BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: 19PC02 **Observer:** LO **Date (dd/mon/yy):** 03JUL2019 **Time:** 0806 - 0816

GPS file name: " " **Datum:** NAD83 **Zone:** 17

UTM: E: 646400 **N:** 4751141

Temperature: 21 **Wind Speed:** B-0 **Cloud Cover:** 100 **Photo #:** —

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) Hab 1: _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	<50	50-100	>100	<50	50-100	>100	<50	50-100	>100	

DATA ENTRY BY: _____

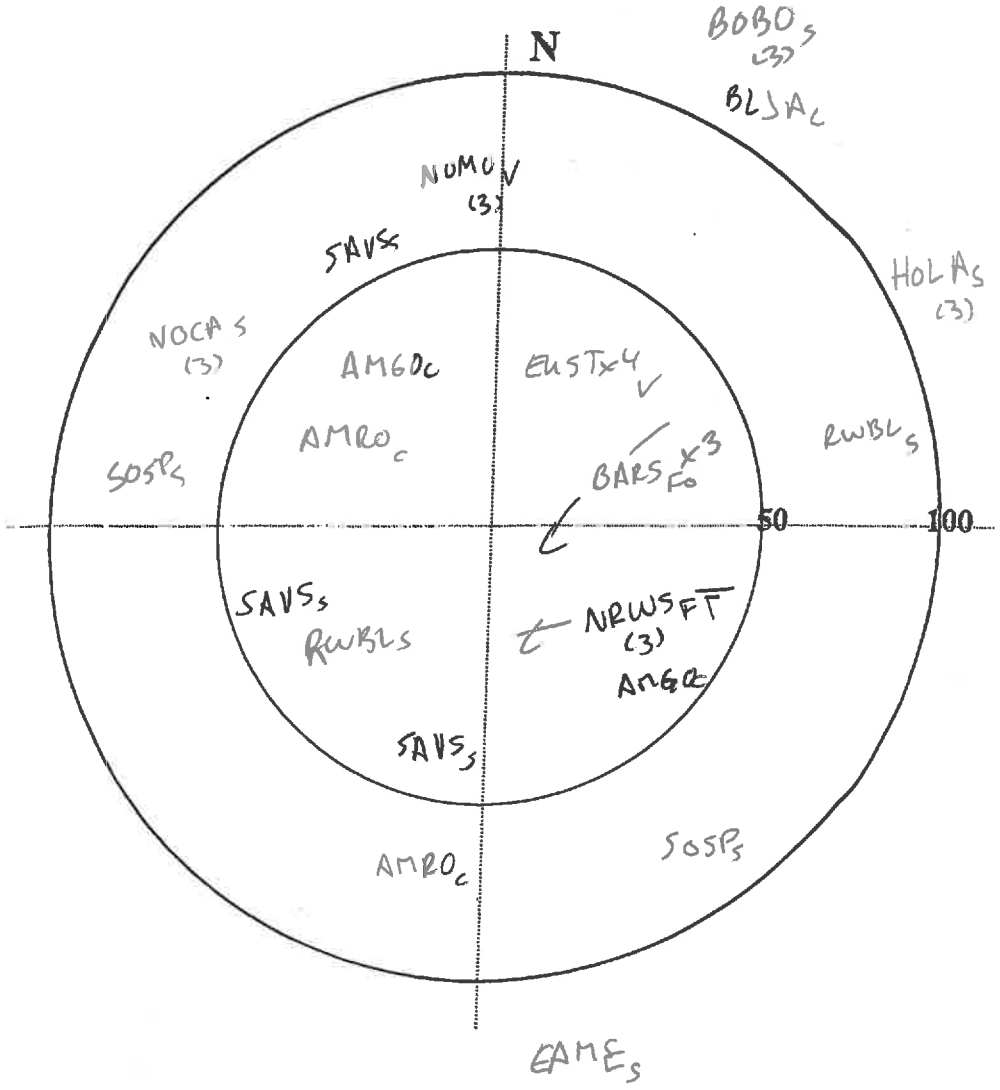
DATE: _____

DATA QA/QC BY: _____

DATE:

19PC02

Port Colborne



Incidental Observation: NOMO

Notes: EAME singing from pasture south of site

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
quatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
ultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project: Port Colborne **Project Number:** 1771656

Point #: 19PC01 **Observer:** LO **Date (dd/mon/yy):** 02 Jul 2019 **Time:** 0750-0800

