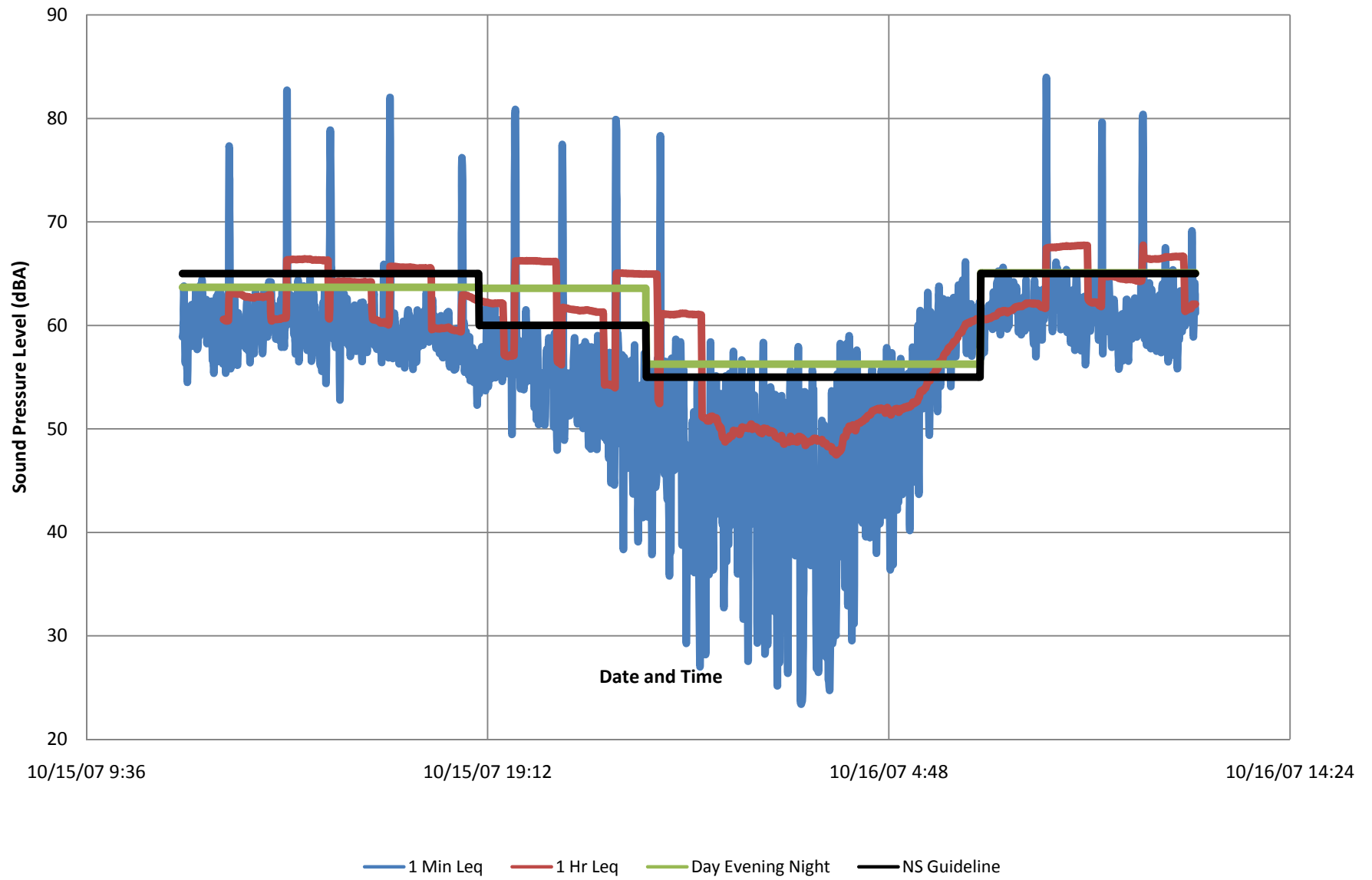


Figure 1.5 24-Hour Sound Pressure Level Monitoring, October 14-15, 2007 - Site 5

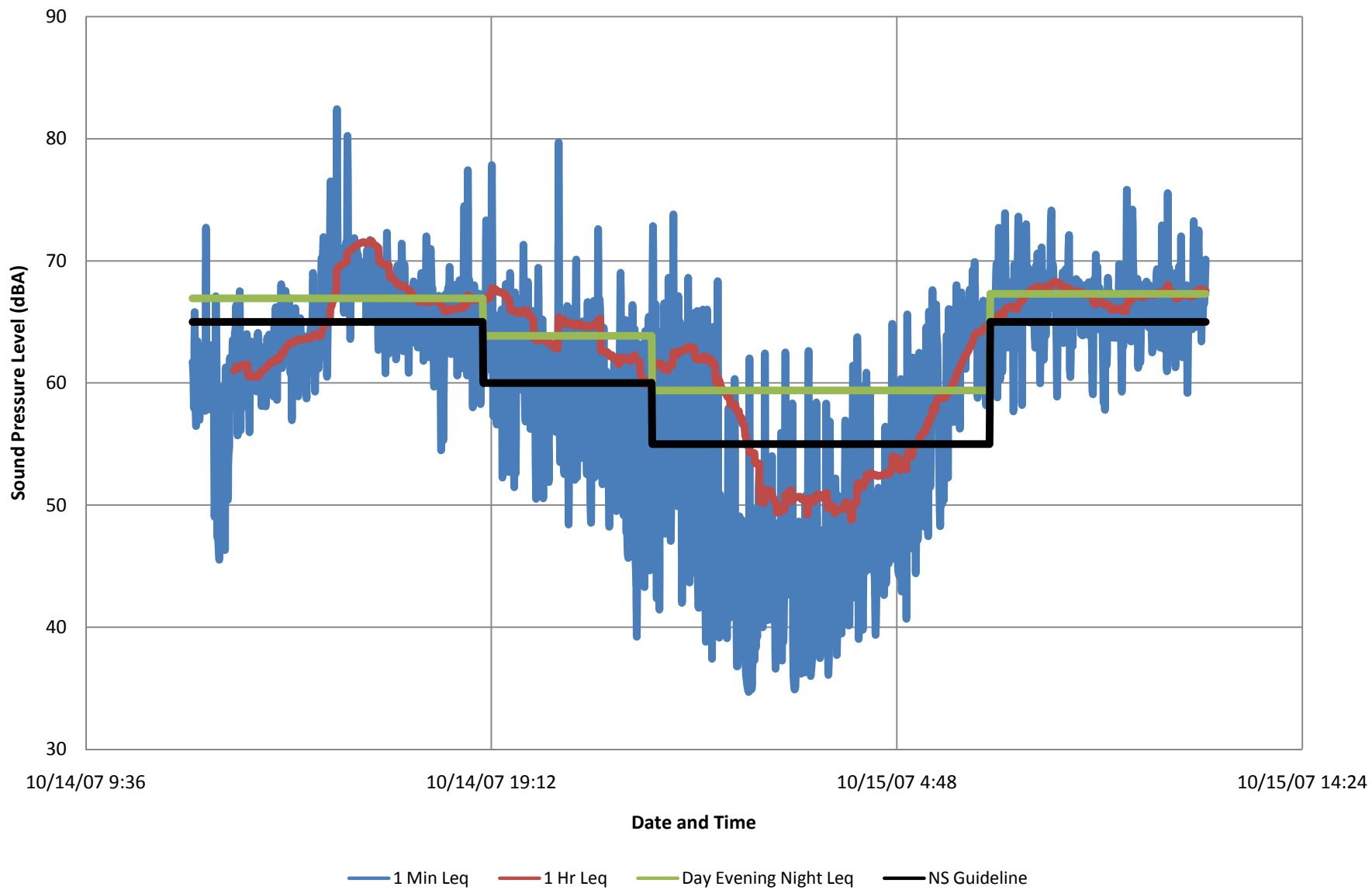


Figure 1.6 24-Hour Sound Pressure Level Monitoring, April 15-16, 2009 - Site 6

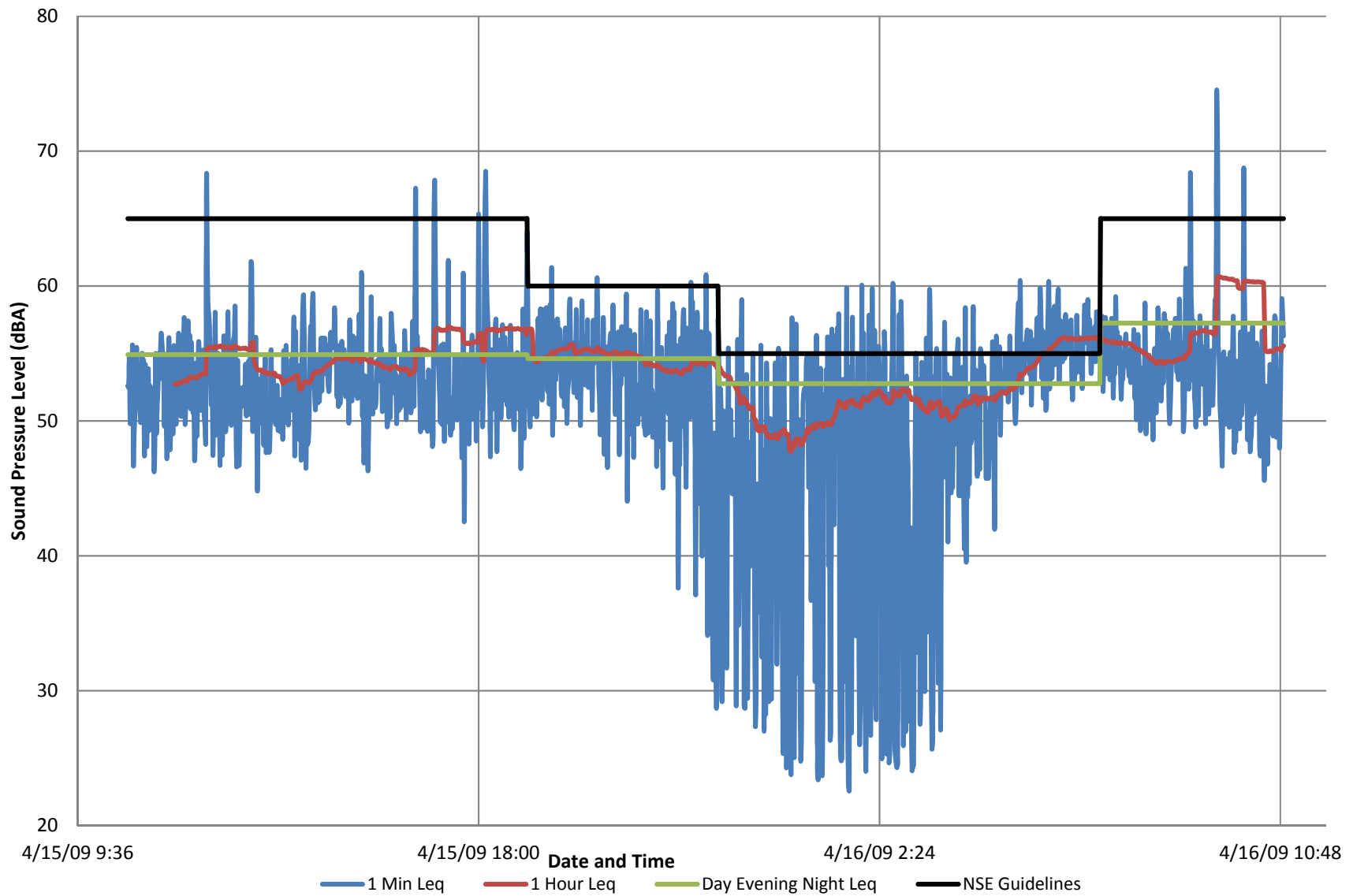
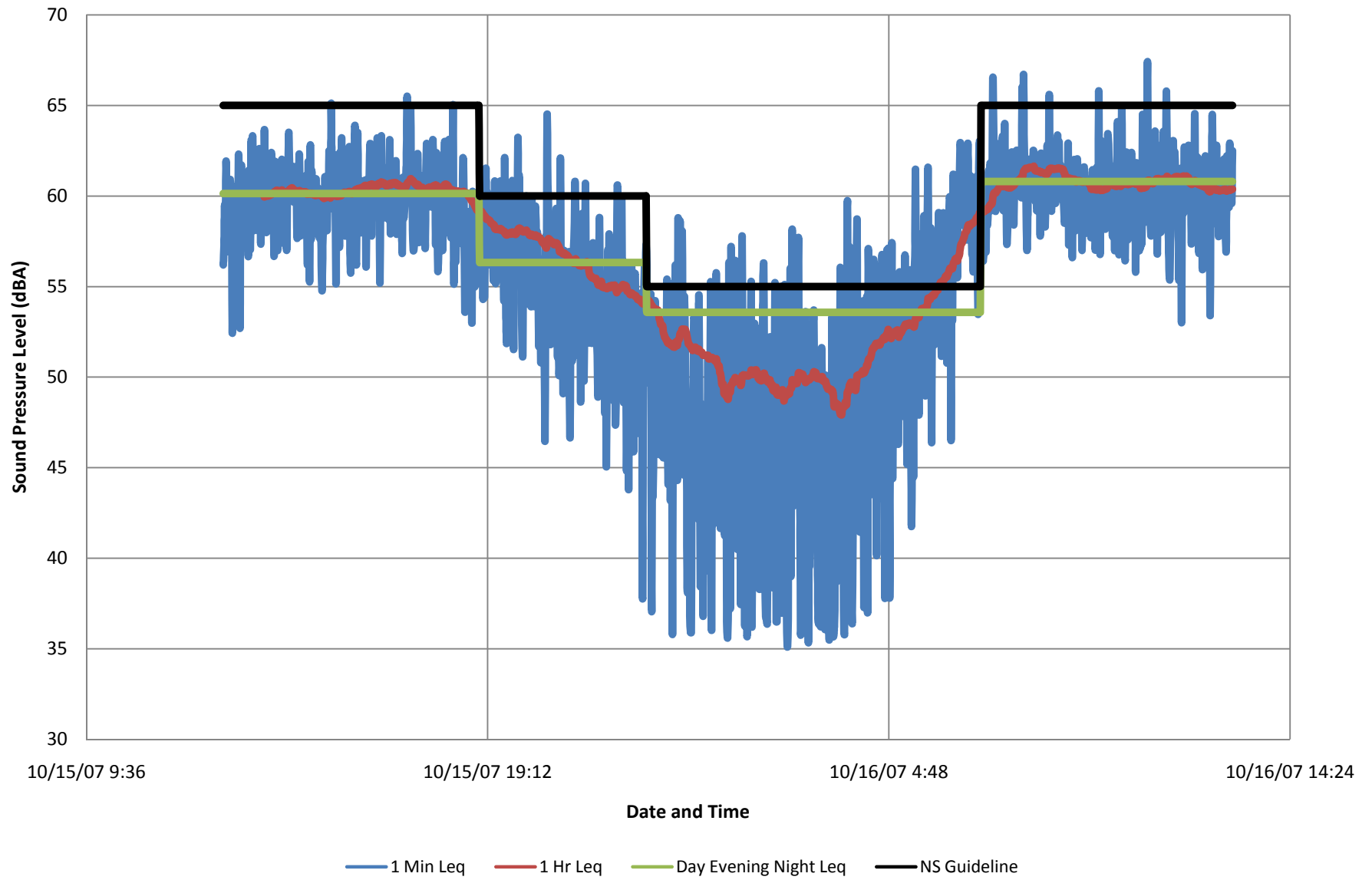


Figure 1.7 24-Hour Sound Pressure Level Monitoring, October 15-16, 2007 - Site 7



May 2017

APPENDIX B AQUATIC FIELD SURVEY RESULTS

Ditch 1

Parameter	Result (July 13, 2016)
Site Measurements	
Wetted Width (m)	2.2
Channel Width (m)	3
Max Depth (m)	0.25
Average Depth (m)	0.1
Dominant Habitat Type	Anthropogenic drainage ditch
Water Depth (m)	
1/4 Stream Width	0.07
1/2 Stream Width	0.09
3/4 Stream Width	0.12
Reach Characteristics	
Flow	No suitable location to collect flow measurements - no flow
Canopy Cover (%)	0
Macrophyte Cover (%)	0
Riparian Vegetation	70% cover Grasses
Substrate Characteristics	
Organics	10
Fines	90
Gravel	0
Large Gravel	0
Cobble	0
Boulder	0
Larger Boulder	0
Bedrock	0
Embeddedness	N/A
Site Description	Anthropogenic channel through active cattle pasture. Evidence of cattle walking in dry channel. One of five channels cut across pasture land, bordered by dyke, Avon river and highway 101.
Photos	Appendix B Photos 37-39

Watercourse 1

Parameter	Result	
	July 19, 2007	July 14, 2016
Site Measurements		
Wetted Width (m)	0.31	0.24
Bankfull Width (m)	4.65	4.5
Length (m)	21.65	-
Total Area (m ²)	6.71	-
Depth (m)	0.173	-
Max Depth (m)	-	0.13
Average Depth (m)	-	0.07
Left Bank Slope (°)	-	25
Right Bank Slope (°)	-	20
Dominant Habitat	-	Run
Reach Characteristics		
Flow	Stagnant pools of water (no measurable flow)	Very little flow - no suitable location to collect flow measurements
Canopy Cover (%)	0	-
Macrophyte Cover (%)	0	-
Riparian Vegetation	Grasses and shrubs (left and right bank)	Grasses, shrubs and wetland plants (cattails) (left and right bank)
Substrate Characteristics		
Dominant Substrate	Silt	Fines
2nd Dominant Substrate	Small pebbles	Organics
Surrounding Material	Sand	-
Embeddedness	Completely embedded	-
Site Description	Downstream of the culvert there was no measurable flow; series of stagnant, muddy pools. Sheening observed (manganese). Reach downstream of culvert 25m and then becomes a cattail wetland with no detectable channel.	Cattail marsh with a channel. Very little flow evident.
Photos	-	Appendix B Photos 1-3

Watercourse 2

Parameter	Result	
	July 19, 2007	July 11, 2016
Site Measurements		
Wetted Width (m)	2.05	0.6
Bankfull Width (m)	3.85	4.5
Length (m)	300	-
Total Area (m ²)	615	-
Depth (m)	0.211	-
Max Depth (m)	-	0.11
Average Depth (m)	-	0.09
Left Bank Slope (°)	-	15
Right Bank Slope (°)	-	15
Dominant Habitat	-	Run
Reach Characteristics		
Flow	Very low flow channel, heavy grass and cattail; heavy silt bottom	0.096 m/s
Canopy Cover (%)	0	-
Macrophyte Cover (%)	0	-
Riparian Vegetation	Grasses, sparse shrubs along reach	Grasses (left and right bank); 90% cover
Substrate Characteristics		
Dominant Substrate	Silt	Fines (85%)
2nd Dominant Substrate	Organics	Organics (15%)
Surrounding Material		
Embeddedness	N/A	N/A
Site Description	Low flow channel, possibly an engineered drainage channel. Downstream and upstream of culverts of approximately 300m separation. Heavy grass and cattail vegetation, homogenous habitat throughout.	Moderately stable banks made of fines/organics. Upstream of crossing, cattails line the ditch. Non-salmonids observed in stream near the culvert.
Photos	-	Appendix B Photos 4-6

Watercourse 3

Parameter	Result		
	July 19, 2007 - Upstream Area	July 19, 2007 - Downstream Area	July 12, 2016
Site Measurements			
Wetted Width (m)	9.25	11.65	2.5
Bankfull Width (m)	10.7	17	10
Length (m)	30	75	-
Total Area (m ²)	321	12.75	-
Depth (m)	0.548	2	-
Max Depth (m)	-	-	0.2
Average Depth (m)	-	-	0.13
Left Bank Slope (°)	-	-	
Right Bank Slope (°)	-	-	
Dominant Habitat	-	-	Riffle
Reach Characteristics			
Flow	0	0	0.256 m/s
Canopy Cover (%)	0	0	-
Macrophyte Cover (%)	0-25	0-25	-
Riparian Vegetation	Grasses, Shrubs, Wildflowers	Grasses, Cattail	-
Substrate Characteristics			
Dominant Substrate	Silt	Silt	-
2nd Dominant Substrate	Sand	-	-
Surrounding Material	Gravel	-	-
Embeddedness	1	N/A	-
Site Description	Stagnant area downstream of highway culvert. Upstream of dirt road culvert very low flow detectable at the culvert. Water very murky, grassy patches in water, flows into Avon river.	Continuous flat, brown, opaque, murky water. Twin metal culverts upstream, wooden culvert downstream. Area tidal (water level rose during survey).	Area affected by tides (banks are exposed mud). Double concrete box culvert under highway 101, twin metal culverts under side road.
Photos	-	-	Appendix B Photos 7-9

Watercourse 4

Parameter	Result	
	July 19, 2007	July 12, 2016
Site Measurements		
Wetted Width (m)	N/A	Pools of water in cow tracks
Bankfull Width (m)	3.5	3.5
Length (m)	N/A	-
Total Area (m ²)	N/A	-
Depth (m)	channel was dry no sample taken	-
Max Depth (m)	-	Pools up to 0.10 m depth
Average Depth (m)	-	-
Left Bank Slope (°)	-	-
Right Bank Slope (°)	-	-
Dominant Habitat	-	-
Reach Characteristics		
Flow	0	No suitable location to collect flow measurements - no flow
Canopy Cover (%)	0	-
Macrophyte Cover (%)	0 Terrestrial grasses in mud/silt	-
Riparian Vegetation	Grasses	Grasses (left and right bank)
Substrate Characteristics		
Dominant Substrate	Silt	Fines
2nd Dominant Substrate	-	Organics
Surrounding Material	-	-
Embeddedness	N/A	N/A
Site Description	Dry, anthropogenic channel through active cattle pasture. Evidence of cattle walking in dry channel. One of four channels cut across pasture land, bordered by dyke, Avon river and highway 101.	Anthropogenic channel through active cattle pasture. Evidence of cattle walking in dry channel. One of five channels cut across pasture land, bordered by dyke, Avon river and highway 101.
Photos		Appendix B Photos 10-12

Watercourse 5

Parameter	Result		
	July 20, 2007 - Upstream Area	July 20, 2007 - Downstream Area	July 12, 2016
Site Measurements			
Wetted Width (m)	3.4	4.6	3
Bankfull Width (m)	5.2	6.15	5.5
Length (m)	32	32	-
Total Area (m ²)	108.8	147.2	-
Depth (m)	0.5	0.5	-
Max Depth (m)	-	-	-
Average Depth (m)	-	-	-
Left Bank Slope (°)	-	-	-
Right Bank Slope (°)	-	-	-
Dominant Habitat	-	-	-
Reach Characteristics			
Flow	0	0	No suitable location to collect flow measurements - no flow
Canopy Cover (%)	0	0	-
Macrophyte Cover (%)	0-25	0-25	-
Riparian Vegetation	Grasses, Shrubs, Wildflowers	Grasses, Shrubs, Wildflowers	Grasses (95% cover)
Substrate Characteristics			
Dominant Substrate	Silt	Silt	Fines
2nd Dominant Substrate	-	-	-
Surrounding Material	-	-	-
Embeddedness	Completely	Completely	-
Site Description	Water stagnant, engineered channel at edge of active grazing field, parallel & adjacent to highway 101. Obvious signs of cows crossing, manure in and around stream, substantial in-stream vegetation (grass and cattails).	Engineered channel at edge of active grazing field, parallel & adjacent to highway 101. Flat, stagnant area with many small minnows. In-stream grass and vegetation on east end.	Anthropogenic channel at the edge of an active pasture adjacent to (and parallel with) highway 101. Flat area with stagnant water and substantial in-stream vegetation (grass, cattails and duckweed). Obvious signs of cows crossing through stream - hoof prints and manure observed in and around stream.
Photos	-	-	Appendix B Photos 13-15

Watercourse 6

Parameter	Result		
	July 20, 2007 - Upstream Area	July 20, 2007 - Downstream Area	July 13, 2016
Site Measurements			
Wetted Width (m)	6.05	6.4	1.25
Bankfull Width (m)	2.95	4.3	1.5
Length (m)	250	250	-
Total Area (m ²)	737.5	1075	-
Depth (m)	0.148	-	-
Max Depth (m)	-	-	0.44
Average Depth (m)	-	-	0.35
Left Bank Slope (°)	-	-	40
Right Bank Slope (°)	-	-	40
Dominant Habitat	-	-	Run
Reach Characteristics			
Flow	0.16 m/s	Stagnant	0.016 m/s
Canopy Cover (%)	0	0	-
Macrophyte Cover (%)	50-75	25-50	-
Riparian Vegetation	Grasses	Grasses	Grasses
Substrate Characteristics			
Dominant Substrate	Silt	Silt	-
2nd Dominant Substrate	Cobble	-	-
Surrounding Material	-	-	-
Embeddedness	3 (60%)	Embedded	-
Site Description	Slow meandering stream, clear water, substantial coverage from filamentous algae and pondweed macrophytes. Steep, muddy banks showing signs of erosion. Double concrete square culvert upstream.	Downstream of highway 101 the stream broadens and consists of a continuous flat. Algae and macrophytes present with a bottom dominated by silt. Erosion present on muddy banks. Flow continues through culvert under dyke and into the Avon river.	Transect was placed upstream of highway 101. This watercourse flows under highway 101 through a double concrete square culvert and continues through an active pasture.
Photos	-	-	Appendix B Photos 16-18

Watercourse 7

Parameter	Result		
	July 20, 2007 - Upstream Area	July 20, 2007 - Downstream Area	July 11, 2016
Site Measurements			
Wetted Width (m)	0.65	0	WC7 does not cross through the PDA***
Bankfull Width (m)	1.25	2.2	
Length (m)	-	-	
Total Area (m ²)	-	-	
Depth (m)	0.1	0	
Max Depth (m)	-	-	
Average Depth (m)	-	-	
Left Bank Slope (°)	-	-	
Right Bank Slope (°)	-	-	
Dominant Habitat	-	-	
Reach Characteristics			
Flow	0	Dry channel	0.088 m/s
Canopy Cover (%)	0	Intermittent 0-75	-
Macrophyte Cover (%)	0	0	-
Riparian Vegetation	Grasses, shrubs	Grasses, shrubs	-
Substrate Characteristics			
Dominant Substrate	Sand	Large pebbles	-
2nd Dominant Substrate	Cobble	Silt, sand	-
Surrounding Material	Silt	-	-
Embeddedness	3/4 Embedded	Embedded	-
Site Description	Straight discontinuous stream channel through open field. Culvert runs under Bog road , North of Bog road is dry. No flow, narrow channel with substantial terrestrial vegetation in stream.	Small, very narrow channel north of corrugated steel culvert. Meandering channel through grassland/field with tall shrubs, wild plants. No obvious erosion low profile banks.	WC7 begins downstream of Bog road (the portion of this watercourse that is upstream of Bog road is considered WC8). WC7 begins in a dug out ditch along Bog road. This portion of the stream has no overhead cover and the banks are very unstable. The ditch eventually transitions into a wetland that provides poor fish habitat. This watercourse eventually runs through private residential property and under highway 1.
Photos	-	-	Appendix B Photos 19-21

Watercourse 8

Parameter	Result	
	July 20, 2007	July 11, 2016
Site Measurements		
Wetted Width (m)	0.9	0.73
Bankfull Width (m)	4	0.55
Length (m)	40	-
Total Area (m ²)	36	-
Depth (m)	0.205	-
Max Depth (m)	-	0.17
Average Depth (m)	-	0.16
Left Bank Slope (°)	-	-
Right Bank Slope (°)	-	-
Dominant Habitat	-	Run
Reach Characteristics		
Flow	No Flow	0.072 m/s
Canopy Cover (%)	50-75	-
Macrophyte Cover (%)	0-25	-
Riparian Vegetation	Grasses, shrubs, coniferous trees	Grasses, shrubs, coniferous and deciduous trees
Substrate Characteristics		
Dominant Substrate	Sand	-
2nd Dominant Substrate	Silt	-
Surrounding Material	-	-
Embeddedness	3/4 Embedded	-
Site Description	Small stagnant flat pool, adjacent to concrete round culvert. Meandering stream joins with no flow coming from culvert upstream. Dries up in a grassy area. Murky water in flat clearer in stream, dark water. Evidence of highway runoff ie. Garbage.	Crossing location is on the south side of existing highway 101 approximately 5 m downstream of 0.9 m diameter concrete culvert. Banks are fairly stable with significant vegetation cover (mostly grasses and shrubs, some trees).
Photos	-	Appendix B Photos 22-24

Watercourse 9

Parameter	Result	
	December 17, 2007	July 2016
Site Measurements		
Wetted Width (m)	-	-
Bankfull Width (m)	-	-
Length (m)	-	-
Total Area (m ²)	-	-
Depth (m)	-	-
Max Depth (m)	-	-
Average Depth (m)	-	-
Left Bank Slope (°)	-	-
Right Bank Slope (°)	-	-
Dominant Habitat	-	-
Reach Characteristics		
Flow	Tidal	Tidal
Canopy Cover (%)	0	0
Macrophyte Cover (%)	None observed (water too silty to see bottom)	None observed (water too silty to see bottom)
Riparian Vegetation	Mudbanks; adjacent to mudbanks: cattle grazing fields (<i>i.e.</i> grasses)	Upstream - bare areas of cobble, shrubs. Downstream - mudbanks and tidal marsh next to active grazing fields
Substrate Characteristics		
Dominant Substrate	Not sampled (inaccessible); assumed to be silt, similar to mudflat banks.	Not sampled (inaccessible).
2nd Dominant Substrate	-	-
Surrounding Material	-	-
Embeddedness	N/A	-
Site Description	Wide river reach downstream of current causeway dam; mudflat banks, extremely turbid water, flow dependent on tidal patterns.	
Photos	-	Appendix B Photos 25-27

Watercourse 10

Parameter	Result
Site Measurements	July 13, 2016
Wetted Width (m)	1.94
Channel Width (m)	4
Max Depth (m)	0.28
Average Depth (m)	0.2
Left Bank Slope (°)	65
Right Bank Slope (°)	70
Dominant Habitat Type	Flat
Water Depth (m)	
1/4 Stream Width	0.14
1/2 Stream Width	0.23
3/4 Stream Width	0.15
Reach Characteristics	
Flow	No suitable location to collect flow measurements - no flow
Canopy Cover (%)	-
Macrophyte Cover (%)	Pondweed, duckweed, plantain
Riparian Vegetation	(70-95% cover) Grasses, shrubs, cattails
Substrate Characteristics	
Organics	30
Fines	70
Gravel	0
Large Gravel	0
Cobble	0
Boulder	0
Larger Boulder	0
Bedrock	0
Embeddedness	N/A
Site Description	
	On the northeast side of highway 101, WC10 is surrounded by an active pasture and is connected to WC5. Hundreds of small fish (non-salmonid) were observed in this portion of WC10. American Black Duck hen with several ducklings were observed along with more than 20 frogs. On the southwest side of highway 101, WC10 flows primarily through cattail marsh with no clearly defined channel. Culverts are present under highway 101, the railbed, and the ramp for highway 101. There was little to no flow observed and it was difficult to determine flow direction at the time of assessment.
Photos	Appendix B Photos 28-30

Watercourse 11

Parameter	Result
Site Measurements	July 12, 2016
Wetted Width (m)	0.78
Channel Width (m)	1.2
Max Depth (m)	0.14
Average Depth (m)	0.03
Dominant Habitat Type	Culvert
Water Depth (m)	
1/4 Stream Width	0.1
1/2 Stream Width	0.14
3/4 Stream Width	0.1
Reach Characteristics	
Flow	-
Canopy Cover (%)	0
Macrophyte Cover (%)	0
Riparian Vegetation	0
Substrate Characteristics	Culvert
Organics	0
Fines	0
Gravel	0
Large Gravel	0
Cobble	0
Boulder	0
Larger Boulder	0
Bedrock	0
Embeddedness	0
Site Description	WC4 and WC5 join at a culvert and become WC11. WC11 flows behind several businesses and there is garbage present in the watercourse. Banks are well vegetated with thick shrubs and tall grasses, some cattails are present throughout. WC11 eventually flows into WC9.
Photos	Appendix B Photos 31-33

Watercourse 12

Parameter	Result
Site Measurements	July 14, 2016
Wetted Width (m)	0.6
Channel Width (m)	1.2
Max Depth (m)	0.06
Average Depth (m)	0.05
Dominant Habitat Type	Run
Water Depth (m)	
1/4 Stream Width	0.04
1/2 Stream Width	0.04
3/4 Stream Width	0.04
Reach Characteristics	
Flow	0
Canopy Cover (%)	0
Macrophyte Cover (%)	0
Riparian Vegetation	10-40% cover Grass and shrubs
Substrate Characteristics	
Organics	10
Fines	65
Gravel	10
Large Gravel	10
Cobble	5
Boulder	0
Larger Boulder	0
Bedrock	0
Embeddedness	-
Site Description	This watercourse was identified by the Lidar survey. WC12 does not appear to be a permanently flowing watercourse. WC12 does not exist on the south side of highway 101, but some water has collected on the north side of the highway in a channelized low area. The origin of the watercourse appeared to be a large hole.
Photos	Appendix B Photos 34-36

Table 1 Abundance of biological organisms in aquatic sediment samples.
 Unnamed Tributaries to Avon River, Hants, Nova Scotia
 July 19-20, 2007

Sample location	WC1	WC2	WC3	WC3	WC5	WC5	WC6	WC6	WC7	WC8
Stream Direction			Upstream	Downstream	East	West	Upstream	Downstream		
Species	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample
DIPTERA										
Chaoboridae					4					
Chironomidae larvae	48	50			2	64	8	36		4
Chironomidae pupae		8		2						
Muscidae										
Tabanidae	10			2		4	6		2	2
Tipulidae		4							2	
pupae									8	
PLECOPTERA										
Nemouridae										
TRICHOPTERA										
Glossomatidae										2
Limnophelidae					2					
Cases										
ODONATA										
Anisoptera	12								2	2
Aeshnidae	16						2			
Zygoptera										
Coenagrionidae							2			
Lestridae	8				2					

Table 1 Abundance of biological organisms in aquatic sediment samples.
 Unnamed Tributaries to Avon River, Hants, Nova Scotia
 July 19-20, 2007

Sample location	WC1	WC2	WC3	WC3	WC5	WC5	WC6	WC6	WC7	WC8
Stream Direction			Upstream	Downstream	East	West	Upstream	Downstream		
Species	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample
EPHEMEROPTERA										
Baetidae										
Damaged						4	2	2		
HEMIPTERA										
Corixidae	6	2			2			34		
Gerridae		2				4		2		
Mesoveliidae	34	2			6	16	6		58	
Notonectidae							2			
Pleidae				2	4		2	2	140	2
Unidentified								4		
COLEOPTERA										
Chrysomelidae										6
Dytiscidae larvae	2									
Dytiscidae adult	4	2			4	12	12	10	2	2
Elmidae larvae							2			
Elmidae adult	2				2			8	2	
Haliplidae larvae	2	4			2		62	20		18
Haliplidae adult		2					6	8		
Unidentified		2								

Table 1 Abundance of biological organisms in aquatic sediment samples.
 Unnamed Tributaries to Avon River, Hants, Nova Scotia
 July 19-20, 2007

Sample location	WC1	WC2	WC3	WC3	WC5	WC5	WC6	WC6	WC7	WC8
Stream Direction			Upstream	Downstream	East	West	Upstream	Downstream		
Species	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample
MOLLUSCA										
Gastropoda										2
Hydrobiidae								14	2	2
Lymnaeidae	208	272		2	6	60	104	18	262	10
Physidae									4	42
Planorbidae	2	2					2		2	2
Bivalvia										
Pisiiidae	192	174			2	60	12		14	256
juvenile	32	12			22	12	4	34		2
MYSIDAE										
Unidentified				2						
ISOPODA										
Ascellidae										4
AMPHIPODA										
Gammaridae			36				6	38		
Haustoridae			2	40						
Talitridae	24				48	16	18			
TURBELLARIA										
Unidentified									4	
ANNELIDA										
Oligochaete	68	424	92	160	2	4	4		12	4

Table 1 Abundance of biological organisms in aquatic sediment samples.
 Unnamed Tributaries to Avon River, Hants, Nova Scotia
 July 19-20, 2007

Sample location	WC1	WC2	WC3	WC3	WC5	WC5	WC6	WC6	WC7	WC8
Stream Direction			Upstream	Downstream	East	West	Upstream	Downstream		
Species	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample	#/sample
COLLEMBOLA										
Isotomidae		2							6	
HIRINDINEA										
lossiphoniidae		6								
HYDRACARINA										
Unidentified	2			2						2
FISH										
<i>Apeltes quadracus</i>							4	4		2
<i>Fundulus heteroclitus</i>					2			2		
<i>Pungitius pungitius</i>		2								
UNIDENTIFIED				2						
SUMMARY										
Total Organisms	670	972	130	214	112	256	266	236	522	360
Number of Taxa	17	16	3	9	16	11	19	15	16	19
EPT:Total Ratio (%)	0	0	0	0	0	0.02	0.01	0	0	0.01



Photograph 1 - Watercourse 1 Upstream



Photograph 2 - Watercourse 1 Downstream



Photograph 3 - Watercourse 1 Substrate



Photograph 4 - Watercourse 2 Upstream



Photograph 5 - Watercourse 2 Downstream



Photograph 6 - Watercourse 2 Substrate



Photograph 7 - Watercourse 3 Upstream



Photograph 8 - Watercourse 3 Downstream



Photograph 9 - Watercourse 3 Substrate



Photograph 10 - Watercourse 4 Upstream



Photograph 11 - Watercourse 4 Downstream



Photograph 12 - Watercourse 4 Substrate



Photograph 13 - Watercourse 5 Upstream



Photograph 14 - Watercourse 5 Downstream



Photograph 15 - Watercourse 5 Substrate



Photograph 16 - Watercourse 6 Upstream



Photograph 17 - Watercourse 6 Downstream



Photograph 18 - Watercourse 6 Substrate



Photograph 19 - Watercourse 7 Upstream



Photograph 20 - Watercourse 7 Downstream



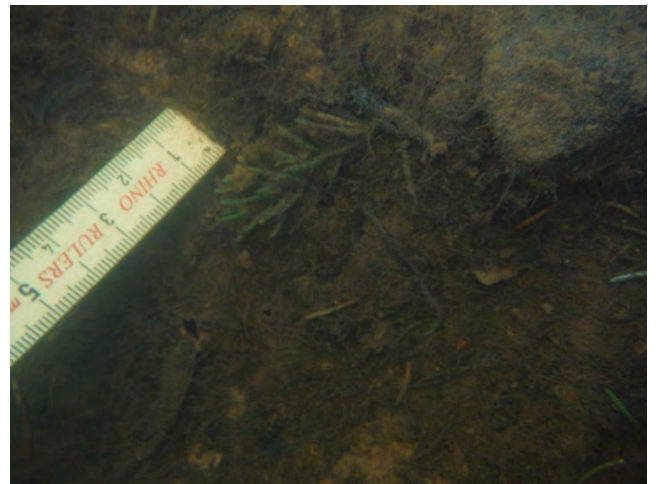
Photograph 21 - Watercourse 7 Substrate



Photograph 22 - Watercourse 8 Upstream



Photograph 23 - Watercourse 8 Downstream



Photograph 24 - Watercourse 8 Substrate



Photograph 25 - Watercourse 9 Upstream



Photograph 26 - Watercourse 9 Downstream



Photograph 27 - Water course 9



Photograph 28 - Watercourse 10 Upstream at 100 m US transect



Photograph 29 - Watercourse 10 Downstream at 100 m US transect



Photograph 30 - Watercourse 10 Substrate at 100 m US transect



Photograph 31 - Watercourse 11 Upstream



Photograph 32 - Watercourse 11 Downstream



Photograph 33 - Watercourse 11 Substrate



Photograph 34 - Watercourse 12 Upstream



Photograph 35 - Watercourse 12 Downstream



Photograph 36 - Watercourse 12 Substrate



Photograph 37 - Ditch 1 Upstream



Photograph 38 - Ditch 1 Downstream



Photograph 39 - Ditch 1 Substrate

May 2017

APPENDIX C VEGETATION FIELD SURVEY RESULTS

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
Northern Maidenhair Fern	<i>Adiantum pedatum</i>	In fertile or quite alkaline soils. Under oak-birch-sugar maple-elm trees on intervals.	Summer	S1	May Be At Risk		9.2 ± 10.0	1
Hooked Agrimony	<i>Agrimonia gryposepala</i>	Thickets, the margins of rich woods, intervals, and slopes.	July and August	S3	Secure		1.3 ± 3.0	14
Virginia Anemone	<i>Anemone virginiana</i>	Intervals and stream sides. Calcareous and salty ledges, shores and thickets.	Early July.	S2	Sensitive		4.0 ± 0.0	3
a Pussytoes	<i>Antennaria parlinii</i>	Dry pine and oak forest, pastures, old fields, and rocky banks.	June and July	S1	May Be At Risk		4.4 ± 0.0	4
Swamp Milkweed	<i>Asclepias incarnata</i> ssp. <i>pulchra</i>	Swamps, thickets and on shores.	Flowers in early August	S3?	Undetermined		5.0 ± 2.0	3
Least Moonwort	<i>Botrychium simplex</i>	Usually on lakeshores or the mossy edges of streams or waterfalls although it has been reported in a wide variety of habitats.	Late May and June	S2S3	Sensitive		1.7 ± 1.0	1
Silvery-flowered Sedge	<i>Carex argyrantha</i>	Sandy thickets, dry woods, and clearings.	June to August	S3S4	Secure		8.8 ± 1.0	3
Bebb's Sedge	<i>Carex bebbii</i>	Northern alkaline regions in poorly drained soils.	June to August	S2	Sensitive		2.3 ± 5.0	10
Bearded Sedge	<i>Carex comosa</i>	Swamps and shallow water.	June to August	S2	Sensitive		4.0 ± 7.0	2

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
Pubescent Sedge	<i>Carex hirtifolia</i>	Calcareous regions, in meadows and thickets, forest slopes.	Seeds (perigynia) required for identification. Can be identified from May through September.	S2S3	Sensitive		9.1 ± 0.0	5
Livid Sedge	<i>Carex livida</i> var. <i>radicaulis</i>	Calcareous bogs and meadows.	Early summer	S1S2	May Be At Risk		1.7 ± 10.0	1
Hop Sedge	<i>Carex lupulina</i>	Mucky meadows along intervals, swales, and wet, deciduous, or treed swamps.	Flowers in June	S3	Secure		1.2 ± 5.0	7
White-Tinged Sedge	<i>Carex peckii</i>	Dry or mesic slopes, mixed deciduous forests, rocky outcrops, old quarries.	May through mid-July	S2?	May Be At Risk		8.9 ± 5.0	1
Rosy Sedge	<i>Carex rosea</i>	Dry, deciduous woods and thickets.	Flowers May to early July	S3	Secure		6.0 ± 1.0	5
Blunt Broom Sedge	<i>Carex tribuloides</i>	Swales and wet woods	Summer	S3	Secure		5.9 ± 0.0	2
Tuckerman's Sedge	<i>Carex tuckermanii</i>	Swale.	June to August	S2	Sensitive		6.2 ± 3.0	2
Blue Cohosh	<i>Caulophyllum thalictroides</i>	Deciduous and intervale forest.	April to early June, can be identified when not in flower	S2	May Be At Risk		9.5 ± 0.0	4

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
Quebec Hawthorn	<i>Crataegus submollis</i>	Hedgerows, rarely in waste places.	June	S2?	Undetermined		6.4 ± 1.0	1
Steller's Rockbrake	<i>Cryptogramma stelleri</i>	Shaded limestone cliffs, and shaded crevices in conglomerate cliff-face.	Late May to September. Can be identified when sporangia are not present.	S1S2	May Be At Risk		1.7 ± 0.0	2
Wild Comfrey	<i>Cynoglossum virginianum</i> var. <i>boreale</i>	Open beech woods, on dryish soils or on gypsum. Woods and thickets	Flowers May and June	S1	May Be At Risk		6.1 ± 1.0	3
Ram's-Head Lady's-Slipper	<i>Cypripedium arietinum</i>	The rough country of gypsum sinkholes.	Late May	S1	At Risk	Endangered	3.6 ± 0.0	137
Yellow Lady's-slipper	<i>Cypripedium parviflorum</i>	Most often associated with gypsum or open calcareous soils.	Flowers in June. Plant identifiable from late May to October	S2S3	Sensitive		2.7 ± 0.0	498
Small Yellow Lady's-Slipper	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Rich calcareous woodlands, also in drier sections of seepage fed wetlands or old beaver pond woodland.	Flowers in June. Plant identifiable from late May to October	S2	Sensitive		3.9 ± 1.0	9
Yellow Lady's-slipper	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Rich calcareous woodlands, also in drier sections of seepage fed wetlands or old	Flowers in June. Plant identifiable from late May to October	S2	Sensitive		3.8 ± 1.0	6

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
		beaver pond woodland.						
Bulblet Bladder Fern	<i>Cystopteris bulbifera</i>	Fertile or calcareous soils. May be locally abundant in dense beds, on moist grounds or on slopes in gypsum areas.	Spores from June to September	S3S4	Secure		1.1 ± 1.0	18
Large Tick-Trefoil	<i>Desmodium glutinosum</i>	Rich deciduous woods or intervals.	June and July	S1	May Be At Risk		8.0 ± 1.0	3
Deer-tongue Panic Grass	<i>Dichanthelium clandestinum</i>	Rich alluvial soils in thickets along rivers.	Flowers until November	S3	Secure		7.3 ± 0.0	2
Narrow-leaved Panic Grass	<i>Dichanthelium linearifolium</i>	Dry sandy soils.	July to October.	S2	Sensitive		4.0 ± 7.0	1
Eastern Leatherwood	<i>Dirca palustris</i>	Rich deciduous or mixed woods.	On or about May 20, appearing before the leaves	S1	May Be At Risk		3.8 ± 0.0	33
Ovate Spikerush	<i>Eleocharis ovata</i>	Muddy shores and ditches.	Flowers/Fruit May to October	S2?	Sensitive		9.0 ± 0.0	1
Spreading Wild Rye	<i>Elymus hystrix</i> var. <i>bigeloviana</i>	Wooded bottomlands.	June to August	S1	May Be At Risk		9.0 ± 0.0	2
Common Scouring-rush	<i>Equisetum hyemale</i> var. <i>affine</i>	Sandy, gravelly banks and low areas. Associated with calcareous areas.	Identifiable throughout the growing season	S3S4	Secure		4.0 ± 10.0	24
Dwarf Scouring-Rush	<i>Equisetum scirpoides</i>	Rich wooded banks, and mossy slopes. Typical of alkaline soils, but inconspicuous	Identifiable throughout the growing season	S3S4	Secure		9.0 ± 0.0	4

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
		among the surrounding vegetation.						
Hyssop-leaved Fleabane	<i>Erigeron hyssopifolius</i>	Exposed gypsum outcrops, damp stream banks between flood levels, banks ledges and cliffs. Calcareous and low competition.	Flowers July and August but identifiable though less noticeable from May to October	S3	Sensitive		9.2 ± 7.0	1
Woodland Strawberry	<i>Fragaria vesca</i> ssp. <i>americana</i>	Occasional along the sides of ravines, banks, and woods, often in dense patches.	June	S3S4	Secure		7.6 ± 0.0	2
Common Bedstraw	<i>Galium aparine</i>	Ballast heaps and waste places.	May to July	S2S3	Sensitive		7.8 ± 0.0	1
Bicknell's Crane's-bill	<i>Geranium bicknellii</i>	Usually in recently burned or cleared areas.	Flowers in late June and July	S3	Secure		1.2 ± 3.0	3
Round-lobed Hepatica	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Dry, usually mixed deciduous forest.	Early May	S1S2	May Be At Risk		3.3 ± 1.0	26
Big-leaved Marsh-elder	<i>Iva frutescens</i> ssp. <i>oraria</i>	Roadside embankments and salt marshes, always near the seashore.	August and September	S2S3	Sensitive		1.4 ± 1.0	2
Dudley's Rush	<i>Juncus dudleyi</i>	Marshy ground.	June to September	S3	Secure		7.0 ± 0.0	4
Canada Wood Nettle	<i>Laportea canadensis</i>	Alluvial woods of mixed or deciduous trees. Floodplains on the Cape Breton	July to September. Can be identified	S3	Sensitive		7.2 ± 2.0	10

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
		plateau. Only in the most fertile locations.	without flowers.					
Canada Lily	<i>Lilium canadense</i>	Rich river or stream interval meadows and forest.	Flowers in July but identifiable from May to October	S2	May Be At Risk		7.8 ± 0.0	7
Narrow-leaved Evening Primrose	<i>Oenothera fruticosa ssp. glauca</i>	Old fields, the edges of thickets, and roadsides. In dry, open, sandy soil.	Flowers June to August	S2	Undetermined		9.2 ± 7.0	2
Smooth Sweet Cicely	<i>Osmorhiza longistylis</i>	Rich deciduous forests, intervals.	Flowers late June to July.	S2	May Be At Risk		9.6 ± 0.0	3
Balsam Groundsel	<i>Packera paupercula</i>	Open Gypsum outcrops, dry cliffs and talus slopes.	Flowers in July but identifiable from May to October	S3	Secure		4.4 ± 0.0	18
Hooker's Orchid	<i>Platanthera hookeri</i>	Mixed wood, frequently under conifers. Prefers open, dry conditions.	Flowers May to August	S3	Secure		6.2 ± 1.0	1
Large Round-Leaved Orchid	<i>Platanthera macrophylla</i>	Rich old deciduous or mixed woods.	August	S2	Sensitive		10.0 ± 1.0	1
Small's Knotweed	<i>Polygonum buxiforme</i>	Sandy soils, not necessarily maritime.	Flowers July to September	S2S3	Undetermined		0.3 ± 0.0	1
Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i>	Roadside ditches, dyked marshes, grain fields.	Flowers July to September	S3	Secure		2.0 ± 0.0	3
Marsh Mermaidweed	<i>Proserpinaca palustris</i>	Boggy swales, savannas, wet	July to September	S3	Secure		2.6 ± 1.0	1

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
		marshes, and the edges of streams.						
Marsh Mermaidweed	<i>Proserpinaca palustris</i> var. <i>crebra</i>	Wet savannas, sphagnous swales, and the sandy, gravelly, or muddy borders of lakes or ponds.	June to October	S3	Secure		4.4 ± 0.0	7
Gmelin's Water Buttercup	<i>Ranunculus gmelinii</i>	Semi-aquatic, in bogs and cold streams.	July to September.	S3	Secure		1.1 ± 5.0	9
Alder-leaved Buckthorn	<i>Rhamnus alnifolia</i>	Calcareous bogs, swamps, swampy woods and meadows, marl bogs in rich alluvial soils.	Flowers mid - May to June. Identifiable from May to October and potentially year round.	S3	Secure		6.3 ± 1.0	4
Wild Black Currant	<i>Ribes americanum</i>	Fertile thickets and slopes.	Flowers May and June	S1	Undetermined		1.5 ± 1.0	2
Cut-Leaved Coneflower	<i>Rudbeckia laciniata</i>	Swales, the edges of swamps, or in gullies - in small colonies.	August, can be identified when not in flower.	S1S2	May Be At Risk		8.9 ± 0.0	2
Triangular-valve Dock	<i>Rumex salicifolius</i> var. <i>mexicanus</i>	Beaches or along rivers.	Not Given, Summer	S2	Sensitive		6.2 ± 1.0	2
Bloodroot	<i>Sanguinaria canadensis</i>	Low ground in rich intervals, or along streams, usually in shade. Often growing just above high-water level.	Flowers in early May	S3S4	Secure		7.7 ± 0.0	16

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
Clustered Sanicle	<i>Sanicula odorata</i>	Rich, alluvial woods and along intervals.	July to August	S1	May Be At Risk		9.1 ± 0.0	3
Rock Spikemoss	<i>Selaginella rupestris</i>	Dry, exposed rocks and sandy soils.	July to October.	S1	May Be At Risk		6.9 ± 0.0	1
Soapberry	<i>Shepherdia canadensis</i>	Gypsum or talus slopes and along the coast within reach of salt spray.	April to June. Can be identified when not in flower.	S2S3	Sensitive		2.6 ± 0.0	72
Small Burreed	<i>Sparganium natans</i>	The shallow waters of pools, the edges of ponds, and alkaline sink holes.	Summer	S3	Secure		3.8 ± 1.0	1
Shining Ladies'-Tresses	<i>Spiranthes lucida</i>	Alluvial soils and rocky shores. Thickets and meadows.	Flowers early July	S2	May Be At Risk		1.7 ± 1.0	3
Horned Sea-blite	<i>Suaeda calceoliformis</i>	Saline or alkaline flats and marshes.	August to October	S3S4	Secure		1.0 ± 0.0	1
Roland's Sea-Blite	<i>Suaeda rolandii</i>	Salt marshes and saline shores.	September	S1?	May Be At Risk		5.8 ± 2.0	1
Wavy-leaved Aster	<i>Symphotrichum undulatum</i>	Old fields and the edges of thickets.	August and September	S2	Sensitive		7.2 ± 0.0	2
Eastern White Cedar	<i>Thuja occidentalis</i>	Lakesides and swamps or old pastures.	Can be identified throughout the year	S1	At Risk	Vulnerable	4.0 ± 7.0	4
Orange-fruited Tinker's Weed	<i>Triosteum aurantiacum</i>	Rich soils of river intervals, or rich forest on limestone.	Flowers in July but identifiable from at least June to October	S2S3	Sensitive		8.0 ± 0.0	6

Table C1 Vascular Plant SOCI Recorded within 10 km of the Center of the Assessment Area (AC CDC 2016)

Common Name	Scientific Name	Habitat Association ¹	Season ¹	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Distance from Project (km)	# of Records
Narrow False Oats	<i>Trisetum spicatum</i>	Rocky outcrops, near streams, cliffs, and rock crevices.	Flowers June to August	S3S4	Secure		8.7 ± 0.0	1
Blue Vervain	<i>Verbena hastata</i>	Damp thickets, shores, roadsides.	Summer	S3	Secure		2.0 ± 0.0	8
Canada Violet	<i>Viola canadensis</i>	Rich deciduous woods.	Late April to July, sporadically to October	SH	Extirpated		5.4 ± 0.0	1
Arrow-Leaved Violet	<i>Viola sagittata</i> var. <i>ovata</i>	Dry sterile woods, clearings and fields.	April and May	S3S4	Secure		9.5 ± 0.0	2

¹ From Zinck (1998) and / or Munro *et al.* (2014)

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Balsam Fir	<i>Abies balsamea</i>	S5	Secure		x	x
Manitoba Maple	<i>Acer negundo</i>	SNA	Exotic		x	x
Norway Maple	<i>Acer platanoides</i>	SNA	Exotic		x	x
Red Maple	<i>Acer rubrum</i>	S5	Secure		x	x
Common Yarrow	<i>Achillea millefolium</i>	S5	Secure		x	x
Sneezeweed	<i>Achillea ptarmica</i>	SNA	Exotic		x	
Bishop's Goutweed	<i>Aegopodium podagraria</i>	SNA	Exotic		x	x
Common Horse Chestnut	<i>Aesculus hippocastanum</i>	SNA	Exotic		x	x
Hooked Agrimony	<i>Agrimonia gryposepala</i>	S3	Secure			x
Woodland Agrimony	<i>Agrimonia striata</i>	S5	Secure		x	x
Velvet Bent Grass	<i>Agrostis canina</i>	SNA	Exotic		x	

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Colonial Bent Grass	<i>Agrostis capillaris</i>	SNA	Exotic		x	x
Redtop	<i>Agrostis gigantea</i>	SNA	Exotic		x	x
Creeping Bent Grass	<i>Agrostis stolonifera</i>	S5	Secure		x	x
Northern Water Plantain	<i>Alisma triviale</i>	S5	Secure		x	x
Wild Chives	<i>Allium schoenoprasum</i> var. <i>schoenoprasum</i>	SNA	Exotic		x	
Speckled Alder	<i>Alnus incana</i>	S5	Secure		x	x
Green Alder	<i>Alnus viridis</i>	S5	Secure		x	x
Meadow Foxtail	<i>Alopecurus pratensis</i>	SNA	Exotic		x	x
Smooth Amaranth	<i>Amaranthus hybridus</i>	SNA	Exotic			x
Common Ragweed	<i>Ambrosia artemisiifolia</i>	S5	Secure		x	x
Great Ragweed	<i>Ambrosia trifida</i>	SNA	Exotic		x	
Smooth Serviceberry	<i>Amelanchier laevis</i>	S5	Secure		x	
a Serviceberry	<i>Amelanchier</i> sp.	na	na		x	x
Pearly Everlasting	<i>Anaphalis margaritacea</i>	S5	Secure		x	x
Field Pussytoes	<i>Antennaria neglecta</i>	SNR	Undetermined		x	
Large Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	SNA	Exotic		x	x
Spreading Dogbane	<i>Apocynum androsaemifolium</i>	S5	Secure		x	x
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	S5	Secure		x	x
Eastern Dwarf Mistletoe	<i>Arceuthobium pusillum</i>	S5	Secure			x
Common Burdock	<i>Arctium minus</i>	SNA	Exotic		x	x
a Wormwood	<i>Artemisia</i> sp.	na	na			x
Common Milkweed	<i>Asclepias syriaca</i>	SNA	Exotic		x	x
Garden Asparagus	<i>Asparagus officinalis</i>	SNA	Exotic		x	x
Common Lady Fern	<i>Athyrium filix-femina</i>	S5	Secure		x	x
Frankton's Saltbush	<i>Atriplex franktonii</i>	S3S4	Secure		x	x
Glabrous Orache	<i>Atriplex glabriuscula</i>	S4S5	Secure			x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
a Saltbush	<i>Atriplex sp.</i>	na	na		x	x
Wild Oats	<i>Avena fatua</i>	SNA	Exotic		x	
Cultivated Oats	<i>Avena sativa</i>	SNA	Exotic		x	
Japanese Barberry	<i>Berberis thunbergii</i>	SNA	Exotic		x	x
Yellow Birch	<i>Betula alleghaniensis</i>	S5	Secure			x
Paper Birch	<i>Betula papyrifera</i>	S5	Secure		x	x
Gray Birch	<i>Betula populifolia</i>	S5	Secure		x	x
Nodding Beggarticks	<i>Bidens cernua</i>	S5	Secure		x	x
Purple-stemmed Beggarticks	<i>Bidens connata</i>	S4	Secure			x
Devil's Beggarticks	<i>Bidens frondosa</i>	S5	Secure		x	x
a Beggartick	<i>Bidens sp.</i>	na	na		x	x
Tall Beggarticks	<i>Bidens vulgata</i>	SNA	Exotic		x	x
Water-shield	<i>Brasenia schreberi</i>	S5	Secure			x
Bird's Rape	<i>Brassica rapa</i>	SNA	Exotic		x	
a Mustard	<i>Brassica sp.</i>	na	na		x	x
Smooth Brome	<i>Bromus inermis</i>	SNA	Exotic		x	x
Rye Brome	<i>Bromus secalinus</i>	SNA	Exotic			x
American Searocket	<i>Cakile edentula</i>	S5	Secure		x	x
Bluejoint Reed Grass	<i>Calamagrostis canadensis</i>	S5	Secure		x	x
Large Water-Starwort	<i>Callitriche heterophylla</i>	S4	Secure		x	
Marsh Water-starwort	<i>Callitriche palustris</i>	S5	Secure		x	
Hedge False Bindweed	<i>Calystegia sepium</i>	S5	Secure		x	x
Curled Plumeless Thistle	<i>Carduus crispus</i>	SNA	Exotic		x	
Water Sedge	<i>Carex aquatilis</i>	S5	Secure		x	x
Drooping Woodland Sedge	<i>Carex arctata</i>	S5	Secure		x	x
Atlantic Sedge	<i>Carex atlantica</i>	S4	Secure		x	
Bebb's Sedge	<i>Carex bebbii</i>	S2	Sensitive		x	x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Brownish Sedge	<i>Carex brunnescens</i>	S5	Secure			x
Silvery Sedge	<i>Carex canescens</i>	S5	Secure		x	x
Fibrous-Root Sedge	<i>Carex communis</i>	S5	Secure		x	x
Fringed Sedge	<i>Carex crinita</i>	S5	Secure		x	
White-edged Sedge	<i>Carex debilis</i>	S5	Secure		x	x
Dewey's Sedge	<i>Carex deweyana</i>	S5	Secure		x	
Lesser Panicked Sedge	<i>Carex diandra</i>	S4	Secure		x	
Heath Sedge	<i>Carex flacca</i>	SNA	Exotic		x	x
Yellow Sedge	<i>Carex flava</i>	S5	Secure		x	x
Graceful Sedge	<i>Carex gracillima</i>	S4S5	Secure			x
Nodding Sedge	<i>Carex gynandra</i>	S5	Secure		x	x
Marsh Straw Sedge	<i>Carex hormathodes</i>	S4S5	Secure		x	
Bladder Sedge	<i>Carex intumescens</i>	S5	Secure		x	x
Lake Sedge	<i>Carex lacustris</i>	S4	Secure		x	x
Slender Sedge	<i>Carex lasiocarpa</i>	S5	Secure			x
Sallow Sedge	<i>Carex lurida</i>	S5	Secure		x	x
Smooth Black Sedge	<i>Carex nigra</i>	S5	Secure		x	x
Pale Sedge	<i>Carex pallescens</i>	S5	Secure		x	x
Long-stalked Sedge	<i>Carex pedunculata</i>	S4	Secure		x	
Necklace Sedge	<i>Carex projecta</i>	S5	Secure		x	x
Cyperuslike Sedge	<i>Carex pseudocyperus</i>	S4S5	Secure		x	x
Retorse Sedge	<i>Carex retrorsa</i>	S4	Secure		x	
Broom Sedge	<i>Carex scoparia</i>	S5	Secure		x	x
Spiked Sedge	<i>Carex spicata</i>	SNA	Exotic		x	
Awl-fruited Sedge	<i>Carex stipata</i>	S5	Secure		x	x
Tussock Sedge	<i>Carex stricta</i>	S5	Secure		x	
Northern Beaked Sedge	<i>Carex utriculata</i>	S5	Secure		x	

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Fox Sedge	<i>Carex vulpinoidea</i>	S4?	Secure		x	x
Black Knapweed	<i>Centaurea nigra</i>	SNA	Exotic		x	x
Branched Centaury	<i>Centaureum pulchellum</i>	SNA	Exotic			x
Mouse-Ear Chickweed	<i>Cerastium arvense</i>	SNR	Undetermined		x	x
Common Chickweed	<i>Cerastium fontanum ssp. vulgare</i>	SNA	Exotic		x	x
Fireweed	<i>Chamerion angustifolium</i>	S5	Secure		x	x
a macroalgae	<i>Chara sp.</i>	na	na			x
White Turtlehead	<i>Chelone glabra</i>	S5	Secure		x	x
Common Lamb's Quarters	<i>Chenopodium album</i>	SNA	Exotic		x	x
a Goosefoot	<i>Chenopodium sp.</i>	na	na		x	
Wild Chicory	<i>Cichorium intybus</i>	SNA	Exotic		x	x
Bulbous Water-hemlock	<i>Cicuta bulbifera</i>	S5	Secure		x	x
Spotted Water-Hemlock	<i>Cicuta maculata</i>	S5	Secure		x	x
Small Enchanter's Nightshade	<i>Circaea alpina</i>	S5	Secure		x	x
Broad-leaved Enchanter's Nightshade	<i>Circaea lutetiana</i>	S5	Secure		x	x
Canada Thistle	<i>Cirsium arvense</i>	SNA	Exotic		x	x
Bull Thistle	<i>Cirsium vulgare</i>	SNA	Exotic		x	x
Marsh Cinquefoil	<i>Comarum palustre</i>	S5	Secure			x
Sweet-fern	<i>Comptonia peregrina</i>	S5	Secure		x	x
Field Bindweed	<i>Convolvulus arvensis</i>	SNA	Exotic			x
Canada Horseweed	<i>Conyza canadensis</i>	S5	Secure		x	
Goldthread	<i>Coptis trifolia</i>	S5	Secure		x	x
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	S5	Secure		x	
Bunchberry	<i>Cornus canadensis</i>	S5	Secure		x	x
Round-leaved Dogwood	<i>Cornus rugosa</i>	S4	Secure		x	x
Red Osier Dogwood	<i>Cornus sericea</i>	S5	Secure		x	x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Beaked Hazel	<i>Corylus cornuta</i>	S5	Secure		x	x
Fireberry Hawthorn	<i>Crataegus chrysocarpa</i>	S4S5	Secure		x	
Fan-leaved Hawthorn	<i>Crataegus flabellata</i>	SNR	Sensitive		x	
English Hawthorn	<i>Crataegus monogyna</i>	SNA	Exotic		x	x
a Hawthorn	<i>Crataegus sp.</i>	na	na		x	x
Narrow-leaved Hawksbeard	<i>Crepis tectorum</i>	SNA	Exotic			x
Orchard Grass	<i>Dactylis glomerata</i>	SNA	Exotic		x	x
Poverty Oat Grass	<i>Danthonia spicata</i>	S5	Secure		x	x
Mezer's Daphne	<i>Daphne mezereum</i>	SNA	Exotic		x	
Queen Anne's Lace	<i>Daucus carota</i>	SNA	Exotic		x	x
Tufted Hair Grass	<i>Deschampsia caespitosa</i>	S4	Secure		x	
Deptford Pink	<i>Dianthus armeria</i>	SNA	Exotic		x	x
Woolly Panic Grass	<i>Dichanthelium acuminatum var. fasciculatum</i>	S5	Secure		x	
A Panic Grass	<i>Dichanthelium sp.</i>	na	na		x	x
Northern Bush Honeysuckle	<i>Diervilla lonicera</i>	S5	Secure		x	x
Hairy Flat-top White Aster	<i>Doellingeria umbellata</i>	S5	Secure		x	x
Spinulose Wood Fern	<i>Dryopteris carthusiana</i>	S5	Secure		x	x
Evergreen Wood Fern	<i>Dryopteris intermedia</i>	S5	Secure		x	x
a Hybrid Wood-fern	<i>Dryopteris x triploidea</i>	SNA	Not Assessed		x	
Three-Way Sedge	<i>Dulichium arundinaceum</i>	S5	Secure			x
Purple Coneflower	<i>Echinacea purpurea</i>	na	na		x	
Large Barnyard Grass	<i>Echinochloa crus-galli</i>	SNA	Exotic		x	x
Wild Cucumber	<i>Echinocystis lobata</i>	SNA	Exotic		x	x
Russian Olive	<i>Elaeagnus angustifolia</i>	SNA			x	
Russian Olive	<i>Elaeagnus sp.</i>	na	na		x	
Blunt Spikerush	<i>Eleocharis obtusa</i>	S5	4 Secure		x	x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Common Spikerush	<i>Eleocharis palustris</i>	S5	Secure		x	x
Quack Grass	<i>Elymus repens</i>	SNA	Exotic		x	x
Slender Wild Rye	<i>Elymus trachycaulus</i>	S4?	Secure		x	
Northern Willowherb	<i>Epilobium ciliatum</i>	S5	Secure		x	x
Purple-veined Willowherb	<i>Epilobium coloratum</i>	S2?	Sensitive		x	
Hairy Willowherb	<i>Epilobium hirsutum</i>	SNA	Exotic			x
Bog Willowherb	<i>Epilobium leptophyllum</i>	S5	Secure		x	
a Willowherb	<i>Epilobium sp.</i>	na	na			x
Helleborine	<i>Epipactis helleborine</i>	SNA	Exotic		x	x
Field Horsetail	<i>Equisetum arvense</i>	S5	Secure		x	x
Woodland Horsetail	<i>Equisetum sylvaticum</i>	S5	Secure		x	x
a Hybrid Horsetail	<i>Equisetum x litorale</i>	SNA	Not Assessed		x	
Eastern Burnweed	<i>Erechtites hieracifolia</i>	S5	Secure		x	x
Annual Fleabane	<i>Erigeron annuus</i>	S4S5	Secure		x	x
Rough Fleabane	<i>Erigeron strigosus</i>	S5	Secure		x	x
Common Dog Mustard	<i>Erucastrum gallicum</i>	SNA	Exotic		x	
Worm-seeded Wallflower	<i>Erysimum cheiranthoides</i>	SNR	Exotic		x	
A Burning Bush	<i>Euonymus sp.</i>	na	na		x	
Spotted Joe-pye-weed	<i>Eupatorium maculatum</i>	S5	Secure		x	x
Large-leaved Aster	<i>Eurybia macrophylla</i>	S5	Secure		x	x
Grass-leaved Goldenrod	<i>Euthamia graminifolia</i>	S5	Secure		x	x
American Beech	<i>Fagus grandifolia</i>	S5	Secure			x
Hair Fescue	<i>Festuca filiformis</i>	SNA	Exotic		x	x
Red Fescue	<i>Festuca rubra</i>	S5	Secure		x	x
a Fescue	<i>Festuca sp.</i>	na	na			x
Hard Fescue	<i>Festuca trachyphylla</i>	SNA	Exotic			x
Wild Strawberry	<i>Fragaria virginiana</i>	S5	Secure		x	x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Glossy Buckthorn	<i>Frangula alnus</i>	SNA	Exotic		x	
White Ash	<i>Fraxinus americana</i>	S5	Secure		x	x
European Ash	<i>Fraxinus excelsior</i>	SNA	Exotic		x	x
Black Ash	<i>Fraxinus nigra</i>	S1S2	At Risk	Threatened	x	x
Common Hemp-nettle	<i>Galeopsis tetrahit</i>	SNA	Exotic		x	x
Smooth Bedstraw	<i>Galium mollugo</i>	SNA	Exotic		x	
Common Marsh Bedstraw	<i>Galium palustre</i>	S5	Secure		x	x
Eastern Teaberry	<i>Gaultheria procumbens</i>	S5	Secure		x	x
Yellow Avens	<i>Geum aleppicum</i>	S5	Secure		x	
Rough Avens	<i>Geum laciniatum</i>	S5	Secure		x	x
Ground Ivy	<i>Glechoma hederacea</i>	SNA	Exotic		x	x
Canada Manna Grass	<i>Glyceria canadensis</i>	S5	Secure		x	x
Common Tall Manna Grass	<i>Glyceria grandis</i>	S4S5	Secure		x	x
Northern Mannagrass	<i>Glyceria laxa</i>	S4?	Secure		x	
Fowl Manna Grass	<i>Glyceria striata</i>	S5	Secure		x	x
Marsh Cudweed	<i>Gnaphalium uliginosum</i>	SNA	Exotic		x	
Common Oak Fern	<i>Gymnocarpium dryopteris</i>	S5	Secure			x
A perennial Sunflower	<i>Helianthus sp.</i>	na	na		x	
Orange Day Lily	<i>Hemerocallis fulva</i>	SNA	Exotic		x	
Dame's Rocket	<i>Hesperis matronalis</i>	SNA	Exotic		x	x
Orange Hawkweed	<i>Hieracium aurantiacum</i>	SNA	Exotic			x
Field Hawkweed	<i>Hieracium caespitosum</i>	SNA	Exotic		x	x
Canada Hawkweed	<i>Hieracium canadense</i>	S4S5	Secure			x
Common Hawkweed	<i>Hieracium lachenalii</i>	SNA	Exotic		x	x
Wall Hawkweed	<i>Hieracium murorum</i>	SNA	Exotic		x	
Mouse-ear Hawkweed	<i>Hieracium pilosella</i>	SNA	Exotic		x	x
Smoothish Hawkweed	<i>Hieracium x floribundum</i>	SNA	Exotic		x	x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Foxtail Barley	<i>Hordeum jubatum</i>	S5	Secure		x	x
Common St. John's-wort	<i>Hypericum perforatum</i>	SNA	Exotic		x	x
A St. John's-Wort	<i>Hypericum sp.</i>	na	na		x	x
Common Winterberry	<i>Ilex verticillata</i>	S5	Secure		x	x
Spotted Jewelweed	<i>Impatiens capensis</i>	S5	Secure		x	x
Harlequin Blue Flag	<i>Iris versicolor</i>	S5	Secure		x	x
Big-leaved Marsh-elder	<i>Iva frutescens</i>	S2	Sensitive		x	
Sharp-Fruit Rush	<i>Juncus acuminatus</i>	S3S4	Secure			x
Jointed Rush	<i>Juncus articulatus</i>	S5	Secure		x	x
Narrow-Panicled Rush	<i>Juncus brevicaudatus</i>	S5	Secure		x	x
Dudley's Rush	<i>Juncus dudleyi</i>	S3	Secure			x
Soft Rush	<i>Juncus effusus</i>	S5	Secure		x	x
Black-Grass Rush	<i>Juncus gerardii</i>	S5	Secure		x	x
Knotted Rush	<i>Juncus nodosus</i>	S4	Secure			x
Slender Rush	<i>Juncus tenuis</i>	S5	Secure		x	x
Common Juniper	<i>Juniperus communis</i>	S5	Secure		x	x
Sheep Laurel	<i>Kalmia angustifolia</i>	S5	Secure			x
Tall Blue Lettuce	<i>Lactuca biennis</i>	S5	Secure		x	
Canada Lettuce	<i>Lactuca canadensis</i>	S5	Secure			x
Tamarack	<i>Larix laricina</i>	S5	Secure		x	x
Rice Cut Grass	<i>Leersia oryzoides</i>	S5	Secure		x	x
Lesser Duckweed	<i>Lemna minor</i>	SNA			x	x
Turion Duckweed	<i>Lemna turionifera</i>	S5	Secure			x
Fall Dandelion	<i>Leontodon autumnalis</i>	SNA	Exotic		x	x
Narrow-leaved Pepperwort	<i>Lepidium ruderale</i>	SNA	Exotic		x	
Pepper-Grass	<i>Lepidium sp.</i>	na	na		x	
Poor-man's Pepperwort	<i>Lepidium virginicum</i>	SNA	Exotic		x	

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Oxeye Daisy	<i>Leucanthemum vulgare</i>	SNA	Exotic		x	x
Scotch Lovage	<i>Ligusticum scoticum</i>	S5	Secure		x	
Tiger Lily	<i>Lilium lancifolium</i>	SNA	Exotic			x
Sea Lavender	<i>Limonium carolinianum</i>	S5	Secure		x	x
Butter-and-Eggs	<i>Linaria vulgaris</i>	SNA	Exotic		x	
Loesel's Twayblade	<i>Liparis loeselii</i>	S3S4	Secure		x	
European Gromwell	<i>Lithospermum officinale</i>	na	na		x	
Indian Tobacco	<i>Lobelia inflata</i>	S5	Secure		x	
Tall Fescue	<i>Lolium arundinaceum</i>	SNA	Exotic		x	x
Meadow Fescue	<i>Lolium pratense</i>	SNA	Exotic		x	
Canada Fly Honeysuckle	<i>Lonicera canadensis</i>	S5	Secure			x
Morrow's Honeysuckle	<i>Lonicera morrowii</i>	na	na		x	
European Honeysuckle	<i>Lonicera periclymenum</i>	SNA	Exotic		x	
A Honeysuckle	<i>Lonicera sp.</i>	na	na		x	
Tartarian Honeysuckle	<i>Lonicera tatarica</i>	SNA	Exotic		x	x
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	SNA	Exotic		x	x
Marsh Seedbox	<i>Ludwigia palustris</i>	S5	Secure			x
Large-Leaved Lupine	<i>Lupinus polyphyllus</i>	SNA	Exotic		x	x
Hairy Woodrush	<i>Luzula acuminata</i>	S5	Secure			x
Common Woodrush	<i>Luzula multiflora</i>	S5	Secure		x	x
American Water Horehound	<i>Lycopus americanus</i>	S5	Secure		x	x
Northern Water Horehound	<i>Lycopus uniflorus</i>	S5	Secure		x	x
Swamp Yellow Loosestrife	<i>Lysimachia terrestris</i>	S5	Secure			x
Purple Loosestrife	<i>Lythrum salicaria</i>	SNA	Exotic		x	x
Wild Lily-of-The-Valley	<i>Maianthemum canadense</i>	S5	Secure		x	x
Siberian Crabapple	<i>Malus baccata</i>	SNA	Exotic		x	
Common Apple	<i>Malus pumila</i>	SNA	Exotic			x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
an Apple	<i>Malus sp.</i>	SNA	Exotic		x	x
Pineapple Weed	<i>Matricaria discoidea</i>	SNA	Exotic		x	x
Ostrich Fern	<i>Matteuccia struthiopteris</i>	S5	Secure			x
Black Medick	<i>Medicago lupulina</i>	SNA	Exotic		x	x
Alfalfa	<i>Medicago sativa</i>	SNA	Exotic		x	x
American Cow Wheat	<i>Melampyrum lineare</i>	S5	Secure			x
Yellow Sweet-clover	<i>Melilotus officinalis</i>	SNA	Exotic		x	x
A Sweetclover	<i>Melilotus sp.</i>	na	na		x	x
Wild Mint	<i>Mentha arvensis</i>	S5	Secure		x	
Partridgeberry	<i>Mitchella repens</i>	S5	Secure		x	x
Indian Pipe	<i>Monotropa uniflora</i>	S5	Secure		x	x
Northern Bayberry	<i>Morella pensylvanica</i>	S5	Secure		x	x
Small Forget-Me-Not	<i>Myosotis laxa</i>	S5	Secure		x	x
na	na	na	na			x
Red Bartsia	<i>Odontites vernus</i>	SNA	Exotic		x	x
An Evening-Primrose	<i>Oenothera sp.</i>	na	na		x	
Common Evening Primrose	<i>Oenothera biennis</i>	S5	Secure		x	x
Small-flowered Evening Primrose	<i>Oenothera parviflora</i>	S4?	Secure		x	
Perennial Evening Primrose	<i>Oenothera perennis</i>	S5	Secure		x	x
Sensitive Fern	<i>Onoclea sensibilis</i>	S5	Secure		x	x
White-grained Mountain Rice	<i>Oryzopsis asperifolia</i>	S5	Secure			x
Interrupted Fern	<i>Osmunda claytoniana</i>	S5	Secure		x	
Royal Fern	<i>Osmunda regalis</i>	S5	Secure		x	x
European Wood Sorrel	<i>Oxalis stricta</i>	S5	Secure		x	x
Common Witch Grass	<i>Panicum capillare</i>	SNA	Exotic		x	
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	SNA	Exotic		x	x
Thicket Creeper	<i>Parthenocissus vitacea</i>	SNR	Exotic			x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Wild Parsnip	<i>Pastinaca sativa</i>	SNA	Exotic		x	x
Reed Canary Grass	<i>Phalaris arundinacea</i>	S5	Secure		x	x
Common Timothy	<i>Phleum pratense</i>	SNA	Exotic		x	x
White Spruce	<i>Picea glauca</i>	S5	Secure		x	x
Black Spruce	<i>Picea mariana</i>	S5	Secure			x
Red Spruce	<i>Picea rubens</i>	S5	Secure			x
Jack Pine	<i>Pinus banksiana</i>	S4	Secure		x	
Austrian Pine	<i>Pinus nigra</i>	na	na		x	
Eastern White Pine	<i>Pinus strobus</i>	S5	Secure		x	x
Scotch Pine	<i>Pinus sylvestris</i>	SNA	Exotic		x	x
English Plantain	<i>Plantago lanceolata</i>	SNA	Exotic		x	x
Common Plantain	<i>Plantago major</i>	SNA	Exotic		x	x
Seaside Plantain	<i>Plantago maritima</i>	S5	Secure		x	x
Ragged Fringed Orchid	<i>Platanthera lacera</i>	S4S5	Secure		x	x
Small Purple Fringed Orchid	<i>Platanthera psycodes</i>	S4	Secure		x	
Annual Blue Grass	<i>Poa annua</i>	SNA	Exotic		x	
Canada Blue Grass	<i>Poa compressa</i>	SNA	Exotic		x	x
Wood Blue Grass	<i>Poa nemoralis</i>	SNA	Exotic			x
Fowl Blue Grass	<i>Poa palustris</i>	S5	Secure		x	x
Kentucky Blue Grass	<i>Poa pratensis</i>	S5	Secure		x	x
a Bluegrass	<i>Poa sp.</i>	na	na			x
Water Smartweed	<i>Polygonum amphibium</i>	S4S5	Secure		x	x
Prostrate Knotweed	<i>Polygonum aviculare</i>	S5	Secure		x	
Fringed Black Bindweed	<i>Polygonum cilinode</i>	S5	Secure		x	
Japanese Knotweed	<i>Polygonum cuspidatum</i>	SNA	Exotic		x	
Spotted Lady's-thumb	<i>Polygonum persicaria</i>	SNA	Exotic		x	x
Dotted Smartweed	<i>Polygonum punctatum</i>	S5	Secure		x	x

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Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Bushy Knotweed	<i>Polygonum ramosissimum</i>	S4	Secure		x	
a Smartweed	<i>Polygonum sp.</i>	na	na		x	x
Christmas Fern	<i>Polystichum acrostichoides</i>	S5	Secure			x
Large-toothed Aspen	<i>Populus grandidentata</i>	S5	Secure		x	x
Black Cottonwood	<i>Populus nigra</i>	SNA	Exotic		x	
Trembling Aspen	<i>Populus tremuloides</i>	S5	Secure		x	x
a Hybrid Poplar	<i>Populus x sp.</i>	na	na		x	
Variable-leaved Pondweed	<i>Potamogeton gramineus</i>	S5	Secure		x	
Rough Cinquefoil	<i>Potentilla norvegica</i>	S5	Secure		x	
Sulphur Cinquefoil	<i>Potentilla recta</i>	SNA	Exotic		x	x
Old Field Cinquefoil	<i>Potentilla simplex</i>	S5	Secure		x	x
Three-leaved Rattlesnakeroot	<i>Prenanthes trifoliolata</i>	S5	Secure		x	x
Marsh Mermaidweed	<i>Proserpinaca palustris</i>	S3	Secure			x
Common Self-heal	<i>Prunella vulgaris</i>	S5	Secure		x	x
Sweet Cherry	<i>Prunus avium</i>	SNA	Exotic		x	
Pin Cherry	<i>Prunus pensylvanica</i>	S5	Secure		x	x
Black Cherry	<i>Prunus serotina</i>	S5	Secure		x	x
Chokecherry	<i>Prunus virginiana</i>	S5	Secure		x	x
Bracken Fern	<i>Pteridium aquilinum</i>	S5	Secure		x	x
Seaside Alkali Grass	<i>Puccinellia americana</i>	S4S5	Secure			x
Spreading Alkali Grass	<i>Puccinellia distans</i>	SNA	Exotic		x	
Round-leaved Pyrola	<i>Pyrola americana</i>	S5	Secure		x	
Shinleaf	<i>Pyrola elliptica</i>	S5	Secure			x
Common Pear	<i>Pyrus communis</i>	SNA	Exotic		x	
English Oak	<i>Quercus robur</i>	SNA	Exotic		x	x
Northern Red Oak	<i>Quercus rubra</i>	S5	Secure		x	x
Common Buttercup	<i>Ranunculus acris</i>	SNA	Exotic		x	x

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Gmelin's Water Buttercup	<i>Ranunculus gmelinii</i>	S3	Secure			x
Creeping Buttercup	<i>Ranunculus repens</i>	SNA	Exotic		x	x
Wild Radish	<i>Raphanus raphanistrum</i>	SNA	Exotic		x	x
European Buckthorn	<i>Rhamnus cathartica</i>	SNA	Exotic		x	x
Rhodora	<i>Rhododendron canadense</i>	S5	Secure			x
Staghorn Sumac	<i>Rhus typhina</i>	S4S5	Secure		x	x
Smooth Gooseberry	<i>Ribes hirtellum</i>	S5	Secure		x	
Black Locust	<i>Robinia pseudoacacia</i>	SNA	Exotic		x	x
Bog Yellowcress	<i>Rorippa palustris</i>	S4	Secure		x	
Dog Rose	<i>Rosa canina</i>	SNA	Exotic		x	
Carolina Rose	<i>Rosa carolina</i>	S4S5	Secure		x	
Multiflora Rose	<i>Rosa multiflora</i>	SNA	Exotic		x	x
Shining Rose	<i>Rosa nitida</i>	S4	Secure			x
Swamp Rose	<i>Rosa palustris</i>	S4	Secure		x	
An Ornamental Rose	<i>Rosa sp.</i>	SNA	Exotic		x	x
Virginia Rose	<i>Rosa virginiana</i>	S5	Secure		x	x
Alleghaney Blackberry	<i>Rubus allegheniensis</i>	S5	Secure		x	x
Smooth Blackberry	<i>Rubus canadensis</i>	S5	Secure		x	x
Bristly Dewberry	<i>Rubus hispidus</i>	S5	Secure			x
Red Raspberry	<i>Rubus idaeus</i>	S5	Secure		x	x
Dwarf Red Raspberry	<i>Rubus pubescens</i>	S5	Secure		x	x
A Blackberry	<i>Rubus sp.</i>	na	na		x	x
Black-Eyed Susan	<i>Rudbeckia hirta</i>	SNA	Exotic		x	
Garden Sorrel	<i>Rumex acetosa</i>	SNA	Exotic		x	x
Sheep Sorrel	<i>Rumex acetosella</i>	SNA	Exotic		x	x
Curled Dock	<i>Rumex crispus</i>	SNA	Exotic		x	x
Tierra del Fuego Dock	<i>Rumex fueginus</i>	S3S4	Secure		x	x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Sea-Side Dock	<i>Rumex maritimus</i>	na	na		x	x
Greater Water Dock	<i>Rumex orbiculatus</i>	S5	Secure		x	
Sea Glasswort	<i>Salicornia maritima</i>	S5	Secure			x
Bebb's Willow	<i>Salix bebbiana</i>	S5	Secure		x	
Pussy Willow	<i>Salix discolor</i>	S5	Secure		x	
Cottony Willow	<i>Salix eriocephala</i>	S5	Secure		x	
Upland Willow	<i>Salix humilis</i>	S5	Secure		x	
Shining Willow	<i>Salix lucida</i>	S5	Secure		x	
a Willow	<i>Salix sp.</i>	na	na			x
Weeping Willow Hybrid	<i>Salix sp.</i>	na	na		x	x
Basket Willow	<i>Salix viminalis</i>	SNA	Exotic		x	
Red Elderberry	<i>Sambucus racemosa</i>	S5	Secure		x	x
Bouncing-Bet	<i>Saponaria officinalis</i>	SNA	Exotic		x	
Hardstem Bulrush	<i>Schoenoplectus acutus</i>	S4	Secure		x	x
Softstem Bulrush	<i>Schoenoplectus tabernaemontani</i>	S5	Secure		x	x
Black-girdled Bulrush	<i>Scirpus atrocinctus</i>	S5	Secure		x	
Dark-green Bulrush	<i>Scirpus atrovirens</i>	SNA	na		x	x
Common Woolly Bulrush	<i>Scirpus cyperinus</i>	S5	Secure		x	x
Small-fruited Bulrush	<i>Scirpus microcarpus</i>	S5	Secure		x	x
A Bulrush	<i>Scirpus sp.</i>	na	na		x	x
Marsh Skullcap	<i>Scutellaria galericulata</i>	S5	Secure		x	x
Mad-dog Skullcap	<i>Scutellaria lateriflora</i>	S5	Secure		x	x
Mossy Stonecrop	<i>Sedum acre</i>	SNA	Exotic		x	
Tansy Ragwort	<i>Senecio jacobaea</i>	SNA	Exotic			x
Sticky Ragwort	<i>Senecio viscosus</i>	SNA	Exotic		x	x
Green Foxtail	<i>Setaria viridis</i>	SNA	Exotic		x	
Soapberry	<i>Shepherdia canadensis</i>	S2S3	Sensitive		x	x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Mountain Blue-eyed-grass	<i>Sisyrinchium montanum</i>	S5	Secure		x	x
Common Water Parsnip	<i>Sium suave</i>	S5	Secure			x
Bittersweet Nightshade	<i>Solanum dulcamara</i>	SNA	Exotic		x	x
White Goldenrod	<i>Solidago bicolor</i>	S5	Secure		x	x
Canada Goldenrod	<i>Solidago canadensis</i>	S5	Secure		x	x
Zigzag Goldenrod	<i>Solidago flexicaulis</i>	S5	Secure		x	
Giant Goldenrod	<i>Solidago gigantea</i>	S5	Secure		x	x
Early Goldenrod	<i>Solidago juncea</i>	S5	Secure		x	x
Gray-stemmed Goldenrod	<i>Solidago nemoralis</i>	S4S5	Secure		x	
Downy Goldenrod	<i>Solidago puberula</i>	S5	Secure		x	x
Rough-stemmed Goldenrod	<i>Solidago rugosa</i>	S5	Secure		x	x
Seaside Goldenrod	<i>Solidago sempervirens</i>	S5	Secure		x	x
Field Sow Thistle	<i>Sonchus arvensis</i>	SNA	Exotic		x	
Prickly Sow Thistle	<i>Sonchus asper</i>	SNA	Exotic			x
Common Sow Thistle	<i>Sonchus oleraceus</i>	SNA	Exotic			x
a Sow Thistle	<i>Sonchus sp.</i>	na	na			x
False Spiraea	<i>Sorbaria sorbifolia</i>	SNA	Exotic			x
European Mountain Ash	<i>Sorbus aucuparia</i>	SNA	Exotic		x	
American Burreed	<i>Sparganium americanum</i>	S5	Secure		x	x
Smooth Cord Grass	<i>Spartina alterniflora</i>	S5	Secure		x	x
Saltmeadow Cord Grass	<i>Spartina patens</i>	S5	Secure		x	x
Prairie Cord Grass	<i>Spartina pectinata</i>	S5	Secure		x	x
Common Corn Spurrey	<i>Spergula arvensis</i>	SNA	Exotic		x	
Ruby Sandspurrey	<i>Spergularia rubra</i>	SNA	Exotic		x	
White Meadowsweet	<i>Spiraea alba</i>	S5	Secure		x	x
Steeplebush	<i>Spiraea tomentosa</i>	S5	Secure		x	x
Sheathed Dropseed	<i>Sporobolus vaginiflorus</i>	SNA	Exotic		x	