GPS file name: " " **Datum:** NAD83 **Zone:** 17

UTM: E: 646307 **N:** 4751363

Temperature: 20 **Wind Speed:** B1 **Cloud Cover:** 100 **Photo #:** —

Precipitation Type: (None) Sleet Rain Hail Snow **Precipitation Rate:** Light Moderate Heavy

Description of Location : _____

Habitat Codes (%) Hab 1: _____( ) **Hab 2:** _____( ) **Hab 3:** _____( ) **Hab 4 :** _____( )

Within 100 of point center

Habitat Representative of Land Cover Class: YES NO Explain: _____

	0 to 3 min			3 to 5 min			5 to 10 min			Measured Distance
SPECIES	<50	50-100	>100	<50	50-100	>100	<50	50-100	>100	

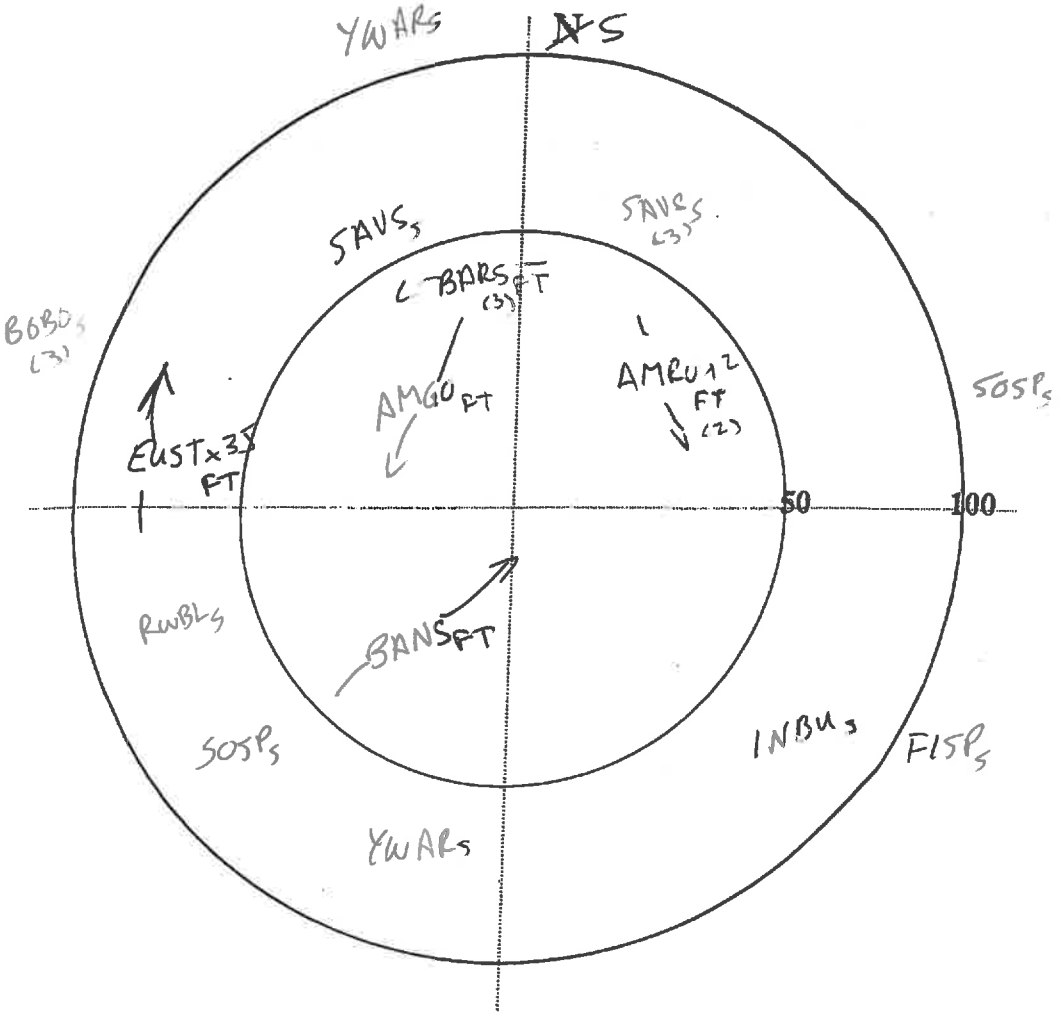
DATA ENTRY BY: _____

DATE: _____

DATA QA/QC BY: _____

DATE:

19PC01
Port Colborne



Incidental Observation: _____

Notes: Quarry noise

Habitat	FOC (Conifer Forest)		FOM (Mixed Forest)	FOD (Decid Forest)	ON (Prairie, Alvar)
	SWC(Conifer Swamp)		SWM(Mixed Swamp)	SWD(Decid Swamp)	SWT(Thicket Swamp)
	THC(Conif Thicket)		THM(Mixed Thicket)	THD(Decid Thicket)	CUP (Plantation)
quatic	MA (Marsh)	LA (Lake)	WC (Watercourse)	ED (Engineered Drainage)	
ultural	AGR-C(Crop)	AGR-P(Pasture)	IND(Industrial/Commercial)	RES(Residential)	RO(roadway)
	CUM(Meadow)	OT (Other)			

surrounding pond 3

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET

Plot # Date (dd/mm/yy): 03Jun2019	Rare Plant Survey Effort (Minutes):
Time (24h) Start: 0905 Finish: 0913	Map Sheet: Alignment Sheet:
Crew Lead: LO Recorder: LO	Zone: 17 UTM E: 646882 UTM N: 4751361
Other Observers: —	GPS File # NAD (83) 27
Location : Pond 3	Photo Start: End:
Project Name: Port Colborne	Classification System (ELC) COFEC NEOFEC NWOFEC NOWES SOWES Other
Project Number/Phase/Task: 177656	
Vegetation Cover Type C CD DC D S F G B L	Is the plot representative of the mapped vegetation polygon ☐ Yes ☐ No – explain in comments
Plot Location Map (Show Sites) ↑ N	Terrain and Vegetation Profile

Community Class Barren Meadow Prairie Thicket Savannah Woodland Forest Plantation
Mineral Surface Type Bedrock Boulder Cobble Gravel Sand Silt Clay Peat
System Terrestrial Wetland Aquatic **Topography:** Ridged Rolling Hummocky Plain
Site Position Crest Shoulder Slope Back Slope Foot Slope Depression Level
Terrain **Slope(%)** _____ **Aspect (°)** _____
Moisture Regime Very Xeric Xeric Subxeric Submesic Mesic Subhygric Hygric Subhydric Hydric Aquatic
Wetland Type Swamp Marsh Bog Fen N/A
Plot Size (m^2) /Shape **Trees** _____ **Shrubs** _____ **Herbs** _____

Stand Description:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp.) (>> MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRND. LAYER			

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT≤0.2m
CVR CODES: <1 (1) 1-2 (2) 2-5 (3) 5-10 (4) 10-25 (5) 25-50 (6) 50-75 (7) 75-95 (8) 95-100

SIZE CLASS ANALYSIS		<10		10-24		25-50		>50
STANDING SNAGS		<10		10-24		25-50		>50
DEADFALL/LOGS		<10		10-24		25-50		>50

ABUNDANCE CODES N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

Soil Analysis:

TEXTURE	DEPTH TO MOTTLES / GLEY	g = (cm)	G = (cm)
MOISTURE	DEPTH TO ORGANICS:		(cm)
HOMOGENEOUS/VARIABLE	DEPTH TO BEDROCK:		(cm)

ELC/FEC CODE

Community Classification:

COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION:		
COMPLEX:		
SOIL TYPE:		

FIELD QA/QC _____

Racetrack Pond 3 veg list Port Colborne

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET (continued)

Species Code	Layer 1	2	3	4	COL.
POPDEL cottonwood					
SOLADU					
SALPET (Slender)					

Species Code	Layer 1	2	3	4	COL.
RUMECR1 alfalfa					
SOLI sp					
HYPE common St. John's wort					
DAUCCAR					
TUSSFAR					
TRIAPRA					
TRIAREP					
PLANLAN lance-leaved plantain					
LOTUCOR					
ASCLSYR					
PHALARU	quack grass				
BUTOUMB	flowering rush				
PHELPRA timothy					

Notes:

FIELD QA/QC _____

Old field

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET

Plot # Date (dd/mm/yy): 03Jul2019	Rare Plant Survey Effort (Minutes):
Time (24h) Start: 0923 Finish:	Map Sheet: Alignment Sheet:
Crew Lead: LO Recorder: LO	Zone: 17 UTM E: 647 205 UTM N: 4751280
Other Observers:	GPS File # NAD (83) 27
Location : Race track	Photo Start: 9829 End: 9830
Project Name: Port Colborne	Classification System (ELC) COFEC NEOFEC NWOFEC NOWES SOWES Other
Project Number/Phase/Task: 177656	
Vegetation Cover Type C CD DC D S F G B L	Is the plot representative of the mapped vegetation polygon ☐ Yes ☐ No – explain in comments
Plot Location Map (Show Sites) ↑ N	Terrain and Vegetation Profile