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Little Starwort	<i>Stellaria graminea</i>	SNA	Exotic		x	x
White Sea-blite	<i>Suaeda maritima</i>	S5	Secure		x	
White Sea-blite	<i>Suaeda maritima ssp. maritima</i>	S5	Secure			x
Roland's Sea-Blite	<i>Suaeda rolandii</i>	S1?	May Be At Risk			x
a Sea-blite	<i>Suaeda sp.</i>	na	na		x	x
Heart-leaved Aster	<i>Symphyotrichum cordifolium</i>	S4S5	Secure		x	
Lance-leaved Aster	<i>Symphyotrichum lanceolatum</i>	S4S5	Secure		x	
Calico Aster	<i>Symphyotrichum lateriflorum</i>	S5	Secure		x	x
New York Aster	<i>Symphyotrichum novi-belgii</i>	S5	Secure		x	x
Purple-stemmed Aster	<i>Symphyotrichum puniceum</i>	S5	Secure		x	x
Common Tansy	<i>Tanacetum vulgare</i>	SNA	Exotic		x	x
Common Dandelion	<i>Taraxacum officinale</i>	SNA	Exotic		x	x
Tall Meadow-Rue	<i>Thalictrum pubescens</i>	S5	Secure		x	x
New York Fern	<i>Thelypteris noveboracensis</i>	S5	Secure		x	x
Eastern Marsh Fern	<i>Thelypteris palustris</i>	S5	Secure		x	x
Eastern White Cedar	<i>Thuja occidentalis</i>	S1	At Risk	Vulnerable	x	x
Little-leaved Linden	<i>Tilia cordata</i>	SNA	Exotic		x	x
Poison Ivy	<i>Toxicodendron radicans</i>	S4	Secure		x	x
Northern Poison Oak	<i>Toxicodendron rydbergii</i>	S5	Secure		x	x
Meadow Goatsbeard	<i>Tragopogon pratensis</i>	SNA	Exotic		x	x
Fraser's Marsh St John's-wort	<i>Triadenum fraseri</i>	S5	Secure			x
Northern Starflower	<i>Trientalis borealis</i>	S5	Secure		x	x
Rabbit's-foot Clover	<i>Trifolium arvense</i>	SNA	Exotic		x	x
Low Hop Clover	<i>Trifolium campestre</i>	SNA	Exotic		x	x
Alsike Clover	<i>Trifolium hybridum</i>	SNA	Exotic		x	x
Red Clover	<i>Trifolium pratense</i>	SNA	Exotic		x	x
White Clover	<i>Trifolium repens</i>	SNA	Exotic		x	x

Table C2 Vascular Plants Recorded During Field Surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	NS ESA Designation	Observed in 2007?	Observed in 2016?
Seashore Chamomile	<i>Tripleurospermum maritima</i>	SNA	Exotic		x	x
Eastern Hemlock	<i>Tsuga canadensis</i>	S4S5	Secure		x	x
Coltsfoot	<i>Tussilago farfara</i>	SNA	Exotic		x	x
Narrow-Leaved Cattail	<i>Typha angustifolia</i>	S5	Secure		x	x
Broad-leaved Cattail	<i>Typha latifolia</i>	S5	Secure		x	x
Blue Cattail	<i>Typha x glauca</i>	SNA	Not Assessed		x	x
White Elm	<i>Ulmus americana</i>	S4	Secure		x	x
Wych Elm	<i>Ulmus glabra</i>	SNA	Exotic		x	
English Elm	<i>Ulmus procera</i>	SNA	Exotic		x	
Siberian Elm	<i>Ulmus pumila</i>	na	na		x	
Stinging Nettle	<i>Urtica dioica ssp. gracilis</i>	S4	Secure			x
Lesser Bladderwort	<i>Utricularia minor</i>	S4	Secure			x
Late Lowbush Blueberry	<i>Vaccinium angustifolium</i>	S5	Secure		x	x
Velvet-leaved Blueberry	<i>Vaccinium myrtilloides</i>	S5	Secure		x	x
Common Mullein	<i>Verbascum thapsus</i>	SNA	Exotic		x	x
Field Speedwell	<i>Veronica agrestis</i>	SNA	Exotic		x	
Long-leaved Speedwell	<i>Veronica longifolia</i>	SNA	Exotic		x	
Common Speedwell	<i>Veronica officinalis</i>	S5	Exotic		x	x
Northern Wild Raisin	<i>Viburnum nudum</i>	S5	Secure		x	x
Highbush Cranberry	<i>Viburnum opulus</i>	S4	Secure		x	
Tufted Vetch	<i>Vicia cracca</i>	SNA	Exotic		x	x
Four-seeded Vetch	<i>Vicia tetrasperma</i>	SNA	Exotic		x	
Marsh Blue Violet	<i>Viola cucullata</i>	S5	Secure		x	
Woolly Blue Violet	<i>Viola sororia</i>	S5	Secure		x	
a Violet	<i>Viola sp.</i>	na	na			x

Table C3 Non-vascular plant SOCI recorded within 10 km of the center of the Assessment Area (AC CDC 2016)

Type	Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank	Distance from Project (km)	# of Records
Lichens	Fingered Tarpaper Lichen	<i>Collema cristatum</i>	S1	Undetermined	4.1 ± 0.0	3
	Valley Oakmoss Lichen	<i>Evernia prunastri</i>	S3S4	Sensitive	4.9 ± 2.0	1
	Tattered Jellyskin Lichen	<i>Leptogium lichenoides</i>	S3	May Be At Risk	3.9 ± 0.0	5
	Beaded Jellyskin Lichen	<i>Leptogium teretiusculum</i>	S2?	Sensitive	5.9 ± 0.0	1
	Tree Pelt Lichen	<i>Peltigera collina</i>	S2?	Sensitive	7.9 ± 2.0	1
	Scaly Pelt Lichen	<i>Peltigera lepidophora</i>	S1	May Be At Risk	5.9 ± 0.0	1
	Woodland Owl Lichen	<i>Solorina saccata</i>	S2S3	May Be At Risk	3.9 ± 0.0	4
Mosses	Short-Beaked Rigid Screw Moss	<i>Aloina brevirostris</i>	S1	na	8.2 ± 2.0	1
	Aloe-Like Rigid Screw Moss	<i>Aloina rigida</i>	S1?	May Be At Risk	6.8 ± 0.0	2
	One-sided Groove Moss	<i>Aulacomnium heterostichum</i>	S1S2	Sensitive	8.2 ± 2.0	1
	a Moss	<i>Bryum algovicum</i>	S2?	Sensitive	8.2 ± 2.0	1
	a Moss	<i>Drummondia prorepens</i>	S3?	Sensitive	9.9 ± 5.0	1
	a Moss	<i>Ephemerum serratum</i>	S2S3	Sensitive	1.1 ± 5.0	1
	Light Beaked Moss	<i>Eurhynchium hians</i>	S2S3	Sensitive	5.6 ± 0.0	1
	Yew-leaved Pocket Moss	<i>Fissidens taxifolius</i>	S2?	Sensitive	1.1 ± 5.0	2
	Wetland-plume Moss	<i>Helodium blandowii</i>	S3?	Secure	1.3 ± 3.0	1
	Star Leafy Moss	<i>Mnium stellare</i>	S3?	Undetermined	6.1 ± 1.0	1
	Thomson's Leafy Moss	<i>Mnium thomsonii</i>	S1S2	Sensitive	2.5 ± 2.0	1
	Anomalous Bristle Moss	<i>Orthotrichum anomalum</i>	S2?	Sensitive	5.4 ± 2.0	1
	a Moss	<i>Weissia muhlenbergiana</i>	S2?	Sensitive	1.0 ± 1.0	4

Table C4 Non-vascular Plants Recorded during field surveys

Common Name	Scientific Name	ACCDC S-Rank	NSDNR General Status Rank
a Moss	<i>Atrichum crispulum</i>	SNR	Undetermined
Golden Creeping Moss	<i>Campylium chrysophyllum</i>	S5	Secure
Drepanocladus Moss	<i>Drepanocladus aduncus</i>	S4S5	Secure
Rock Pocket Moss	<i>Fissidens dubius</i>	S5	Secure
Constricted Feather Moss	<i>Leptodictyum humile</i>	S4S5	Secure

May 2017

APPENDIX D WETLAND FIELD SURVEY RESULTS

Table D1 Wetlands Identified in the Assessment Area

Wetland Number	Wetland Type	Source ¹	Area (ha)		
			Assessment Area	Field Survey Area	PDA
1	Graminoid Basin Marsh, Shallow Water Basin	Field / Desktop	9.51		
2	Graminoid Basin Marsh	Field	0.53	0.26	0.07
3	Graminoid Basin Marsh	Field	0.33	0.11	0.02
4	Graminoid Basin Marsh ²	Field	0.07	0.07	0.01
5	Graminoid Basin Marsh ²	Field	0.03	0.03	0.03
6	Graminoid Basin Marsh ²	Field	0.07	0.05	
7	Treed / Tall Shrub Basin Swamp	Desktop	0.09		
8	Graminoid Basin Marsh	Field	0.03	0.03	
9	Graminoid Basin Marsh	Field	0.04	0.04	0.01
10	Shallow Water Basin, Graminoid Basin Marsh	Field	0.12	0.12	0.11
11	Graminoid Basin Marsh	Desktop	0.17		
12	Graminoid Basin Marsh, Shrub Basin Swamp	Field	1.79	0.91	0.20
13	Graminoid Basin Marsh ²	Field	0.10	0.10	0.10
14	Graminoid Basin Marsh ²	Field	0.07	0.07	
15	Graminoid Basin Marsh ²	Field	0.05	0.02	
16	Graminoid Basin Marsh	Field	0.01	0.01	0.01
17	Shallow Water Basin	Desktop	0.72		
18	Graminoid Tidal Bay Marsh (salt marsh)	Desktop	9.15		
19	Graminoid Estuarine Marsh (brackish)	Field	0.19	0.12	0.01
20	Graminoid Estuarine Marsh (brackish)	Field	0.08	0.08	0.08
21	Graminoid Estuarine Marsh (brackish)	Field	0.30	0.04	
22	Graminoid Basin Marsh ²	Field	0.06	0.06	0.06
23	Graminoid Basin Marsh	Field	0.13	0.12	0.06
24	Graminoid Basin Marsh (brackish)	Field	0.16	0.16	0.15
25	Graminoid Tidal Bay Marsh (salt marsh)	Field / Desktop	45.66	4.10	2.23
26	Graminoid Tidal Bay Marsh (salt marsh)	Field / Desktop	0.12	0.10	0.04

Table D1 Wetlands Identified in the Assessment Area

Wetland Number	Wetland Type	Source ¹	Area (ha)		
			Assessment Area	Field Survey Area	PDA
27	Graminoid Basin Marsh	Desktop	0.24		
28	Graminoid Basin Marsh	Field	0.43	0.20	0.14
29	Graminoid Tidal Bay Marsh (salt marsh)	Desktop	10.64		
30	Graminoid Basin Marsh, Shallow Water Basin	Desktop	1.06		
31	Graminoid Basin Marsh, Shallow Water Basin	Desktop	0.11		
32	Graminoid Basin Marsh	Field	0.09	0.01	
33	Graminoid Basin Marsh ²	Field	0.31	0.31	0.02
34	Tall Shrub / Treed Basin Swamp	Desktop	0.10		
35	Graminoid Basin Marsh ²	Field	0.13	0.13	0.13
36	Tall Shrub Slope Swamp	Field	0.37	0.28	0.01
37	Graminoid Basin Marsh, Shallow Water Basin	Desktop	0.00		
38	Treed Drainageway Swamp	Desktop	0.01		
39	Treed / Tall Shrub Swamp	Desktop	0.41		
40	Graminoid Basin Marsh / Hardwood Treed Basin Swamp	Field	0.18	0.18	0.07
41	Graminoid Basin Marsh ² / Mixed Treed Basin Swamp	Field	0.23	0.16	0.01
42	Shallow Water Basin, Graminoid Basin Marsh	Field	0.11		
43	Tall Shrub / Treed Swamp	Desktop	21.96		
44	Trees Swamp, Graminoid Marsh, Shallow Water	Desktop	1.29		
Total		Field / Desktop	107.22	7.84	3.56
¹ Only wetlands within accessible portions of the Field Survey Area were field surveyed; wetlands identified through desktop assessment have not been confirmed ² Wetland, or portion of wetland within PDA, is a roadside ditch which has been constructed specifically for wastewater or storm water treatment					

Table D2 Summary of Wetland Character (Field Assessment Results)

Wetland Number	Wetland Type	Landscape Position	Origin	Dominant Water Regime	Ave Water Depth (cm)	% Inundated	Inlet / Outlet	Stressors
1	Graminoid Basin Marsh, Shallow Water Basin	Terrene Pond	Created (old quarry)	Permanently flooded	na	60	Inlet and outlet	Commercial development
2	Graminoid Basin Marsh	Terrene	Natural	Temporarily flooded, permanently saturated	0-20	na	None observed	Highway
3	Graminoid Basin Marsh	Terrene	Natural	Temporarily flooded, permanently saturated	0-20	na	None observed	Highway
8	Graminoid Basin Marsh	Terrene	Created?	Temporarily flooded, permanently saturated	10	20	Outlet	Roads
9	Graminoid Basin Marsh	Terrene	Created	Permanently saturated	na	0	None observed	Roads
10	Shallow Water Basin, Graminoid Basin Marsh	Terrene Pond	Created	Permanently flooded, permanently saturated	>30	75	None observed	Roads
12	Graminoid Basin Marsh, Shrub Basin Swamp	Terrene	Natural / Created?	Seasonally flooded, temporarily flooded, permanently saturated	na	0	Outlet (culvert)	Roads, clearing
16	Graminoid Basin Marsh	Terrene	Natural / Created?	Temporarily flooded	na	0	None observed	Mowing, agriculture
19	Graminoid Estuarine Marsh	Lotic Stream	Natural / Created?	Temporarily flooded, regularly flooded tidal	20	10	Inlet and outlet	Roads
20	Graminoid Estuarine Marsh	Lotic Stream	Natural / Created?	Temporarily flooded, regularly flooded tidal	10	10	Inlet and outlet	Roads, commercial development
23	Graminoid Basin Marsh	Terrene	Natural / Created?	Temporarily flooded, seasonally saturated	na	0	None observed	Mowing, roads, riprap, urban development
24	Graminoid Basin Marsh	Terrene	Natural / Created?	Regularly flooded tidal	20	1	None observed	Mowing, roads, commercial development
25 / 26	Graminoid Tidal Bay Marsh	Estuarine Embayment	Natural / Created?	Regularly flooded tidal	na	0-100	Inlet and outlet	Water control structure, fill, roads
28	Graminoid Basin Marsh	Terrene	Natural	Permanently flooded, temporarily flooded, permanently saturated	>30	5	Inlet and outlet	Mowing, roads, commercial development
35	Graminoid Basin Marsh	Terrene	Created	Temporarily flooded	5	80	Inlet and outlet	Drainage ditch, roads
36	Tall Shrub Slope Swamp	Terrene	Natural	Permanently saturated	na	0	Outlet	Agriculture
40	Graminoid Basin Marsh, Hardwood Treed Basin Swamp	Terrene	Natural	Seasonally flooded, temporarily flooded, permanently saturated	10	50	Inlet (culvert), drains into ditch but no channelized flow	Highway
41	Graminoid Basin Marsh / Mixed Treed Basin Swamp	Terrene	Natural	Temporarily flooded, permanently saturated	20	15	Outlet (culvert)	Highway

Table D3 Summary of Significant Wetland Functions (Field-assessment NovaWET Results)

Wetland Number	Significant Wetland Functions from NovaWET ¹																								
	SF3 (General condition / integrity)	SF4 (Adjacent Land condition / integrity)	SF5 (WSS?)	SF6 (Commercial/recreational fish / shellfish?)	SF8 (Conservation/ compensation agreements / activity?)	SF9 (Calcareous fen, black ash, cedar swamp, or wild rice marsh?)	SF11 (Floodplain upstream or within populated area?)	SF12 (Fed/Prov/Municipal area of interest?)	SF13 (WL hydrologic condition)	SF14 (WL important for maintaining stream flow?)	SF15 (WL ability to detain surface water)	SF16 (Wetland improves water quality?)	SF17 (Evidence of excess nutrient loading / contamination?)	SF18 (WL contributes to water quality in downstream resources)	SF19 (WL serves as a recharge site)	SF20 (WL serves as a discharge site)	SF21 (WL ability to stabilize shoreline)	SF22 (Unique or rare plant community?)	SF23 (Contains a diversity of plant communities?)	SF24 (Overall integrity / quality of plant community?)	SF25 (Rare or endangered plant species?)	SF26 (Does WEL support fish / fish habitat?)	SF27 (rare or endangered fish / wildlife species?)	SF28 (Overall fish and wildlife habitat quality)	SF29 (Community use / value)
1	M	M	No	Yes	No	No	No	Yes	Mod.	No?	H	Yes	L	M	No	Yes	M	No	M	M-H	<i>Prosperpinica palustris</i>	Yes	na	H	H
2	M	M	No	No	No	No	No	No	Mod.	No	H	Yes	L	M	No	?	na	No	L	M	<i>Ranunculus gmelinii</i>	No	Eastern Wood-Pewee recorded nearby	M	L
3	M	M	No	No	No	No	No	No	Mod.	No	H	Yes	L	M	No	?	na	No	L	M	<i>Ranunculus gmelinii</i>	No	Eastern Wood-Pewee recorded nearby	M	L
8	M	M	No	No	No	No	No	No	Mod.	No	M	Yes	L	M	No	Yes?	na	No	L	M	<i>Carex bebbii</i>	No	na	M	L
9	M	M	No	No	No	No	No	No	Mod.	No	L	Yes	L	L	No	Yes?	L	No	L	M	<i>Carex bebbii</i>	No	na	L	L
10	M	M	No	No	No	No	No	No	Mod.	No	H	Yes	L	L	No	Yes?	L	No	L	M	<i>Carex bebbii</i>	No	Eastern Kingbird, Solitary Sandpiper	M	L
12	M	M	No	No	No	No	No	No	Mod.	Yes	M	Yes	L	M	No	Yes?	na	No	M	M-H	<i>Carex bebbii</i>	No	na	M	L
16	M	L-M	No	No	No	No	No	No	Mod.	No	L	No	L	L	?	?	L	No	L	M	No	No	na	L	L
19	M	L	Yes (brackish)	Yes	No	No	No	No	Mod.	No	M	Yes?	L	M	na	na	M	No	L	H	No	Yes	na	M	L
20	M	L	Yes (brackish)	Yes	No	No	No	No	Mod.	No	M	Yes?	L	M	na	na	M	No	L	H	No	Yes	na	M	L

Table D3 Summary of Significant Wetland Functions (Field-assessment NovaWET Results)

Wetland Number	Significant Wetland Functions from NovaWET ¹																								
	SF3 (General condition / integrity)	SF4 (Adjacent Land condition / integrity)	SF5 (WSS?)	SF6 (Commercial/recreational fish / shellfish?)	SF8 (Conservation/ compensation agreements / activity?)	SF9 (Calcareous fen, black ash, cedar swamp, or wild rice marsh?)	SF11 (Floodplain upstream or within populated area?)	SF12 (Fed/Prov/Municipal area of interest?)	SF13 (WL hydrologic condition)	SF14 (WL important for maintaining stream flow?)	SF15 (WL ability to detain surface water)	SF16 (Wetland improves water quality?)	SF17 (Evidence of excess nutrient loading / contamination?)	SF18 (WL contributes to water quality in downstream resources)	SF19 (WL serves as a recharge site)	SF20 (WL serves as a discharge site)	SF21 (WL ability to stabilize shoreline)	SF22 (Unique or rare plant community?)	SF23 (Contains a diversity of plant communities?)	SF24 (Overall integrity / quality of plant community?)	SF25 (Rare or endangered plant species?)	SF26 (Does WEL support fish / fish habitat?)	SF27 (rare or endangered fish / wildlife species?)	SF28 (Overall fish and wildlife habitat quality)	SF29 (Community use / value)
23	L	L	No	No	No	No	No	No	Mod.	No	M	Yes	L	L	?	?	na	No	L	M	<i>Rumex fueginus</i>	No	na	L	L
24	M	L	Yes (salt marsh)	No	No	No	No	No	Mod.	No	M	No	L	L	?	?	na	No	L	M	<i>Atriplex franktonii</i>	No	Migratory shorebirds	L	L
25 / 26	M-H	L-M	Yes (salt marsh)	Yes	No	No	No	Yes	Mod.	No	L	No	L-M	L	No	Yes	M	No	L	H	<i>Atriplex franktonii</i> , <i>Suaeda rolandii</i>	Yes	Migratory shorebirds	H	H
28	M	M	No	No	No	No	No	No	Mod.	No	M	Yes	L	M	?	?	M	No	M	H	No	No	na	M	L
35	L	L	No	No	No	No	No	No	Mod.	Yes?	M	Yes	L	M	No	Yes?	na	No	L	L	No	No?	na	L	L
36	M	M	No	No	No	No	No	No	Mod.	Yes	M	Yes	L	M	No	Yes?	na	No	L	M	No	No	na	M	L
40	M	M	No	No	No	No	No	No	Mod.	No	H	Yes	L	M	No?	Yes?	na	No	M	H	No	No	na	M	L
41	M	M	No	No	No	No	No	No	Mod.	No	H	Yes	L	M	No	Yes	na	No	L	H	No	No	Eastern Wood-Pewee recorded nearby	M	L

¹L = Low, M = Moderate or Medium, H = High; Nat. = Natural, Mod. = Modified

APPENDIX E WILDLIFE FIELD SURVEY RESULTS

Table E1 2008 Breeding Bird Field Survey Results: Species List

Common Name	Scientific Name	COSEWIC	NS ESA	AC CDC s-Rank	NSDNR General Status Rank	Breeding Status (Field Survey)
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Not at Risk		S5B	Secure	No Evidence of Nesting
Great Blue Heron	<i>Ardea herodias</i>			S4B	Secure	No Evidence of Nesting
Green-winged Teal	<i>Anas crecca</i>			S4S5B	Secure	No Evidence of Nesting
American Black Duck	<i>Anas rubripes</i>			S5	Secure	Confirmed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not at Risk		S4	Secure	No Evidence of Nesting
Northern Harrier	<i>Circus cyaneus</i>	Not at Risk		S5B	Secure	No Evidence of Nesting
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Not at Risk		S5	Secure	No Evidence of Nesting
Ring-necked Pheasant	<i>Phasianus colchicus</i>			SNA	Exotic	Possible
Killdeer	<i>Charadrius vociferus</i>			S3S4B	Sensitive	Possible
Willet	<i>Caoptrophorus semipalmatus</i>			S2S3B	May Be At Risk	Possible
Spotted Sandpiper	<i>Actitis macularia</i>			S3S4B	Sensitive	No Evidence of Nesting
Ring-billed Gull	<i>Larus delawarensis</i>			S1?B,S5N	Secure	No Evidence of Nesting
Herring Gull	<i>Larus argentatus</i>			S4S5	Secure	No Evidence of Nesting
Great Black-backed Gull	<i>Larus marinus</i>			S4	Secure	No Evidence of Nesting
Rock Dove	<i>Columba livia</i>			SNA	Exotic	Possible
Mourning Dove	<i>Zenaida macroura</i>			S5	Secure	Probable
Downy Woodpecker	<i>Picoides pubescens</i>			S5	Secure	Possible
Northern Flicker	<i>Colaptes auratus</i>			S5B	Secure	Possible
Eastern Wood-Pewee	<i>Contopus virens</i>	Special Concern	Vulnerable	S3S4B	Sensitive	Possible
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>			S3S4B	Sensitive	Possible
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B	Secure	Possible
Eastern Kingbird	<i>Tyrannus tyrannus</i>			S3S4B	Sensitive	Probable
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Endangered	S3B	At Risk	No Evidence of Nesting
Blue Jay	<i>Cyanocitta cristata</i>			S5	Secure	Possible
American Crow	<i>Corvus brachyrhynchos</i>			S5	Secure	No Evidence of Nesting
Common Raven	<i>Corvus corax</i>			S5	Secure	No Evidence of Nesting
Black-capped Chickadee	<i>Parus atricapillus</i>			S5	Secure	Possible
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S4	Sensitive	Possible
Veery	<i>Catharus fuscescens</i>			S4B	Secure	Possible
American Robin	<i>Turdus migratorius</i>			S5B	Secure	Confirmed
Gray Catbird	<i>Dumetella carolinensis</i>			S3B	May Be At Risk	Probable
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5B	Secure	Probable
European Starling	<i>Sturnus vulgaris</i>			SNA	Exotic	Confirmed
Blue-headed Vireo	<i>Vireo solitarius</i>			S5B	Secure	Possible
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B	Secure	Confirmed

Common Name	Scientific Name	COSEWIC	NS ESA	AC CDC s-Rank	NSDNR General Status Rank	Breeding Status (Field Survey)
Northern Parula	<i>Parula americana</i>			S5B	Secure	Possible
Yellow Warbler	<i>Dendroica petechia</i>			S5B	Secure	Confirmed
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			S5B	Secure	Possible
Magnolia Warbler	<i>Dendroica magnolia</i>			S5B	Secure	Possible
Black-and-white Warbler	<i>Mniotilta varia</i>			S4S5B	Secure	Possible
American Redstart	<i>Setophaga ruticilla</i>			S5B	Secure	Possible
Ovenbird	<i>Seiurus aurocapillus</i>			S5B	Secure	Confirmed
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B	Secure	Probable
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			S3S4B	Sensitive	Possible
Chipping Sparrow	<i>Spizella passerina</i>			S4S5B	Secure	Confirmed
Savannah Sparrow	<i>Passerculus sandwichensis</i>			S4B	Secure	Confirmed
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>					Possible
Song Sparrow	<i>Melospiza melodia</i>			S5B	Secure	Confirmed
Swamp Sparrow	<i>Melospiza georgiana</i>			S5B	Secure	Confirmed
White-throated Sparrow	<i>Zonotrichia albicollis</i>			S5B	Secure	Probable
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	Vulnerable	S3S4B	Sensitive	Possible
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4S5B	Secure	Confirmed
Common Grackle	<i>Quiscalus quiscula</i>			S5B	Secure	Confirmed
Baltimore Oriole	<i>Icterus galbula</i>			S2S3B	May Be At Risk	Possible
American Goldfinch	<i>Carduelis tristis</i>			S5	Secure	Probable
House Sparrow	<i>Passer domesticus</i>			SNA	Exotic	Possible

Table E2 2016 Breeding Bird Field Survey Results: Species List

Species	Scientific Name	COSEWIC	NS ESA	AC CDC S-Rank	NSDNR General Status Rank	Highest Breeding Category Observed
Great Blue Heron	<i>Ardea herodias</i>			S4B	Secure	Possible
American Black Duck	<i>Anas rubripes</i>			S5	Secure	Observed
Mallard	<i>Anas platyrhynchos</i>			S5	Secure	Probable
Ring-necked Duck	<i>Aythya collaris</i>			S5B	Secure	Possible
Osprey	<i>Pandion haliaetus</i>			S5B	Secure	Observed
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not At Risk		S4	Secure	Observed
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Not At Risk		S5	Secure	Possible
Ring-necked Pheasant	<i>Phasianus colchicus</i>			SNA	Exotic	Probable
Ruffed Grouse	<i>Bonasa umbellus</i>			S4S5	Secure	Possible
Sora	<i>Porzana carolina</i>			S4S5B	Secure	Possible
Lesser Yellowlegs	<i>Tringa flavipes</i>			S5M	Secure	Observed
Solitary Sandpiper	<i>Tringa solitaria</i>			S1?B,S4S5M	Secure	Possible
Spotted Sandpiper	<i>Actitis macularius</i>			S3S4B	Sensitive	Probable
Ring-billed Gull	<i>Larus delawarensis</i>			S1?B,S5N	Secure	Observed
Herring Gull	<i>Larus argentatus</i>			S4S5	Secure	Observed
Great Black-backed Gull	<i>Larus marinus</i>			S4	Secure	Observed
Rock Pigeon	<i>Columba livia</i>			SNA	Exotic	Possible
Mourning Dove	<i>Zenaida macroura</i>			S5	Secure	Probable
Belted Kingfisher	<i>Megaceryle alcyon</i>			S5B	Secure	Observed
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			S4S5B	Secure	Possible
Downy Woodpecker	<i>Picoides pubescens</i>			S5	Secure	Possible
Northern Flicker	<i>Colaptes auratus</i>			S5B	Secure	Possible
Eastern Wood-Pewee	<i>Contopus virens</i>	Special Concern	Vulnerable	S3S4B	Sensitive	Possible
Alder Flycatcher	<i>Empidonax alnorum</i>			S5B	Secure	Possible
Least Flycatcher	<i>Empidonax minimus</i>			S4B	Secure	Possible
Eastern Kingbird	<i>Tyrannus tyrannus</i>			S3S4B	Sensitive	Probable

Table E2 2016 Breeding Bird Field Survey Results: Species List

Species	Scientific Name	COSEWIC	NS ESA	AC CDC S-Rank	NSDNR General Status Rank	Highest Breeding Category Observed
Tree Swallow	<i>Tachycineta bicolor</i>			S4B	Sensitive	Observed
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Endangered	S3B	Sensitive	Observed
Blue Jay	<i>Cyanocitta cristata</i>			S5	Secure	Possible
American Crow	<i>Corvus brachyrhynchos</i>			S5	Secure	Possible
Common Raven	<i>Corvus corax</i>			S5	Secure	Observed
Black-capped Chickadee	<i>Poecile atricapilla</i>			S5	Secure	Possible
Golden-crowned Kinglet	<i>Regulus satrapa</i>			S4	Sensitive	Possible
American Robin	<i>Turdus migratorius</i>			S5B	Secure	Confirmed
Gray Catbird	<i>Dumetella carolinensis</i>			S3B	May Be At Risk	Probable
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5B	Secure	Probable
European Starling	<i>Sturnus vulgaris</i>			SNA	Exotic	Possible
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5B	Secure	Probable
Nashville Warbler	<i>Vermivora ruficapilla</i>			S5B	Secure	Possible
Northern Parula	<i>Parula americana</i>			S5B	Secure	Possible
Yellow Warbler	<i>Dendroica petechia</i>			S5B	Secure	Probable
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>			S5B	Secure	Possible
Magnolia Warbler	<i>Dendroica magnolia</i>			S5B	Secure	Possible
Yellow-rumped Warbler	<i>Dendroica coronata</i>			S5B	Secure	Possible
Black-throated Green Warbler	<i>Dendroica virens</i>			S4S5B	Secure	Possible
Black-and-White Warbler	<i>Mniotilta varia</i>			S4S5B	Secure	Possible
American Redstart	<i>Setophaga ruticilla</i>			S5B	Secure	Possible
Ovenbird	<i>Seiurus aurocapillus</i>			S5B	Secure	Possible
Mourning Warbler	<i>Oporornis philadelphia</i>			S4B	Secure	Possible
Common Yellowthroat	<i>Geothlypis trichas</i>			S5B	Secure	Possible
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			S3S4B	Sensitive	Possible
Savannah Sparrow	<i>Passerculus sandwichensis</i>			S4B	Secure	Probable

Table E2 **2016 Breeding Bird Field Survey Results: Species List**

Species	Scientific Name	COSEWIC	NS ESA	AC CDC S-Rank	NSDNR General Status Rank	Highest Breeding Category Observed
Song Sparrow	<i>Melospiza melodia</i>			S5B	Secure	Probable
Dark-eyed Junco	<i>Junco hyemalis</i>			S4S5	Secure	Possible
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	Vulnerable	S3S4B	Sensitive	Probable
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4S5B	Secure	Confirmed
Common Grackle	<i>Quiscalus quiscula</i>			S5B	Secure	Confirmed
Purple Finch	<i>Carpodacus purpureus</i>			S4S5	Secure	Possible
American Goldfinch	<i>Carduelis tristis</i>			S5	Secure	Probable

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
19-Aug-16	Gull sp.	4	8:09	800	
19-Aug-16	shorebird	5	8:09	800	
19-Aug-16	Gull sp.	1	8:09	800	
19-Aug-16	Gull sp.	1	8:09	900	
19-Aug-16	Great blue heron	1	8:09	200	
19-Aug-16	Greater Yellowlegs	3	8:09	300	
19-Aug-16	Great blue heron	1	8:09	300	
19-Aug-16	Great blue heron	2	8:09	400	
19-Aug-16	shorebird	5	8:09	400	
19-Aug-16	American Black Duck	9	8:09	500	
19-Aug-16	Gull sp.	1	8:09	700	
19-Aug-16	Greater Yellowlegs	2	8:40	200	
19-Aug-16	Great blue heron	1	8:40	200	
19-Aug-16	Great blue heron	3	8:40	200	
19-Aug-16	Great blue heron	3	8:40	400	
19-Aug-16	American Black Duck	11	8:40	500	
19-Aug-16	Ring-billed Gull	1	8:40	600	
19-Aug-16	shorebird	50	8:40	800	
19-Aug-16	Gull sp.	4	8:40	900	
19-Aug-16	shorebird	100	8:40	900	
19-Aug-16	Gull sp.	4	9:10	900	
19-Aug-16	shorebird	10	9:10	800	
19-Aug-16	Gull sp.	15	9:10	900	
19-Aug-16	shorebird	80	9:10	600	
19-Aug-16	Gull sp.	25	9:10	800	
19-Aug-16	shorebird	30	9:10	400	
19-Aug-16	American Black Duck	8	9:10	500	
19-Aug-16	Canada Goose	50	9:10	100	
19-Aug-16	double-crested cormorant	2	9:10	100	walk about
19-Aug-16	Cedar waxwing	2	9:10	100	walk about
19-Aug-16	Spotted Sandpiper	1	9:10	100	walk about
19-Aug-16	Ring-billed Gull	1	9:10	100	walk about
19-Aug-16	Ring-billed Gull	1	9:10	200	
19-Aug-16	Ring-billed Gull	1	9:10	200	
19-Aug-16	Greater Yellowlegs	2	9:10	200	walk about
19-Aug-16	Great blue heron	1	9:10	200	walk about
19-Aug-16	Great blue heron	4	9:10	300	
19-Aug-16	Great Black-backed Gull	1	9:41	900	
19-Aug-16	Greater Yellowlegs	1	9:41	100	
19-Aug-16	Canada Goose	21	9:41	200	
19-Aug-16	shorebird	50	9:41	200	
19-Aug-16	Great blue heron	3	9:41	300	
19-Aug-16	Semipalmated Sandpiper	75	9:41	400	
19-Aug-16	American Black Duck	8	9:41	500	
19-Aug-16	shorebird	100	9:41	800	
19-Aug-16	shorebird	300	9:41	800	
19-Aug-16	Gull sp.	40	9:41	800	
19-Aug-16	Spotted Sandpiper	1	10:10	100	
19-Aug-16	Ring-billed Gull	1	10:10	100	walk about
19-Aug-16	Ring-billed Gull	1	10:10	200	
19-Aug-16	Great blue heron	4	10:10	300	
19-Aug-16	American Black Duck	2	10:10	300	
19-Aug-16	Great blue heron	1	10:10	300	walk about
19-Aug-16	American Black Duck	2	10:10	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
19-Aug-16	American Black Duck	10	10:10	500	
19-Aug-16	shorebird	150	10:10	600	
19-Aug-16	Gull sp.	14	10:10	700	
19-Aug-16	Gull sp.	10	10:10	800	
19-Aug-16	Gull sp.	6	10:10	800	
19-Aug-16	Ring-billed Gull	1	10:40	200	
19-Aug-16	Great Black-backed Gull	1	10:40	300	
19-Aug-16	Great blue heron	4	10:40	300	
19-Aug-16	shorebird	6	10:40	500	
19-Aug-16	American Black Duck	12	10:40	500	
19-Aug-16	Ring-billed Gull	15	10:40	700	
19-Aug-16	shorebird	100	10:40	700	
19-Aug-16	Northern harrier	1	10:40	700	
19-Aug-16	duck sp.	1	10:40	800	
19-Aug-16	Gull sp.	25	10:40	800	
19-Aug-16	Gull sp.	8	10:40	900	
19-Aug-16	shorebird	3	10:40	200	
19-Aug-16	Ring-billed Gull	1	10:40	200	
19-Aug-16	Greater Yellowlegs	2	11:10	100	
19-Aug-16	Ring-billed Gull	1	11:10	100	
19-Aug-16	Greater Yellowlegs	1	11:10	100	walk about
19-Aug-16	American Black Duck	2	11:10	100	walk about
19-Aug-16	shorebird	1	11:10	100	walk about
19-Aug-16	Savannah sparrow	2	11:10	100	walk about
19-Aug-16	Ring-billed Gull	1	11:10	100	walk about
19-Aug-16	Least Sandpiper	4	11:10	100	walk about
19-Aug-16	American Black Duck	10	11:10	200	
19-Aug-16	American Black Duck	8	11:10	200	
19-Aug-16	Ring-billed Gull	1	11:10	200	
19-Aug-16	American Black Duck	1	11:10	200	walk about
19-Aug-16	Ring-billed Gull	1	11:10	200	walk about
19-Aug-16	Great blue heron	4	11:10	300	
19-Aug-16	American Black Duck	7	11:10	300	
19-Aug-16	Ring-billed Gull	20	11:10	500	
19-Aug-16	American Black Duck	9	11:10	500	
19-Aug-16	shorebird	50	11:10	500	
19-Aug-16	American Black Duck	17	11:10	500	
19-Aug-16	Gull sp.	15	11:10	600	
19-Aug-16	shorebird	200	11:10	800	
19-Aug-16	Gull sp.	15	11:10	800	
19-Aug-16	shorebird	150	11:10	800	
19-Aug-16	Greater Yellowlegs	1	11:42	200	
19-Aug-16	Ring-billed Gull	1	11:42	200	
19-Aug-16	Greater Yellowlegs	3	11:42	200	
19-Aug-16	Ring-billed Gull	4	11:42	200	
19-Aug-16	shorebird	6	11:42	300	
19-Aug-16	American Black Duck	13	11:42	300	
19-Aug-16	Great blue heron	5	11:42	300	
19-Aug-16	American Black Duck	11	11:42	300	
19-Aug-16	Northern harrier	1	11:42	400	
19-Aug-16	shorebird	6	11:42	500	
19-Aug-16	American Black Duck	10	11:42	500	
19-Aug-16	shorebird	2	11:42	600	
19-Aug-16	Ring-billed Gull	7	11:42	600	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
19-Aug-16	American Black Duck	3	11:42	700	
19-Aug-16	Gull sp.	40	11:42	800	
19-Aug-16	American Black Duck	3	12:10	100	walk about
19-Aug-16	Ring-billed Gull	1	12:10	100	
19-Aug-16	Ring-billed Gull	1	12:10	200	
19-Aug-16	American Black Duck	6	12:10	200	
19-Aug-16	shorebird	2	12:10	200	
19-Aug-16	great blue heron	6	12:10	300	
19-Aug-16	American Black Duck	9	12:10	400	
19-Aug-16	American Black Duck	13	12:10	500	
19-Aug-16	American Black Duck	15	12:10	600	
19-Aug-16	Northern harrier	1	12:10	600	
19-Aug-16	Ring-billed Gull	4	12:10	700	
19-Aug-16	shorebird	30	12:10	700	
19-Aug-16	Gull sp.	6	12:10	800	
19-Aug-16	American Black Duck	7	12:10	800	
19-Aug-16	Gull sp.	4	12:10	800	
19-Aug-16	Gull sp.	4	12:10	900	
19-Aug-16	bald eagle	2	12:10	1000	walk about
19-Aug-16	shorebird	2	12:10	100	
19-Aug-16	American Black Duck	1	12:10	100	walk about
19-Aug-16	shorebird	8	12:42	100	
19-Aug-16	shorebird	15	12:42	100	
19-Aug-16	American Black Duck	6	12:42	200	
19-Aug-16	Least Sandpiper	2	12:42	200	
19-Aug-16	Least Sandpiper	6	12:42	200	
19-Aug-16	American Black Duck	1	12:42	300	
19-Aug-16	Great blue heron	4	12:42	300	
19-Aug-16	American Black Duck	15	12:42	500	
19-Aug-16	Great Black-backed Gull	1	12:42	700	
19-Aug-16	shorebird	20	12:42	800	
19-Aug-16	Gull sp.	1	12:42	900	
19-Aug-16	Mourning Dove	1	13:10	100	
19-Aug-16	double-crested cormorant	1	13:10	100	walk about
19-Aug-16	American Black Duck	1	13:10	100	walk about
19-Aug-16	American Goldfinch	2	13:10	100	walk about
19-Aug-16	Ring-billed Gull	1	13:10	100	walk about
19-Aug-16	shorebird	15	13:10	100	walk about
19-Aug-16	Great Black-backed Gull	1	13:10	100	walk about
19-Aug-16	Ring-billed Gull	2	13:10	100	walk about
19-Aug-16	shorebird	20	13:10	200	
19-Aug-16	American Black Duck	2	13:10	200	walk about
19-Aug-16	Great blue heron	5	13:10	300	
19-Aug-16	American Black Duck	1	13:10	300	
19-Aug-16	shorebird	40	13:10	800	
19-Aug-16	American Black Duck	4	13:10	800	
19-Aug-16	American Black Duck	5	13:10	900	
19-Aug-16	Gull sp.	3	13:10	900	
19-Aug-16	American Black Duck	2	13:40	500	
19-Aug-16	Great blue heron	1	13:40	600	
19-Aug-16	Ring-billed Gull	1	13:40	600	
19-Aug-16	American Black Duck	1	13:40	700	
19-Aug-16	Ring-billed Gull	4	13:40	700	
19-Aug-16	American Black Duck	3	13:40	800	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
19-Aug-16	Ring-billed Gull	1	13:40	800	
19-Aug-16	Gull sp.	5	13:40	800	
19-Aug-16	Northern harrier	1	13:40	800	
19-Aug-16	Great Black-backed Gull	3	13:40	900	
19-Aug-16	Gull sp.	30	13:40	900	
19-Aug-16	duck sp.	3	13:40	900	
19-Aug-16	double-crested cormorant	1	13:40	100	
19-Aug-16	Least Sandpiper	1	13:40	200	
19-Aug-16	shorebird	5	13:40	200	
19-Aug-16	Great Black-backed Gull	1	13:40	200	
19-Aug-16	Great blue heron	1	13:40	300	
19-Aug-16	Great blue heron	1	13:40	400	
19-Aug-16	Great Black-backed Gull	1	14:10	100	
19-Aug-16	shorebird	1	14:10	200	
19-Aug-16	Nelson's Sharp-tailed Sparrow	1	14:10	200	
19-Aug-16	Ring-billed Gull	3	14:10	200	
19-Aug-16	Ring-billed Gull	1	14:10	200	walk about
19-Aug-16	Gull sp.	20	14:10	200	walk about
19-Aug-16	Great Black-backed Gull	1	14:10	300	
19-Aug-16	Great Black-backed Gull	1	14:10	300	walk about
19-Aug-16	Great Black-backed Gull	1	14:10	300	
19-Aug-16	Great Black-backed Gull	2	14:10	700	walk about
19-Aug-16	Gull sp.	4	14:10	700	walk about
19-Aug-16	Ring-billed Gull	1	14:10	700	
19-Aug-16	American Black Duck	3	14:10	700	
19-Aug-16	Gull sp.	25	14:10	800	walk about
19-Aug-16	duck sp.	11	14:10	800	
19-Aug-16	Gull sp.	10	14:10	900	
19-Aug-16	duck sp.	1	14:10	900	
19-Aug-16	Gull sp.	40	14:10	900	
12-Aug-16	American Goldfinch	2	8:30	100	
12-Aug-16	Ring-billed Gull	1	8:30	100	Walk about
12-Aug-16	Ring-billed Gull	2	8:30	100	
12-Aug-16	Semipalmated Sandpiper	1	8:30	100	Walk about
12-Aug-16	shorebird	1	8:30	100	Walk about
12-Aug-16	Greater Yellowlegs	1	8:30	100	Walk about
12-Aug-16	Semipalmated sandpiper	3	8:30	200	
12-Aug-16	Short-billed Dowitcher	4	8:30	200	
12-Aug-16	Lesser Yellowlegs	1	8:30	200	
12-Aug-16	shorebird	6	8:30	500	
12-Aug-16	shorebird	5	8:30	500	
12-Aug-16	shorebird	20	8:30	800	
12-Aug-16	American Black Duck	4	8:30	800	
12-Aug-16	American Black Duck	12	8:30	800	
12-Aug-16	Great Black-backed Gull	1	8:30	800	
12-Aug-16	duck sp.	2	8:30	800	
12-Aug-16	Canada Goose	60	9:07	200	
12-Aug-16	Swallow sp.	15	9:07	400	
12-Aug-16	American Black Duck	1	9:07	800	
12-Aug-16	American Black Duck	5	9:07	800	
12-Aug-16	Great Black-backed Gull	1	9:07	900	
12-Aug-16	shorebird	30	9:07	900	
12-Aug-16	duck sp.	1	9:07	900	
12-Aug-16	shorebird	50	9:07	1000	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
12-Aug-16	Gull sp.	1	9:07	1000	
12-Aug-16	Great blue heron	2	9:07	100	
12-Aug-16	Spotted Sandpiper	1	9:07	200	
12-Aug-16	Short-billed Dowitcher	4	9:07	200	
12-Aug-16	Semipalmated Sandpiper	4	9:07	200	
12-Aug-16	Ring-billed Gull	1	9:07	200	
12-Aug-16	Canada Goose	30	9:07	200	
12-Aug-16	Semipalmated Sandpiper	4	9:32	200	
12-Aug-16	Great blue heron	1	9:32	200	
12-Aug-16	Greater Yellowlegs	1	9:32	200	
12-Aug-16	Swallow sp.	10	9:32	300	
12-Aug-16	American Black Duck	8	9:32	500	
12-Aug-16	American Black Duck	2	9:32	500	
12-Aug-16	shorebird	4	9:32	600	
12-Aug-16	Gull sp.	1	9:32	700	
12-Aug-16	shorebird	50	9:32	700	
12-Aug-16	Great Black-backed Gull	1	9:32	800	
12-Aug-16	Great blue heron	1	9:32	100	walk about
12-Aug-16	Greater Yellowlegs	1	9:32	100	walk about
12-Aug-16	American Goldfinch	1	9:32	100	walk about
12-Aug-16	American Black Duck	2	9:32	100	walk about
12-Aug-16	Great blue heron	1	9:32	100	walk about
12-Aug-16	American Black Duck	1	9:32	200	
12-Aug-16	shorebird	400	9:32	900	
12-Aug-16	American Black Duck	1	10:02	200	
12-Aug-16	Great blue heron	1	10:02	300	
12-Aug-16	shorebird	25	10:02	500	
12-Aug-16	Great Black-backed Gull	1	10:02	600	
12-Aug-16	American Black Duck	12	10:02	700	
12-Aug-16	shorebird	150	10:02	700	
12-Aug-16	Gull sp.	2	10:02	800	
12-Aug-16	American Black Duck	5	10:02	800	
12-Aug-16	shorebird	50	10:02	800	
12-Aug-16	American Black Duck	3	10:02	900	
12-Aug-16	Swallow sp.	10	10:02	900	
12-Aug-16	Gull sp.	2	10:02	1000	
12-Aug-16	Greater Yellowlegs	1	10:30	100	walk about
12-Aug-16	Herring Gull	1	10:30	100	walk about
12-Aug-16	Great blue heron	1	10:30	100	walk about
12-Aug-16	Northern harrier	1	10:30	100	walk about
12-Aug-16	Ring-billed Gull	1	10:30	200	walk about
12-Aug-16	American Black Duck	1	10:30	200	walk about
12-Aug-16	American Black Duck	3	10:30	200	
12-Aug-16	Ring-billed Gull	1	10:30	200	
12-Aug-16	Ring-billed Gull	1	10:30	300	walk about
12-Aug-16	Great blue heron	1	10:30	300	
12-Aug-16	American Black Duck	3	10:30	300	
12-Aug-16	American Black Duck	1	10:30	300	
12-Aug-16	American Black Duck	1	10:30	400	
12-Aug-16	shorebird	200	10:30	600	
12-Aug-16	American Black Duck	5	10:30	900	
12-Aug-16	American Black Duck	9	10:30	900	
12-Aug-16	Ring-billed Gull	1	10:30	900	
12-Aug-16	American Black Duck	1	10:30	900	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
12-Aug-16	Gull sp.	3	10:30	900	
12-Aug-16	shorebird	2	10:30	1000	
12-Aug-16	Great blue heron	1	11:00	100	
12-Aug-16	American Black Duck	1	11:00	200	
12-Aug-16	Nelson's Sharp-tailed Sparrow	1	11:00	200	
12-Aug-16	American Black Duck	4	11:00	200	
12-Aug-16	American Black Duck	9	11:00	300	
12-Aug-16	American Black Duck	1	11:00	300	
12-Aug-16	Ring-billed Gull	3	11:00	300	
12-Aug-16	Canada Goose	13	11:00	300	
12-Aug-16	Northern harrier	1	11:00	600	
12-Aug-16	Ring-billed Gull	1	11:00	700	
12-Aug-16	shorebird	125	11:00	700	
12-Aug-16	Herring Gull	1	11:00	800	
12-Aug-16	shorebird	5	11:00	800	
12-Aug-16	Gull sp.	1	11:00	900	
12-Aug-16	European Starling	30	11:30	100	
12-Aug-16	American Black Duck	3	11:30	100	walk about
12-Aug-16	duck sp.	1	11:30	100	
12-Aug-16	Northern harrier	1	11:30	100	
12-Aug-16	shorebird	3	11:30	100	
12-Aug-16	Mourning Dove	1	11:30	100	walk about
12-Aug-16	Ring-billed Gull	1	11:30	100	walk about
12-Aug-16	Ring-billed Gull	5	11:30	100	walk about
12-Aug-16	American Black Duck	2	11:30	200	
12-Aug-16	Greater Yellowlegs	1	11:30	200	walk about
12-Aug-16	Greater Yellowlegs	3	11:30	100	walk about
12-Aug-16	American Black Duck	6	11:30	200	
12-Aug-16	Ring-billed Gull	2	11:30	200	
12-Aug-16	Ring-billed Gull	2	11:30	200	
12-Aug-16	Ring-billed Gull	1	11:30	200	walk about
12-Aug-16	American Black Duck	4	11:30	300	
12-Aug-16	Great Black-backed Gull	1	11:30	300	
12-Aug-16	American Black Duck	4	11:30	300	
12-Aug-16	Ring-billed Gull	1	11:30	700	
12-Aug-16	shorebird	25	11:30	700	
12-Aug-16	Ring-billed Gull	1	11:30	800	
12-Aug-16	Gull sp.	2	11:30	1000	
12-Aug-16	American Black Duck	1	12:02	100	
12-Aug-16	Greater Yellowlegs	3	12:02	200	
12-Aug-16	Ring-billed Gull	1	12:02	200	
12-Aug-16	Ring-billed Gull	1	12:02	200	
12-Aug-16	Nelson's Sharp-tailed Sparrow	1	12:02	200	
12-Aug-16	American Black Duck	12	12:02	400	
12-Aug-16	American Black Duck	2	12:02	500	
12-Aug-16	shorebird	6	12:02	700	
12-Aug-16	Ring-billed Gull	2	12:02	700	
12-Aug-16	European Starling	40	12:31	100	walk about
12-Aug-16	American Goldfinch	2	12:31	100	walk about
12-Aug-16	Ring-billed Gull	1	12:31	100	walk about
12-Aug-16	Ring-billed Gull	1	12:31	100	
12-Aug-16	shorebird	3	12:31	100	walk about
12-Aug-16	Ring-billed Gull	1	12:31	100	walk about
12-Aug-16	Greater Yellowlegs	3	12:31	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
12-Aug-16	Ring-billed Gull	2	12:31	200	
12-Aug-16	American Black Duck	2	12:31	400	
12-Aug-16	American Black Duck	12	12:31	500	
12-Aug-16	Gull sp.	2	12:31	800	
12-Aug-16	Gull sp.	1	12:31	900	
12-Aug-16	Ring-billed Gull	2	13:00	100	
12-Aug-16	Greater Yellowlegs	5	13:00	200	
12-Aug-16	Ring-billed Gull	1	13:00	200	
12-Aug-16	American Black Duck	4	13:00	500	
12-Aug-16	Ring-billed Gull	1	13:00	600	
12-Aug-16	American Black Duck	14	13:00	600	
12-Aug-16	Gull sp.	2	13:00	700	
12-Aug-16	Gull sp.	2	13:00	1000	
12-Aug-16	Greater Yellowlegs	3	13:30	100	
12-Aug-16	Ring-billed Gull	1	13:30	100	walk about
12-Aug-16	Ring-billed Gull	3	13:30	100	walk about
12-Aug-16	Gull sp.	1	13:30	100	walk about
12-Aug-16	Ring-billed Gull	2	13:30	200	
12-Aug-16	Ring-billed Gull	1	13:30	200	
12-Aug-16	shorebird	10	13:30	300	
12-Aug-16	American Black Duck	9	13:30	400	
12-Aug-16	American Black Duck	3	13:30	500	
12-Aug-16	Great Black-backed Gull	1	13:30	500	
12-Aug-16	American Black Duck	4	13:30	600	
12-Aug-16	Gull sp.	2	13:30	800	
12-Aug-16	Ring-billed Gull	2	13:30	800	
12-Aug-16	Gull sp.	2	13:30	900	
12-Aug-16	Canada Goose	11	14:00	100	
12-Aug-16	Ring-billed Gull	1	14:00	100	
12-Aug-16	Greater Yellowlegs	2	14:00	100	
12-Aug-16	American crow	1	14:00	100	
12-Aug-16	American crow	3	14:00	200	
12-Aug-16	Canada Goose	40	14:00	200	
12-Aug-16	Ring-billed Gull	10	14:00	200	
12-Aug-16	Ring-billed Gull	1	14:00	200	
12-Aug-16	Canada Goose	12	14:00	300	
12-Aug-16	American Black Duck	9	14:00	400	
12-Aug-16	American Black Duck	3	14:00	400	
12-Aug-16	Ring-billed Gull	8	14:00	500	
12-Aug-16	Gull sp.	13	14:00	900	
12-Aug-16	Ring-billed Gull	3	14:30	100	walk about
12-Aug-16	duck sp.	1	14:30	100	walk about
12-Aug-16	Ring-billed Gull	1	14:30	100	
12-Aug-16	Ring-billed Gull	1	14:30	200	
12-Aug-16	Ring-billed Gull	1	14:30	400	
12-Aug-16	American Black Duck	7	14:30	500	
12-Aug-16	Ring-billed Gull	8	14:30	600	
12-Aug-16	Gull sp.	12	14:30	700	
12-Aug-16	American crow	1	14:30	800	
5-Aug-16	American Black Duck	4	9:30	300	
5-Aug-16	Lesser Yellowlegs	4	9:30	200	
5-Aug-16	Herring Gull	1	9:30	100	
5-Aug-16	Gull sp.	14	9:30	1100	
5-Aug-16	Herring Gull	7	9:30	900	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-16	shorebird	7	10:00	1000	
5-Aug-16	Gull sp.	10	10:00	900	
5-Aug-16	shorebird	23	10:00	900	
5-Aug-16	American Black Duck	5	10:00	600	
5-Aug-16	American Black Duck	1	10:00	500	
5-Aug-16	Lesser Yellowlegs	2	10:00	200	
5-Aug-16	Least Sandpiper	1	10:00	200	
5-Aug-16	Nelson's Sharp-tailed Sparrow	1	10:00	200	Walkabout
5-Aug-16	shorebird	2	10:00	100	
5-Aug-16	shorebird	1	10:00	100	Walkabout
5-Aug-16	Semipalmated Plover	2	10:00	100	Walkabout
5-Aug-16	Herring Gull	6	10:00	100	Walkabout
5-Aug-16	American Crow	1	10:00	100	Walkabout
5-Aug-16	Herring Gull	2	10:00	100	Walkabout
5-Aug-16	shorebird	60	10:30	1000	
5-Aug-16	Gull sp.	7	10:30	900	
5-Aug-16	Gull sp.	9	10:30	800	
5-Aug-16	shorebird	12	10:30	800	
5-Aug-16	American Black Duck	5	10:30	500	
5-Aug-16	shorebird	10	10:30	300	
5-Aug-16	Lesser Yellowlegs	2	10:30	200	
5-Aug-16	shorebird	5	10:30	200	
5-Aug-16	Ring-billed Gull	10	10:30	200	
5-Aug-16	Gull sp.	4	11:00	900	
5-Aug-16	American Black Duck	8	11:00	500	
5-Aug-16	American Black Duck	1	11:00	300	
5-Aug-16	Ring-billed Gull	7	11:00	200	
5-Aug-16	Lesser Yellowlegs	2	11:00	100	Walkabout
5-Aug-16	shorebird	2	11:00	100	
5-Aug-16	shorebird	5	11:00	100	Walkabout
5-Aug-16	Spotted Sandpiper	2	11:00	100	Walkabout
5-Aug-16	Gull sp.	13	11:00	1100	
5-Aug-16	Black-bellied Plover	7	11:00	900	
5-Aug-16	Gull sp.	12	11:30	1100	
5-Aug-16	Herring Gull	7	11:30	1000	
5-Aug-16	shorebird	300	11:30	900	
5-Aug-16	Gull sp.	13	11:30	900	
5-Aug-16	Black-bellied Plover	8	11:30	800	
5-Aug-16	Ring-billed Gull	2	11:30	700	
5-Aug-16	Great Black-backed Gull	1	11:30	600	
5-Aug-16	American Black Duck	10	11:30	500	
5-Aug-16	shorebird	200	11:30	200	
5-Aug-16	Gull sp.	12	12:00	1000	
5-Aug-16	shorebird	150	12:00	800	
5-Aug-16	American Black Duck	20	12:00	600	
5-Aug-16	American Black Duck	10	12:00	500	
5-Aug-16	Spotted Sandpiper	1	12:00	500	
5-Aug-16	Greater Yellowlegs	1	12:00	500	
5-Aug-16	Ring-billed Gull	44	12:00	400	
5-Aug-16	Ring-billed Gull	2	12:00	300	
5-Aug-16	Lesser Yellowlegs	1	12:00	200	
5-Aug-16	Herring Gull	2	12:00	100	Walkabout
5-Aug-16	Gull sp.	35	12:30	600	
5-Aug-16	American Black Duck	6	12:30	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-16	Ring-billed Gull	35	12:30	300	
5-Aug-16	Bonaparte's Gull	1	12:30	200	
5-Aug-16	Ring-billed Gull	25	12:30	200	
5-Aug-16	American Black Duck	9	12:30	200	
5-Aug-16	Lesser Yellowlegs	3	12:30	100	
5-Aug-16	shorebird	1	12:30	200	
5-Aug-16	Spotted Sandpiper	1	12:30	200	
5-Aug-16	Gull sp.	12	12:30	700	
5-Aug-16	American Black Duck	2	12:30	600	
5-Aug-16	shorebird	25	13:00	1000	
5-Aug-16	Gull sp.	2	13:00	1000	
5-Aug-16	American Black Duck	4	13:00	700	
5-Aug-16	Ring-billed Gull	32	13:00	600	
5-Aug-16	American Black Duck	4	13:00	600	
5-Aug-16	shorebird	1	13:00	600	
5-Aug-16	American Black Duck	1	13:00	500	
5-Aug-16	Ring-billed Gull	10	13:00	500	
5-Aug-16	Bonaparte's Gull	1	13:00	300	
5-Aug-16	American Black Duck	5	13:00	300	
5-Aug-16	Least Sandpiper	4	13:00	300	
5-Aug-16	Ring-billed Gull	8	13:00	300	
5-Aug-16	shorebird	10	13:00	200	
5-Aug-16	Lesser Yellowlegs	3	13:00	200	
5-Aug-16	shorebird	4	13:00	200	Walkabout
5-Aug-16	shorebird	6	13:00	100	Walkabout
5-Aug-16	Gull sp.	8	13:30	1000	
5-Aug-16	American Black Duck	3	13:30	500	
5-Aug-16	American Black Duck	6	13:30	300	
5-Aug-16	Semipalmated Sandpiper	31	13:30	200	
5-Aug-16	Ring-billed Gull	1	13:30	200	
5-Aug-16	American Black Duck	1	13:30	200	
5-Aug-16	shorebird	1	13:30	100	
5-Aug-16	Ring-billed Gull	1	14:00	300	
5-Aug-16	Lesser Yellowlegs	1	14:00	300	
5-Aug-16	shorebird	3	14:00	200	
5-Aug-16	American Black Duck	1	14:00	200	
5-Aug-16	Least Sandpiper	29	14:00	200	
5-Aug-16	Spotted Sandpiper	3	14:00	200	
5-Aug-16	American Black Duck	2	14:00	200	Walkabout
5-Aug-16	Semipalmated Sandpiper	15	14:00	100	Walkabout
5-Aug-16	American Black Duck	5	14:00	100	Walkabout
5-Aug-16	shorebird	5	14:00	100	Walkabout
5-Aug-16	Gull sp.	2	14:00	1000	
5-Aug-16	American Black Duck	5	14:00	500	
5-Aug-16	Gull sp.	11	14:30	1100	
5-Aug-16	Great Black-backed Gull	1	14:30	1000	
5-Aug-16	duck sp.	2	14:30	900	
5-Aug-16	American Black Duck	3	14:30	900	
5-Aug-16	duck sp.	1	14:30	800	
5-Aug-16	Gull sp.	1	14:30	800	
5-Aug-16	American Black Duck	3	14:30	700	
5-Aug-16	Lesser Yellowlegs	1	14:30	200	
5-Aug-16	Spotted Sandpiper	1	14:30	200	
5-Aug-16	shorebird	33	14:30	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-16	Least Sandpiper	7	14:30	200	
5-Aug-16	Ring-billed Gull	1	14:30	100	
5-Aug-16	shorebird	30	14:30	100	
5-Aug-16	American Black Duck	1	14:30	100	
5-Aug-16	Gull sp.	49	15:00	1100	
5-Aug-16	duck sp.	2	15:00	1100	
5-Aug-16	Great Black-backed Gull	1	15:00	1000	
5-Aug-16	duck sp.	3	15:00	900	
5-Aug-16	Gull sp.	1	15:00	900	
5-Aug-16	American Black Duck	1	15:00	600	
5-Aug-16	Great Black-backed Gull	1	15:00	400	Walkabout
5-Aug-16	Gull sp.	4	15:00	300	
5-Aug-16	Lesser Yellowlegs	1	15:00	200	
5-Aug-16	Spotted Sandpiper	13	15:00	200	
5-Aug-16	Ring-billed Gull	2	15:00	200	Walkabout
5-Aug-16	shorebird	4	15:00	200	
5-Aug-16	Spotted Sandpiper	3	15:00	100	Walkabout
5-Aug-16	shorebird	2	15:00	100	Walkabout
5-Aug-16	American Black Duck	1	15:00	100	Walkabout
5-Aug-16	duck sp.	4	15:30	900	
5-Aug-16	Gull sp.	10	15:30	700	
5-Aug-16	Great Black-backed Gull	1	15:30	600	
5-Aug-16	American Black Duck	1	15:30	500	
5-Aug-16	Least Sandpiper	21	15:30	200	
5-Aug-16	Lesser Yellowlegs	1	15:30	200	
5-Aug-16	Spotted Sandpiper	1	15:30	200	
5-Aug-16	shorebird	1	15:30	200	
5-Aug-16	shorebird	12	15:30	100	
5-Aug-16	Great Black-backed Gull	1	15:30	900	
5-Aug-16	Gull sp.	40	15:30	900	
29-Jul-16	Gull sp.	3	9:20	1000	
29-Jul-16	shorebird	300	9:20	1000	
29-Jul-16	Great Black-backed Gull	1	9:20	1000	
29-Jul-16	Herring Gull	3	9:20	900	
29-Jul-16	duck sp.	2	9:20	900	
29-Jul-16	Herring Gull	8	9:20	800	
29-Jul-16	American Black Duck	3	9:20	800	
29-Jul-16	Herring Gull	1	9:20	700	
29-Jul-16	Great Black-backed Gull	1	9:20	700	
29-Jul-16	American Black Duck	1	9:20	500	
29-Jul-16	Least Sandpiper	5	9:20	200	
29-Jul-16	Nelson's Sharp-tailed Sparrow	1	9:20	200	
29-Jul-16	American Crow	2	9:20	100	
29-Jul-16	American Black Duck	1	9:20	100	Walkabout
29-Jul-16	Mourning Dove	1	9:20	100	Walkabout
29-Jul-16	shorebird	300	9:50	800	
29-Jul-16	duck sp.	1	9:50	700	
29-Jul-16	American Black Duck	2	9:50	400	
29-Jul-16	Spotted Sandpiper	1	9:50	400	
29-Jul-16	Least Sandpiper	6	9:50	200	
29-Jul-16	Spotted Sandpiper	3	9:50	200	
29-Jul-16	duck sp.	1	9:50	200	
29-Jul-16	shorebird	9	9:50	200	
29-Jul-16	Spotted Sandpiper	1	9:50	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
29-Jul-16	Herring Gull	3	9:50	900	
29-Jul-16	Great Black-backed Gull	1	9:50	900	
29-Jul-16	Herring Gull	1	10:20	800	
29-Jul-16	American Black Duck	3	10:20	700	
29-Jul-16	American Black Duck	5	10:20	300	
29-Jul-16	Semipalmated Sandpiper	25	10:20	200	
29-Jul-16	Greater Yellowlegs	1	10:20	200	
29-Jul-16	Spotted Sandpiper	2	10:20	200	
29-Jul-16	American Goldfinch	2	10:20	100	
29-Jul-16	Song Sparrow	3	10:20	100	Walkabout
29-Jul-16	Herring Gull	1	10:50	1000	
29-Jul-16	duck sp.	27	10:50	800	
29-Jul-16	American Black Duck	7	10:50	800	
29-Jul-16	Great Black-backed Gull	1	10:50	800	
29-Jul-16	shorebird	7	10:50	600	
29-Jul-16	Bald Eagle	1	10:50	600	
29-Jul-16	Spotted Sandpiper	1	10:50	600	
29-Jul-16	shorebird	4	10:50	300	
29-Jul-16	Great Black-backed Gull	1	10:50	300	
29-Jul-16	Spotted Sandpiper	1	10:50	200	
29-Jul-16	Semipalmated Sandpiper	1	10:50	200	
29-Jul-16	Spotted Sandpiper	1	11:20	600	
29-Jul-16	shorebird	2	11:20	600	
29-Jul-16	American Black Duck	2	11:20	500	
29-Jul-16	American Black Duck	1	11:20	300	
29-Jul-16	Greater Yellowlegs	2	11:20	100	Walkabout
29-Jul-16	American Black Duck	25	11:20	1100	
29-Jul-16	American Black Duck	14	11:20	700	
29-Jul-16	Gull sp.	1	11:50	1100	
29-Jul-16	American Black Duck	5	11:50	1100	
29-Jul-16	American Black Duck	4	11:50	1000	
29-Jul-16	American Black Duck	2	11:50	600	
29-Jul-16	Greater Yellowlegs	2	11:50	400	
29-Jul-16	Great Black-backed Gull	1	11:50	300	
29-Jul-16	Herring Gull	10	12:20	1100	
29-Jul-16	American Black Duck	3	12:20	500	
29-Jul-16	Greater Yellowlegs	1	12:20	300	
29-Jul-16	Great Black-backed Gull	1	12:20	300	
29-Jul-16	Greater Yellowlegs	1	12:20	200	
29-Jul-16	Herring Gull	1	12:20	100	
29-Jul-16	Herring Gull	1	12:20	100	Walkabout
29-Jul-16	American Goldfinch	1	12:20	100	Walkabout
29-Jul-16	American Black Duck	2	12:50	500	
29-Jul-16	Gull sp.	9	12:50	1100	
29-Jul-16	Swallow sp.	7	12:50	600	
29-Jul-16	Bald Eagle	1	13:20	1100	
29-Jul-16	Herring Gull	4	13:20	1100	
29-Jul-16	Herring Gull	2	13:20	400	
29-Jul-16	Great Black-backed Gull	1	13:20	400	
29-Jul-16	Spotted Sandpiper	1	13:20	200	
29-Jul-16	Herring Gull	1	13:20	100	Walkabout
29-Jul-16	Great Black-backed Gull	1	13:20	100	Walkabout
29-Jul-16	Herring Gull	4	13:50	1100	
29-Jul-16	American Black Duck	1	13:50	800	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
29-Jul-16	Herring Gull	4	13:50	700	
29-Jul-16	Great Black-backed Gull	1	13:50	700	
29-Jul-16	Herring Gull	1	14:20	800	
29-Jul-16	Herring Gull	2	14:20	700	
29-Jul-16	Herring Gull	2	14:20	600	
29-Jul-16	Great Black-backed Gull	1	14:20	600	
29-Jul-16	Herring Gull	1	14:20	500	
29-Jul-16	Herring Gull	2	14:20	400	
29-Jul-16	Nelson's Sharp-tailed Sparrow	1	14:20	200	
29-Jul-16	Herring Gull	1	14:20	200	
29-Jul-16	European Starling	29	14:20	100	Walkabout
29-Jul-16	Nelson's Sharp-tailed Sparrow	1	14:20	100	
29-Jul-16	Mourning Dove	1	14:20	100	Walkabout
29-Jul-16	Herring Gull	5	14:20	100	Walkabout
29-Jul-16	Song Sparrow	6	14:20	100	Walkabout
29-Jul-16	Herring Gull	3	14:20	1100	
29-Jul-16	Herring Gull	4	14:20	1000	
29-Jul-16	Gull sp.	2	14:50	1000	
29-Jul-16	Herring Gull	5	14:50	1000	
29-Jul-16	Greater Yellowlegs	1	14:50	400	
29-Jul-16	Lesser Yellowlegs	1	14:50	400	
29-Jul-16	Nelson's Sharp-tailed Sparrow	1	14:50	200	
29-Jul-16	Herring Gull	3	14:50	100	
29-Jul-16	Nelson's Sharp-tailed Sparrow	1	14:50	100	
29-Jul-16	European Starling	11	14:50	100	
29-Jul-16	Herring Gull	2	15:20	800	
29-Jul-16	Herring Gull	8	15:20	700	
29-Jul-16	American Black Duck	1	15:20	500	
29-Jul-16	Semipalmated Sandpiper	3	15:20	300	
29-Jul-16	Greater Yellowlegs	1	15:20	300	
29-Jul-16	Great Black-backed Gull	1	15:20	200	
29-Jul-16	Herring Gull	1	15:20	200	Walkabout
29-Jul-16	Herring Gull	1	15:20	100	Walkabout
21-Jul-16	Mallard	1	8:30	200	
21-Jul-16	Spotted Sandpiper	3	8:30	100	Walkabout
21-Jul-16	Mallard	4	8:30	100	
21-Jul-16	Savannah Sparrow	1	8:30	100	Walkabout
21-Jul-16	Spotted Sandpiper	2	8:30	100	Walkabout
21-Jul-16	Great Black-backed Gull	1	9:00	1000	
21-Jul-16	shorebird	20	9:00	600	
21-Jul-16	Ring-billed Gull	1	9:30	200	
21-Jul-16	Spotted Sandpiper	1	9:30	200	
21-Jul-16	Nelson's Sharp-tailed Sparrow	2	9:30	200	
21-Jul-16	Spotted Sandpiper	3	9:30	100	Walkabout
21-Jul-16	Sharp-shinned Hawk	1	9:30	100	Walkabout
21-Jul-16	Herring Gull	1	9:30	1000	
21-Jul-16	Great Black-backed Gull	1	9:30	900	
21-Jul-16	Gull sp.	2	10:00	1100	
21-Jul-16	Gull sp.	1	10:00	500	
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	10:00	400	
21-Jul-16	American Black Duck	1	10:00	400	
21-Jul-16	shorebird	3	10:00	200	
21-Jul-16	Osprey	1	10:00	100	
21-Jul-16	American Black Duck	1	10:30	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	10:30	400	
21-Jul-16	Spotted Sandpiper	3	10:30	400	
21-Jul-16	Great Black-backed Gull	1	10:30	300	
21-Jul-16	Ring-billed Gull	1	10:30	300	
21-Jul-16	Nelson's Sharp-tailed Sparrow	3	10:30	300	
21-Jul-16	Spotted Sandpiper	1	10:30	200	Walkabout
21-Jul-16	American Black Duck	1	11:00	600	
21-Jul-16	Mallard	3	11:00	500	
21-Jul-16	American Black Duck	1	11:00	500	
21-Jul-16	Spotted Sandpiper	1	11:00	500	
21-Jul-16	Great Black-backed Gull	1	11:00	300	
21-Jul-16	Herring Gull	1	11:00	200	
21-Jul-16	shorebird	50	11:00	100	
21-Jul-16	Canada Goose	1	11:00	1000	
21-Jul-16	Mallard	4	11:00	600	
21-Jul-16	Gull sp.	2	11:30	1000	
21-Jul-16	Gull sp.	2	11:30	800	
21-Jul-16	shorebird	30	11:30	800	
21-Jul-16	Mallard	5	11:30	800	
21-Jul-16	American Black Duck	8	11:30	800	
21-Jul-16	Tree Swallow	1	11:30	800	
21-Jul-16	American Black Duck	26	11:30	700	
21-Jul-16	Mallard	15	11:30	700	
21-Jul-16	shorebird	2	11:30	700	
21-Jul-16	American Black Duck	13	11:30	600	
21-Jul-16	Mallard	8	11:30	600	
21-Jul-16	American Black Duck	3	11:30	400	
21-Jul-16	Mallard	5	11:30	300	
21-Jul-16	American Black Duck	3	11:30	300	
21-Jul-16	Mallard	2	11:30	100	
21-Jul-16	Mourning Dove	2	11:30	100	Walkabout
21-Jul-16	Gull sp.	11	12:00	900	
21-Jul-16	American Black Duck	2	12:00	800	
21-Jul-16	shorebird	2	12:00	800	
21-Jul-16	American Black Duck	6	12:00	600	
21-Jul-16	Mallard	9	12:00	600	
21-Jul-16	Ring-billed Gull	1	12:00	600	
21-Jul-16	American Black Duck	1	12:00	500	
21-Jul-16	American Black Duck	3	12:00	400	
21-Jul-16	Mallard	2	12:00	400	
21-Jul-16	Great Black-backed Gull	1	12:00	400	
21-Jul-16	Spotted Sandpiper	2	12:00	400	
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	12:00	300	
21-Jul-16	Spotted Sandpiper	1	12:00	200	
21-Jul-16	shorebird	50	12:30	800	
21-Jul-16	Mallard	2	12:30	700	
21-Jul-16	American Black Duck	2	12:30	700	
21-Jul-16	shorebird	2	12:30	700	
21-Jul-16	American Black Duck	2	12:30	600	
21-Jul-16	Herring Gull	1	12:30	600	
21-Jul-16	Mallard	3	12:30	600	
21-Jul-16	Ring-billed Gull	1	12:30	500	
21-Jul-16	American Black Duck	4	12:30	400	
21-Jul-16	Barn Swallow	1	12:30	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
21-Jul-16	Spotted Sandpiper	1	12:30	200	
21-Jul-16	Spotted Sandpiper	2	12:30	100	
21-Jul-16	shorebird	60	12:30	100	
21-Jul-16	Mallard	2	12:30	800	
21-Jul-16	American Black Duck	2	12:30	600	
21-Jul-16	Mallard	3	12:30	500	
21-Jul-16	shorebird	2	12:30	500	
21-Jul-16	Mallard	1	12:30	400	
21-Jul-16	American Black Duck	4	12:30	400	
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	12:30	400	
21-Jul-16	Spotted Sandpiper	1	12:30	200	
21-Jul-16	Herring Gull	2	12:30	100	Walkabout
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	12:30	100	Walkabout
21-Jul-16	Gull sp.	6	13:00	900	
21-Jul-16	Ring-billed Gull	1	13:00	800	
21-Jul-16	Spotted Sandpiper	1	13:00	100	Walkabout
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	13:00	100	
21-Jul-16	Mourning Dove	1	13:00	100	Walkabout
21-Jul-16	duck sp.	8	13:00	900	
21-Jul-16	Gull sp.	5	13:00	900	
21-Jul-16	Gull sp.	6	13:30	900	
21-Jul-16	American Black Duck	3	13:30	700	
21-Jul-16	Spotted Sandpiper	1	13:30	100	
21-Jul-16	Mallard	14	13:30	700	
21-Jul-16	Ring-billed Gull	7	13:30	700	
21-Jul-16	Mallard	6	13:30	600	
21-Jul-16	Mallard	1	13:30	500	
21-Jul-16	shorebird	1	13:30	300	
21-Jul-16	Spotted Sandpiper	2	13:30	200	
21-Jul-16	Mallard	2	14:00	700	
21-Jul-16	American Black Duck	3	14:00	700	
21-Jul-16	Mallard	7	14:00	600	
21-Jul-16	American Black Duck	2	14:00	600	
21-Jul-16	American Black Duck	1	14:00	500	
21-Jul-16	American Black Duck	2	14:00	400	
21-Jul-16	American Black Duck	1	14:00	300	
21-Jul-16	Gull sp.	31	14:00	1100	
21-Jul-16	Gull sp.	2	14:00	1000	
21-Jul-16	Gull sp.	38	14:30	1100	
21-Jul-16	Gull sp.	2	14:30	1000	
21-Jul-16	American Black Duck	1	14:30	1000	
21-Jul-16	Great Black-backed Gull	1	14:30	1000	
21-Jul-16	American Black Duck	2	14:30	900	
21-Jul-16	Canada Goose	10	14:30	800	
21-Jul-16	Mallard	5	14:30	800	
21-Jul-16	American Black Duck	6	14:30	800	
21-Jul-16	Mallard	1	14:30	400	
21-Jul-16	Savannah Sparrow	2	14:30	300	
21-Jul-16	Nelson's Sharp-tailed Sparrow	2	14:30	200	
21-Jul-16	American Black Duck	2	14:30	200	
21-Jul-16	Savannah Sparrow	1	14:30	100	
21-Jul-16	Savannah Sparrow	4	14:30	100	Walkabout, possible nest
21-Jul-16	Least Sandpiper	4	14:30	100	
21-Jul-16	American Black Duck	2	14:30	100	Walkabout