Community Class Barren (Meadow) Prairie Thicket Savannah Woodland Forest Plantation
Mineral Surface Type Bedrock Boulder Cobble Gravel Sand Silt (Clay) Peat
System (Terrestrial) Wetland Aquatic **Topography:** Ridged Rolling Hummocky (Plain)
Site Position Crest Shoulder Slope Back Slope Foot Slope Depression (Level)
Terrain **Slope(%)** _____ **Aspect (°)** _____
Moisture Regime Very Xeric Xeric (Subxeric) Submesic Mesic Subhygric Hygric Subhydric Hydric Aquatic
Wetland Type Swamp Marsh Bog Fen (N/A)
Plot Size (m^2) /Shape **Trees** _____ **Shrubs** _____ **Herbs** _____

Stand Description:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp.) (>> MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRND. LAYER			

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT≤0.2m
CVR CODES: <1 (1) 1-2 (2) 2-5 (3) 5-10 (4) 10-25 (5) 25-50 (6) 50-75 (7) 75-95 (8) 95-100

		<10		10-24		25-50		>50
SIZE CLASS ANALYSIS								
STANDING SNAGS								
DEADFALL/LOGS								

ABUNDANCE CODES N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

Soil Analysis:

TEXTURE	DEPTH TO MOTTLES / GLEY	g = (cm) G = (cm)
MOISTURE	DEPTH TO ORGANICS:	(cm)
HOMOGENEOUS/VARIABLE	DEPTH TO BEDROCK:	(cm)

ELC/FEC CODE

Community Classification:

COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION:		
COMPLEX:		
SOIL TYPE:		

FIELD QA/QC _____

old field at racetrack Port Colborne

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET (continued)

Species Code	Layer 1	2	3	4	COL.
FRAXPEN					
eastern red cedar					

Species Code	Layer 1	2	3	4	COL.
TRIFRA					
TRIFREP					
PLANMAJ common plantain					
TARAOFF					
CHICINT					
RUMECRI					
SOLI SP					
Alfalfa					
LOTUCOR					
Yellow sweet clover					
DIPSFUL					
TYPHANG					
VICICRA bird vetch					
CAREVUL					
JUNCCAN					
quackgrass					
PHELPRA					
POA SP					
FOXTAIL Barley					

Notes:

cultural meadow with wet depressions supporting wetland plants.

FIELD QA/QC _____

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET

Plot # Date (dd/mm/yy): 03 JUL 2014	Rare Plant Survey Effort (Minutes):
Time (24h) Start: 0942 Finish:	Map Sheet: Alignment Sheet:
Crew Lead: LO Recorder: LO	Zone: 17 UTM E: 647045 UTM N: 4751052
Other Observers: —	GPS File # NAD 83 27
Location : Port Colborne Racetrack PC	Photo Start: 9831 End: 9832
Project Name: 17 Port Colborne	Classification System ELC COFEC NEOFEC NWOFEC NOWES SOWES Other
Project Number/Phase/Task: 13-1456	
Vegetation Cover Type C CD DC D S F G B L	Is the plot representative of the mapped vegetation polygon ☐ Yes ☐ No – explain in comments
Plot Location Map (Show Sites) ↑ N	Terrain and Vegetation Profile

Community Class Barren Meadow Prairie Thicket Savannah Woodland Forest Plantation
Mineral Surface Type Bedrock Boulder Cobble Gravel Sand Silt Clay Peat
System Terrestrial Wetland Aquatic **Topography:** Ridged Rolling Hummocky Plain
Site Position Crest Shoulder Slope Back Slope Foot Slope Depression Level
Terrain **Slope(%)** _____ **Aspect (°)** _____
Moisture Regime Very Xeric Xeric Subxeric Submesic Mesic Subhygric Hygric Subhydric Hydric Aquatic
Wetland Type Swamp Marsh Bog Fen N/A
Plot Size (m²) /Shape **Trees** _____ **Shrubs** _____ **Herbs** _____

Stand Description:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (up to 4 sp.) (>> MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRND. LAYER			

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT≤0.2m
CVR CODES: <1 (1) 1-2 (2) 2-5 (3) 5-10 (4) 10-25 (5) 25-50 (6) 50-75 (7) 75-95 (8) 95-100

SIZE CLASS ANALYSIS		<10		10-24		25-50		>50
STANDING SNAGS		<10		10-24		25-50		>50
DEADFALL/LOGS		<10		10-24		25-50		>50

ABUNDANCE CODES N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

Soil Analysis:

TEXTURE	DEPTH TO MOTTLES / GLEY	g = (cm)	G = (cm)
MOISTURE	DEPTH TO ORGANICS:		(cm)
HOMOGENEOUS/VARIABLE	DEPTH TO BEDROCK:		(cm)

ELC/FEC CODE

Community Classification:

COMMUNITY CLASS:		
COMMUNITY SERIES:		
ECOSITE:		
VEGETATION TYPE:		
INCLUSION:		
COMPLEX:		
SOIL TYPE:		

FIELD QA/QC _____

DRAFT – ONTARIO VEGETATION SURVEY DATASHEET (continued)

Species Code	Layer				
	1	2	3	4	COL.
PINUSYL Scot's Pine					
FRAXPEN					
ACERSAC					
PINUSTR					
PICGLA					
SALI SP.					
RHAMCAT					
CRATAEGUS SP					

Species Code	Layer				
	1	2	3	4	COL.
LOTUCOR					
PLANLAN					
CICHINT chicory					
field bindweed					
TYPHLAT					
DIPSFUL					
SALI SP					
TRIFPRA					
TRIFREP					
VICCRA					
RUMECR					
quack grass					
PHELPRA					
CAREVUL					
PHRAAUS invasive ssp.					

Notes:

Young conifer dominated forest with low wet pockets

Scots pine dominated.

FIELD QA/QC _____

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771654( )( ) Date: 18APR2020 Station #: Frog08 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646963 Northing: 4752 GPS Unit ID: _____ Photos: _____

Start Time: 2256 End Time: 2259 Temp: 8 °C Wind Speed: 12 Wind Dir: E Cloud: 50

Visibility (circle): ~~good~~ fair poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

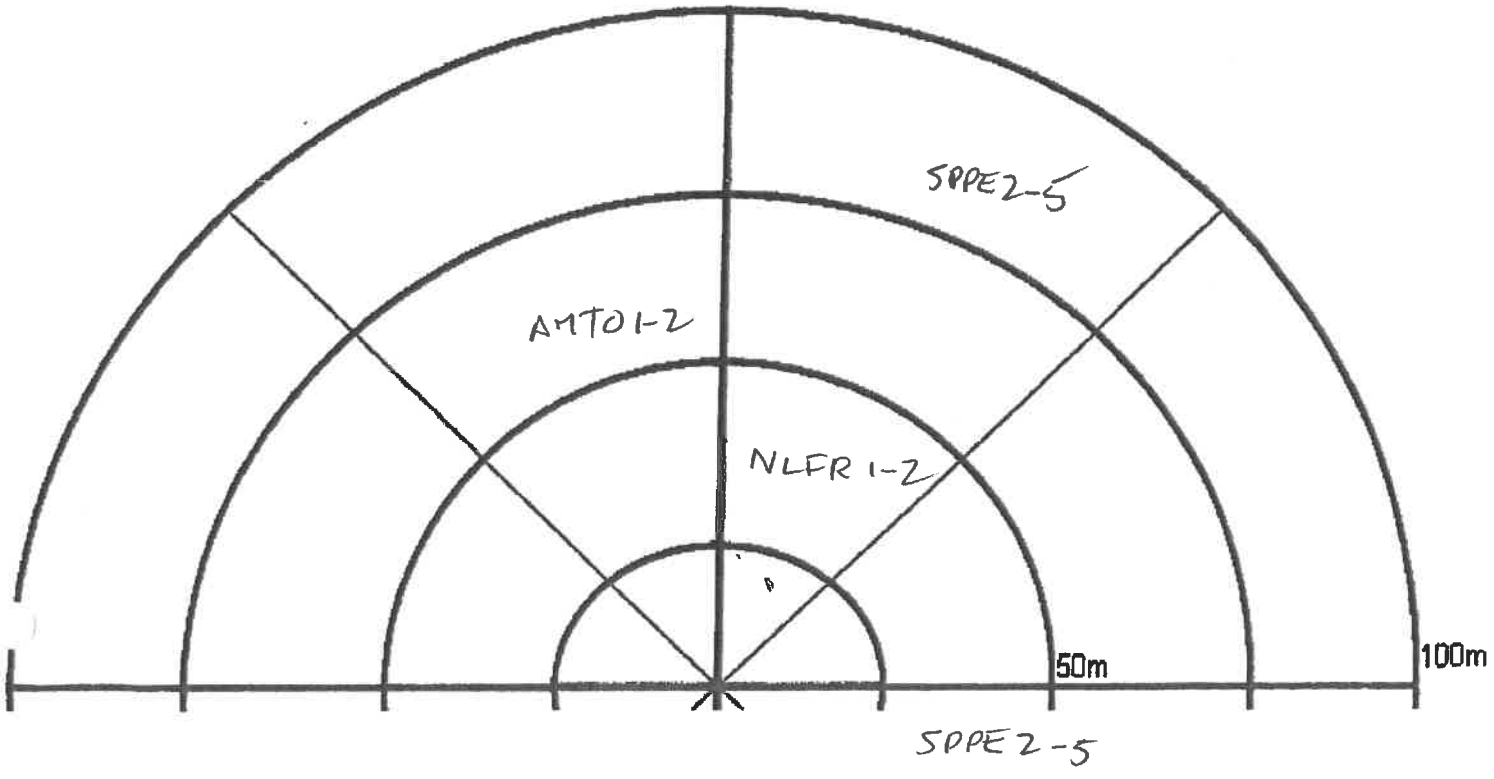
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	(1) 2 3	1 2 3	1-2		1	
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	(1) 2 3	1 2 3	1-2		1	
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 (2) 3	2-5	2-5	2	2
WOFO	1 2 3	1 2 3				