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
21-Jul-16	Gull sp.	11	15:00	1100	
21-Jul-16	American Black Duck	5	15:00	900	
21-Jul-16	Canada Goose	10	15:00	900	
21-Jul-16	Gull sp.	2	15:00	800	
21-Jul-16	American Black Duck	1	15:00	700	
21-Jul-16	American Black Duck	7	15:00	600	
21-Jul-16	Mallard	10	15:00	600	
21-Jul-16	American Black Duck	3	15:00	500	
21-Jul-16	American Black Duck	1	15:00	400	
21-Jul-16	Tree Swallow	1	15:00	400	
21-Jul-16	Barn Swallow	1	15:00	400	
21-Jul-16	American Black Duck	1	15:00	200	
21-Jul-16	American Black Duck	1	15:30	800	
21-Jul-16	American Black Duck	8	15:30	400	
21-Jul-16	American Black Duck	1	15:30	300	
21-Jul-16	Savannah Sparrow	1	15:30	200	
21-Jul-16	Spotted Sandpiper	4	15:30	200	Walkabout
21-Jul-16	Ring-billed Gull	2	15:30	200	
21-Jul-16	Herring Gull	1	15:30	200	Walkabout
21-Jul-16	Spotted Sandpiper	1	15:30	100	
21-Jul-16	Savannah Sparrow	2	15:30	100	Walkabout
21-Jul-16	American Black Duck	2	15:30	100	Walkabout
21-Jul-16	duck sp.	10	15:30	1100	
21-Jul-16	Canada Goose	4	15:30	800	
21-Jul-16	shorebird	25	16:00	900	
21-Jul-16	Great Black-backed Gull	1	16:00	900	
21-Jul-16	American Black Duck	1	16:00	800	
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	16:00	500	
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	16:00	300	
21-Jul-16	Spotted Sandpiper	2	16:00	200	
21-Jul-16	American Black Duck	1	16:00	200	
21-Jul-16	Spotted Sandpiper	2	16:00	100	
21-Jul-16	shorebird	20	16:30	1100	
21-Jul-16	American Black Duck	2	16:30	900	
21-Jul-16	shorebird	30	16:30	900	
21-Jul-16	Ring-billed Gull	1	16:30	700	
21-Jul-16	American Black Duck	1	16:30	600	
21-Jul-16	American Black Duck	1	16:30	300	
21-Jul-16	Least Sandpiper	2	16:30	200	
21-Jul-16	Spotted Sandpiper	2	16:30	100	Walkabout
21-Jul-16	shorebird	1	16:30	100	
21-Jul-16	American Black Duck	1	16:30	100	Walkabout
21-Jul-16	Nelson's Sharp-tailed Sparrow	1	17:00	400	
21-Jul-16	Spotted Sandpiper	1	17:00	300	
21-Jul-16	American Black Duck	3	17:00	300	
21-Jul-16	Mallard	4	17:00	700	
21-Jul-16	American Black Duck	7	17:00	600	
15-Jul-16	American Crow	4	8:45	100	
15-Jul-16	shorebird	1	8:45	100	
15-Jul-16	Ring-billed Gull	2	8:45	100	
15-Jul-16	Ring-billed Gull	1	8:45	100	
15-Jul-16	Semipalmated Sandpiper	6	8:45	200	
15-Jul-16	American Black Duck	25	8:45	800	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Jul-16	Greater Yellowlegs	1	8:45	200	
15-Jul-16	Herring Gull	2	8:45	800	Walkabout
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	8:45	300	Walkabout
15-Jul-16	shorebird	1	8:45	800	
15-Jul-16	Spotted Sandpiper	1	8:45	200	
15-Jul-16	American Black Duck	4	9:15	800	
15-Jul-16	Gull sp.	1	9:15	1000	
15-Jul-16	Least Sandpiper	1	9:15	200	
15-Jul-16	Mourning Dove	1	9:15	100	
15-Jul-16	shorebird	15	9:15	300	
15-Jul-16	shorebird	30	9:15	800	
15-Jul-16	Savannah Sparrow	1	9:15	100	
15-Jul-16	Semipalmated Sandpiper	20	9:15	300	
15-Jul-16	Short-billed Dowitcher	3	9:15	200	
15-Jul-16	Spotted Sandpiper	2	9:15	500	
15-Jul-16	Spotted Sandpiper	1	9:15	100	
15-Jul-16	American Black Duck	3	9:45	1000	
15-Jul-16	American Black Duck	1	9:45	900	
15-Jul-16	American Black Duck	4	9:45	800	
15-Jul-16	American Crow	1	9:45	1000	
15-Jul-16	European Starling	3	9:45	200	
15-Jul-16	European Starling	10	9:45	100	
15-Jul-16	Herring Gull	2	9:45	1000	Walkabout
15-Jul-16	Least Sandpiper	1	9:45	100	
15-Jul-16	Mourning Dove	2	9:45	100	
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	9:45	500	
15-Jul-16	shorebird	18	9:45	500	
15-Jul-16	shorebird	6	9:45	100	
15-Jul-16	Ring-billed Gull	1	9:45	300	
15-Jul-16	shorebird	8	9:45	900	
15-Jul-16	shorebird	1	9:45	500	
15-Jul-16	Savannah Sparrow	1	9:45	300	
15-Jul-16	Semipalmated Sandpiper	15	9:45	100	
15-Jul-16	Short-billed Dowitcher	3	9:45	200	
15-Jul-16	American Black Duck	1	10:15	600	
15-Jul-16	shorebird	5	10:15	300	
15-Jul-16	shorebird	1	10:15	100	
15-Jul-16	Semipalmated Sandpiper	1	10:15	200	
15-Jul-16	Spotted Sandpiper	2	10:15	400	
15-Jul-16	Spotted Sandpiper	1	10:15	100	
15-Jul-16	Tree Swallow	1	10:15	300	Walkabout
15-Jul-16	Great Black-backed Gull	1	10:15	900	
15-Jul-16	shorebird	2	10:15	200	
15-Jul-16	Ring-billed Gull	5	10:15	900	
15-Jul-16	American Black Duck	2	10:45	900	
15-Jul-16	Ring-billed Gull	8	10:45	800	
15-Jul-16	American Black Duck	1	10:45	600	
15-Jul-16	Great Black-backed Gull	1	10:45	200	Walkabout
15-Jul-16	Least Sandpiper	1	10:45	200	2 Ducklings
15-Jul-16	Mourning Dove	1	10:45	100	Walkabout
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	10:45	100	
15-Jul-16	shorebird	5	10:45	500	
15-Jul-16	shorebird	30	10:45	200	
15-Jul-16	Spotted Sandpiper	1	10:45	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Jul-16	American Black Duck	6	11:15	900	Walkabout
15-Jul-16	American Black Duck	1	11:15	700	
15-Jul-16	American Black Duck	3	11:15	500	Walkabout
15-Jul-16	Canada Goose	2	11:15	800	
15-Jul-16	Ring-billed Gull	2	11:15	700	
15-Jul-16	Short-billed Dowitcher	10	11:15	300	
15-Jul-16	shorebird	7	11:45	200	
15-Jul-16	Semipalmated Sandpiper	2	11:45	100	Walkabout
15-Jul-16	Spotted Sandpiper	1	11:45	100	Walkabout
15-Jul-16	American Black Duck	12	11:45	1100	
15-Jul-16	American Black Duck	1	11:45	600	
15-Jul-16	Gull sp.	6	11:45	1100	
15-Jul-16	Least Sandpiper	1	11:45	200	
15-Jul-16	Ring-billed Gull	9	11:45	1100	
15-Jul-16	Short-billed Dowitcher	8	11:45	500	
15-Jul-16	Spotted Sandpiper	2	11:45	400	Walkabout
15-Jul-16	American Black Duck	14	12:00	900	
15-Jul-16	American Black Duck	1	12:00	600	
15-Jul-16	Canada Goose	10	12:00	900	
15-Jul-16	Gull sp.	7	12:00	900	
15-Jul-16	Least Sandpiper	3	12:00	200	
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	12:00	400	
15-Jul-16	shorebird	1	12:00	200	
15-Jul-16	shorebird	8	12:00	700	
15-Jul-16	Spotted Sandpiper	2	12:00	500	
15-Jul-16	Spotted Sandpiper	1	12:00	300	
15-Jul-16	American Black Duck	1	12:45	900	
15-Jul-16	American Black Duck	4	12:45	700	
15-Jul-16	Gull sp.	11	12:45	900	
15-Jul-16	shorebird	3	12:45	200	Total consisted of 3 females, 2 ducklings and 3 additional ABDU
15-Jul-16	Semipalmated Sandpiper	10	12:45	300	
15-Jul-16	Short-billed Dowitcher	5	12:45	500	
15-Jul-16	Spotted Sandpiper	3	12:45	500	
15-Jul-16	Spotted Sandpiper	2	12:45	300	
15-Jul-16	American Black Duck	8	13:15	600	
15-Jul-16	American Black Duck	1	13:15	500	
15-Jul-16	Gull sp.	1	13:15	800	
15-Jul-16	Least Sandpiper	10	13:15	200	
15-Jul-16	shorebird	5	13:15	200	
15-Jul-16	shorebird	21	13:15	100	
15-Jul-16	Ring-billed Gull	1	13:15	200	
15-Jul-16	Spotted Sandpiper	1	13:15	200	
15-Jul-16	American Black Duck	1	13:45	400	
15-Jul-16	Bald Eagle	1	13:45	800	
15-Jul-16	Barn Swallow	1	13:45	200	
15-Jul-16	Gull sp.	1	13:45	800	
15-Jul-16	Least Sandpiper	4	13:45	200	
15-Jul-16	Ring-billed Gull	1	13:45	800	
15-Jul-16	Ring-billed Gull	2	13:45	800	
15-Jul-16	Spotted Sandpiper	1	13:45	200	
15-Jul-16	Great Black-backed Gull	1	13:45	200	
15-Jul-16	shorebird	2	13:45	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Jul-16	Spotted Sandpiper	1	13:45	100	
15-Jul-16	American Black Duck	1	14:15	500	
15-Jul-16	Great Black-backed Gull	3	14:15	400	Walkabout
15-Jul-16	Gull sp.	2	14:15	800	
15-Jul-16	Great Black-backed Gull	1	14:45	400	Walkabout
15-Jul-16	Great Black-backed Gull	1	14:45	300	Walkabout
15-Jul-16	Herring Gull	1	14:45	200	Walkabout
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	14:45	300	
15-Jul-16	shorebird	1	14:45	300	
15-Jul-16	shorebird	8	14:45	100	
15-Jul-16	Spotted Sandpiper	1	14:45	100	
15-Jul-16	Great Black-backed Gull	3	14:45	600	Walkabout
15-Jul-16	Gull sp.	2	14:45	900	
15-Jul-16	Great Black-backed Gull	1	15:15	800	
15-Jul-16	Herring Gull	1	15:15	800	
15-Jul-16	American Black Duck	1	15:15	500	
15-Jul-16	Least Sandpiper	7	15:15	100	
15-Jul-16	Nelson's Sharp-tailed Sparrow	2	15:15	400	
15-Jul-16	shorebird	5	15:15	300	
15-Jul-16	shorebird	5	15:15	100	
15-Jul-16	Spotted Sandpiper	1	15:15	100	
15-Jul-16	American Black Duck	1	15:45	500	
15-Jul-16	Great Black-backed Gull	1	15:45	900	
15-Jul-16	Great Black-backed Gull	1	15:45	200	
15-Jul-16	Great Black-backed Gull	1	15:45	200	
15-Jul-16	Least Sandpiper	3	15:45	200	
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	15:45	300	
15-Jul-16	shorebird	1	15:45	100	
15-Jul-16	Spotted Sandpiper	4	15:45	200	
15-Jul-16	Barn Swallow	1	16:15	300	
15-Jul-16	European Starling	1	16:15	100	
15-Jul-16	Least Sandpiper	3	16:15	100	
15-Jul-16	Spotted Sandpiper	1	16:15	100	
15-Jul-16	Herring Gull	2	16:15	500	
15-Jul-16	shorebird	1	16:15	600	
15-Jul-16	Gull sp.	2	16:45	900	
15-Jul-16	Ring-billed Gull	1	16:45	800	
15-Jul-16	Great Black-backed Gull	1	16:45	800	
15-Jul-16	Great Black-backed Gull	1	16:45	100	
15-Jul-16	Herring Gull	1	16:45	500	
15-Jul-16	Nelson's Sharp-tailed Sparrow	1	16:45	200	
15-Jul-16	Spotted Sandpiper	2	16:45	200	
16-Oct-08	American Black Duck	3	9:00	300	
16-Oct-08	American Black Duck	15	9:00	400	
16-Oct-08	American Black Duck	20	9:00	500	
16-Oct-08	American Black Duck	5	9:00	500	
16-Oct-08	American Black Duck	2	9:00	600	
16-Oct-08	Great Black-backed Gull	1	9:00	100	
16-Oct-08	Greater Yellowlegs	2	9:00	400	
16-Oct-08	Green-winged Teal	4	9:00	300	
16-Oct-08	Shorebird	66	9:00	900	
16-Oct-08	American Black Duck	3	9:30	300	
16-Oct-08	American Black Duck	4	9:30	300	
16-Oct-08	American Black Duck	15	9:30	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	American Black Duck	2	9:30	400	
16-Oct-08	American Black Duck	6	9:30	500	
16-Oct-08	American Black Duck	3	9:30	500	
16-Oct-08	American Black Duck	10	9:30	600	
16-Oct-08	American Black Duck	7	9:30	600	
16-Oct-08	American Black Duck	2	9:30	600	
16-Oct-08	Great Blue Heron	3	9:30	300	
16-Oct-08	Green-winged Teal	3	9:30	300	
16-Oct-08	Shorebird	12	9:30	900	
16-Oct-08	American Black Duck	7	10:00	100	
16-Oct-08	American Black Duck	15	10:00	100	
16-Oct-08	American Black Duck	2	10:00	100	
16-Oct-08	American Black Duck	6	10:00	100	
16-Oct-08	American Black Duck	7	10:00	200	
16-Oct-08	American Black Duck	2	10:00	200	
16-Oct-08	American Black Duck	9	10:00	300	
16-Oct-08	American Black Duck	4	10:00	300	
16-Oct-08	American Black Duck	8	10:00	300	
16-Oct-08	American Black Duck	6	10:00	300	
16-Oct-08	American Black Duck	17	10:00	400	
16-Oct-08	American Black Duck	2	10:00	400	
16-Oct-08	American Black Duck	13	10:00	500	
16-Oct-08	American Black Duck	7	10:00	500	
16-Oct-08	American Black Duck	7	10:00	500	
16-Oct-08	Double-crested Cormorant	1	10:00	400	
16-Oct-08	Great Blue Heron	6	10:00	300	
16-Oct-08	Green-winged Teal	4	10:00	300	
16-Oct-08	Green-winged Teal	2	10:00	300	
16-Oct-08	Mallard	2	10:00	100	
16-Oct-08	Shorebird	48	10:00	900	
16-Oct-08	American Black Duck	8	10:30	400	
16-Oct-08	American Black Duck	12	10:30	400	
16-Oct-08	American Black Duck	3	10:30	400	
16-Oct-08	American Black Duck	4	10:30	500	
16-Oct-08	American Black Duck	2	10:30	500	
16-Oct-08	American Black Duck	12	10:30	500	
16-Oct-08	American Black Duck	16	10:30	600	
16-Oct-08	American Black Duck	2	10:30	700	
16-Oct-08	American Black Duck	10	10:30	800	
16-Oct-08	Double-crested Cormorant	1	10:30	300	
16-Oct-08	Red-breasted Merganser	1	10:30	400	
16-Oct-08	Ring-billed Gull	4	10:30	900	
16-Oct-08	Shorebird	110	10:30	900	
16-Oct-08	American Black Duck	5	11:00	100	
16-Oct-08	American Black Duck	1	11:00	200	
16-Oct-08	American Black Duck	3	11:00	200	
16-Oct-08	American Black Duck	15	11:00	300	
16-Oct-08	American Black Duck	5	11:00	300	
16-Oct-08	American Black Duck	5	11:00	300	
16-Oct-08	American Black Duck	11	11:00	300	
16-Oct-08	American Black Duck	10	11:00	400	
16-Oct-08	American Black Duck	2	11:00	400	
16-Oct-08	American Black Duck	14	11:00	500	
16-Oct-08	American Black Duck	4	11:00	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	American Black Duck	3	11:00	500	
16-Oct-08	American Black Duck	6	11:00	500	
16-Oct-08	American Black Duck	4	11:00	800	
16-Oct-08	American Black Duck	3	11:00	800	
16-Oct-08	American Black Duck	8	11:00	900	
16-Oct-08	Canada Goose	13	11:00	300	
16-Oct-08	Canada Goose	12	11:00	700	
16-Oct-08	Canada Goose	80	11:00	700	
16-Oct-08	Canada Goose	45	11:00	700	
16-Oct-08	Green-winged Teal	4	11:00	300	
16-Oct-08	American Black Duck	3	11:30	100	
16-Oct-08	American Black Duck	4	11:30	100	
16-Oct-08	American Black Duck	3	11:30	100	
16-Oct-08	American Black Duck	2	11:30	200	
16-Oct-08	American Black Duck	3	11:30	300	
16-Oct-08	American Black Duck	2	11:30	300	
16-Oct-08	American Black Duck	6	11:30	300	
16-Oct-08	American Black Duck	2	11:30	400	
16-Oct-08	American Black Duck	10	11:30	500	
16-Oct-08	American Black Duck	18	11:30	500	
16-Oct-08	American Black Duck	29	11:30	600	
16-Oct-08	American Black Duck	32	11:30	800	
16-Oct-08	Canada Goose	101	11:30	700	
16-Oct-08	Great Blue Heron	4	11:30	300	
16-Oct-08	Green-winged Teal	2	11:30	200	
16-Oct-08	Green-winged Teal	2	11:30	300	
16-Oct-08	American Black Duck	2	12:00	100	
16-Oct-08	American Black Duck	2	12:00	100	
16-Oct-08	American Black Duck	3	12:00	200	
16-Oct-08	American Black Duck	5	12:00	400	
16-Oct-08	American Black Duck	2	12:00	700	
16-Oct-08	Canada Goose	134	12:00	700	
16-Oct-08	Great Blue Heron	1	12:00	300	
16-Oct-08	Lesser Yellowlegs	3	12:00	100	
16-Oct-08	Lesser Yellowlegs	1	12:00	100	
16-Oct-08	Ring-billed Gull	1	12:00	800	
16-Oct-08	American Black Duck	1	12:30	100	
16-Oct-08	American Black Duck	1	12:30	100	
16-Oct-08	American Black Duck	3	12:30	100	
16-Oct-08	American Black Duck	1	12:30	300	
16-Oct-08	American Black Duck	2	12:30	300	
16-Oct-08	American Black Duck	7	12:30	500	
16-Oct-08	American Black Duck	50	12:30	500	
16-Oct-08	Canada Goose	48	12:30	600	
16-Oct-08	Canada Goose	170	12:30	600	
16-Oct-08	Green-winged Teal	7	12:30	1000	
16-Oct-08	American Black Duck	1	13:00	100	
16-Oct-08	American Black Duck	2	13:00	100	
16-Oct-08	American Black Duck	3	13:00	100	
16-Oct-08	American Black Duck	2	13:00	100	
16-Oct-08	American Black Duck	2	13:00	300	
16-Oct-08	American Black Duck	3	13:00	300	
16-Oct-08	American Black Duck	2	13:00	300	
16-Oct-08	American Black Duck	1	13:00	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	American Black Duck	6	13:00	400	
16-Oct-08	American Black Duck	6	13:00	500	
16-Oct-08	American Black Duck	12	13:00	500	
16-Oct-08	American Black Duck	5	13:00	500	
16-Oct-08	American Black Duck	27	13:00	500	
16-Oct-08	American Black Duck	17	13:00	600	
16-Oct-08	American Black Duck	3	13:00	600	
16-Oct-08	Canada Goose	60	13:00	600	
16-Oct-08	Canada Goose	160	13:00	600	
16-Oct-08	Green-winged Teal	1	13:00	100	
16-Oct-08	Green-winged Teal	1	13:00	300	
16-Oct-08	Ring-billed Gull	1	13:00	400	
16-Oct-08	American Black Duck	13	13:30	600	
16-Oct-08	American Black Duck	87	13:30	600	
16-Oct-08	Canada Goose	79	13:30	600	
16-Oct-08	Canada Goose	118	13:30	600	
16-Oct-08	Lesser Yellowlegs	2	13:30	100	
16-Oct-08	Mallard	1	13:30	600	
16-Oct-08	American Black Duck	3	14:00	100	
16-Oct-08	American Black Duck	11	14:00	200	
16-Oct-08	American Black Duck	2	14:00	200	
16-Oct-08	American Black Duck	2	14:00	300	
16-Oct-08	American Black Duck	6	14:00	500	
16-Oct-08	American Black Duck	1	14:00	600	
16-Oct-08	American Black Duck	210	14:00	600	
16-Oct-08	Canada Goose	33	14:00	500	
16-Oct-08	Canada Goose	3	14:00	500	
16-Oct-08	Canada Goose	85	14:00	600	
16-Oct-08	Canada Goose	17	14:00	600	
16-Oct-08	Green-winged Teal	2	14:00	500	
16-Oct-08	Ring-billed Gull	2	14:00	400	
16-Oct-08	American Black Duck	2	14:30	100	
16-Oct-08	American Black Duck	1	14:30	100	
16-Oct-08	American Black Duck	3	14:30	100	
16-Oct-08	American Black Duck	1	14:30	100	
16-Oct-08	American Black Duck	2	14:30	200	
16-Oct-08	American Black Duck	2	14:30	300	
16-Oct-08	American Black Duck	6	14:30	300	
16-Oct-08	American Black Duck	5	14:30	400	
16-Oct-08	American Black Duck	1	14:30	400	
16-Oct-08	Canada Goose	8	14:30	300	
16-Oct-08	Canada Goose	25	14:30	400	
16-Oct-08	Canada Goose	8	14:30	600	
16-Oct-08	Canada Goose	70	14:30	700	
16-Oct-08	Lesser Yellowlegs	2	14:30	400	
16-Oct-08	Ring-billed Gull	1	14:30	100	
16-Oct-08	Ring-billed Gull	2	14:30	800	
16-Oct-08	Ring-billed Gull	2	14:30	800	
16-Oct-08	American Black Duck	4	15:00	100	
16-Oct-08	American Black Duck	2	15:00	100	
16-Oct-08	American Black Duck	2	15:00	100	
16-Oct-08	American Black Duck	4	15:00	400	
16-Oct-08	American Black Duck	2	15:00	400	
16-Oct-08	Canada Goose	49	15:00	600	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	Ring-billed Gull	2	15:00	700	
16-Oct-08	Ring-billed Gull	2	15:00	800	
16-Oct-08	American Black Duck	4	15:30	100	
16-Oct-08	American Black Duck	2	15:30	100	
16-Oct-08	American Black Duck	2	15:30	100	
16-Oct-08	American Black Duck	3	15:30	100	
16-Oct-08	American Black Duck	2	15:30	200	
16-Oct-08	American Black Duck	2	15:30	200	
16-Oct-08	American Black Duck	4	15:30	300	
16-Oct-08	American Black Duck	2	15:30	300	
16-Oct-08	American Black Duck	2	15:30	400	
16-Oct-08	American Black Duck	14	15:30	500	
16-Oct-08	American Black Duck	3	15:30	600	
16-Oct-08	American Black Duck	3	15:30	600	
16-Oct-08	Green-winged Teal	5	15:30	200	
16-Oct-08	Ring-billed Gull	2	15:30	100	
16-Oct-08	Ring-billed Gull	28	15:30	100	
16-Oct-08	American Black Duck	3	16:00	100	
16-Oct-08	American Black Duck	2	16:00	100	
16-Oct-08	American Black Duck	2	16:00	100	
16-Oct-08	American Black Duck	2	16:00	100	
16-Oct-08	American Black Duck	2	16:00	100	
16-Oct-08	American Black Duck	4	16:00	100	
16-Oct-08	American Black Duck	4	16:00	200	
16-Oct-08	American Black Duck	1	16:00	200	
16-Oct-08	American Black Duck	1	16:00	200	
16-Oct-08	American Black Duck	4	16:00	500	
16-Oct-08	American Black Duck	23	16:00	500	
16-Oct-08	American Black Duck	30	16:00	600	
16-Oct-08	American Black Duck	10	16:00	700	
16-Oct-08	Green-winged Teal	2	16:00	200	
16-Oct-08	Green-winged Teal	4	16:00	300	
16-Oct-08	Ring-billed Gull	2	16:00	100	
16-Oct-08	Ring-billed Gull	2	16:00	100	
16-Oct-08	Ring-billed Gull	11	16:00	100	
16-Oct-08	American Black Duck	1	16:30	100	
16-Oct-08	American Black Duck	4	16:30	100	
16-Oct-08	American Black Duck	4	16:30	100	
16-Oct-08	American Black Duck	4	16:30	100	
16-Oct-08	American Black Duck	14	16:30	200	
16-Oct-08	American Black Duck	4	16:30	300	
16-Oct-08	American Black Duck	5	16:30	400	
16-Oct-08	American Black Duck	1	16:30	400	
16-Oct-08	American Black Duck	1	16:30	400	
16-Oct-08	American Black Duck	40	16:30	400	
16-Oct-08	American Black Duck	12	16:30	500	
16-Oct-08	American Black Duck	10	16:30	500	
16-Oct-08	Canada Goose	12	16:30	600	
16-Oct-08	Canada Goose	17	16:30	700	
16-Oct-08	Canada Goose	8	16:30	700	
16-Oct-08	Green-winged Teal	4	16:30	400	
16-Oct-08	Ring-billed Gull	9	16:30	100	
16-Oct-08	Ring-billed Gull	5	16:30	100	
16-Oct-08	Ring-billed Gull	18	16:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	American Black Duck	4	17:00	100	
16-Oct-08	American Black Duck	10	17:00	100	
16-Oct-08	American Black Duck	3	17:00	100	
16-Oct-08	American Black Duck	4	17:00	200	
16-Oct-08	American Black Duck	9	17:00	200	
16-Oct-08	American Black Duck	2	17:00	200	
16-Oct-08	American Black Duck	4	17:00	300	
16-Oct-08	American Black Duck	18	17:00	400	
16-Oct-08	American Black Duck	1	17:00	500	
16-Oct-08	American Black Duck	10	17:00	500	
16-Oct-08	American Black Duck	25	17:00	600	
16-Oct-08	Canada Goose	166	17:00	400	
16-Oct-08	Canada Goose	4	17:00	700	
16-Oct-08	Green-winged Teal	3	17:00	300	
16-Oct-08	Green-winged Teal	3	17:00	500	
16-Oct-08	Mallard	1	17:00	200	
16-Oct-08	Mallard	2	17:00	600	
16-Oct-08	Ring-billed Gull	8	17:00	100	
16-Oct-08	Ring-billed Gull	7	17:00	100	
16-Oct-08	American Black Duck	12	17:30	100	
16-Oct-08	American Black Duck	6	17:30	100	
16-Oct-08	American Black Duck	8	17:30	200	
16-Oct-08	American Black Duck	8	17:30	300	
16-Oct-08	American Black Duck	10	17:30	300	
16-Oct-08	American Black Duck	5	17:30	400	
16-Oct-08	American Black Duck	5	17:30	500	
16-Oct-08	American Black Duck	4	17:30	500	
16-Oct-08	American Black Duck	21	17:30	500	
16-Oct-08	American Black Duck	7	17:30	600	
16-Oct-08	American Black Duck	4	17:30	600	
16-Oct-08	American Black Duck	6	17:30	700	
16-Oct-08	Canada Goose	8	17:30	200	
16-Oct-08	Canada Goose	8	17:30	200	
16-Oct-08	Canada Goose	39	17:30	300	
16-Oct-08	Green-winged Teal	4	17:30	300	
16-Oct-08	Mallard	1	17:30	100	
16-Oct-08	Mallard	1	17:30	300	
16-Oct-08	Mallard	1	17:30	700	
16-Oct-08	Ring-billed Gull	1	17:30	100	
16-Oct-08	Great Blue Heron	1	18:00	400	
16-Oct-08	American Black Duck	19	18:00	100	
16-Oct-08	American Black Duck	2	18:00	100	
16-Oct-08	American Black Duck	6	18:00	200	
16-Oct-08	American Black Duck	8	18:00	300	
16-Oct-08	American Black Duck	5	18:00	300	
16-Oct-08	American Black Duck	4	18:00	300	
16-Oct-08	American Black Duck	4	18:00	400	
16-Oct-08	American Black Duck	4	18:00	400	
16-Oct-08	American Black Duck	9	18:00	500	
16-Oct-08	American Black Duck	20	18:00	500	
16-Oct-08	American Black Duck	1	18:00	500	
16-Oct-08	American Black Duck	2	18:00	600	
16-Oct-08	American Black Duck	10	18:00	700	
16-Oct-08	American Black Duck	2	18:00	800	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
16-Oct-08	Green-winged Teal	4	18:00	300	
16-Oct-08	Green-winged Teal	5	18:00	300	
16-Oct-08	Mallard	1	18:00	300	
16-Oct-08	Mallard	1	18:00	700	
6-Oct-08	American Black Duck	4	9:00	100	
6-Oct-08	American Black Duck	12	9:00	400	
6-Oct-08	American Black Duck	2	9:00	500	
6-Oct-08	American Black Duck	2	9:00	600	
6-Oct-08	Double-crested Cormorant	1	9:00	600	
6-Oct-08	Great Blue Heron	8	9:00	900	
6-Oct-08	Greater Yellowlegs	3	9:00	100	
6-Oct-08	Gull sp.	25	9:00	900	
6-Oct-08	Savannah Sparrow	2	9:00	100	
6-Oct-08	Semipalmated Plover	8	9:00	100	
6-Oct-08	American Black Duck	14	9:30	400	
6-Oct-08	American Black Duck	2	9:30	500	
6-Oct-08	American Crow	12	9:30	200	
6-Oct-08	Great Blue Heron	2	9:30	100	
6-Oct-08	Great Blue Heron	8	9:30	900	
6-Oct-08	Gull sp.	25	9:30	900	
6-Oct-08	Savannah Sparrow	5	9:30	100	
6-Oct-08	Semipalmated Plover	8	9:30	100	
6-Oct-08	Semipalmated Sandpiper	2	9:30	100	
6-Oct-08	American Black Duck	12	10:00	400	
6-Oct-08	Great Blue Heron	3	10:00	800	
6-Oct-08	Greater Yellowlegs	3	10:00	300	
6-Oct-08	Green-winged Teal	2	10:00	400	
6-Oct-08	Savannah Sparrow	3	10:00	100	
6-Oct-08	Semipalmated Plover	5	10:00	100	
6-Oct-08	Semipalmated Sandpiper	1	10:00	100	
6-Oct-08	Shorebird	300	10:00	900	
6-Oct-08	American Black Duck	1	10:30	300	
6-Oct-08	American Black Duck	8	10:30	400	
6-Oct-08	American Black Duck	12	10:30	400	
6-Oct-08	American Crow	3	10:30	200	
6-Oct-08	Great Blue Heron	2	10:30	100	
6-Oct-08	Green-winged Teal	2	10:30	400	
6-Oct-08	Savannah Sparrow	1	10:30	100	
6-Oct-08	Savannah Sparrow	1	10:30	100	
6-Oct-08	American Black Duck	15	11:00	400	
6-Oct-08	American Crow	1	11:00	200	
6-Oct-08	Great Blue Heron	1	11:00	400	
6-Oct-08	Great Blue Heron	1	11:00	400	
6-Oct-08	Least Sandpiper	1	11:00	100	
6-Oct-08	Savannah Sparrow	1	11:00	100	
6-Oct-08	Savannah Sparrow	1	11:00	100	
6-Oct-08	Semipalmated Plover	2	11:00	100	
6-Oct-08	American Black Duck	2	11:30	100	
6-Oct-08	American Black Duck	2	11:30	300	
6-Oct-08	American Black Duck	2	11:30	300	
6-Oct-08	American Black Duck	12	11:30	400	
6-Oct-08	Great Blue Heron	2	11:30	100	
6-Oct-08	Great Blue Heron	1	11:30	300	
6-Oct-08	Great Blue Heron	1	11:30	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
6-Oct-08	Greater Yellowlegs	2	11:30	200	
6-Oct-08	Green-winged Teal	2	11:30	400	
6-Oct-08	Savannah Sparrow	1	11:30	100	
6-Oct-08	Savannah Sparrow	1	11:30	100	
6-Oct-08	Semipalmated Plover	1	11:30	100	
6-Oct-08	Semipalmated Plover	1	11:30	100	
6-Oct-08	Semipalmated Plover	2	11:30	100	
6-Oct-08	Semipalmated Plover	2	11:30	100	
6-Oct-08	Semipalmated Sandpiper	1	11:30	100	
6-Oct-08	Semipalmated Sandpiper	1	11:30	100	
6-Oct-08	Semipalmated Sandpiper	3	11:30	100	
6-Oct-08	Semipalmated Sandpiper	1	11:30	200	
6-Oct-08	Semipalmated Sandpiper	8	11:30	200	
6-Oct-08	American Black Duck	2	12:00	100	
6-Oct-08	American Black Duck	2	12:00	100	
6-Oct-08	American Black Duck	2	12:00	300	
6-Oct-08	American Black Duck	12	12:00	400	
6-Oct-08	Greater Yellowlegs	2	12:00	400	
6-Oct-08	Green-winged Teal	4	12:00	400	
6-Oct-08	Green-winged Teal	1	12:00	400	
6-Oct-08	Semipalmated Plover	2	12:00	100	
6-Oct-08	Semipalmated Plover	1	12:00	100	
6-Oct-08	Semipalmated Sandpiper	1	12:00	100	
6-Oct-08	American Black Duck	8	12:30	300	
6-Oct-08	American Black Duck	4	12:30	300	
6-Oct-08	American Black Duck	4	12:30	400	
6-Oct-08	American Black Duck	1	12:30	400	
6-Oct-08	American Black Duck	12	12:30	400	
6-Oct-08	Great Blue Heron	1	12:30	100	
6-Oct-08	Green-winged Teal	2	12:30	300	
6-Oct-08	Green-winged Teal	4	12:30	300	
6-Oct-08	Green-winged Teal	4	12:30	400	
6-Oct-08	Green-winged Teal	12	12:30	400	
6-Oct-08	Green-winged Teal	2	12:30	400	
6-Oct-08	Semipalmated Plover	30	12:30	100	
6-Oct-08	Semipalmated Sandpiper	15	12:30	100	
6-Oct-08	American Black Duck	10	13:00	400	
6-Oct-08	American Black Duck	1	13:00	500	
6-Oct-08	Great Blue Heron	1	13:00	400	
6-Oct-08	Great Blue Heron	1	13:00	400	
6-Oct-08	Great Blue Heron	1	13:00	400	
6-Oct-08	Ring-billed Gull	9	13:00	400	
6-Oct-08	Ring-billed Gull	6	13:00	300	
6-Oct-08	Ring-billed Gull	10	13:00	500	
6-Oct-08	American Black Duck	2	13:30	300	
6-Oct-08	American Black Duck	12	13:30	400	
6-Oct-08	American Black Duck	4	13:30	400	
6-Oct-08	American Black Duck	10	13:30	400	
6-Oct-08	Greater Yellowlegs	2	13:30	400	
6-Oct-08	Greater Yellowlegs	1	13:30	100	
6-Oct-08	Green-winged Teal	2	13:30	400	
6-Oct-08	Gull sp.	15	13:30	900	
6-Oct-08	Semipalmated Plover	25	13:30	200	
6-Oct-08	Semipalmated Sandpiper	5	13:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
6-Oct-08	American Black Duck	2	14:00	100	
6-Oct-08	American Black Duck	4	14:00	200	
6-Oct-08	American Black Duck	6	14:00	200	
6-Oct-08	American Black Duck	6	14:00	300	
6-Oct-08	American Black Duck	16	14:00	400	
6-Oct-08	American Black Duck	2	14:00	400	
6-Oct-08	Double-crested Cormorant	1	14:00	400	
6-Oct-08	Greater Yellowlegs	1	14:00	300	
6-Oct-08	Green-winged Teal	12	14:00	200	
6-Oct-08	Green-winged Teal	9	14:00	300	
6-Oct-08	Gull sp.	30	14:00	900	
6-Oct-08	Ring-billed Gull	1	14:00	100	
6-Oct-08	Ring-billed Gull	1	14:00	200	
6-Oct-08	Ring-billed Gull	1	14:00	300	
6-Oct-08	Ring-billed Gull	30	14:00	400	
6-Oct-08	Semipalmated Plover	10	14:00	100	
6-Oct-08	Semipalmated Plover	6	14:00	300	
6-Oct-08	Semipalmated Sandpiper	20	14:00	100	
6-Oct-08	Semipalmated Sandpiper	15	14:00	100	
6-Oct-08	Semipalmated Sandpiper	5	14:00	300	
6-Oct-08	American Black Duck	4	14:30	100	
6-Oct-08	American Black Duck	6	14:30	100	
6-Oct-08	American Black Duck	1	14:30	100	
6-Oct-08	American Black Duck	1	14:30	200	
6-Oct-08	American Black Duck	6	14:30	200	
6-Oct-08	American Black Duck	6	14:30	400	
6-Oct-08	American Black Duck	1	14:30	400	
6-Oct-08	American Black Duck	6	14:30	400	
6-Oct-08	American Black Duck	6	14:30	400	
6-Oct-08	Great Blue Heron	1	14:30	400	
6-Oct-08	Green-winged Teal	10	14:30	400	
6-Oct-08	Green-winged Teal	4	14:30	400	
6-Oct-08	Gull sp.	15	14:30	900	
6-Oct-08	Mallard	2	14:30	300	
6-Oct-08	Ring-billed Gull	1	14:30	300	
6-Oct-08	Ring-billed Gull	7	14:30	500	
6-Oct-08	Semipalmated Plover	20	14:30	500	
6-Oct-08	American Black Duck	6	15:00	100	
6-Oct-08	American Black Duck	2	15:00	100	
6-Oct-08	American Black Duck	2	15:00	200	
6-Oct-08	American Black Duck	8	15:00	400	
6-Oct-08	American Black Duck	5	15:00	400	
6-Oct-08	American Black Duck	6	15:00	400	
6-Oct-08	American Black Duck	4	15:00	400	
6-Oct-08	American Black Duck	14	15:00	500	
6-Oct-08	Great Blue Heron	1	15:00	400	
6-Oct-08	Great Blue Heron	1	15:00	400	
6-Oct-08	Green-winged Teal	4	15:00	400	
6-Oct-08	Green-winged Teal	10	15:00	400	
6-Oct-08	Semipalmated Plover	2	15:00	100	
6-Oct-08	Semipalmated Plover	25	15:00	400	
6-Oct-08	Semipalmated Sandpiper	5	15:00	100	
6-Oct-08	Semipalmated Sandpiper	5	15:00	400	
6-Oct-08	American Black Duck	2	15:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
6-Oct-08	American Black Duck	6	15:30	100	
6-Oct-08	American Black Duck	2	15:30	200	
6-Oct-08	American Black Duck	5	15:30	300	
6-Oct-08	American Black Duck	4	15:30	400	
6-Oct-08	American Black Duck	3	15:30	400	
6-Oct-08	American Black Duck	1	15:30	500	
6-Oct-08	American Black Duck	2	15:30	500	
6-Oct-08	American Black Duck	4	15:30	700	
6-Oct-08	Great Black-backed Gull	1	15:30	800	
6-Oct-08	Great Blue Heron	1	15:30	400	
6-Oct-08	Great Blue Heron	1	15:30	400	
6-Oct-08	Green-winged Teal	8	15:30	400	
6-Oct-08	Semipalmated Plover	50	15:30	100	
6-Oct-08	Semipalmated Plover	2	15:30	100	
6-Oct-08	Semipalmated Plover	25	15:30	400	
6-Oct-08	Semipalmated Sandpiper	10	15:30	100	
6-Oct-08	American Black Duck	2	16:00	100	
6-Oct-08	American Black Duck	2	16:00	200	
6-Oct-08	American Black Duck	6	16:00	300	
6-Oct-08	American Black Duck	2	16:00	400	
6-Oct-08	American Black Duck	2	16:00	600	
6-Oct-08	American Black Duck	2	16:00	700	
6-Oct-08	Double-crested Cormorant	1	16:00	600	
6-Oct-08	Great Black-backed Gull	1	16:00	700	
6-Oct-08	Great Blue Heron	1	16:00	400	
6-Oct-08	Green-winged Teal	5	16:00	400	
6-Oct-08	Green-winged Teal	1	16:00	400	
6-Oct-08	Semipalmated Plover	15	16:00	100	
6-Oct-08	Semipalmated Sandpiper	20	16:00	100	
6-Oct-08	American Black Duck	7	16:30	100	
6-Oct-08	American Black Duck	10	16:30	100	
6-Oct-08	American Black Duck	7	16:30	100	
6-Oct-08	American Black Duck	6	16:30	300	
6-Oct-08	American Black Duck	5	16:30	600	
6-Oct-08	American Black Duck	8	16:30	600	
6-Oct-08	American Black Duck	40	16:30	800	
6-Oct-08	Great Black-backed Gull	1	16:30	700	
6-Oct-08	Green-winged Teal	6	16:30	400	
6-Oct-08	Shorebird	50	16:30	900	
6-Oct-08	Bald Eagle	1	17:00	800	
6-Oct-08	American Black Duck	4	17:00	300	
6-Oct-08	American Black Duck	6	17:00	300	
6-Oct-08	American Black Duck	7	17:00	400	
6-Oct-08	American Black Duck	25	17:00	500	
6-Oct-08	American Black Duck	15	17:00	600	
6-Oct-08	American Black Duck	20	17:00	700	
6-Oct-08	American Black Duck	6	17:00	700	
6-Oct-08	Great Blue Heron	1	17:00	400	
6-Oct-08	Great Blue Heron	14	17:00	700	
6-Oct-08	Green-winged Teal	8	17:00	400	
6-Oct-08	American Black Duck	2	17:30	400	
6-Oct-08	American Black Duck	7	17:30	400	
6-Oct-08	American Black Duck	2	17:30	500	
6-Oct-08	American Black Duck	5	17:30	700	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
6-Oct-08	Greater Yellowlegs	4	18:00	100	
6-Oct-08	American Black Duck	4	18:00	400	
6-Oct-08	American Black Duck	5	18:00	600	
6-Oct-08	Great Blue Heron	1	18:00	300	
6-Oct-08	Great Blue Heron	1	18:00	400	
6-Oct-08	Great Blue Heron	1	18:00	400	
6-Oct-08	Great Blue Heron	1	0:00	400	
26-Sep-08	American Black Duck	2	9:30	100	
26-Sep-08	American Black Duck	3	9:30	800	
26-Sep-08	American Black Duck	3	9:30	800	
26-Sep-08	American Black Duck	1	9:30	800	
26-Sep-08	Semipalmated Plover	2	9:30	100	
26-Sep-08	American Black Duck	2	10:00	400	
26-Sep-08	American Black Duck	2	10:00	400	
26-Sep-08	American Black Duck	2	10:00	600	
26-Sep-08	American Black Duck	1	10:00	800	
26-Sep-08	Savannah Sparrow	1	10:00	100	
26-Sep-08	Semipalmated Plover	2	10:00	100	
26-Sep-08	Semipalmated Sandpiper	2	10:00	100	
26-Sep-08	Spotted Sandpiper	1	10:00	100	
26-Sep-08	American Black Duck	1	10:30	100	
26-Sep-08	American Black Duck	1	10:30	600	
26-Sep-08	American Black Duck	2	10:30	800	
26-Sep-08	Double-crested Cormorant	2	10:30	200	
26-Sep-08	Savannah Sparrow	1	10:30	100	
26-Sep-08	Semipalmated Plover	2	10:30	100	
26-Sep-08	American Black Duck	1	11:00	600	
26-Sep-08	American Black Duck	3	11:00	600	
26-Sep-08	American Black Duck	1	11:00	600	
26-Sep-08	American Black Duck	1	11:00	700	
26-Sep-08	Great Black-backed Gull	2	11:00	800	
26-Sep-08	Semipalmated Plover	2	11:00	100	
26-Sep-08	American Black Duck	2	11:30	100	
26-Sep-08	American Black Duck	1	11:30	600	
26-Sep-08	American Black Duck	12	11:30	700	
26-Sep-08	Double-crested Cormorant	1	11:30	700	
26-Sep-08	Double-crested Cormorant	1	11:30	800	
26-Sep-08	Great Black-backed Gull	1	11:30	600	
26-Sep-08	Mallard	1	11:30	600	
26-Sep-08	Semipalmated Plover	2	11:30	100	
26-Sep-08	American Black Duck	12	12:00	700	
26-Sep-08	Semipalmated Plover	3	12:00	100	
26-Sep-08	American Black Duck	7	12:30	100	
26-Sep-08	American Black Duck	1	12:30	200	
26-Sep-08	American Black Duck	2	12:30	300	
26-Sep-08	American Black Duck	7	12:30	500	
26-Sep-08	American Black Duck	8	12:30	500	
26-Sep-08	American Black Duck	2	12:30	500	
26-Sep-08	American Black Duck	1	12:30	600	
26-Sep-08	American Black Duck	1	12:30	600	
26-Sep-08	Green-winged Teal	2	12:30	500	
26-Sep-08	Ring-billed Gull	1	12:30	100	
26-Sep-08	Savannah Sparrow	1	12:30	100	
26-Sep-08	Semipalmated Plover	1	12:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
26-Sep-08	Semipalmated Plover	2	12:30	100	
26-Sep-08	American Black Duck	4	13:00	100	
26-Sep-08	American Black Duck	2	13:00	200	
26-Sep-08	American Black Duck	1	13:00	400	
26-Sep-08	American Black Duck	1	13:00	500	
26-Sep-08	American Black Duck	1	13:00	500	
26-Sep-08	American Black Duck	3	13:00	500	
26-Sep-08	American Black Duck	5	13:00	600	
26-Sep-08	American Black Duck	5	13:00	800	
26-Sep-08	Double-crested Cormorant	1	13:00	600	
26-Sep-08	Double-crested Cormorant	1	13:00	800	
26-Sep-08	Greater Yellowlegs	2	13:00	100	
26-Sep-08	Greater Yellowlegs	1	13:00	100	
26-Sep-08	shorebird	15	13:00	700	
26-Sep-08	Semipalmated Plover	3	13:00	100	
26-Sep-08	American Black Duck	4	13:30	100	
26-Sep-08	American Black Duck	3	13:30	100	
26-Sep-08	American Black Duck	2	13:30	200	
26-Sep-08	American Black Duck	8	13:30	200	
26-Sep-08	American Black Duck	2	13:30	300	
26-Sep-08	American Black Duck	3	13:30	600	
26-Sep-08	American Black Duck	2	13:30	600	
26-Sep-08	American Black Duck	4	13:30	600	
26-Sep-08	American Black Duck	40	13:30	800	
26-Sep-08	Great Black-backed Gull	1	13:30	200	
26-Sep-08	Greater Yellowlegs	3	13:30	100	
26-Sep-08	Ring-billed Gull	8	13:30	100	
26-Sep-08	Ring-billed Gull	5	13:30	100	
26-Sep-08	Ring-billed Gull	1	13:30	100	
26-Sep-08	Semipalmated Plover	4	13:30	200	
26-Sep-08	American Black Duck	1	14:00	100	
26-Sep-08	American Black Duck	1	14:00	200	
26-Sep-08	American Black Duck	6	14:00	200	
26-Sep-08	American Black Duck	2	14:00	200	
26-Sep-08	American Black Duck	2	14:00	400	
26-Sep-08	American Black Duck	6	14:00	600	
26-Sep-08	American Black Duck	12	14:00	800	
26-Sep-08	Greater Yellowlegs	3	14:00	100	
26-Sep-08	Greater Yellowlegs	1	14:00	200	
26-Sep-08	Green-winged Teal	2	14:00	400	
26-Sep-08	Herring Gull	2	14:00	100	
26-Sep-08	Ring-billed Gull	60	14:00	100	
26-Sep-08	Semipalmated Plover	4	14:00	200	
26-Sep-08	American Black Duck	4	14:30	100	
26-Sep-08	American Black Duck	2	14:30	100	
26-Sep-08	American Black Duck	1	14:30	400	
26-Sep-08	American Black Duck	3	14:30	400	
26-Sep-08	American Black Duck	2	14:30	400	
26-Sep-08	American Black Duck	8	14:30	400	
26-Sep-08	American Black Duck	12	14:30	500	
26-Sep-08	American Black Duck	5	14:30	800	
26-Sep-08	Double-crested Cormorant	1	14:30	400	
26-Sep-08	Greater Yellowlegs	3	14:30	200	
26-Sep-08	Herring Gull	2	14:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
26-Sep-08	Ring-billed Gull	3	14:30	100	
26-Sep-08	Ring-billed Gull	3	14:30	100	
26-Sep-08	Ring-billed Gull	50	14:30	100	
26-Sep-08	Ring-billed Gull	25	14:30	100	
26-Sep-08	Ring-billed Gull	7	14:30	100	
26-Sep-08	Ring-billed Gull	1	14:30	100	
26-Sep-08	Ring-billed Gull	1	14:30	300	
26-Sep-08	Semipalmated Plover	4	14:30	100	
26-Sep-08	American Black Duck	8	15:00	200	
26-Sep-08	American Black Duck	7	15:00	400	
26-Sep-08	American Black Duck	4	15:00	400	
26-Sep-08	American Black Duck	4	15:00	400	
26-Sep-08	Greater Yellowlegs	2	15:00	300	
26-Sep-08	Greater Yellowlegs	1	15:00	300	
26-Sep-08	Green-winged Teal	4	15:00	400	
26-Sep-08	Ring-billed Gull	40	15:00	100	
26-Sep-08	Ring-billed Gull	3	15:00	100	
26-Sep-08	Ring-billed Gull	6	15:00	100	
26-Sep-08	Ring-billed Gull	3	15:00	100	
26-Sep-08	Ring-billed Gull	1	15:00	200	
26-Sep-08	Ring-billed Gull	12	15:00	600	
26-Sep-08	Semipalmated Plover	4	15:00	100	
26-Sep-08	American Black Duck	2	15:30	100	
26-Sep-08	American Black Duck	2	15:30	300	
26-Sep-08	American Black Duck	8	15:30	300	
26-Sep-08	American Black Duck	2	15:30	400	
26-Sep-08	American Black Duck	4	15:30	600	
26-Sep-08	Greater Yellowlegs	1	15:30	200	
26-Sep-08	Greater Yellowlegs	1	15:30	600	
26-Sep-08	Ring-billed Gull	2	15:30	100	
26-Sep-08	Ring-billed Gull	40	15:30	100	
26-Sep-08	Ring-billed Gull	4	15:30	100	
26-Sep-08	Ring-billed Gull	8	15:30	100	
26-Sep-08	Ring-billed Gull	7	15:30	400	
26-Sep-08	Ring-billed Gull	10	15:30	600	
26-Sep-08	Semipalmated Plover	4	15:30	200	
26-Sep-08	American Black Duck	2	16:00	200	
26-Sep-08	American Black Duck	2	16:00	300	
26-Sep-08	American Black Duck	2	16:00	400	
26-Sep-08	Double-crested Cormorant	1	16:00	600	
26-Sep-08	Great Blue Heron	1	16:00	100	
26-Sep-08	Greater Yellowlegs	1	16:00	300	
26-Sep-08	Ring-billed Gull	1	16:00	100	
26-Sep-08	Ring-billed Gull	3	16:00	100	
26-Sep-08	Ring-billed Gull	8	16:00	100	
26-Sep-08	Ring-billed Gull	11	16:00	100	
26-Sep-08	Ring-billed Gull	12	16:00	100	
26-Sep-08	Ring-billed Gull	2	16:00	200	
26-Sep-08	Ring-billed Gull	6	16:00	300	
26-Sep-08	Ring-billed Gull	1	16:00	300	
26-Sep-08	Ring-billed Gull	2	16:00	600	
26-Sep-08	American Black Duck	8	16:30	400	
26-Sep-08	Green-winged Teal	2	16:30	300	
26-Sep-08	Ring-billed Gull	1	16:30	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
26-Sep-08	Ring-billed Gull	12	16:30	300	
26-Sep-08	Ring-billed Gull	5	16:30	300	
26-Sep-08	Ring-billed Gull	5	16:30	500	
26-Sep-08	American Black Duck	2	17:00	300	
26-Sep-08	American Black Duck	10	17:00	300	
26-Sep-08	American Black Duck	10	17:00	300	
26-Sep-08	Great Blue Heron	1	17:00	100	
26-Sep-08	Great Blue Heron	3	17:00	400	
26-Sep-08	Greater Yellowlegs	2	17:00	400	
26-Sep-08	Green-winged Teal	2	17:00	300	
26-Sep-08	Ring-billed Gull	9	17:00	200	
26-Sep-08	Ring-billed Gull	5	17:00	300	
26-Sep-08	Ring-billed Gull	5	17:00	300	
26-Sep-08	Ring-billed Gull	8	17:00	400	
26-Sep-08	Ring-billed Gull	2	17:00	600	
26-Sep-08	Shorebird	300	17:00	900	
26-Sep-08	American Black Duck	2	17:30	200	
26-Sep-08	American Black Duck	2	17:30	300	
26-Sep-08	American Black Duck	16	17:30	400	
26-Sep-08	Great Blue Heron	1	17:30	100	
26-Sep-08	Great Blue Heron	1	17:30	300	
26-Sep-08	Greater Yellowlegs	1	17:30	300	
26-Sep-08	Greater Yellowlegs	2	17:30	400	
26-Sep-08	Ring-billed Gull	7	17:30	100	
26-Sep-08	Ring-billed Gull	10	17:30	400	
26-Sep-08	Ring-billed Gull	8	17:30	500	
26-Sep-08	Ring-billed Gull	10	17:30	600	
26-Sep-08	Shorebird	50	17:30	900	
26-Sep-08	American Black Duck	3	18:00	400	
26-Sep-08	American Black Duck	25	18:00	400	
26-Sep-08	American Black Duck	8	18:00	400	
26-Sep-08	Great Blue Heron	1	18:00	100	
26-Sep-08	Great Blue Heron	1	18:00	400	
26-Sep-08	Great Blue Heron	1	18:00	500	
26-Sep-08	Shorebird	10	18:00	600	
26-Sep-08	American Crow	2	18:30	200	
26-Sep-08	American Black Duck	25	18:30	400	
26-Sep-08	American Black Duck	10	18:30	600	
26-Sep-08	American Black Duck	50	18:30	600	
26-Sep-08	Great Blue Heron	1	18:30	400	
26-Sep-08	Ring-billed Gull	10	0:00	300	
26-Sep-08	Ring-billed Gull	1	0:00	600	
26-Sep-08	Ring-billed Gull	5	0:00	600	
15-Sep-08	American Black Duck	22	9:00	300	
15-Sep-08	American Black Duck	7	9:00	300	
15-Sep-08	American Black Duck	3	9:00	300	
15-Sep-08	American Black Duck	9	9:00	300	
15-Sep-08	American Black Duck	2	9:00	400	
15-Sep-08	Greater Yellowlegs	3	9:00	200	
15-Sep-08	Greater Yellowlegs	2	9:00	200	
15-Sep-08	Ring-billed Gull	20	9:00	600	
15-Sep-08	Shorebird	10	9:00	900	
15-Sep-08	American Black Duck	2	9:30	200	
15-Sep-08	American Black Duck	2	9:30	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Sep-08	American Black Duck	7	9:30	200	
15-Sep-08	American Black Duck	22	9:30	300	
15-Sep-08	American Black Duck	2	9:30	300	
15-Sep-08	American Black Duck	8	9:30	300	
15-Sep-08	Ring-billed Gull	10	9:30	400	
15-Sep-08	Ring-billed Gull	4	9:30	500	
15-Sep-08	Ring-billed Gull	5	9:30	500	
15-Sep-08	Shorebird	100	9:30	900	
15-Sep-08	American Black Duck	4	10:00	200	
15-Sep-08	American Black Duck	2	10:00	200	
15-Sep-08	American Black Duck	20	10:00	300	
15-Sep-08	American Black Duck	30	10:00	300	
15-Sep-08	American Black Duck	5	10:00	400	
15-Sep-08	American Black Duck	2	10:00	400	
15-Sep-08	American Black Duck	5	10:00	500	
15-Sep-08	Double-crested Cormorant	1	10:00	700	
15-Sep-08	Greater Yellowlegs	2	10:00	200	
15-Sep-08	Ring-billed Gull	2	10:00	500	
15-Sep-08	Ring-billed Gull	7	10:00	500	
15-Sep-08	Shorebird	50	10:00	900	
15-Sep-08	American Black Duck	3	10:30	100	
15-Sep-08	American Black Duck	30	10:30	300	
15-Sep-08	American Black Duck	4	10:30	600	
15-Sep-08	American Black Duck	30	10:30	800	
15-Sep-08	American Black Duck	1	10:30	1000	
15-Sep-08	American Crow	12	10:30	200	
15-Sep-08	Double-crested Cormorant	1	10:30	700	
15-Sep-08	Greater Yellowlegs	2	10:30	200	
15-Sep-08	Green-winged Teal	2	10:30	200	
15-Sep-08	Ring-billed Gull	2	10:30	200	
15-Sep-08	Ring-billed Gull	4	10:30	600	
15-Sep-08	Ring-billed Gull	50	10:30	700	
15-Sep-08	American Black Duck	2	11:00	300	
15-Sep-08	American Black Duck	7	11:00	600	
15-Sep-08	American Black Duck	20	11:00	700	
15-Sep-08	Double-crested Cormorant	1	11:00	800	
15-Sep-08	Greater Yellowlegs	1	11:00	200	
15-Sep-08	Ring-billed Gull	2	11:00	300	
15-Sep-08	American Black Duck	2	11:30	100	
15-Sep-08	American Black Duck	1	11:30	100	
15-Sep-08	American Black Duck	2	11:30	100	
15-Sep-08	American Black Duck	1	11:30	100	
15-Sep-08	American Black Duck	2	11:30	400	
15-Sep-08	American Black Duck	2	11:30	700	
15-Sep-08	Greater Yellowlegs	2	11:30	100	
15-Sep-08	Greater Yellowlegs	1	11:30	400	
15-Sep-08	Greater Yellowlegs	2	11:30	400	
15-Sep-08	Savannah Sparrow	1	11:30	100	
15-Sep-08	American Black Duck	2	12:00	800	
15-Sep-08	Double-crested Cormorant	1	12:00	800	
15-Sep-08	Great Black-backed Gull	1	12:00	700	
15-Sep-08	American Black Duck	1	12:30	100	
15-Sep-08	American Black Duck	1	12:30	600	
15-Sep-08	American Black Duck	4	12:30	600	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Sep-08	American Black Duck	200	12:30	800	
15-Sep-08	American Black Duck	10	12:30	800	
15-Sep-08	Bald Eagle	2	12:30	900	
15-Sep-08	Great Black-backed Gull	1	12:30	500	
15-Sep-08	Great Blue Heron	5	12:30	200	
15-Sep-08	American Black Duck	1	13:00	200	
15-Sep-08	American Black Duck	200	13:00	800	
15-Sep-08	American Black Duck	20	13:00	900	
15-Sep-08	Double-crested Cormorant	3	13:00	700	
15-Sep-08	American Black Duck	1	13:30	100	
15-Sep-08	American Black Duck	3	13:30	600	
15-Sep-08	American Black Duck	20	13:30	600	
15-Sep-08	American Black Duck	2	13:30	600	
15-Sep-08	American Black Duck	200	13:30	700	
15-Sep-08	Double-crested Cormorant	1	13:30	100	
15-Sep-08	Great Black-backed Gull	1	13:30	500	
15-Sep-08	Savannah Sparrow	1	13:30	100	
15-Sep-08	American Black Duck	40	14:00	700	
15-Sep-08	Double-crested Cormorant	1	14:00	600	
15-Sep-08	Great Black-backed Gull	1	14:00	600	
15-Sep-08	Ring-billed Gull	1	14:00	700	
15-Sep-08	American Black Duck	8	14:30	600	
15-Sep-08	American Black Duck	1	14:30	600	
15-Sep-08	American Black Duck	5	14:30	600	
15-Sep-08	Great Black-backed Gull	1	14:30	700	
15-Sep-08	Great Blue Heron	1	14:30	400	
15-Sep-08	Ring-billed Gull	1	14:30	700	
15-Sep-08	American Black Duck	1	15:00	100	
15-Sep-08	American Black Duck	4	15:00	100	
15-Sep-08	American Black Duck	1	15:00	500	
15-Sep-08	American Black Duck	1	15:00	600	
15-Sep-08	Greater Yellowlegs	1	15:00	100	
15-Sep-08	Greater Yellowlegs	1	15:00	100	
15-Sep-08	Greater Yellowlegs	3	15:00	100	
15-Sep-08	Greater Yellowlegs	2	15:00	100	
15-Sep-08	American Black Duck	2	15:30	100	
15-Sep-08	American Black Duck	3	15:30	100	
15-Sep-08	American Black Duck	4	15:30	100	
15-Sep-08	American Black Duck	3	15:30	700	
15-Sep-08	Greater Yellowlegs	2	15:30	100	
15-Sep-08	Greater Yellowlegs	1	15:30	100	
15-Sep-08	Greater Yellowlegs	2	15:30	100	
15-Sep-08	Ring-billed Gull	2	15:30	100	
15-Sep-08	Ring-billed Gull	1	15:30	100	
15-Sep-08	Ring-billed Gull	1	15:30	100	
15-Sep-08	Ring-billed Gull	12	15:30	1000	
15-Sep-08	Ring-billed Gull	4	15:30	1000	
15-Sep-08	American Black Duck	4	16:00	100	
15-Sep-08	American Black Duck	4	16:00	300	
15-Sep-08	American Black Duck	8	16:00	400	
15-Sep-08	American Black Duck	2	16:00	400	
15-Sep-08	American Black Duck	3	16:00	1000	
15-Sep-08	Ring-billed Gull	12	16:00	100	
15-Sep-08	Ring-billed Gull	50	16:00	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Sep-08	Shorebird	300	16:00	800	
15-Sep-08	American Black Duck	4	16:30	400	
15-Sep-08	American Black Duck	5	16:30	400	
15-Sep-08	American Black Duck	8	16:30	500	
15-Sep-08	American Black Duck	2	16:30	600	
15-Sep-08	American Black Duck	5	16:30	600	
15-Sep-08	American Black Duck	8	16:30	700	
15-Sep-08	Great Black-backed Gull	1	16:30	400	
15-Sep-08	Ring-billed Gull	1	16:30	400	
15-Sep-08	Ring-billed Gull	3	16:30	400	
15-Sep-08	Shorebird	50	16:30	800	
15-Sep-08	American Black Duck	7	17:00	200	
15-Sep-08	American Black Duck	15	17:00	400	
15-Sep-08	American Black Duck	5	17:00	400	
15-Sep-08	American Black Duck	5	17:00	400	
15-Sep-08	Great Black-backed Gull	2	17:00	200	
15-Sep-08	Great Black-backed Gull	1	17:00	600	
15-Sep-08	Greater Yellowlegs	1	17:00	200	
15-Sep-08	Ring-billed Gull	6	17:00	200	
15-Sep-08	Ring-billed Gull	20	17:00	400	
15-Sep-08	Shorebird	100	17:00	800	
15-Sep-08	American Black Duck	2	17:30	300	
15-Sep-08	American Black Duck	12	17:30	400	
15-Sep-08	Double-crested Cormorant	2	17:30	400	
15-Sep-08	Great Black-backed Gull	1	17:30	300	
15-Sep-08	Ring-billed Gull	1	17:30	100	
15-Sep-08	Ring-billed Gull	2	17:30	100	
15-Sep-08	Ring-billed Gull	12	17:30	300	
15-Sep-08	Ring-billed Gull	50	17:30	500	
15-Sep-08	Ring-billed Gull	15	17:30	500	
15-Sep-08	shorebird	60	17:30	800	
15-Sep-08	Shorebird	60	17:30	1000	
15-Sep-08	American Black Duck	20	18:00	400	
15-Sep-08	Double-crested Cormorant	2	18:00	400	
15-Sep-08	Great Black-backed Gull	1	18:00	200	
15-Sep-08	Ring-billed Gull	20	18:00	200	
15-Sep-08	Ring-billed Gull	5	18:00	200	
15-Sep-08	Ring-billed Gull	4	18:00	400	
15-Sep-08	Ring-billed Gull	15	18:00	400	
15-Sep-08	Ring-billed Gull	15	18:00	500	
15-Sep-08	Shorebird	300	18:00	800	
15-Sep-08	Gull sp.	50	18:30		
5-Sep-08	American Black Duck	3	10:00	400	
5-Sep-08	American Black Duck	8	10:00	500	
5-Sep-08	Green-winged Teal	8	10:00	500	
5-Sep-08	shorebird	36	10:00	700	
5-Sep-08	Shorebird	170	10:00	900	
5-Sep-08	American Black Duck	1	10:30	400	
5-Sep-08	American Black Duck	10	10:30	500	
5-Sep-08	Green-winged Teal	8	10:30	400	
5-Sep-08	Green-winged Teal	3	10:30	400	
5-Sep-08	shorebird	4	10:30	700	
5-Sep-08	Shorebird	90	10:30	900	
5-Sep-08	American Black Duck	10	11:00	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Sep-08	Greater Yellowlegs	2	11:00	500	
5-Sep-08	Green-winged Teal	2	11:00	400	
5-Sep-08	Green-winged Teal	5	11:00	500	
5-Sep-08	Green-winged Teal	2	11:00	500	
5-Sep-08	shorebird	40	11:00	700	
5-Sep-08	Shorebird	150	11:00	900	
5-Sep-08	American Black Duck	3	11:30	300	
5-Sep-08	American Black Duck	10	11:30	400	
5-Sep-08	Black-bellied Plover	2	11:30	700	
5-Sep-08	Great Blue Heron	8	11:30	200	
5-Sep-08	Greater Yellowlegs	2	11:30	100	
5-Sep-08	Greater Yellowlegs	1	11:30	500	
5-Sep-08	Green-winged Teal	6	11:30	400	
5-Sep-08	Green-winged Teal	2	11:30	500	
5-Sep-08	Green-winged Teal	6	11:30	600	
5-Sep-08	shorebird	60	11:30	700	
5-Sep-08	Shorebird	30	11:30	900	
5-Sep-08	American Black Duck	3	12:00	300	
5-Sep-08	American Black Duck	7	12:00	500	
5-Sep-08	American Black Duck	3	12:00	600	
5-Sep-08	Black-bellied Plover	2	12:00	700	
5-Sep-08	Great Blue Heron	3	12:00	300	
5-Sep-08	Greater Yellowlegs	3	12:00	500	
5-Sep-08	Green-winged Teal	8	12:00	500	
5-Sep-08	Green-winged Teal	5	12:00	500	
5-Sep-08	shorebird	15	12:00	600	
5-Sep-08	Shorebird	70	12:00	900	
5-Sep-08	American Black Duck	3	12:30	300	
5-Sep-08	American Black Duck	10	12:30	500	
5-Sep-08	Great Blue Heron	3	12:30	300	
5-Sep-08	Greater Yellowlegs	1	12:30	300	
5-Sep-08	Greater Yellowlegs	1	12:30	400	
5-Sep-08	Greater Yellowlegs	1	12:30	500	
5-Sep-08	Green-winged Teal	3	12:30	300	
5-Sep-08	Green-winged Teal	2	12:30	400	
5-Sep-08	Green-winged Teal	5	12:30	500	
5-Sep-08	shorebird	29	12:30	700	
5-Sep-08	Semipalmated Plover	1	12:30	300	
5-Sep-08	Semipalmated Plover	19	12:30	500	
5-Sep-08	Semipalmated Sandpiper	10	12:30	500	
5-Sep-08	Semipalmated Sandpiper	8	12:30	600	
5-Sep-08	Shorebird	20	12:30	900	
5-Sep-08	American Black Duck	3	13:00	100	
5-Sep-08	American Black Duck	2	13:00	400	
5-Sep-08	American Black Duck	2	13:00	400	
5-Sep-08	American Black Duck	10	13:00	500	
5-Sep-08	American Black Duck	1	13:00	500	
5-Sep-08	American Black Duck	1	13:00	500	
5-Sep-08	American Black Duck	2	13:00	600	
5-Sep-08	American Black Duck	1	13:00	600	
5-Sep-08	Great Blue Heron	6	13:00	300	
5-Sep-08	Great Blue Heron	1	13:00	300	
5-Sep-08	Great Blue Heron	4	13:00	400	
5-Sep-08	Greater Yellowlegs	2	13:00	300	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Sep-08	Green-winged Teal	10	13:00	500	
5-Sep-08	Green-winged Teal	3	13:00	600	
5-Sep-08	Semipalmated Plover	1	13:00	500	
5-Sep-08	Semipalmated Plover	3	13:00	500	
5-Sep-08	Semipalmated Plover	4	13:00	600	
5-Sep-08	Semipalmated Sandpiper	1	13:00	300	
5-Sep-08	Semipalmated Sandpiper	4	13:00	400	
5-Sep-08	Semipalmated Sandpiper	1	13:00	500	
5-Sep-08	Semipalmated Sandpiper	13	13:00	600	
5-Sep-08	American Black Duck	6	13:30	500	
5-Sep-08	American Black Duck	1	13:30	500	
5-Sep-08	Double-crested Cormorant	1	13:30	800	
5-Sep-08	Greater Yellowlegs	1	13:30	400	
5-Sep-08	Green-winged Teal	4	13:30	500	
5-Sep-08	Green-winged Teal	3	13:30	500	
5-Sep-08	shorebird	8	13:30	700	
5-Sep-08	shorebird	12	13:30	700	
5-Sep-08	Semipalmated Plover	4	13:30	500	
5-Sep-08	Semipalmated Sandpiper	4	13:30	500	
5-Sep-08	Shorebird	30	13:30	900	
5-Sep-08	American Black Duck	1	14:00	300	
5-Sep-08	American Black Duck	5	14:00	400	
5-Sep-08	American Black Duck	2	14:00	400	
5-Sep-08	American Black Duck	3	14:00	700	
5-Sep-08	American Black Duck	40	14:00	800	
5-Sep-08	Black-bellied Plover	3	14:00	600	
5-Sep-08	Great Blue Heron	3	14:00	400	
5-Sep-08	Greater Yellowlegs	1	14:00	500	
5-Sep-08	Green-winged Teal	5	14:00	400	
5-Sep-08	Green-winged Teal	2	14:00	500	
5-Sep-08	Least Sandpiper	1	14:00	100	
5-Sep-08	shorebird	3	14:00	500	
5-Sep-08	shorebird	5	14:00	600	
5-Sep-08	shorebird	5	14:00	600	
5-Sep-08	shorebird	17	14:00	700	
5-Sep-08	shorebird	19	14:00	700	
5-Sep-08	Semipalmated Plover	11	14:00	100	
5-Sep-08	Semipalmated Plover	6	14:00	500	
5-Sep-08	Semipalmated Plover	12	14:00	1000	
5-Sep-08	Semipalmated Sandpiper	1	14:00	100	
5-Sep-08	Semipalmated Sandpiper	8	14:00	500	
5-Sep-08	American Black Duck	3	14:30	200	
5-Sep-08	American Black Duck	1	14:30	300	
5-Sep-08	American Black Duck	5	14:30	400	
5-Sep-08	American Black Duck	2	14:30	700	
5-Sep-08	American Black Duck	31	14:30	800	
5-Sep-08	American Black Duck	6	14:30	800	
5-Sep-08	Black-bellied Plover	2	14:30	600	
5-Sep-08	Great Blue Heron	2	14:30	300	
5-Sep-08	Great Blue Heron	1	14:30	400	
5-Sep-08	Green-winged Teal	3	14:30	300	
5-Sep-08	Least Sandpiper	2	14:30	400	
5-Sep-08	shorebird	31	14:30	500	
5-Sep-08	shorebird	16	14:30	600	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Sep-08	shorebird	14	14:30	700	
5-Sep-08	Semipalmated Plover	2	14:30	400	
5-Sep-08	Semipalmated Sandpiper	7	14:30	400	
5-Sep-08	Shorebird	10	14:30	900	
5-Sep-08	American Black Duck	5	15:00	200	
5-Sep-08	American Black Duck	1	15:00	400	
5-Sep-08	American Black Duck	2	15:00	600	
5-Sep-08	American Black Duck	2	15:00	700	
5-Sep-08	American Black Duck	15	15:00	800	
5-Sep-08	Black-bellied Plover	3	15:00	600	
5-Sep-08	Great Blue Heron	3	15:00	300	
5-Sep-08	Greater Yellowlegs	3	15:00	400	
5-Sep-08	Green-winged Teal	4	15:00	300	
5-Sep-08	Mallard	1	15:00	400	
5-Sep-08	shorebird	25	15:00	700	
5-Sep-08	Ring-billed Gull	1	15:00	700	
5-Sep-08	Ring-billed Gull	1	15:00	800	
5-Sep-08	Semipalmated Plover	4	15:00	100	
5-Sep-08	Shorebird	80	15:00	900	
5-Sep-08	American Black Duck	2	15:30	100	
5-Sep-08	American Black Duck	2	15:30	100	
5-Sep-08	Great Blue Heron	2	15:30	300	
5-Sep-08	Great Blue Heron	2	15:30	300	
5-Sep-08	Greater Yellowlegs	1	15:30	100	
5-Sep-08	Greater Yellowlegs	2	15:30	100	
5-Sep-08	Green-winged Teal	1	15:30	300	
5-Sep-08	Green-winged Teal	1	15:30	300	
5-Sep-08	Green-winged Teal	1	15:30	500	
5-Sep-08	Least Sandpiper	10	15:30	100	
5-Sep-08	Least Sandpiper	10	15:30	100	
5-Sep-08	Mallard	1	15:30	400	
5-Sep-08	shorebird	57	15:30	700	
5-Sep-08	Semipalmated Plover	4	15:30	100	
5-Sep-08	American Black Duck	2	16:00	100	
5-Sep-08	Double-crested Cormorant	1	16:00	400	
5-Sep-08	Great Blue Heron	2	16:00	300	
5-Sep-08	Greater Yellowlegs	2	16:00	100	
5-Sep-08	Greater Yellowlegs	2	16:00	500	
5-Sep-08	Green-winged Teal	1	16:00	400	
5-Sep-08	Least Sandpiper	10	16:00	100	
5-Sep-08	Semipalmated Plover	7	16:00	100	
5-Sep-08	Semipalmated Sandpiper	12	16:00	100	
5-Sep-08	American Black Duck	3	16:30	100	
5-Sep-08	American Black Duck	1	16:30	400	
5-Sep-08	Double-crested Cormorant	1	16:30	100	
5-Sep-08	Great Blue Heron	2	16:30	300	
5-Sep-08	Great Blue Heron	1	16:30	300	
5-Sep-08	Greater Yellowlegs	2	16:30	100	
5-Sep-08	Greater Yellowlegs	2	16:30	100	
5-Sep-08	Least Sandpiper	1	16:30	100	
5-Sep-08	Semipalmated Plover	3	16:30	100	
5-Sep-08	American Crow	5	17:00	200	
5-Sep-08	Great Blue Heron	3	17:00	300	
5-Sep-08	Great Blue Heron	1	17:00	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Sep-08	Greater Yellowlegs	2	17:00	100	
5-Sep-08	American Black Duck	2	17:30	100	
5-Sep-08	American Black Duck	2	17:30	600	
5-Sep-08	American Black Duck	1	17:30	700	
5-Sep-08	Double-crested Cormorant	1	17:30	600	
5-Sep-08	Greater Yellowlegs	2	17:30	100	
5-Sep-08	Ring-billed Gull	1	17:30	500	
5-Sep-08	American Black Duck	4	18:00	600	
5-Sep-08	Double-crested Cormorant	1	18:00	600	
5-Sep-08	Least Sandpiper	1	18:00	100	
5-Sep-08	Ring-billed Gull	1	18:00	800	
5-Sep-08	Ring-billed Gull	3	18:00	800	
5-Sep-08	Ring-billed Gull	1	18:00	800	
5-Sep-08	Semipalmated Sandpiper	20	0:00	100	
5-Sep-08	Semipalmated Sandpiper	12	0:00	100	
25-Aug-08	Great Blue Heron	1	6:30	400	
25-Aug-08	American Black Duck	4	9:30	300	
25-Aug-08	American Black Duck	9	9:30	500	
25-Aug-08	American Black Duck	11	9:30	800	
25-Aug-08	Black-bellied Plover	4	9:30	100	
25-Aug-08	Greater Yellowlegs	1	9:30	200	
25-Aug-08	shorebird	35	9:30	400	
25-Aug-08	shorebird	40	9:30	400	
25-Aug-08	shorebird	200	9:30	600	
25-Aug-08	Semipalmated Plover	5	9:30	400	
25-Aug-08	Semipalmated Sandpiper	6	9:30	100	
25-Aug-08	Semipalmated Sandpiper	7	9:30	100	
25-Aug-08	Semipalmated Sandpiper	11	9:30	100	
25-Aug-08	Shorebird	100	9:30	800	
25-Aug-08	American Black Duck	5	10:00	100	
25-Aug-08	American Black Duck	1	10:00	100	
25-Aug-08	American Black Duck	2	10:00	100	
25-Aug-08	American Black Duck	2	10:00	900	
25-Aug-08	American Black Duck	15	10:00	900	
25-Aug-08	Black-bellied Plover	18	10:00	100	
25-Aug-08	Black-bellied Plover	5	10:00	100	
25-Aug-08	Black-bellied Plover	3	10:00	100	
25-Aug-08	Black-bellied Plover	4	10:00	100	
25-Aug-08	Black-bellied Plover	3	10:00	100	
25-Aug-08	Black-bellied Plover	2	10:00	400	
25-Aug-08	Greater Yellowlegs	1	10:00	100	
25-Aug-08	shorebird	26	10:00	400	
25-Aug-08	Semipalmated Sandpiper	1	10:00	100	
25-Aug-08	Semipalmated Sandpiper	9	10:00	100	
25-Aug-08	Semipalmated Sandpiper	2	10:00	300	
25-Aug-08	Semipalmated Sandpiper	16	10:00	300	
25-Aug-08	Semipalmated Sandpiper	3	10:00	400	
25-Aug-08	Semipalmated Sandpiper	29	10:00	400	
25-Aug-08	Shorebird	32	10:00	500	
25-Aug-08	Shorebird	50	10:00	600	
25-Aug-08	Shorebird	50	10:00	800	
25-Aug-08	American Black Duck	3	10:30	200	
25-Aug-08	American Black Duck	4	10:30	200	
25-Aug-08	American Black Duck	3	10:30	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	American Black Duck	1	10:30	400	
25-Aug-08	American Black Duck	1	10:30	700	
25-Aug-08	American Black Duck	1	10:30	900	
25-Aug-08	American Black Duck	17	10:30	900	
25-Aug-08	Black-bellied Plover	7	10:30	100	
25-Aug-08	Black-bellied Plover	2	10:30	300	
25-Aug-08	Greater Yellowlegs	1	10:30	100	
25-Aug-08	shorebird	59	10:30	300	
25-Aug-08	shorebird	100	10:30	400	
25-Aug-08	shorebird	10	10:30	400	
25-Aug-08	shorebird	100	10:30	500	
25-Aug-08	shorebird	300	10:30	800	
25-Aug-08	Ring-billed Gull	2	10:30	100	
25-Aug-08	Semipalmated Plover	5	10:30	100	
25-Aug-08	Semipalmated Sandpiper	5	10:30	100	
25-Aug-08	American Black Duck	1	11:00	200	
25-Aug-08	American Black Duck	2	11:00	300	
25-Aug-08	American Black Duck	2	11:00	400	
25-Aug-08	American Black Duck	4	11:00	400	
25-Aug-08	American Black Duck	3	11:00	800	
25-Aug-08	American Black Duck	4	11:00	900	
25-Aug-08	Black-bellied Plover	8	11:00	100	
25-Aug-08	Black-bellied Plover	18	11:00	300	
25-Aug-08	Black-bellied Plover	4	11:00	400	
25-Aug-08	Green-winged Teal	2	11:00	300	
25-Aug-08	shorebird	39	11:00	300	
25-Aug-08	shorebird	37	11:00	400	
25-Aug-08	shorebird	27	11:00	500	
25-Aug-08	shorebird	27	11:00	500	
25-Aug-08	shorebird	35	11:00	700	
25-Aug-08	Semipalmated Plover	8	11:00	100	
25-Aug-08	Semipalmated Sandpiper	1	11:00	100	
25-Aug-08	Semipalmated Sandpiper	12	11:00	100	
25-Aug-08	Shorebird	100	11:00	800	
25-Aug-08	American Black Duck	3	11:30	100	
25-Aug-08	American Black Duck	2	11:30	200	
25-Aug-08	American Black Duck	4	11:30	300	
25-Aug-08	American Black Duck	1	11:30	400	
25-Aug-08	Black-bellied Plover	12	11:30	100	
25-Aug-08	Black-bellied Plover	13	11:30	100	
25-Aug-08	Black-bellied Plover	1	11:30	300	
25-Aug-08	Double-crested Cormorant	1	11:30	800	
25-Aug-08	Great Black-backed Gull	1	11:30	200	
25-Aug-08	Green-winged Teal	4	11:30	300	
25-Aug-08	Herring Gull	2	11:30	200	
25-Aug-08	Lesser Yellowlegs	2	11:30	100	
25-Aug-08	Lesser Yellowlegs	1	11:30	100	
25-Aug-08	shorebird	43	11:30	400	
25-Aug-08	shorebird	52	11:30	400	
25-Aug-08	shorebird	20	11:30	500	
25-Aug-08	shorebird	50	11:30	600	
25-Aug-08	shorebird	300	11:30	700	
25-Aug-08	Ring-billed Gull	22	11:30	200	
25-Aug-08	Ring-billed Gull	11	11:30	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	Ring-billed Gull	1	11:30	900	
25-Aug-08	Semipalmated Sandpiper	9	11:30	100	
25-Aug-08	Semipalmated Sandpiper	11	11:30	100	
25-Aug-08	Shorebird	150	11:30	800	
25-Aug-08	American Black Duck	1	12:00	200	
25-Aug-08	American Black Duck	5	12:00	300	
25-Aug-08	American Black Duck	2	12:00	400	
25-Aug-08	Black-bellied Plover	2	12:00	100	
25-Aug-08	Black-bellied Plover	5	12:00	400	
25-Aug-08	Double-crested Cormorant	1	12:00	800	
25-Aug-08	Great Black-backed Gull	1	12:00	200	
25-Aug-08	Green-winged Teal	2	12:00	300	
25-Aug-08	Least Sandpiper	1	12:00	100	
25-Aug-08	Lesser Yellowlegs	1	12:00	100	
25-Aug-08	shorebird	27	12:00	400	
25-Aug-08	shorebird	60	12:00	500	
25-Aug-08	shorebird	50	12:00	700	
25-Aug-08	Ring-billed Gull	1	12:00	100	
25-Aug-08	Ring-billed Gull	7	12:00	600	
25-Aug-08	Semipalmated Sandpiper	3	12:00	100	
25-Aug-08	Semipalmated Sandpiper	9	12:00	100	
25-Aug-08	Semipalmated Sandpiper	1	12:00	100	
25-Aug-08	Semipalmated Sandpiper	15	12:00	400	
25-Aug-08	shorebird	150	12:00	800	
25-Aug-08	American Black Duck	1	12:30	100	
25-Aug-08	American Black Duck	2	12:30	300	
25-Aug-08	American Black Duck	1	12:30	300	
25-Aug-08	American Black Duck	2	12:30	300	
25-Aug-08	Black-bellied Plover	21	12:30	100	
25-Aug-08	Black-bellied Plover	3	12:30	100	
25-Aug-08	Great Black-backed Gull	1	12:30	200	
25-Aug-08	Green-winged Teal	2	12:30	300	
25-Aug-08	Green-winged Teal	2	12:30	300	
25-Aug-08	shorebird	27	12:30	400	
25-Aug-08	shorebird	42	12:30	500	
25-Aug-08	shorebird	71	12:30	700	
25-Aug-08	shorebird	100	12:30	800	
25-Aug-08	Ring-billed Gull	9	12:30	100	
25-Aug-08	Ring-billed Gull	1	12:30	100	
25-Aug-08	Ring-billed Gull	1	12:30	100	
25-Aug-08	Ring-billed Gull	2	12:30	400	
25-Aug-08	Ring-billed Gull	1	12:30	500	
25-Aug-08	Ring-billed Gull	2	12:30	700	
25-Aug-08	Semipalmated Sandpiper	4	12:30	300	
25-Aug-08	Shorebird	140	12:30	800	
25-Aug-08	American Black Duck	4	13:00	300	
25-Aug-08	American Black Duck	2	13:00	600	
25-Aug-08	Black-bellied Plover	15	13:00	600	
25-Aug-08	Greater Yellowlegs	1	13:00	300	
25-Aug-08	Green-winged Teal	4	13:00	300	
25-Aug-08	Least Sandpiper	1	13:00	100	
25-Aug-08	Lesser Yellowlegs	1	13:00	300	
25-Aug-08	shorebird	59	13:00	500	
25-Aug-08	shorebird	5	13:00	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	shorebird	60	13:00	600	
25-Aug-08	Ring-billed Gull	17	13:00	100	
25-Aug-08	Semipalmated Plover	3	13:00	100	
25-Aug-08	Semipalmated Plover	4	13:00	300	
25-Aug-08	Semipalmated Sandpiper	51	13:00	300	
25-Aug-08	Shorebird	150	13:00	800	
25-Aug-08	American Black Duck	5	13:30	300	
25-Aug-08	Black-bellied Plover	22	13:30	100	
25-Aug-08	Black-bellied Plover	4	13:30	500	
25-Aug-08	Greater Yellowlegs	1	13:30	100	
25-Aug-08	Greater Yellowlegs	3	13:30	300	
25-Aug-08	Green-winged Teal	4	13:30	300	
25-Aug-08	shorebird	42	13:30	400	
25-Aug-08	shorebird	29	13:30	600	
25-Aug-08	shorebird	10	13:30	600	
25-Aug-08	shorebird	90	13:30	1000	
25-Aug-08	Ring-billed Gull	12	13:30	100	
25-Aug-08	Ring-billed Gull	3	13:30	100	
25-Aug-08	Ring-billed Gull	5	13:30	100	
25-Aug-08	Ring-billed Gull	1	13:30	700	
25-Aug-08	Semipalmated Plover	5	13:30	100	
25-Aug-08	Shorebird	200	13:30	800	
25-Aug-08	American Black Duck	5	14:00	300	
25-Aug-08	Black-bellied Plover	18	14:00	100	
25-Aug-08	Greater Yellowlegs	3	14:00	300	
25-Aug-08	Green-winged Teal	5	14:00	300	
25-Aug-08	Least Sandpiper	15	14:00	100	
25-Aug-08	Least Sandpiper	3	14:00	100	
25-Aug-08	shorebird	150	14:00	700	
25-Aug-08	Ring-billed Gull	1	14:00	100	
25-Aug-08	Ring-billed Gull	2	14:00	200	
25-Aug-08	Ring-billed Gull	7	14:00	400	
25-Aug-08	Semipalmated Plover	3	14:00	100	
25-Aug-08	Semipalmated Sandpiper	31	14:00	100	
25-Aug-08	Shorebird	180	14:00	800	
25-Aug-08	American Black Duck	3	14:30	300	
25-Aug-08	Black-bellied Plover	7	14:30	100	
25-Aug-08	Black-bellied Plover	12	14:30	100	
25-Aug-08	Black-bellied Plover	6	14:30	400	
25-Aug-08	Greater Yellowlegs	1	14:30	300	
25-Aug-08	Green-winged Teal	3	14:30	300	
25-Aug-08	shorebird	1	14:30	300	
25-Aug-08	shorebird	12	14:30	700	
25-Aug-08	Ring-billed Gull	7	14:30	100	
25-Aug-08	Ring-billed Gull	4	14:30	100	
25-Aug-08	Ring-billed Gull	2	14:30	100	
25-Aug-08	Ring-billed Gull	1	14:30	100	
25-Aug-08	Ring-billed Gull	8	14:30	400	
25-Aug-08	Ring-billed Gull	2222	14:30	700	
25-Aug-08	Semipalmated Plover	2	14:30	300	
25-Aug-08	Semipalmated Sandpiper	1	14:30	100	
25-Aug-08	Semipalmated Sandpiper	4	14:30	300	
25-Aug-08	Shorebird	130	14:30	800	
25-Aug-08	American Black Duck	3	15:00	300	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	Black-bellied Plover	14	15:00	100	
25-Aug-08	Black-bellied Plover	2	15:00	300	
25-Aug-08	Great Black-backed Gull	1	15:00	200	
25-Aug-08	Greater Yellowlegs	1	15:00	300	
25-Aug-08	Greater Yellowlegs	1	15:00	300	
25-Aug-08	Green-winged Teal	3	15:00	300	
25-Aug-08	shorebird	33	15:00	500	
25-Aug-08	shorebird	30	15:00	700	
25-Aug-08	Ring-billed Gull	3	15:00	100	
25-Aug-08	Ring-billed Gull	3	15:00	100	
25-Aug-08	Ring-billed Gull	11	15:00	100	
25-Aug-08	Ring-billed Gull	17	15:00	200	
25-Aug-08	Ring-billed Gull	6	15:00	300	
25-Aug-08	Ring-billed Gull	2	15:00	400	
25-Aug-08	Ring-billed Gull	3	15:00	400	
25-Aug-08	Ring-billed Gull	6	15:00	600	
25-Aug-08	Ring-billed Gull	3	15:00	700	
25-Aug-08	Semipalmated Sandpiper	6	15:00	300	
25-Aug-08	Shorebird	330	15:00	800	
25-Aug-08	American Black Duck	3	15:30	300	
25-Aug-08	Black-bellied Plover	4	15:30	100	
25-Aug-08	Black-bellied Plover	7	15:30	100	
25-Aug-08	Black-bellied Plover	20	15:30	100	
25-Aug-08	Great Black-backed Gull	1	15:30	200	
25-Aug-08	Greater Yellowlegs	1	15:30	300	
25-Aug-08	shorebird	23	15:30	400	
25-Aug-08	shorebird	8	15:30	500	
25-Aug-08	shorebird	22	15:30	600	
25-Aug-08	shorebird	33	15:30	700	
25-Aug-08	Ring-billed Gull	3	15:30	100	
25-Aug-08	Ring-billed Gull	7	15:30	100	
25-Aug-08	Ring-billed Gull	7	15:30	100	
25-Aug-08	Semipalmated Plover	2	15:30	100	
25-Aug-08	Shorebird	290	15:30	800	
25-Aug-08	American Black Duck	3	16:00	300	
25-Aug-08	American Black Duck	3	16:00	400	
25-Aug-08	Black-bellied Plover	2	16:00	100	
25-Aug-08	Black-bellied Plover	1	16:00	100	
25-Aug-08	Black-bellied Plover	23	16:00	100	
25-Aug-08	Black-bellied Plover	2	16:00	100	
25-Aug-08	Black-bellied Plover	3	16:00	400	
25-Aug-08	Great Black-backed Gull	1	16:00	200	
25-Aug-08	Greater Yellowlegs	2	16:00	300	
25-Aug-08	Greater Yellowlegs	1	16:00	300	
25-Aug-08	Herring Gull	1	16:00	200	
25-Aug-08	shorebird	300	16:00	700	
25-Aug-08	Ring-billed Gull	8	16:00	100	
25-Aug-08	Ring-billed Gull	19	16:00	100	
25-Aug-08	Ring-billed Gull	3	16:00	100	
25-Aug-08	Ring-billed Gull	1	16:00	200	
25-Aug-08	Shorebird	310	16:00	800	
25-Aug-08	Shorebird	500	16:00	800	
25-Aug-08	American Black Duck	6	16:30	300	
25-Aug-08	American Black Duck	2	16:30	500	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	American Black Duck	2	16:30	500	
25-Aug-08	American Black Duck	1	16:30	600	
25-Aug-08	Black-bellied Plover	4	16:30	400	
25-Aug-08	Black-bellied Plover	21	16:30	600	
25-Aug-08	Green-winged Teal	4	16:30	300	
25-Aug-08	Green-winged Teal	5	16:30	600	
25-Aug-08	shorebird	25	16:30	600	
25-Aug-08	shorebird	150	16:30	700	
25-Aug-08	Ring-billed Gull	17	16:30	200	
25-Aug-08	Ring-billed Gull	1	16:30	300	
25-Aug-08	Shorebird	460	16:30	800	
25-Aug-08	American Black Duck	1	17:00	100	
25-Aug-08	American Black Duck	2	17:00	200	
25-Aug-08	American Black Duck	1	17:00	300	
25-Aug-08	American Black Duck	4	17:00	300	
25-Aug-08	American Black Duck	2	17:00	400	
25-Aug-08	American Black Duck	1	17:00	400	
25-Aug-08	American Black Duck	4	17:00	400	
25-Aug-08	American Black Duck	1	17:00	600	
25-Aug-08	American Black Duck	4	17:00	600	
25-Aug-08	American Black Duck	2	17:00	600	
25-Aug-08	Black-bellied Plover	2	17:00	100	
25-Aug-08	Black-bellied Plover	2	17:00	400	
25-Aug-08	Black-bellied Plover	2	17:00	400	
25-Aug-08	Great Black-backed Gull	1	17:00	200	
25-Aug-08	Green-winged Teal	2	17:00	300	
25-Aug-08	Green-winged Teal	2	17:00	600	
25-Aug-08	Lesser Yellowlegs	1	17:00	100	
25-Aug-08	shorebird	21	17:00	600	
25-Aug-08	Ring-billed Gull	13	17:00	200	
25-Aug-08	Ring-billed Gull	1	17:00	300	
25-Aug-08	Ring-billed Gull	1	17:00	400	
25-Aug-08	Semipalmated Sandpiper	6	17:00	500	
25-Aug-08	Shorebird	150	17:00	800	
25-Aug-08	American Black Duck	1	17:30	100	
25-Aug-08	American Black Duck	2	17:30	400	
25-Aug-08	American Black Duck	1	17:30	400	
25-Aug-08	American Black Duck	4	17:30	700	
25-Aug-08	American Black Duck	6	17:30	900	
25-Aug-08	American Black Duck	6	17:30	900	
25-Aug-08	Black-bellied Plover	6	17:30	100	
25-Aug-08	Great Black-backed Gull	1	17:30	200	
25-Aug-08	Greater Yellowlegs	1	17:30	400	
25-Aug-08	Greater Yellowlegs	1	17:30	700	
25-Aug-08	Green-winged Teal	3	17:30	400	
25-Aug-08	Ring-billed Gull	20	17:30	200	
25-Aug-08	Semipalmated Sandpiper	43	17:30	300	
25-Aug-08	Shorebird	400	17:30	800	
25-Aug-08	American Black Duck	1	18:00	200	
25-Aug-08	American Black Duck	3	18:00	300	
25-Aug-08	American Black Duck	1	18:00	400	
25-Aug-08	American Black Duck	54	18:00	800	
25-Aug-08	American Black Duck	22	18:00	900	
25-Aug-08	Great Black-backed Gull	1	18:00	200	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
25-Aug-08	Great Black-backed Gull	1	18:00	200	
25-Aug-08	Lesser Yellowlegs	1	18:00	100	
25-Aug-08	shorebird	2	18:00	400	
25-Aug-08	shorebird	2	18:00	400	
25-Aug-08	Ring-billed Gull	23	18:00	200	
25-Aug-08	Semipalmated Sandpiper	1	18:00	400	
25-Aug-08	Shorebird	120	18:00	800	
25-Aug-08	American Black Duck	2	18:30	500	
25-Aug-08	American Black Duck	2	18:30	500	
25-Aug-08	American Black Duck	22	18:30	700	
25-Aug-08	Herring Gull	1	18:30	200	
25-Aug-08	Lesser Yellowlegs	1	18:30	1000	
25-Aug-08	Ring-billed Gull	21	18:30	200	
25-Aug-08	American Black Duck	1	19:00	100	
25-Aug-08	Great Black-backed Gull	1	19:00	200	
25-Aug-08	Semipalmated Sandpiper	8	19:00	100	
15-Aug-08	American Black Duck	1	9:30	300	
15-Aug-08	American Black Duck	1	9:30	300	
15-Aug-08	American Black Duck	2	9:30	300	
15-Aug-08	American Black Duck	2	9:30	400	
15-Aug-08	American Black Duck	2	9:30	400	
15-Aug-08	American Black Duck	3	9:30	400	
15-Aug-08	American Black Duck	2	9:30	400	
15-Aug-08	American Black Duck	5	9:30	700	
15-Aug-08	American Black Duck	5	9:30	800	
15-Aug-08	American Black Duck	2	9:30	900	
15-Aug-08	Black-bellied Plover	2	9:30	300	
15-Aug-08	Black-bellied Plover	5	9:30	500	
15-Aug-08	shorebird	29	9:30	500	
15-Aug-08	shorebird	40	9:30	700	
15-Aug-08	shorebird	50	9:30	900	
15-Aug-08	American Black Duck	1	10:00	200	
15-Aug-08	American Black Duck	3	10:00	200	
15-Aug-08	American Black Duck	2	10:00	300	
15-Aug-08	American Black Duck	7	10:00	400	
15-Aug-08	American Black Duck	3	10:00	400	
15-Aug-08	American Black Duck	1	10:00	500	
15-Aug-08	Black-bellied Plover	22	10:00	500	
15-Aug-08	shorebird	41	10:00	500	
15-Aug-08	shorebird	30	10:00	600	
15-Aug-08	shorebird	40	10:00	700	
15-Aug-08	Shorebird	300	10:00	900	
15-Aug-08	American Black Duck	3	10:30	100	
15-Aug-08	American Black Duck	1	10:30	300	
15-Aug-08	American Black Duck	5	10:30	500	
15-Aug-08	American Black Duck	2	10:30	600	
15-Aug-08	American Black Duck	6	10:30	700	
15-Aug-08	American Black Duck	1	10:30	800	
15-Aug-08	American Black Duck	4	10:30	900	
15-Aug-08	American Black Duck	12	10:30	900	
15-Aug-08	shorebird	10	10:30	300	
15-Aug-08	shorebird	20	10:30	400	
15-Aug-08	Semipalmated Sandpiper	20	10:30	100	
15-Aug-08	Shorebird	2000	10:30	900	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Aug-08	American Black Duck	3	11:00	100	
15-Aug-08	American Black Duck	1	11:00	200	
15-Aug-08	American Black Duck	2	11:00	700	
15-Aug-08	American Black Duck	45	11:00	800	
15-Aug-08	shorebird	10	11:00	400	
15-Aug-08	American Black Duck	4	11:30	400	
15-Aug-08	shorebird	20	11:30	200	
15-Aug-08	American Black Duck	2	12:00	100	
15-Aug-08	American Black Duck	1	12:00	500	
15-Aug-08	American Black Duck	2	12:00	600	
15-Aug-08	Northern Harrier	1	12:00	200	
15-Aug-08	Semipalmated Sandpiper	26	12:00	100	
15-Aug-08	Semipalmated Sandpiper	15	12:00	200	
15-Aug-08	American Black Duck	1	12:30	400	
15-Aug-08	American Black Duck	4	12:30	900	
15-Aug-08	Great Blue Heron	2	12:30	300	
15-Aug-08	Semipalmated Sandpiper	25	12:30	100	
15-Aug-08	Semipalmated Sandpiper	5	12:30	100	
15-Aug-08	American Black Duck	2	13:00	400	
15-Aug-08	American Black Duck	2	13:00	500	
15-Aug-08	Great Black-backed Gull	2	13:00	1000	
15-Aug-08	Gull sp.	18	13:00	800	
15-Aug-08	Least Sandpiper	26	13:00	100	
15-Aug-08	Ring-billed Gull	2	13:00	600	
15-Aug-08	Ring-billed Gull	2	13:00	700	
15-Aug-08	Semipalmated Sandpiper	80	13:00	100	
15-Aug-08	Semipalmated Sandpiper	20	13:00	100	
15-Aug-08	Semipalmated Sandpiper	35	13:00	100	
15-Aug-08	American Black Duck	1	13:30	200	
15-Aug-08	American Black Duck	1	13:30	400	
15-Aug-08	Black-bellied Plover	1	13:30	100	
15-Aug-08	Great Black-backed Gull	1	13:30	500	
15-Aug-08	Least Sandpiper	1	13:30	100	
15-Aug-08	Least Sandpiper	4	13:30	100	
15-Aug-08	Ring-billed Gull	10	13:30	100	
15-Aug-08	Ring-billed Gull	10	13:30	500	
15-Aug-08	Semipalmated Plover	10	13:30	100	
15-Aug-08	Semipalmated Sandpiper	1	13:30	100	
15-Aug-08	Black-bellied Plover	11	14:00	100	
15-Aug-08	Black-bellied Plover	2	14:00	100	
15-Aug-08	Black-bellied Plover	1	14:00	100	
15-Aug-08	Least Sandpiper	2	14:00	100	
15-Aug-08	Ring-billed Gull	2	14:00	100	
15-Aug-08	Ring-billed Gull	2	14:00	100	
15-Aug-08	Semipalmated Plover	1	14:00	100	
15-Aug-08	Semipalmated Plover	8	14:00	100	
15-Aug-08	Semipalmated Sandpiper	3	14:00	100	
15-Aug-08	Semipalmated Sandpiper	14	14:00	100	
15-Aug-08	Semipalmated Sandpiper	20	14:00	100	
15-Aug-08	American Black Duck	1	14:30	100	
15-Aug-08	American Black Duck	2	14:30	400	
15-Aug-08	American Black Duck	7	14:30	700	
15-Aug-08	Double-crested Cormorant	3	14:30	400	
15-Aug-08	Gull sp.	49	14:30	900	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Aug-08	Herring Gull	1	14:30	100	
15-Aug-08	Lesser Yellowlegs	1	14:30	100	
15-Aug-08	shorebird	10	14:30	700	
15-Aug-08	shorebird	40	14:30	900	
15-Aug-08	Ring-billed Gull	1	14:30	100	
15-Aug-08	Ring-billed Gull	2	14:30	100	
15-Aug-08	Ring-billed Gull	1	14:30	100	
15-Aug-08	Ring-billed Gull	20	14:30	100	
15-Aug-08	Ring-billed Gull	3	14:30	100	
15-Aug-08	Ring-billed Gull	4	14:30	400	
15-Aug-08	American Black Duck	6	15:00	100	
15-Aug-08	American Black Duck	2	15:00	400	
15-Aug-08	American Black Duck	1	15:00	600	
15-Aug-08	American Black Duck	8	15:00	900	
15-Aug-08	Gull sp.	2	15:00	900	
15-Aug-08	Lesser Yellowlegs	1	15:00	200	
15-Aug-08	Ring-billed Gull	66	15:00	100	
15-Aug-08	Ring-billed Gull	1	15:00	300	
15-Aug-08	Ring-billed Gull	9	15:00	500	
15-Aug-08	Shorebird	200	15:00	800	
15-Aug-08	Shorebird	200	15:00	900	
15-Aug-08	American Black Duck	1	15:30	400	
15-Aug-08	American Black Duck	2	15:30	400	
15-Aug-08	American Black Duck	40	15:30	900	
15-Aug-08	Herring Gull	7	15:30	100	
15-Aug-08	Ring-billed Gull	1	15:30	100	
15-Aug-08	Ring-billed Gull	173	15:30	100	
15-Aug-08	Ring-billed Gull	17	15:30	100	
15-Aug-08	Ring-billed Gull	29	15:30	500	
15-Aug-08	Ring-billed Gull	1	15:30	700	
15-Aug-08	Ring-billed Gull	12	15:30	900	
15-Aug-08	Shorebird	39	15:30	800	
15-Aug-08	Shorebird	100	15:30	900	
15-Aug-08	American Black Duck	2	16:00	100	
15-Aug-08	American Black Duck	2	16:00	300	
15-Aug-08	American Black Duck	9	16:00	400	
15-Aug-08	American Black Duck	2	16:00	400	
15-Aug-08	American Black Duck	4	16:00	400	
15-Aug-08	American Black Duck	1	16:00	500	
15-Aug-08	American Black Duck	1	16:00	500	
15-Aug-08	American Black Duck	8	16:00	800	
15-Aug-08	American Black Duck	27	16:00	900	
15-Aug-08	American Black Duck	27	16:00	900	
15-Aug-08	Black-bellied Plover	29	16:00	500	
15-Aug-08	Black-bellied Plover	5	16:00	600	
15-Aug-08	Herring Gull	2	16:00	1000	
15-Aug-08	Herring Gull	2	16:00	1000	
15-Aug-08	Lesser Yellowlegs	1	16:00	100	
15-Aug-08	Ring-billed Gull	100	16:00	100	
15-Aug-08	Ring-billed Gull	84	16:00	200	
15-Aug-08	Ring-billed Gull	31	16:00	200	
15-Aug-08	Ring-billed Gull	3	16:00	500	
15-Aug-08	Ring-billed Gull	10	16:00	900	
15-Aug-08	Ring-billed Gull	10	16:00	900	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Aug-08	Shorebird	3000	16:00	900	
15-Aug-08	Shorebird	100	16:00	900	
15-Aug-08	Shorebird	3000	16:00	900	
15-Aug-08	Shorebird	100	16:00	900	
15-Aug-08	American Black Duck	1	16:30	300	
15-Aug-08	American Black Duck	2	16:30	300	
15-Aug-08	American Black Duck	9	16:30	300	
15-Aug-08	American Black Duck	3	16:30	400	
15-Aug-08	American Black Duck	2	16:30	500	
15-Aug-08	American Black Duck	14	16:30	900	
15-Aug-08	Black-bellied Plover	10	16:30	800	
15-Aug-08	Green-winged Teal	1	16:30	300	
15-Aug-08	Herring Gull	1	16:30	200	
15-Aug-08	Lesser Yellowlegs	1	16:30	100	
15-Aug-08	shorebird	200	16:30	800	
15-Aug-08	Ring-billed Gull	1	16:30	100	
15-Aug-08	Ring-billed Gull	127	16:30	100	
15-Aug-08	Ring-billed Gull	74	16:30	200	
15-Aug-08	Ring-billed Gull	47	16:30	200	
15-Aug-08	Ring-billed Gull	6	16:30	500	
15-Aug-08	Ring-billed Gull	1	16:30	900	
15-Aug-08	Shorebird	100	16:30	900	
15-Aug-08	American Black Duck	3	17:00	200	
15-Aug-08	American Black Duck	1	17:00	200	
15-Aug-08	American Black Duck	2	17:00	300	
15-Aug-08	American Black Duck	1	17:00	400	
15-Aug-08	American Black Duck	3	17:00	500	
15-Aug-08	American Black Duck	10	17:00	900	
15-Aug-08	Green-winged Teal	1	17:00	300	
15-Aug-08	Lesser Yellowlegs	1	17:00	100	
15-Aug-08	shorebird	5	17:00	300	
15-Aug-08	shorebird	94	17:00	800	
15-Aug-08	Ring-billed Gull	1	17:00	100	
15-Aug-08	Ring-billed Gull	77	17:00	100	
15-Aug-08	Ring-billed Gull	7	17:00	200	
15-Aug-08	Ring-billed Gull	29	17:00	200	
15-Aug-08	American Black Duck	1	17:30	100	
15-Aug-08	American Black Duck	2	17:30	200	
15-Aug-08	American Black Duck	1	17:30	300	
15-Aug-08	American Black Duck	1	17:30	300	
15-Aug-08	American Black Duck	9	17:30	900	
15-Aug-08	Double-crested Cormorant	1	17:30	100	
15-Aug-08	Lesser Yellowlegs	2	17:30	200	
15-Aug-08	shorebird	130	17:30	900	
15-Aug-08	Ring-billed Gull	69	17:30	100	
15-Aug-08	Ring-billed Gull	27	17:30	200	
15-Aug-08	Ring-billed Gull	1	17:30	500	
15-Aug-08	Ring-billed Gull	1	17:30	900	
15-Aug-08	American Black Duck	1	18:00	200	
15-Aug-08	American Black Duck	3	18:00	200	
15-Aug-08	American Black Duck	2	18:00	300	
15-Aug-08	American Black Duck	1	18:00	300	
15-Aug-08	American Black Duck	1	18:00	300	
15-Aug-08	American Black Duck	1	18:00	400	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
15-Aug-08	American Black Duck	4	18:00	900	
15-Aug-08	Black-bellied Plover	5	18:00	500	
15-Aug-08	Black-bellied Plover	2	18:00	700	
15-Aug-08	Black-bellied Plover	2	18:00	700	
15-Aug-08	Ring-billed Gull	1	18:00	100	
15-Aug-08	Ring-billed Gull	45	18:00	100	
15-Aug-08	Ring-billed Gull	1	18:00	200	
15-Aug-08	Ring-billed Gull	3	18:00	300	
15-Aug-08	Ring-billed Gull	1	18:00	300	
15-Aug-08	Ring-billed Gull	5	18:00	400	
15-Aug-08	Ring-billed Gull	1	18:00	500	
15-Aug-08	Shorebird	500	18:00	900	
15-Aug-08	American Black Duck	2	18:30	200	
15-Aug-08	American Black Duck	1	18:30	300	
15-Aug-08	American Black Duck	4	18:30	300	
15-Aug-08	American Black Duck	3	18:30	400	
15-Aug-08	American Black Duck	1	18:30	400	
15-Aug-08	Black-bellied Plover	7	18:30	500	
15-Aug-08	Lesser Yellowlegs	1	18:30	300	
15-Aug-08	shorebird	12	18:30	500	
15-Aug-08	Ring-billed Gull	1	18:30	100	
15-Aug-08	Ring-billed Gull	3	18:30	500	
15-Aug-08	Shorebird	500	18:30	900	
5-Aug-08	American Black Duck	22	9:30	400	
5-Aug-08	American Black Duck	10	9:30	400	
5-Aug-08	shorebird	300	9:30	700	
5-Aug-08	shorebird	150	9:30	800	
5-Aug-08	Ring-billed Gull	2	9:30	100	
5-Aug-08	Ring-billed Gull	1	9:30	500	
5-Aug-08	Ring-billed Gull	6	9:30	500	
5-Aug-08	Ring-billed Gull	1	9:30	600	
5-Aug-08	American Black Duck	1	10:00	300	
5-Aug-08	American Black Duck	12	10:00	400	
5-Aug-08	American Black Duck	7	10:00	500	
5-Aug-08	American Black Duck	4	10:00	700	
5-Aug-08	shorebird	90	10:00	700	
5-Aug-08	shorebird	100	10:00	800	
5-Aug-08	Ring-billed Gull	12	10:00	300	
5-Aug-08	Ring-billed Gull	8	10:00	600	
5-Aug-08	Ring-billed Gull	2	10:00	700	
5-Aug-08	American Black Duck	13	10:30	400	
5-Aug-08	American Black Duck	8	10:30	500	
5-Aug-08	American Black Duck	4	10:30	700	
5-Aug-08	shorebird	80	10:30	600	
5-Aug-08	shorebird	39	10:30	800	
5-Aug-08	shorebird	500	10:30	900	
5-Aug-08	Ring-billed Gull	3	10:30	200	
5-Aug-08	Ring-billed Gull	4	10:30	300	
5-Aug-08	Ring-billed Gull	1	10:30	500	
5-Aug-08	Ring-billed Gull	16	10:30	500	
5-Aug-08	Ring-billed Gull	5	10:30	500	
5-Aug-08	American Black Duck	12	11:00	400	
5-Aug-08	American Black Duck	2	11:00	500	
5-Aug-08	American Black Duck	4	11:00	700	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-08	American Black Duck	3	11:00	1000	
5-Aug-08	shorebird	500	11:00	800	
5-Aug-08	Ring-billed Gull	1	11:00	300	
5-Aug-08	Ring-billed Gull	33	11:00	300	
5-Aug-08	Ring-billed Gull	8	11:00	400	
5-Aug-08	Ring-billed Gull	3	11:00	500	
5-Aug-08	Ring-billed Gull	5	11:00	500	
5-Aug-08	Ring-billed Gull	7	11:00	500	
5-Aug-08	American Black Duck	2	11:30	300	
5-Aug-08	American Black Duck	6	11:30	400	
5-Aug-08	American Black Duck	11	11:30	400	
5-Aug-08	American Black Duck	4	11:30	600	
5-Aug-08	American Black Duck	4	11:30	700	
5-Aug-08	Herring Gull	1	11:30	500	
5-Aug-08	shorebird	1000	11:30	800	
5-Aug-08	Ring-billed Gull	4	11:30	100	
5-Aug-08	Ring-billed Gull	4	11:30	200	
5-Aug-08	Ring-billed Gull	9	11:30	300	
5-Aug-08	Ring-billed Gull	4	11:30	400	
5-Aug-08	Ring-billed Gull	16	11:30	500	
5-Aug-08	American Black Duck	12	12:00	400	
5-Aug-08	American Black Duck	3	12:00	400	
5-Aug-08	American Black Duck	4	12:00	500	
5-Aug-08	American Black Duck	4	12:00	700	
5-Aug-08	American Black Duck	4	12:00	700	
5-Aug-08	shorebird	3	12:00	700	
5-Aug-08	shorebird	25	12:00	800	
5-Aug-08	Ring-billed Gull	1	12:00	100	
5-Aug-08	Ring-billed Gull	4	12:00	300	
5-Aug-08	Ring-billed Gull	14	12:00	300	
5-Aug-08	Ring-billed Gull	4	12:00	400	
5-Aug-08	Ring-billed Gull	4	12:00	500	
5-Aug-08	Ring-billed Gull	5	12:00	500	
5-Aug-08	Ring-billed Gull	15	12:00	600	
5-Aug-08	American Black Duck	3	12:30	400	
5-Aug-08	American Black Duck	15	12:30	400	
5-Aug-08	American Black Duck	4	12:30	500	
5-Aug-08	Double-crested Cormorant	1	12:30	100	
5-Aug-08	shorebird	25	12:30	800	
5-Aug-08	shorebird	200	12:30	900	
5-Aug-08	Ring-billed Gull	7	12:30	300	
5-Aug-08	Ring-billed Gull	15	12:30	300	
5-Aug-08	Ring-billed Gull	1	12:30	400	
5-Aug-08	Ring-billed Gull	3	12:30	500	
5-Aug-08	Ring-billed Gull	3	12:30	500	
5-Aug-08	Ring-billed Gull	5	12:30	500	
5-Aug-08	American Black Duck	7	13:00	400	
5-Aug-08	American Black Duck	4	13:00	400	
5-Aug-08	American Black Duck	11	13:00	500	
5-Aug-08	shorebird	100	13:00	700	
5-Aug-08	shorebird	100	13:00	800	
5-Aug-08	Ring-billed Gull	12	13:00	100	
5-Aug-08	Ring-billed Gull	5	13:00	200	
5-Aug-08	Ring-billed Gull	2	13:00	300	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-08	Ring-billed Gull	17	13:00	300	
5-Aug-08	Ring-billed Gull	4	13:00	500	
5-Aug-08	Ring-billed Gull	6	13:00	500	
5-Aug-08	Ring-billed Gull	9	13:00	600	
5-Aug-08	American Black Duck	1	13:30	100	
5-Aug-08	American Black Duck	10	13:30	200	
5-Aug-08	American Black Duck	4	13:30	400	
5-Aug-08	American Black Duck	5	13:30	400	
5-Aug-08	American Black Duck	16	13:30	400	
5-Aug-08	Double-crested Cormorant	1	13:30	1000	
5-Aug-08	shorebird	200	13:30	700	
5-Aug-08	shorebird	300	13:30	800	
5-Aug-08	Ring-billed Gull	7	13:30	100	
5-Aug-08	Ring-billed Gull	3	13:30	100	
5-Aug-08	Ring-billed Gull	6	13:30	300	
5-Aug-08	Ring-billed Gull	2	13:30	400	
5-Aug-08	Ring-billed Gull	1	13:30	500	
5-Aug-08	Ring-billed Gull	6	13:30	600	
5-Aug-08	Ring-billed Gull	2	13:30	600	
5-Aug-08	American Black Duck	3	14:00	100	
5-Aug-08	American Black Duck	2	14:00	300	
5-Aug-08	American Black Duck	6	14:00	300	
5-Aug-08	American Black Duck	4	14:00	400	
5-Aug-08	American Black Duck	3	14:00	400	
5-Aug-08	American Black Duck	4	14:00	400	
5-Aug-08	American Black Duck	2	14:00	700	
5-Aug-08	American Black Duck	1	14:00	800	
5-Aug-08	American Black Duck	4	14:00	100	
5-Aug-08	American Black Duck	2	14:30	100	
5-Aug-08	American Black Duck	2	14:30	100	
5-Aug-08	American Black Duck	3	14:30	200	
5-Aug-08	American Black Duck	1	14:30	300	
5-Aug-08	American Black Duck	8	14:30	400	
5-Aug-08	American Black Duck	31	14:30	900	
5-Aug-08	American Black Duck	2	15:00	100	
5-Aug-08	American Black Duck	2	15:00	200	
5-Aug-08	American Black Duck	1	15:00	400	
5-Aug-08	American Black Duck	4	15:00	400	
5-Aug-08	American Black Duck	3	15:00	500	
5-Aug-08	Semipalmated Sandpiper	2	15:00	100	
5-Aug-08	Semipalmated Sandpiper	3	15:00	200	
5-Aug-08	American Black Duck	3	15:30	100	
5-Aug-08	American Black Duck	1	15:30	100	
5-Aug-08	American Black Duck	2	15:30	100	
5-Aug-08	American Black Duck	1	15:30	500	
5-Aug-08	American Black Duck	2	16:00	100	
5-Aug-08	American Black Duck	2	16:00	100	
5-Aug-08	American Black Duck	1	16:00	100	
5-Aug-08	American Black Duck	1	16:00	500	
5-Aug-08	American Black Duck	1	16:30	1000	
5-Aug-08	American Black Duck	1	16:30		
5-Aug-08	Great Black-backed Gull	1	16:30		
5-Aug-08	Ring-billed Gull	11	16:30	700	
5-Aug-08	American Black Duck	1	17:00	100	