Call Level:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:
0



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658)( ) Date: 28 APR 2020 Station #: Frog 13 Surveyor: LO Page: __of__

Datum: 83 Zone: 19 Easting: 647130 Northing: 4751401 GPS Unit ID: _____ Photos: ——

Start Time: 2238 End Time: 2241 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: 30

Visibility (circle): good ~~fair~~ poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

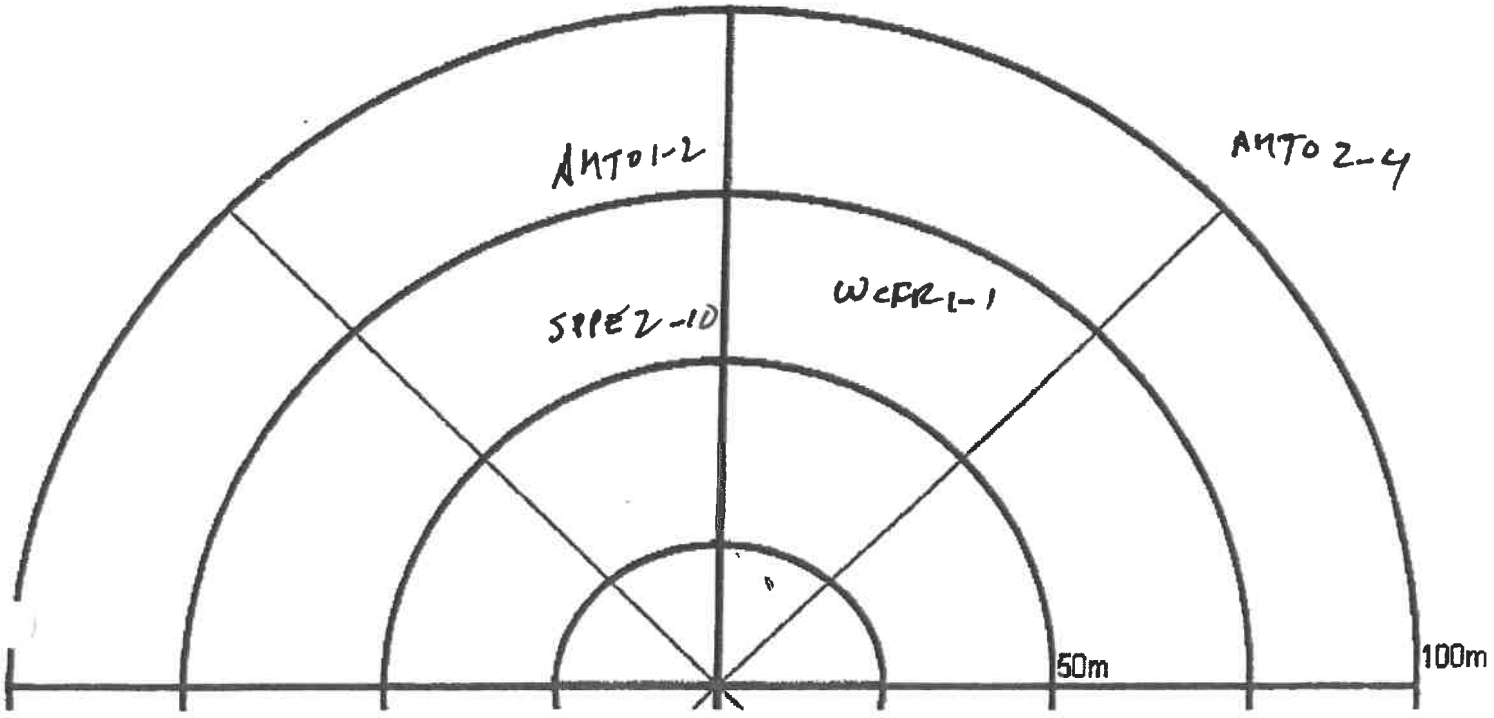
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	(1) 2 3	1 (2) 3	1-2	2-4	1	2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	1 2 3	1-1		1	
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	2-10		2	
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside/outside boundary	Abundance:	Any #	Individuals if counted