Table E3 Fall Migration Survey Results - 2008-2016

Date	Species	Number of Birds	Survey Start Time	Distance from Causeway	Comments
5-Aug-08	American Black Duck	3	17:00	400	
5-Aug-08	American Black Duck	1	17:00	400	
5-Aug-08	American Black Duck	2	17:00	500	
5-Aug-08	Semipalmated Sandpiper	50	17:00	200	
5-Aug-08	Semipalmated Sandpiper	30	17:00	200	
5-Aug-08	Semipalmated Sandpiper	10	17:00	200	
5-Aug-08	American Black Duck	1	17:30	600	
5-Aug-08	Semipalmated Sandpiper	20	17:30	100	
5-Aug-08	Semipalmated Sandpiper	1	17:30	100	
5-Aug-08	American Black Duck	1	18:00	500	
5-Aug-08	Lesser Yellowlegs	2	18:00	100	
5-Aug-08	Lesser Yellowlegs	1	18:00	100	
5-Aug-08	Ring-billed Gull	4	18:00	100	
5-Aug-08	Ring-billed Gull	2	18:00	100	
5-Aug-08	Ring-billed Gull	8	18:00	100	
5-Aug-08	Ring-billed Gull	11	18:00	100	
5-Aug-08	Semipalmated Sandpiper	6	18:00	100	
5-Aug-08	Semipalmated Sandpiper	2	18:00	100	
5-Aug-08	Semipalmated Sandpiper	1	18:00	200	
5-Aug-08	Semipalmated Sandpiper	9	18:00	200	
5-Aug-08	Semipalmated Sandpiper	7	18:00	300	
5-Aug-08	American Black Duck	1	18:30	100	
5-Aug-08	American Black Duck	1	18:30	400	
5-Aug-08	American Black Duck	1	18:30	500	
5-Aug-08	shorebird	600	18:30	1000	
5-Aug-08	Ring-billed Gull	1	18:30	100	
5-Aug-08	Ring-billed Gull	1	18:30	100	
5-Aug-08	Ring-billed Gull	7	18:30	100	
5-Aug-08	Ring-billed Gull	1	18:30	100	
5-Aug-08	Ring-billed Gull	9	18:30	100	
5-Aug-08	shorebird	90		700	
5-Aug-08	shorebird	250		900	
5-Aug-08	Ring-billed Gull	8		500	

Table E4 Bird Abundance by Survey Date

Species	Mean Number of Birds/Observation Period														
	Survey Date														
	15-Jul-16	21-Jul-16	29-Jul-16	5-Aug-16	5-Aug-08	12-Aug-16	15-Aug-08	19-Aug-16	25-Aug-08	5-Sep-08	15-Sep-08	26-Sep-08	6-Oct-08	15-Oct-08	Total
Double-crested Cormorant					0.10		0.21	0.31	0.10	0.29	0.68	0.42	0.16	0.11	2.38
Great Blue Heron						0.69	0.11	4.23	0.05	2.76	0.32	0.58	3.05	0.79	12.58
Canada Goose	0.71	1.47				12.77		5.46						83.16	103.57
Green-winged Teal							0.11		2.35	6.06	0.11	0.63	6.00	3.47	18.73
American Black Duck	5.71	9.12	6.31	9.85	17.55	15.08	20.47	19.31	15.50	14.29	58.84	24.05	28.63	81.42	326.11
Mallard		7.00								0.12		0.05	0.11	0.58	7.86
Red-breasted Merganser														0.05	0.05
Duck sp.		1.06	2.38	0.92		0.38		1.23							5.98
Osprey		0.06													0.06
Bald Eagle	0.06		0.15					0.15			0.11		0.05		0.53
Northern harrier						0.23	0.05	0.31							0.59
Sharp-shinned Hawk		0.06													0.06
Black-bellied Plover				1.15			5.47		16.70	0.71					24.03
Semipalmated Plover				0.15			1.00		1.85	4.76		2.05	12.74		22.55
Greater Yellowlegs	0.06		0.69	0.08		1.85		1.15	1.00	1.94	1.47	1.26	0.95	0.11	10.56
Lesser Yellowlegs			0.08	1.62	0.15	0.08	0.42		0.40					0.42	3.16
Tringa sp.				0.08											0.08
Spotted Sandpiper	1.82	2.18	0.85	1.92		0.08		0.15				0.05			7.05
Semipalmated Sandpiper	3.18		2.23	3.54	7.05	0.92	13.89	5.77	15.25	5.94		0.11	6.21		64.09
Least Sandpiper	2.00	0.35	0.85	4.77			1.74	1.00	1.00	2.06			0.05		13.82

Table E4 Bird Abundance by Survey Date

Species	Mean Number of Birds/Observation Period														
	Survey Date														
	15-Jul-16	21-Jul-16	29-Jul-16	5-Aug-16	5-Aug-08	12-Aug-16	15-Aug-08	19-Aug-16	25-Aug-08	5-Sep-08	15-Sep-08	26-Sep-08	6-Oct-08	15-Oct-08	Total
Short-billed Dowitcher	1.71					0.62									2.32
Unidentified Shorebird*	11.24	17.53	47.85	70.31	239.80	90.00	597.26	120.15	385.00	76.94	55.68	23.20	38.37	12.95	1786.27
Bonaparte's Gull				0.15											0.15
Ring-billed Gull	1.94	0.88		13.85	19.05	6.23	59.74	6.08	127.55	0.47	18.89	23.68	3.47	5.79	287.62
Herring Gull	0.53	0.35	6.54	1.92	0.05	0.15	0.68		0.20			0.21			10.64
Great Black-backed Gull	1.00	0.41	0.92	0.46	0.05	0.46	0.16	1.08	0.55		0.58	0.21	0.16	0.05	6.09
Gull sp.	1.94	7.12	1.15	20.69		3.77	3.63	29.23			2.63		5.79		75.95
Tree Swallow	0.06	0.12													0.18
Barn Swallow	0.12	0.12													0.24
Swallow sp.			0.54			2.69									3.23
American Crow	0.29		0.15	0.08		0.38				0.29	0.63	0.11	0.84		2.78
Savannah Sparrow	0.12	0.65						0.15			0.11	0.16	0.84		2.03
Nelson's Sharp-tailed Sparrow	0.53	0.94	0.38	0.08		0.15		0.08							2.16
Total	33.00	49.41	71.08	131.62	283.80	136.54	704.94	195.85	567.50	116.63	140.05	76.77	107.42	188.90	

*Unidentified shorebirds include all peeps and other shorebirds that could not be positively identified in the field.

Table E5 Percentage of Observations of each Bird Species by Distance from the Causeway (2008 and 2016 results combined)

Species	0-100m	100-200m	200-300m	300-400m	400-500m	500-600m	600-700m	700-800m	800-900m	900-1000m	100-1100m
Ring-billed Gull	26.34	10.79	4.70	3.96	6.26	3.18	42.93	0.55	0.83	0.29	0.17
Herring Gull	25.50	6.71	-	2.68	3.36	2.01	10.07	10.74	8.72	16.11	14.09
Great Black-backed Gull	5.21	21.88	12.50	8.33	4.17	10.42	9.38	8.33	11.46	7.29	-
Gull sp.	0.09	1.82	0.36	-	0.09	4.56	5.11	22.63	38.87	3.92	17.97
Tree Swallow	-	-	33.33	33.33	-	-	-	33.33	-	-	-
Barn Swallow	-	25.00	25.00	50.00	-	-	-	-	-	-	-
Swallow sp.	-	-	23.81	35.71	-	16.67	-	-	23.81	-	-
American Crow	16.67	79.17	-	-	-	-	-	2.08	-	2.08	-
Savannah Sparrow	88.89	2.78	8.33	-	-	-	-	-	-	-	-
Nelson's Sharp-tailed Sparrow	14.71	35.29	23.53	20.59	5.88	-	-	-	-	-	-
Notes: ¹ To reduce the bias of only being able to identify shorebirds within a few hundred meters, shorebird observations are combined and presented as <i>All shorebirds</i> . This group consists of all identified sandpipers and plovers, as well as all unidentified shorebirds.											

APPENDIX F
MI'KMAQ ECOLOGICAL KNOWLEDGE
STUDY

Mi'kmaq Ecological Knowledge Study

Highway 101 Twinning Exit 5 to Falmouth

Prepared for NS Transportation and Infrastructure Renewal

Prepared by
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TABLE OF CONTENTS

1.0 INTRODUCTION	5
1.1 MAINLAND MI'KMAQ DEVELOPMENT INC.	5
1.2 PROJECT DESCRIPTION.....	5
2.0 DEFINITION OF TERMS	5
3.0 PURPOSE AND SCOPE OF THE MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY	7
3.1 PURPOSE OF THE MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY.....	7
3.2 SCOPE OF THE MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY.....	7
3.3 NOT INCLUDED IN THE SCOPE OF THE MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY	7
3.3.1 SECTION 35 CONSULTATION.....	7
3.3.2 ARCHAEOLOGICAL SCREENING AND RESOURCE IMPACT ASSESSMENT	7
3.3.3 NOTIFICATION OF MI'KMAW INDIVIDUALS OR COMMUNITIES OF THE PROJECT	8
4.0 METHODOLOGY	8
4.1 HISTORIC MI'KMAQ LAND AND RESOURCE USE.....	8
4.1.1 STUDY AREA	8
4.1.2 METHODS.....	8
4.1.3 LIMITATIONS.....	8
4.2 CURRENT MI'KMAQ LAND AND RESOURCE USE	9
4.2.1 STUDY AREAS	9
4.2.1.1 Current Mi'kmaq Land and Resource Use Sites	9
4.2.1.2 Species of Significance to Mi'kmaq	9
4.2.1.3 Mi'kmaq Communities	9
4.2.2 METHODS	9
4.2.2.1 Current Mi'kmaq Land and Resource Use Sites	9
4.2.2.2 Species of Significance to Mi'kmaq	10
4.2.2.3 Mi'kmaq Communities	10
4.2.3 LIMITATIONS.....	10

5.0 RESULTS 10

5.1 HISTORIC MI'KMAQ LAND AND RESOURCE USE. 10
5.1.1 CHRONOLOGY OF HISTORICAL EVENTS 12
5.1.2 POPULATION AND CENSUS INFORMATION. 16
5.1.3 ARCHAEOLOGY 22
5.2 CURRENT MI'KMAQ LAND AND RESOURCE USE 22
5.2.1 CURRENT MI'KMAQ LAND AND RESOURCE USE SITES. 22
5.2.2 SPECIES OF SIGNIFICANCE TO MI'KMAQ PRESENT IN STUDY AREA. . . 23
5.2.3 MI'KMAW COMMUNITIES 23

6.0 POTENTIAL PROJECT IMPACTS ON MI'KMAQ LAND AND RESOURCE USE 25

7.0 SIGNIFICANCE OF POTENTIAL PROJECT IMPACTS ON MI'KMAQ LAND AND RESOURCE USE 25

7.1 SIGNIFICANCE CRITERIA 25
7.2 EVALUATION OF SIGNIFICANCE 25

8.0 CONCLUSIONS AND RECOMMENDATIONS 26

9.0 RECORDS AND SOURCES CONSULTED 27

SECONDARY SOURCES. 27
PRIMARY SOURCES 28

TABLES & FIGURES

FIGURE 1:

Historic and Current Use Timeline	6
---	---

TABLE 1:

Windsor Band Council Allotted Hunting, Fishing and Berry Gathering Areas	11
--	----

TABLE 2:

Mi'kmaq identified in 1871 Census for the sub-districts Saint Croix, Windsor, Falmouth, Forks, and Brooklyn.	17
--	----

TABLE 3:

Mi'kmaq identified in 1881 Census in the sub-districts Saint Croix, Windsor, Falmouth, Windsor Forks, and Brooklyn	19
--	----

TABLE 4:

Hants County Mi'kmaq Population Information from The Department Of Indian Affairs Annual Reports.	20
---	----

TABLE 5:

Mi'kmaw Place Names.	24
------------------------------	----

TABLE 1:

Description of Activities Undertaken in Current Mi'kmaq Land and Resource Use Sites	23
---	----

TABLE 2:

Number of Species of Significance to Mi'kmaq Present in the Study Areas Summer 2014/15.	23
---	----

TABLE 3:

Potential Project Impacts on Mi'kmaq Land and Resource Use	25
--	----

TABLE 4:

Significance of Potential Project Impacts on Mi'kmaq Land and Resource Use.	26
---	----

FIGURE 2:

Map of Current Mi'kmaq Land and Resource Use Study Areas	29
--	----

1.0 INTRODUCTION

1.1 Mainland Mi'kmaq Development Inc.

The Confederacy of Mainland Mi'kmaq (CMM) Environmental Services is a program operated by the Lands, Environment, and Natural Resources, that provides fee for service in environmental consulting; this division is currently known as Mainland Mi'kmaq Developments Incorporated (MMDI). The CMM provides advisory services to seven Mi'kmaq communities in the province of Nova Scotia: Paqtnkek Mi'kmaw Nation, Annapolis Valley First Nation, Bear River First Nation, Glooscap First Nation, Millbrook First Nation, Pictou Landing and Sipekne'katik First Nation.

The MMDI had been successful in the contract to complete a second Mi'kmaq Ecological Knowledge Study (MEKS) for the Hwy 101 Exit 5 to Falmouth, as part of the original report 2004 Hwy 101 Twinning St. Croix to Greenwood MEKS, for NS Transportation and Infrastructure Renewal.

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1.2 Project Description

The Mainland Mi'kmaq Development Inc. has been selected to complete a second MEKS for a portion of the original MEKS St. Croix to Greenwood 2004, Hwy 101 Exit 5 to Falmouth MEKS. The project site is located in Hants County, which is located in Falmouth, NS. The alignment will cross the Avon River near Dimock Point with proposed new structures and ramps included in the project.

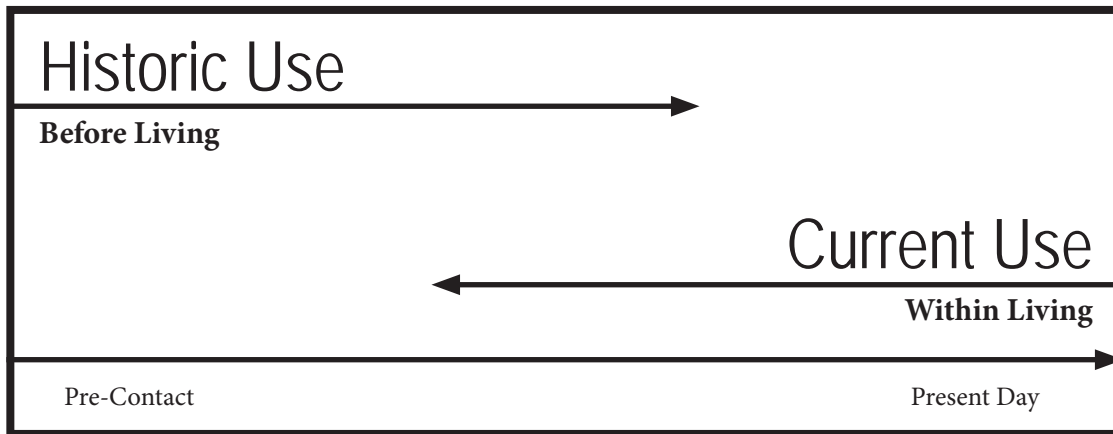
2.0 DEFINITION OF TERMS

Living Memory is the memory of living Mi'kmaw. The period of time included in living memory varies from knowledge holder to knowledge holder. Living memory often extends to the parent and grandparent of the knowledge holder and can be estimated at three to four generations.

Current Mi'kmaq Land and Resource Use occurred within living memory or is occurring at the present day (Figure 1)

Historic Mi'kmaq Land and Resource Use occurred before living memory (Figure 1)

Figure 1: Historic and Current Use Timeline



Mi'kmaw Ecological Knowledge (MEKS) is the collective body of knowledge which Mi'kmaq possess based on their intimate relationship with their natural surroundings, which involves exploitation, conservation and spiritual ideologies, and has been passed on from generation to generation, “*kisaku kinutemuatel mijuijij*”, elder to child.

Mi'kmaq Land and Resource Use Sites are locations where Mi'kmaq land and resource use activities have taken place or are taking place at present day. These sites may or may not display physical evidence of Mi'kmaq use.

Mi'kmaq/Mi'kmaw: *Mi'kmaq* means the Family and is an undeclined form. The variant form, *Mi'kmaw*, plays two grammatical roles: 1) it is the singular of Mi'kmaq and 2) it is an adjective in circumstances where it precedes a noun.

Mi'kma'ki is the Mi'kmaw homeland (Atlantic Provinces and Gaspé Peninsula)

Specific Land Claim arises when a First Nation alleges that the federal government has not honoured its treaties, agreements or legal responsibilities. According to federal policy, a valid specific claim exists when a First Nation can prove the government has an “outstanding lawful obligation”. The Mi'kmaq are currently pursuing several specific land claims in Nova Scotia.

Comprehensive Claim is based on underlying Aboriginal Title to traditional territory that has not been dealt with by treaty or other means. Aboriginal Title to lands exists as a legal right derived from First Nations historical occupation and possession of their tribal lands. The process of negotiating the settlement of comprehensive claims, which is known as modern-day treaty making, clarifies access and ownership to land and

resources. Currently, the Mi'kmaq has a comprehensive claim to all lands within the province of Nova Scotia including all inland and adjacent waters.

3.0 PURPOSE AND SCOPE OF THE MI'KMAQ ECOLOGICAL KNOWLEDGE STUDY

3.1 Purpose of the Mi'kmaq Ecological Knowledge Study

The purpose of the Mi'kmaq Ecological Knowledge Study is to support the integration of Mi'kmaq knowledge of use and occupation of Mi'kma'ki into development decisions via the environmental assessment process.

3.2 Scope of the Mi'kmaq Ecological Knowledge Study

The MEKS includes:

- 1) a study of historic and current Mi'kmaq land and resource use;
- 2) an evaluation of the potential impacts of the Project on Mi'kmaq use and occupation and constitutionally based rights;
- 3) an evaluation of the significance of the potential impacts of the Project on Mi'kmaq use and occupation; and
- 4) Recommendations to proponents and regulators that may include recommendations for mitigation measures, further study, or consultation with Mi'kmaq.

3.3 Not included in the scope of the Mi'kmaq Ecological Knowledge Study

3.3.1 Section 35 Consultation

This study is not consultation for justification of the infringement of constitutionally protected aboriginal and treaty rights. If the project involves possible infringements of Mi'kmaq constitutional rights, the MEKS recommends further action.

3.3.2 Archaeological Screening and Resource Impact Assessment

The study is not an Archaeological Screening or Archaeological Resource Impact Assessment. Results presented in the study can inform and be informed by archaeological screenings and assessments.

3.3.3 *Notification of Mi'kmaw individuals or communities of the Project*

The study is not intended to inform or notify Mi'kmaw individuals or communities of the Project, solicit the opinions or concerns of Mi'kmaw individuals or communities on the Project, or promote the Project to Mi'kmaw individuals or communities.

4.0 METHODOLOGY

4.1 Historic Mi'kmaq Land and Resource Use

Historic Mi'kmaq land and resource use occurred before living memory. The study of historic land and resource use paints a broad portrait of Mi'kmaq use and occupation of Mi'kma'ki in centuries past.

4.1.1 *Study Area*

This study encompasses the area surrounding Windsor and Falmouth, Hants County, Nova Scotia. The study area is adjacent to the Avon and the St. Croix rivers.

4.1.2 *Methods*

Research was completed from within The Confederacy of Mainland Mi'kmaq research department library as well as external sources from the Nova Scotia Public Archives, Nova Scotia Museum, Cape Breton University's Mi'kmaq Resource Centre and the Colchester library. Secondary sources include Crown Land index sheets, church records, cemetery record, maps and published papers and books on Nova Scotia History.

4.1.3 *Limitations*

Recorded documents are the primary source of information for the study of historic Mi'kmaq land and resource use. There are no recorded documents in the pre-contact period and recorded documents in the post-contact period are not comprehensive. Furthermore, existing documentation has largely been written by people of a different culture. This means that information may either not be completely accurate or may be incomplete.

4.2 Current Mi'kmaq Land and Resource Use

Current Mi'kmaq land and resource use occurred within living memory or is presently occurring. The MEKS includes a study of:

- 1) Current Mi'kmaq land and resource use sites
- 2) Species of Significance to Mi'kmaq
- 3) Mi'kmaw Communities

4.2.1 Study Areas

The study areas are described in Figure 2.

4.2.1.1 Current Mi'kmaq Land and Resource Use Sites

The study area for current Mi'kmaq land and resource use sites is the proposed area of development – five-kilometer radius surrounding proposed project site.

4.2.1.2 Species of Significance to Mi'kmaq

Study areas are marked on Figure 2.

4.2.1.3 Mi'kmaw Communities

The study area for Mi'kmaw communities is a 5 km radius surrounding the proposed development area.

4.2.2 Methods

4.2.2.1 Current Mi'kmaq Land and Resource Use Sites

Mi'kmaq knowledge on current land and resource sites will be gathered through a review of information collected through oral interviews with Mi'kmaw knowledge holders.

All individuals, whom will be interviewed, will sign consent forms. Knowledge will be gathered in accordance within the spirit of the *Mi'kmaq Ecological Knowledge Protocol*.

Knowledge collected is reported in a general format only. No names or specific locations are published. Collected knowledge will be digitized and compiled to allow for an analysis of potential impacts of the project on current Mi'kmaq land and resource use.

4.2.2.2 Species of Significance to Mi'kmaq

A system of stratified random sampling was employed to identify flora species present in the study areas of significance to Mi'kmaq. Plants were surveyed in the spring and fall of 2016. Information collected is reported in a general format only. The names of the species are not recorded.

4.2.2.3 Mi'kmaw Communities

A review of outstanding specific land claims within the study area was undertaken by CMM. There are no known specific land claims identified within the project area, however, the record of outstanding specific land claims in no way infers that specific land claims may not arise in the future.

4.2.3 Limitations

While every attempt was made to document all available Mi'kmaw knowledge, the knowledge gathering process may not have captured some available Mi'kmaw knowledge. It is also recognized that over generations of cultural and political suppression, much Mi'kmaq knowledge has been irretrievably lost.

5.0 RESULTS

Results of the study are divided into two categories:

- 1) Historic land and resource use, that is, use that occurred before living memory, and
- 2) Current land and resource use, or use that occurred within living memory or is occurring at the present day.

Land and resource use may be for hunting, burial/birth, ceremonial, gathering, or habitation purposes.