Declination: _____

Heading:
270



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 28 APR 2020 Station #: F06 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646825 Northing: 6751345 GPS Unit ID: _____ Photos: _____

Start Time: 2229 End Time: 2232 Temp: 5 °C Wind Speed: 12 Wind Dir: E Cloud: _____

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

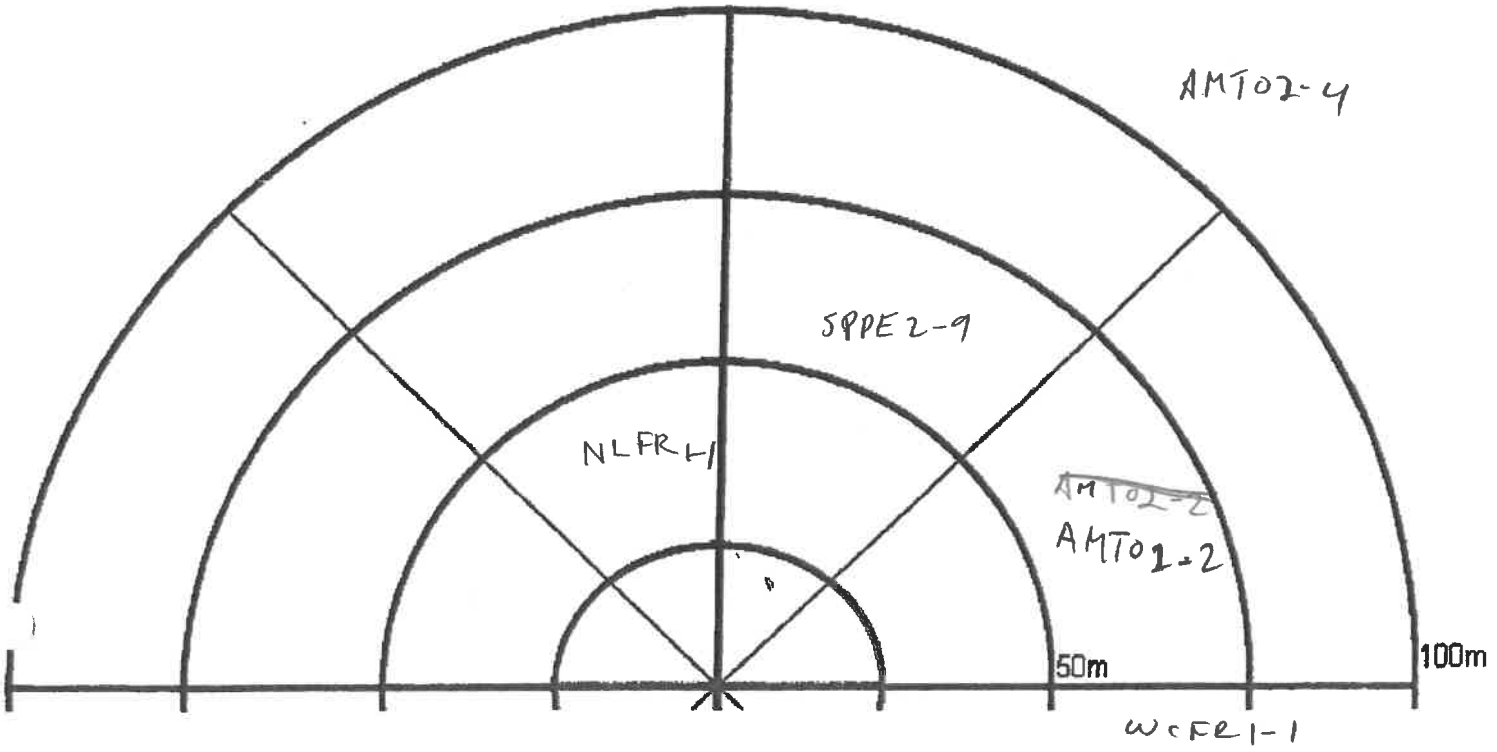
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	(1) 2 3	1 (2) 3	1-2	2-4	1	2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3		1-1		1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	(1) 2 3	1 2 3	1-1		1	
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	2-9		2	
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: _____