5.1 Historic Mi'kmaq Land and Resource Use

The project is located within the District Segepenegatig, the “ground nut place.”¹
The Segepenegatig District covers the modern counties of Colchester, Hants, Kings,

¹Bernard G Hoffman,
The Historical Ethnography of the Micmacs of the Sixteenth and

Lunenburg up to Lahave, including the entire Minas Basin.² Hoffman identified that in Segepenegatig there were three or four summer villages.³

John Reid wrote that people had been in the Maritime Provinces “*continuously for more than 10,000 years and the direct ancestors of the Micmac and Maliseet-Passamaquoddy Indian peoples had been established since about 1000 BC. Since then their culture had altered and evolved. Among the periods of most significant change was the century following the first European contacts in or about the year 1500.*”⁴

The Mi’kmaq of Nova Scotia sustained themselves through hunting and fishing activities. Speck, observed that the country had been “*subdivided into more or less well recognized districts in which certain individual proprietries or families enjoyed the inherited privilege of hunting.*”⁵ Typically, during the winter months families would travel to the interior “*where game is found more readily, and where the lakes afford a supply of fish which are no longer to be caught on the sea-coast.*”⁶

It has been recorded that in the Windsor area the Mi’kmaq would have hunted *the moose, the caribou, the bear, the beaver, the fox and marten.*⁷

Speck, also writes that, “*These bands and their gathering places at the present time have grown into the local groups which are found all through the province on small reservations. It may be added that Bear River seems to have been a kind of capital village for the bands in the southwestern part of the province, and Shubenecadie another for the central part.*”⁸

While travelling Nova Scotia, Speck observed that the, “*Micmacs, through their political resources, Grand Tribal Council and local Band Council allotted hunting, fishing and berry gathering areas to heads of family units in each Band.*”⁹ The Hunting and Fishing areas [for the Windsor Band] were as follows:

Table 1: Windsor Band Council Allotted Hunting, Fishing and Berry Gathering Areas

Name of Proprietor	District
Frank Penhall ¹⁰	Lakes south of Windsor
Tom Phillips ¹¹	Ponhook and Caribou Lakes
John Ferris ¹²	Kenneticook River Valley

In 1750, it was recorded that the chief of the District of Segepenegatig was Jean Baptiste Cope, who in 1760, was succeeded by Claud Piguidawalwet.¹³ Stephen E Patterson writes that in 1750 the Shubenecadie band split. Some members of the band followed the French missionary, Le Loutre to Fort Beauséjour. The remaining 90 Mi’kmaq saw Cope as their chief and “*withdrew to lands on the eastern shore near Musquodobit which had traditionally been within the territory of the Shubenecadie band (the Shubenecadie River and the series of lakes and streams transvers the province from the Minas Basin to Musquodobit, and this waterway had traditionally carried the seasonal migrants of the band*

Seventeenth Centuries (Ph D Thesis, University of California, 1955) [unpublished] at 534 [Hoffman, *Historical Ethnography of the Micmacs*].

²Donald M Julien, “Historical Perspectives”, *The Confederacy of Mainland Micmacs* at 2 [Julien, “Historical Perspectives”].

³Hoffman, *Historical Ethnography of the Micmacs* at 534.

⁴John Reid, *Six Crucial Decades: Time of Change in the History of the Maritimes*, 1987 at 3.

⁵Frank G. Speck, *Beothuk and Micmac* (New York: Museum of the American Indian Heye Foundation, 1922) at 93 [Speck, *Beothuk and Micmac*].

⁶Captain W. Moorsom, *Letters from Nova Scotia: Comprising Sketches of a Young Country* (London: Henry Colburn & Richard Bentley, 1830) at 115.

⁷Nova Scotia Archives, PANS RG 1 vol 430 #176 m/f 15, 496 [NSA].

⁸Speck, *Beothuk and Micmac*, *supra* note 5 at 93.

⁹The Union of Nova Scotia Indians, *Crown Land Rights and Hunting and Fishing Rights of Micmac Indians in Nova Scotia* (Revised Edition, 1976) at 16 [UNSI, *Crown Land Rights and Hunting and Fishing Rights of Micmac*].

¹⁰Frank G. Speck, *Beothuk and Micmac*, *supra* note 5 at 101.

¹¹*Ibid.*

¹²UNSI, *Crown Land Rights and Hunting and Fishing Rights of Micmac*, *supra* note 5 at 16.

¹³Julien, “Historical Perspectives”, *supra* note 2 at 3.

which on some occasions was called the Shubenacadie- Musquodobit “tribe”).¹⁴

By the turn of the nineteenth century the compounding stresses of over hunting due to the fur trade, increased waves of settlers and the “Indian Wars” initiated by Cornwallis had dramatically reduced the Mi’kmaq population. Daniel Paul writes, “*the Mi’kmaq were beggars in their own homeland. With the arrival of hordes of new settlers, their traditional sources of food had all but disappeared.*”¹⁵

According to the West Hants Historical Society, “A census in 1764 recorded two tribes totaling 131 people living between Windsor and the Gaspereau River.”¹⁶ Also, “Between 1870-1885 on King Street in Curry’s Corner, [in Windsor] an old burial area was unearthed in which bodies of the Mi’kmaq people were found wrapped in birch bark, as was the custom, suggesting that a Mi’kmaq mission chapel had existed nearby.”¹⁷

5.1.1 Chronology of Historical Events

As early as 1699, Father Louis-Pierre Thury “sought to gather the Mi’kmaq of Peninsular Nova Scotia into a single settlement around Shubenacadie.”¹⁸ Father Louis-Pierre Thury vision was abandoned after his “untimely death at Chebucto later that same year.”¹⁹

In 1703, Brouillan reported, “he had 100 Native fighters at Port Royal. Hard-pressed by the decline of the fur trade, Micmac chiefs had even expressed interest in a proposal of Brouillan that they should resettle in a sedentary community at ‘Chequabenakady’ (Shubenacadie).”²⁰

In 1744 war broke out between Britain and France. Once the war had ended Le Loutre “received fresh instructions to remove his headquarters from Shubenacadie to Beauséjour and to take with him ‘the Indians from Chigabenakady and the other tribes dependent on it as far away as Cape Sable, as they were too near Halifax.’ Le Loutre was never precise about how many Micmacs he controlled, but it is clear that he had a large following, which he called ‘my Indians’; several families of them removed with him to Beauséjour...”²¹

October 1, 1749, the British colonial government declared war on the Mi’kmaq. An Order in Council was given to the commanding officers at Annapolis Royal, Minas, and all others within the Province, “to annoy, distress & destroy the Indians every where--.”²² Ten Guineas was promised for every Mi’kmaq killed or taken Prisoner and orders were given to raise two more companies, one under Major Gilman, to be like Gorham’s Rangers, and one under Wm. Champlain.²³

On June 2, 1750, a Governor informed the council that he had sent Capt. Gorham to Peziquid [Windsor] to apprehend some of the inhabitants [Acadians?] that were in arms with the Indians and that Gorham had captured three young men who were now prisoner in one of the forts. Council was unanimous that the three should be detained in custody until they could stand trial.²⁴

¹⁴Stephen E Patterson, “Indian-White Relations in Nova Scotia, 1749-51: A Study in Political Interaction”, *Acadiensis* XXIII, 1 (Autumn 1993) 23 at 37-38.

¹⁵Daniel Paul, *We Were Not the Savages*, 3d ed (Halifax: Fernwood Publishing, 2006) at 192 [Paul, *We Were Not the Savages*].

¹⁶West Hants Historical Society, *The History of Hants*, online: <http://westhantshistoricalso-ciety.ca/history/>.

¹⁷*Ibid.*

¹⁸Northeast Archeological Research, “Mission Sainte-Anne: Shubenacadie, Nova Scotia” online at: http://northeastarch.com/sainte_anne.html.

¹⁹*Ibid.*

²⁰John G Reid, “1686-1720 Imperial Intrusions” in Phillip A Buckner & John G Reid, eds, *The Atlantic Region to Confederation: A History* (Toronto: University of Toronto Press and Acadiensis Press, 1994) 78 at 89.

²¹Stephen E Patterson, “1744-1763: Colonial Wars and Aboriginal Peoples” in Phillip A Buckner & John G Reid, eds, *The Atlantic Region to Confederation: A History* (Toronto: University of Toronto Press and Acadiensis Press, 1994) 125 at 132 [Patterson, “Colonial Wars and Aboriginal Peoples”].

²²Minutes of H.M.’s Council (transcripts), PANS RG1, vol 209, pp 22-23, reel 15310.

²³*Ibid.*

²⁴Minutes of H.M.’s Council (transcripts), PANS RG1, vol 209, p 42, reel 15310.

In 1750 the Lords of Trade wrote Cornwallis suggesting, “gentler methods and offers of Peace and Friendship should be tendered to the Indians.”²⁵ Unfortunately, this caution from the Lords of Trade arrived too late as Cornwallis had already implemented the Provincial Proclamation on Indian Scalps and “Captain Gorham’s Rangers were already hunting down Micmacs in the backwoods of Nova Scotia.”²⁶

In September of 1752, Major Jean Baptiste Cope, “Chief of the Schubenacadie Mi’kmaq – whose territory comprised an area that today covers approximately Cumberland, Colchester, Guysborough, Hants, Halifax and parts of Antigonish, Pictou, Kings and Lunenburg counties – approached the British ... with a proposal that peace be with his District.”²⁷ At his meeting with the Council, Cope proposed the “the Indians should be paid for land the English had settled upon in this country.”²⁸

On November 24, 1752, “Chief Cope returned to Halifax with the approval of his followers to sign a formal treaty.”²⁹ The treaty was sealed with the Great Seal of Nova Scotia and renewed the treaty of 1725. Within the 1752 Treaty the British government promised to build a truckhouse at Shubenacadie and recognized certain areas, such as those around Shubeneacdie, as being tribal lands of the Micmac Indians:

*It is agreed that the said Tribe of Indians shall not be hindered from, but-have free liberty to hunting and fishing as usual and that if they shall think a Truck house needful at the River Chibenacadie, or any other place of their resort they shall have the same built and proper Merchandize, lodged therein to be exchanged for what the Indians shall have to dispose of and that in the meantime the Indians shall have free liberty to bring to Sale to Halifax or any other Settlement within this Province, Skins, feathers, fowl, fish or any other thing they shall have to sell, where they shall have liberty to dispose thereof to the best Advantage.*³⁰

By 1753 the Peace and Friendship Treaty of 1752 was broken. “Governor Hopson noted in a letter to the Lords of Trade that two sailors had arrived at Halifax in early April 1753, carrying six Indian (Shubenacadie) scalps.”³¹

Again in 1754, Le Loutre drafted a letter for the Mi’kmaq that was sent to the British colonial government. The letter proposed “that a substantial portion of Nova Scotia should be recognized by the British as Micmac territory. It would run from the isthmus to Minas, then to Cobequid and Shubenacadie, including Le Loutre’s old mission, across to Musquodoboit, then along the eastern shore to Canso, and finally through the strait (or Fronsac) along the north shore and back to Baie Verte. For a people who lived by hunting and fishing, argued Le Loutre, this was a reasonable demand...”³²

July 16, 1759, Bands of Indians with a few Frenchmen, had threatened the forts at Windsor.³³

In 1783 the British colonial government implemented a land policy that offered the Mi’kmaq “temporary grants of occupation to them [for] some of their own land.”³⁴ Several licences were issued to those Indians that promised to settle on the lands granted.³⁵

²⁵Julien, “Historical Perspectives”, supra note 2 at 10.

²⁶Ibid.

²⁷Paul, *We Were Not the Savages*, supra note 15 at 125.

²⁸Julien, “Historical Perspectives”, supra note 2 at 10.

²⁹Ibid.

³⁰Gary P Gould and Alan J Semple, *Our Land: The Maritimes: The Basis of the Indian Claim in the Maritime Provinces of Canada* (Fredericton: Saint Anne’s Point Press, 1980) at 131 [Gould & Semple, *Our Land*].

³¹Julien, “Historical Perspectives”, supra note 2 at 11.

³²Patterson, “Colonial Wars and Aboriginal Peoples”, supra note 21 at 139.

³³R. S. Longley, *The Coming of the New England Planters to the Annapolis Valley* (read before the Nova Scotia Historical Society, April 1960) at 93.

³⁴Paul, *We Were Not the Savages*, supra note 15 at 186.

³⁵Gould and Semple, *Our Land*, supra note 29 at 40.

In March 1801, the government changed their land policy to that of the reserve system due to white settlers encroaching on lands granted to the Indians.³⁶ In Hants County 2,100 acres was reserved for the Indians, nothing was reserves for the Mi'kmaq at Windsor:

Hants Co.

- | | | |
|---|-------|-------------|
| (1. Western side of Great Lake Shubenacadie | 1,000 | |
| (2. Shubenacadie | 1,100 | 2,100 acres |

In 1815, Indian Affairs within Nova Scotia wrote a report. The report “*dealt primarily with lands which had already been allotted to the Indians at Shubenacadie River, Pugwash, Antigonish, St. Margret’s Bay, and Chester. The report called for reserving of land frequented by the Indians.*”³⁷

Throughout the 1800s, the Mi'kmaq “*suffered from disease and from the threat of starvation*”.³⁸ Many infectious diseases, such as smallpox, whooping cough, measles³⁹ and tuberculosis⁴⁰ were contracted from the Europeans during this time.

On January 17, 1831, George Morris sent a letter to Governor of Maitland, which had enclosed in it the Petition of Chief Benjamin Paul. The petition identified that 200 Mi'kmaq, who were encamped at Windsor, Newport, Kennetcook and Rawden are in need of relief from the cold and hunger. Within the Petition, George Morris states, “*That the condition of the Indians would not be so bad could they find in the forest of Nova Scotia the same abundance of food and fur as formally, but the sound of the settlements are has scared off the moose, the caribou, the bear, the beaver, the fox and marten.*”⁴¹

December 2, 1834, Peter Paul et al, sent a Petition for Relief to His Excellency Sir Colin Campbell K.C.B. Lieutenant Governor and Commander. Relief was being sought for 38 Mi'kmaq, of which 30 were women and children, living near Windsor in Hants County. Within the petition Paul stated, there was a “*great scarcity of wild animals of every description owing to the general settlement and cultivation of the Country by the White Inhabitants [leaving them] totally unable to maintain themselves by hunting...*”⁴²

In 1836 the bones of an aboriginal person, along with “*relics of arrows*”, were discovered in an open gypsum quarry near Windsor, Nova Scotia. “*It is presumed that this unfortunate individual, while pursuing his favorite occupation of the chase [hunting]...His bones are preserved in the library of King’s College, at Windsor...*”⁴³

In 1841, Grand Chief Pemmeenauweet, who resided with his family in Shubenacadie, wrote to Queen Victoria begging for mercy for his people. Among other things, Chief Pemmeenauweet wrote:

I have seen upwards to a thousand Moons. When I was young I had plenty, now I

³⁶*Ibid* at 43.

³⁷E Palmer Patterson II, *The Canadian Indian: A History Since 1500* (Collier-Macmillan Canada, Ltd, 1972) at 64.

³⁸Daniel Paul, *We Were Not the Savages*, *supra* note 15 at 200.

³⁹*Ibid* at 199.

⁴⁰*Ibid* at 200.

⁴¹NSA, PANS RG 1 vol 430 #176 m/f 15, 496.

⁴²NSA, PANS RG1 vol 431 #9, m/f 15, 472.

⁴³Ruth Holmes Whitehead, *The Old Man Told Us: Excerpts from Micmac History 1500-1950* (Halifax: Nimbus Publishing Ltd, 1991) at 213 [Whitehead, The Old Man Told Us].

*am old, poor and sickly too. My people are poor. No Hunting Grounds, No Beaver, No Otter, No Nothing. Indians are poor, poor forever, No Store, No Chest, No Cloths. All these woods once ours. Our Fathers possessed them all. Now we cannot cut a Tree to warm our Wigwams in Winter unless the White Man pleases.*⁴⁴

Five days after receiving the letter, Queen Victoria order that enquires be made into the circumstances of the Mi'kmaq in Nova Scotia.

In 1842, it was recorded that the Mi'kmaq lived and used the lands in Hants County. The principal livelihood of the Mi'kmaq recorded was hunting, fishing, coopering, basket making, and fancy quillwork.⁴⁵

In 1844, Indian Agent Joseph Howe, reported to the Legislative Assembly of Nova Scotia that John Stephen, a Mi'kmaq, lived in Newport with his wife and three children.⁴⁶

In January of 1849 the Mi'kmaq tribe residing in Hants County filed a petition to the Nova Scotia Legislature requesting relief because they were “*wholly unable to provide themselves with the necessaries of life.*” The petitioners were “*in very destitute circumstances*”.⁴⁷ The names on the petition include:

Joseph Coutts, his wife and two children
Christopher Paul, his wife and two children
Francis Philips, his wife and five children
Michael Paul, his wife and two children
Francis Paul, his wife and three children
Thomas Benis, his wife and five children
Thomas Philip, his wife and two children
Abraham Philip, his wife and two children
Alexander Maurice, his wife and child
Lewis Paul, his wife and seven children
Abram Benis, his wife and child
Newel Jeddore, his wife and two children
John Stephen, his wife and eight children
Thomas Newel, his wife and children
Noel Jeremy, which wife and children

In 1852, lands were set-aside for the Mi'kmaq at Ponhook. The Plan of Indian Lands at Ponhook Lake, laid off areas of land for the Following Mi'kmaq: Jacob Francis, Noel Francis, Christopher Francis, Thomas Phillips, 100 acres each at Ponhook Lake where St. Croix River flows out of Lake, in Hants County.⁴⁸

On February 6, 1852, Mr. John Reden, surveyor for the Crown ands Department prepared the survey plan for the St. Croix Indian Reserve, Hants County, The Land Plan included the lands to be further subdivided into four individual parcels of land.⁴⁹

⁴⁴Paul, *We Were Not the Savages* at 202.

⁴⁵NSA, PANS MG 15 vol 3 #74 m.f 15, 106.

⁴⁶Whitehead, *The Old Man Told Us*, *supra* note 42 at 227.

⁴⁷NSA, PANS, RG 5 Series vol 85 #9, m/f 15, 623 – Transcript.

⁴⁸National Archives of Canada, RG10, vol 459, reel 13,329 at 422-423 [NAC].

⁴⁹Crown Lands Reg., Halifax, Nova Scotia, PANS, Misc. Indian Lands Documents, RG 10, vol. 2039, File # 8947.

Around 1863, there is a record of the Mi'kmaq having camps and hunting foxes in the Windsor area.⁵⁰

In December of 1869, Indian Agent S. Fairbanks received a receipt for 20 blankets that were distributed among the Mi'kmaq at Windsor, Hants County.⁵¹

In a letter dated, February 4, 1871, E. P. Burnham in communication with Agent Fairbanks stated that he believes an Indian man who came in two weeks ago for blankets came back again for more blankets and that Benjamin Brooks was ill. Burnham also sent supplies to Mrs. Tom Phillips, who lives 7 miles from Windsor at Ponhook with her grandson. She is ill and her grandson, who hurt his foot badly in the woods.⁵²

In 1870, J.J. Withrow excavated a Mi'kmaq burial site. The site was located "on an old French/Micmac trail from Shubenacadie to Newport, Hants County."⁵³ The site is the oldest known copper-pot site, which evidences trade activity between the Mi'kmaq and Europeans between 1580-1600.⁵⁴

Another Mi'kmaq burial site was uncovered between 1870 and 1885 on King Street in Curry's Corner. When this burial area was unearthed they found the "bodies of the Mi'kmaq people were ... wrapped in birch bark, as was the custom, suggesting that a Mi'kmaq mission chapel had existed nearby."⁵⁵

5.1.2 Population and Census Information

A census in 1764 recorded two tribes totaling 131 people living between Windsor and the Gaspereau river.⁵⁶

In 1842 it was recorded that there were 280 Mi'kmaq in total in the area (144 males; and 136 females).⁵⁷

March 3, 1862, Indian Affairs recorded that there were 113 Mi'kmaq in Hants County.⁵⁸

The following table shows the names and ages of Mi'kmaq recorded on the 1871 Census of the sub-districts Saint Croix, Windsor, Falmouth, Forks, and Brooklyn in Hants County.

⁵⁰Ruth Holmes Whitehead, *The Old Man Told Us: Excerpts from Micmac History 1500-1950* (Halifax: Nimbus Publishing Ltd, 1991) at 264-265 [Whitehead, *The Old Man Told Us*].

⁵¹NCA, RG10, vol 459, reel 13,329 at 544-545.

⁵²NCA, RG10, vol 459, reel 13,329 at 668-669.

⁵³Ruth Holmes Whitehead, Nova Scotia: *The Protohistoric Period 1500-1630* (Halifax: Department of Education, 1993) at 29.

⁵⁴Ibid at 24 and 29.

⁵⁵West Hants Historical Society, *History of Hants*, online: <http://westhantshistoricalalso-ciety.ca/history/>

⁵⁶*Ibid.*

⁵⁷NSA, PANS MG 15 vol 3 #74 m.f 15, 106.

⁵⁸Journals of House of Assembly, NS, Appendix No. 30, Indian Affairs, PANS.

Table 2: Mi'kmaq identified in 1871 Census for the sub-districts Saint Croix, Windsor, Falmouth, Forks, and Brooklyn

Saint Croix	
None found	
Windsor	
None found	
Forks	
None found	
Brooklyn	
None found	
Falmouth	
Joseph Brooks; 29 years ⁵⁹	Daniel Labum; 26 years ⁶⁰
Catherine Brooks; 28 years ⁶¹	Harriet Labum; 25 years ⁶²
Isabella Brooks; 4 years ⁶³	Daniel Labum; 4 years ⁶⁴
Benjiman Brooks; 1 year ⁶⁵	Mary Labum; 1 year ⁶⁶
Benjiman Brooks; 53 years ⁶⁷	Sarah Gload; 9 years ⁶⁸
Mary Brooks; 49 years ⁶⁹	Margaret Gload; 6 years ⁷⁰
Hannah Brooks; 16 years ⁷¹	Frank E. Brooks; 30 years ⁷²
Newel Paul; 26 years ⁷³	Christina Brooks; 26 years
Jane Paul; 23 years ⁷⁴	Joseph Brooks; 5 years ⁷⁵
Lizie Paul; 2 years ⁷⁶	Alexander Joe; 40 years ⁷⁷
Clarene Paul; 1 month ⁷⁸	Mary Joe; 5 years ⁷⁹
Joseph Simonds; 30 years ⁸⁰	Loui Joe; 3 years ⁸¹

⁵⁹Government of Canada, Library and Archives Canada, "Search Results: Census of Canada, 1871", online at: http://data2.collections-canada.ca/1871/pdf/4396321_00511.pdf.

⁶⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁶¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00511.pdf.

⁶²*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁶³*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00511.pdf.

⁶⁴*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁶⁵*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00511.pdf.

⁶⁶*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁶⁷*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00511.pdf.

⁶⁸*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁶⁹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00511.pdf.

⁷⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁷¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00512.pdf.

⁷²*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁷³*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00512.pdf.

⁷⁴*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00512.pdf.

⁷⁵*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁷⁶*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00512.pdf.

⁷⁷*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁷⁸*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00512.pdf.

⁷⁹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

⁸⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.

⁸¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

Mary Jane Simonds; 28 years ⁸²	Margaret Davi; 86 years ⁸³
Alexander Simonds; 5 years ⁸⁴	Peter Nockwood; 23 years ⁸⁵
Mary Ann Simonds; 3 years ⁸⁶	Michael Stephens; 63 years ⁸⁷
Hiawatha Simonds; 1 month ⁸⁸	Fannie Stephens; 68 years ⁸⁹
Peter Barss; 49 years ⁹⁰	Annie Gload; 19 years ⁹¹
Nancy Barss; 54 years ⁹²	Mary A. Gload; 35 years ⁹³
Joseph Barss; 21 years ⁹⁴	Abraham Gload; 5 years ⁹⁵
Sarah Barss; 15 years ⁹⁶	Christine Gload; 3 years ⁹⁷
John Barss; 10 years ⁹⁸	Jedore Newal; 61 years ⁹⁹
Mary Barss; 1.3 years ¹⁰⁰	Nancy Newal; 56 years ¹⁰¹
Frank Cope; 17 years ¹⁰²	Ellen Newal; 24 years ¹⁰³
James Cope; 36 years ¹⁰⁴	John T. Newal; 5 years ¹⁰⁵
Madeline Cope; 25 years ¹⁰⁶	Lizzie Newal; 2 years ¹⁰⁷
Susan Cope; 3 years ¹⁰⁸	Thomas Brooks; 42 years ¹⁰⁹
Joseph Cope; 2 years ¹¹⁰	Eliza Brooks; 36 years ¹¹¹

The following table shows the names and ages of Mi'kmaq recorded on the 1881 Census of the sub-districts Saint Croix, Windsor, Falmouth, Windsor Forks, and Brooklyn in Hants County.

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- ⁸²*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁸³*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁸⁴*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁸⁵*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁸⁶*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁸⁷*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁸⁸*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁸⁹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁹⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁹¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁹²*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁹³*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁹⁴*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁹⁵*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁹⁶*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁹⁷*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ⁹⁸*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ⁹⁹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ¹⁰¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰²*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00518.pdf.
- ¹⁰³*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁴*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁵*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁶*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁷*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁸*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹⁰⁹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹¹⁰*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.
- ¹¹¹*Ibid*, online: http://data2.collectionscanada.ca/1871/pdf/4396321_00519.pdf.

Table 3: Mi'kmaq identified in 1881 Census in the sub-districts Saint Croix, Windsor, Falmouth, Windsor Forks, and Brooklyn

Windsor	
John Toney; 27 years ¹¹²	Mary Barrs; 8 years ¹¹³
Sarah Toney; 26 years ¹¹⁴	Mary S. Simon; 42 years ¹¹⁵
Moses Toney; 3 years ¹¹⁶	Alexander Simon; 16 years ¹¹⁷
Peter Toney; 1 year ¹¹⁸	Mary A. Simon; 13 years ¹¹⁹
Peter Barrs; 71 years ¹²⁰	Noel Simon; 10 years ¹²¹
Nancy Barrs; 68 years ¹²²	Frank Toney; 46 years ¹²³
Joseph Barrs; 32 years ¹²⁴	Magt Toney; 45 years ¹²⁵
Mary S. Barrs; 39 years ¹²⁶	
Ste. Croix	
Francis Paul; 49 years ¹²⁷	George Paul; 7 years ¹²⁸
Eliza Paul; 51 years ¹²⁹	Mary Paul; 3 years ¹³⁰
Dennis Paul; 26 years ¹³¹	
Falmouth	
None found	
Windsor Forks	
None found	
Brooklyn	
None found	

The following table is a summary of the Mi'kmaq population information in Hants County as reported in the Department of Indian Affairs Annual Reports.

¹¹²Government of Canada, Library and Archives Canada, "Search Results: Census of Canada, 1881", online at: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹³*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁴*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁵*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁶*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁷*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁸*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹¹⁹*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²⁰*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²¹*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²²*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²³*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121918.pdf>.

¹²⁴*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²⁵*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121918.pdf>.

¹²⁶*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121917.pdf>.

¹²⁷*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121963.pdf>.

¹²⁸*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121963.pdf>.

¹²⁹*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121963.pdf>.

¹³⁰*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121963.pdf>.

¹³¹*Ibid*, online: <http://data2.collectionscanada.gc.ca/e/e325/e008121963.pdf>.

Table 4: Hants County Mi’kmaq Population Information from The Department Of Indian Affairs Annual Reports

Year of Report	Mi’kmaq Population of Hants County	Other Notes
1874 ¹³³	168	No other information
1878 ¹³⁴	368	Agent Dr. McLean No Report Combined population of the Micmacs of Halifax, Hants, Cumberland and Colchester
1879 ¹³⁵	150	Agent Dr. McLean Combined population of the Micmacs of Hants and Colchester
1880 ¹³⁶	80	Agent James Gass In the western counties of Nova Scotia, the Indians continue to obtain their livelihood from fishing, porpoise shooting, and the manufacture and sale of articles of Indian handicraft.
1881 ¹³⁷	169	Agent James Gass Micmacs of Hant’s County. - The crops were short this year, owing to the season being backward, and the injury caused to them by the weevil and by rust.
1882 ¹³⁸	169	Agent James Gass These Indians have a reserve at Indian Brook, Shubenacadie, and appear to be making some progress.
1883 ¹³⁹	170	Agent James Gass There is not much advancement among those Indians. Owing, however, to the meagre report of the Agent, it is impossible to give Your Excellency much information about them. They occupy 14 houses and own 7 barns and stables, have 275 acres of land under cultivation, own 11 farming implements and 20 heads of live stock. They are said to have raised 250 bushels of produce and to have cut 60 tons of bay.
1884 ¹⁴⁰	170	Agent F. McDormand Combined population of Mi’kmaq in Annapolis, Digby, Yarmouth and Slerburn. The Mi’kmaq at Bear River engage extensively in porpoise hunting and fishing, preferring those modes for obtaining subsistence for their families to tilling the soil, though a few of them do cultivate land.
1885 ¹⁴¹	170	Agent James Gass No Report
1886 ¹⁴²	169	Agent James Gass The Indians of the County of Hants are described as an industrious people.

¹³²Canada, Library and Archives, “Indian Affairs Annual Reports, 1864-1990, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/list.aspx?k=Shubenacadie&>.

¹³³*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1874-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁴*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1878-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁵*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1879-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁶*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1880-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁷*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1881-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁸*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1882-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹³⁹*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1883-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹⁴⁰*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1884-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹⁴¹*Ibid*, online: <http://central.bac-lac.gc.ca/.item/?id=1885-IAAR-RAAI&op=pdf&app=indianaffairs>.

¹⁴²*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=4964>.

Year of Report	Mi'kmaq Population of Hants County	Other Notes
1887 ¹⁴³	167	Agent James Gass The condition of the Indians of the County of Hants is represented as being satisfactory on the whole.
1888 ¹⁴⁴	164	Agent James Gass The very short report of the Agent for the County of Hants contains so little information, that all that can be gathered from it is that matters in his district are about in the same condition as usual.
1889 ¹⁴⁵	164	Agent James Gass
1890 ¹⁴⁶	163	Agent James Gass
1891 ¹⁴⁷	182	Agent James Gass
1892 ¹⁴⁸	187	Agent James Gass
1893 ¹⁴⁹	199	Agent James Gass
1894 ¹⁵⁰	199	Agent James Gass
1895 ¹⁵¹	199	Agent James Gass
1896 ¹⁵²	104	Agent James Gass The Indians who reside continuously on the reserve, seem to be improving in their condition.
1897 ¹⁵³	93	Agent Alonzo Wallace Generally speaking, the Micmac Indians do not take the interest in farming ... but as coopers and makers of baskets and fancy work they certainly excel. From these latter they derive the greater part of their livelihood. The men are generally fond hunting and fishing, gathering material from the forest for the manufacture of such articles as baskets and butter, while basket making was left mostly to women.

¹⁴³*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=5743>.

¹⁴⁴*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=6423>.

¹⁴⁵*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=6919>.

¹⁴⁶*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=7565>.

¹⁴⁷*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=8144>.

¹⁴⁸*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=8780>.

¹⁴⁹*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=9234>.

¹⁵⁰*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=9675>.

¹⁵¹*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=10305>.

¹⁵²*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=10997>.

¹⁵³*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=11564>.

Year of Report	Mi'kmaq Population of Hants County	Other Notes
1898 ¹⁵⁴	Indian Brook - 95 Windsor Junction 4	Agent Alonzo Wallace The Indians supported themselves by making oars and hockey sticks, as well as keeping the market well supplied with butter-tubs and baskets. Although they do not take an interest in farming, they still they do a good deal of gardening.
1899 ¹⁵⁵	Indian Brook - 74 Windsor Junction - 23	Agent Alonzo Wallace Among the occupations of these Indians are hunting, fishing in the streams, cooper-work, and goods for the sporting market.
1900 ¹⁵⁶	Indian Brook - 94 Wellington and Windsor Junction - 51	Agent Alonzo Wallace
1901 ¹⁵⁷	Indian Brook - 85 Wellington, Bedford & Windsor Junction - 51	Agent Alonzo Wallace The Indians during the year have supported themselves by manufacturing goods for the sporting market, copper-work, basket-work, but principally by farming, raising such crops as hay, oats and potatoes.

5.1.3 Archaeology

The Confederacy of Mainland Mi'kmaq records did not contain any archaeological sites within the study area. The adjoining areas have had some activity recorded in the Maritime Archaeological Resource Inventory. The information collected from that research has shown that Mi'kmaq presence occurred all around the study area.

5.2 Current Mi'kmaq Land and Resource Use

The study of current Mi'kmaq land and resource use is comprised of a study of current Mi'kmaq land and resource use sites, species of significance to Mi'kmaq, and Mi'kmaw communities.

5.2.1 Current Mi'kmaq Land and Resource Use Sites

Current Mi'kmaq land and resource use activities are divided into five categories:

- 1) Kill/hunting
- 2) Burial/birth
- 3) Ceremonial
- 4) Gathering food/ medicinal
- 5) Occupation/habitation

¹⁵⁴*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=12435>.

¹⁵⁵*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=13270>.

¹⁵⁶*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=14230>.

¹⁵⁷*Ibid*, online: <http://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/first-nations/indian-affairs-annual-reports/Pages/item.aspx?IdNumber=15124>.

Table 1 provides a description of activities undertaken at the sites.

Table 1: Description of Activities Undertaken in Current Mi'kmaq Land and Resource Use Sites

TYPE OF SITE	DESCRIPTION OF ACTIVITIES IN STUDY AREA
HUNTING/KILL	Eel, Mackerel
BURIAL/BIRTH	
CEREMONIAL	
GATHERING	Berries, Wild Fruit, Specialty Wood, Decoration plant
HABITATION	

5.2.2 Species of Significance to Mi'kmaq present in study area

Species of significance to Mi'kmaq in the study area are divided into three categories:

- 1) Medicinal
- 2) Food/Beverage
- 3) Craft/Art

The following table describes the number of plants of significance present in the study areas during the fall and spring surveys.

Table 2: Number of Species of Significance to Mi'kmaq Present in the Study Areas Spring & Fall of 2016

TYPE OF USE	NUMBER OF SPECIES PRESENT SPRING & FALL 2016
MEDICINAL	20
FOOD/BEVERAGE	14
CRAFT/ART	10

5.2.3 Mi'kmaw Communities

There are two Mi'kmaw communities near the project site, Annapolis Valley First Nation and Glooscap First Nation. The registered population of Annapolis Valley as of October 2016 was 289 persons; with 117 living on reserve and 172 band members living off reserve.¹⁵⁸ The Annapolis Valley First Nation is comprised of two parcels. Annapolis Valley is located at Cambridge Station, consists of 59 hectares and is the main land base where the majority of the population.¹⁵⁹ The Parcel St. Croix 34 is 126.20 hectares and located 46.4 kilometers northwest of Halifax.¹⁶⁰ The registered population of Glooscap as of October 2016 was 376 persons; with 95 people living on

¹⁵⁸Indigenous and Northern Affairs Canada, *Registered Population*, online: http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNReg-Population.aspx?BAND_NUMBER=20&lang=eng [INAC].

¹⁵⁹INAC, *Reserve/Settlement/Village Detail*, online: http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNReserves.aspx?BAND_NUMBER=20&lang=eng.

¹⁶⁰INAC, *Reserve/Settlement/Village Detail*, online: http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNReserves.aspx?BAND_

reserve and 280 band members living off reserve.¹⁶¹ Glooscap First Nation consists of one parcel, Glooscap 35, which is located 68.8 kilometers northwest of Halifax.¹⁶²

Table 5: Mi'kmaw Place Names

Place	Mi'kmaw Place Name	Meaning (if given)
Lands		
Hantsport	Kaqakwek	“meat drying place”
Windsor	Pesikitk ¹⁶³	“to flow splitwise”
Brooklyn, Newport	Nélégâkumek	“broken snowshoes”
Falmouth	Kwesawatqek ¹⁶⁴	“thickly wooded point”
Horton	Kluskap ¹⁶⁵	“trickster”
Lower Horton	Umtaban'	“an overflowing flood”
Glooscap First Nation	Maqapskejek ¹⁶⁶	
St. Croix Reserve IR 34	Panuk ¹⁶⁷	“at the opening”
Waters		
St. Croix River	Maqmekwtik ¹⁶⁸	“a large, wide portion of the river”
Avon River	Amaqapskiket ¹⁶⁹	“flowing over rocks”
Avon River Forks	Pesikitk ¹⁷⁰	“running over stones”
Windsor Forks	Niktue'k ¹⁷¹ or Tuitnuk	“to flow splitwise” “a river's mouth”

NUMBER=20&lang=eng.

¹⁶¹INAC, *Registered Population*, online: http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=30&lang=eng.

¹⁶²INAC, *Reserve/Settlement/Village Detail*, online: http://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/RVDetail.aspx?RESERVE_NUMBER=06036&lang=eng.

¹⁶³Ta'n Weji-sqalia'tiek, “Mi'kmaw Place Names,” online at <http://sparc.smu.ca/mpnmap/>.

¹⁶⁴*Ibid.*

¹⁶⁵*Ibid.*

¹⁶⁶*Ibid.*

¹⁶⁷*Ibid.*

¹⁶⁸*Ibid.*

¹⁶⁹*Ibid.*

¹⁷⁰*Ibid.*

¹⁷¹*Ibid.*

6.0 POTENTIAL PROJECT IMPACTS ON MI'KMAQ LAND AND RESOURCE USE

The following table presents potential project impacts on historic and current Mi'kmaq land and resource use.

Table 3: Potential Project Impacts on Mi'kmaq Land and Resource Use

POTENTIAL IMPACTS ON MI'KMAQ LAND AND RESOURCE USE	
6.01	The historic review of Mi'kmaq use and occupation documents historic Mi'kmaq use and occupation in the study area, and potentially the project area. A potential impact of the project is the disturbance of archaeological resources.
6.02	Several species of significance to Mi'kmaq have been identified in the study area. Permanent loss of some species is an impact of the project.

7.0 SIGNIFICANCE OF POTENTIAL PROJECT IMPACTS ON MI'KMAQ LAND AND RESOURCE USE

The concept of significance in the Mi'kmaq Ecological Knowledge Study is distinct from the concept of significance under the *Canadian Environmental Assessment Act* or the *Nova Scotia Environmental Assessment Regulations*. Significance to Mi'kmaq is evaluated only in accordance with the criteria listed below. The MEKS evaluation of the significance of the potential project impacts on Mi'kmaq should be used by regulators to inform their determination of the significance of the environmental effects of the Project.

7.1 Significance Criteria

The following criteria are used to analyze the significance of the potential project impacts on Mi'kmaq use:

- 1) Uniqueness of land or resource
- 2) Culture or spiritual meaning of land or resource
- 3) Nature of Mi'kmaq use of land or resource
- 4) Mi'kmaq constitutionally protected rights in relation to land or resource.

7.2 Evaluation of Significance

Table 4: Significance of Potential Project Impacts on Mi’kmaq Land and Resource Use

POTENTIAL IMPACT		EVALUATION OF SIGNIFICANCE	
6.01	The historic review of Mi’kmaq use and occupation documents Mi’kmaq use and occupation in the study area, and potentially the project area. A potential impact of the project is the disturbance of archaeological resources.	7.2.01	Mi’kmaq archaeological resources are extremely important to Mi’kmaq as a method of determining Mi’kmaq use and occupation of Mi’kma’ki and as an enduring record of the Mi’kmaq nation and culture across the centuries. Archaeological resources are irreplaceable. Any disturbance of Mi’kmaq archaeological resources is significant.
6.02	Several species of significance to Mi’kmaq have been identified in the study areas. Permanent loss of some specimens is an impact of the Project.	7.2.02	The plant species of significance to Mi’kmaq identified within the study area exists within the surrounding area. The destruction of some specimens within the study areas does not pose a threat to Mi’kmaq use of the species. The impact of the permanent loss of some specimens of plant species of significance to Mi’kmaq is evaluated as not likely significant.

8.0 CONCLUSIONS AND RECOMMENDATIONS

- 8.01 In the event that Mi’kmaq archaeological deposits are encountered during construction or operation of the Project, all work should be halted and immediate contact should be made with Laura Bennett, Special Places Coordinator, at the Nova Scotia Museum and, Kwilmu’kw Maw-klusagn Negotiation Office (KM-KNO) and the First Nation communities of Millbrook and Sipekne’katik.
- 8.02 There is no land claims registered with the Specific Claims branch of Indian and Northern Affairs Canada in Ottawa for any of the Mi’kmaq communities in Nova Scotia within the Project area. However, that does not suggest that any other Mi’kmaq claimants for this area may not submit land claims in the future.

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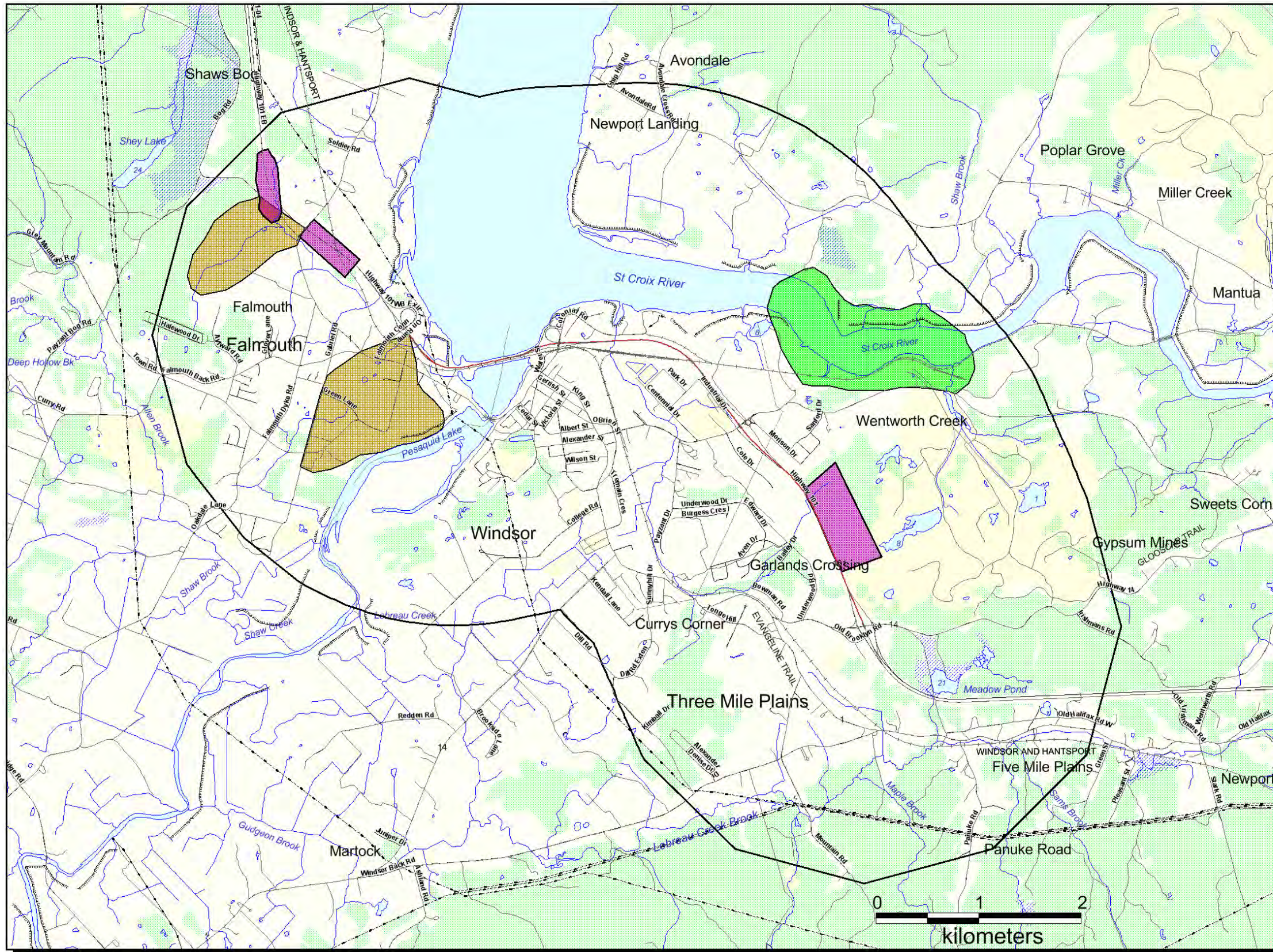
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Figure 2: Map of Current Mi'kmaq Land and Resource Use Study Area



**EXIT 5 TO EXIT 7 FALMOUTH
HIGHWAY 101 PROJECT**

**Current Mi'kmaq Land
and
Resource Use Study Area**

Figure 2

Study Areas

- Current Mi'kmaq Land and Resource Use Site
- Plants of Significance Study
- Gathering Area
- Aquatic Harvesting Area
- Proposed Highway Twinning

Legend

- Roads
- River, Lake, Brook
- Utilities
- Dyke
- Railroad
- Treed Area
- Water Bodies
- Wetland

Mainland Mi'kmaq Development Inc

The Confederacy of Mainland Mi'kmaq