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (____)(____) Date: 28APR2020 Station #: Frog 07 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646787 Northing: 4750947 GPS Unit ID: _____ Photos: _____

Start Time: 2215 End Time: 2218 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: 25

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

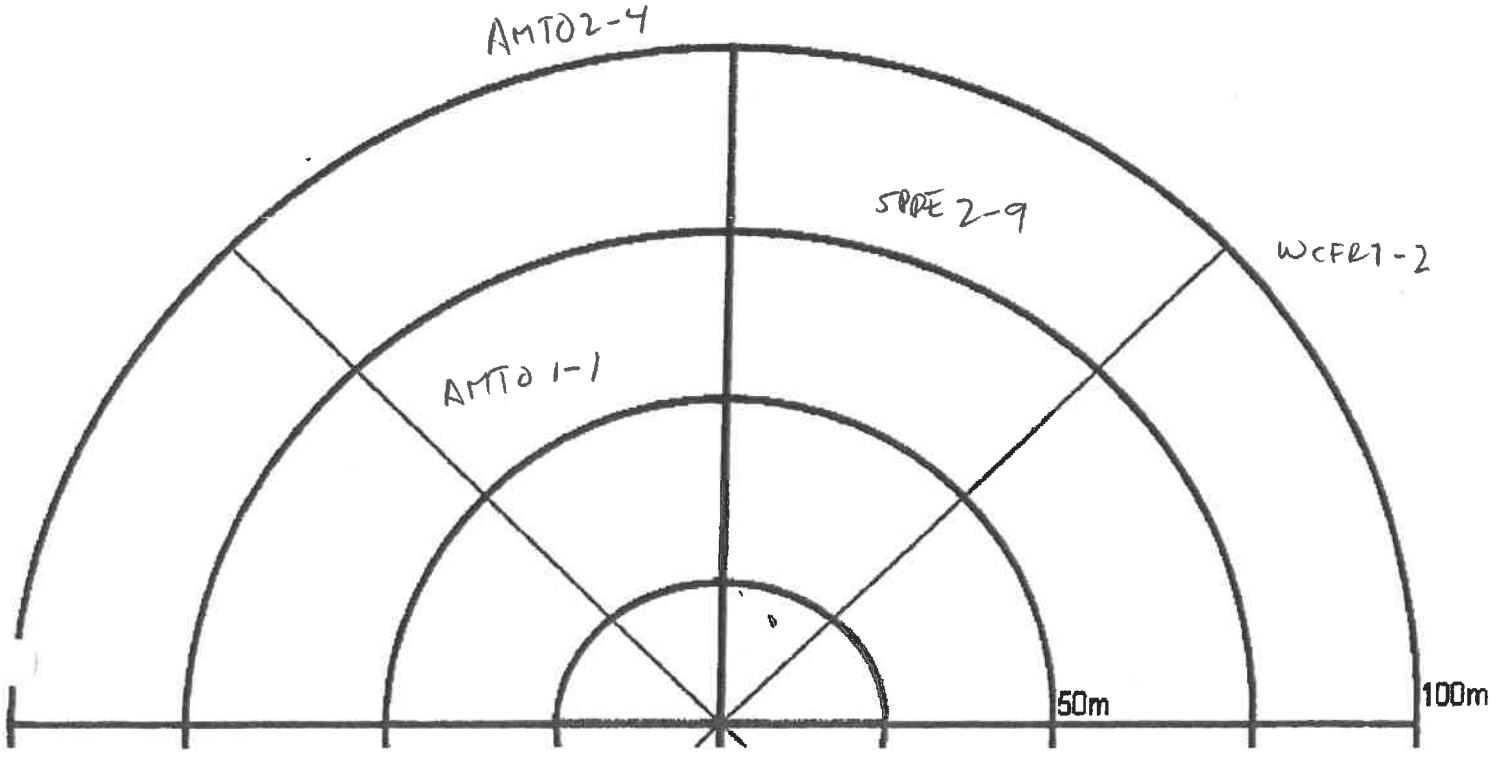
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	1 (2) 3	1-1	2-4	1	2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	(1) 2 3		1-2		1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	2-9		2	
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted	A	Inside boundary		1	Count Individuals	
	2	Individuals sometimes overlap, abundance can't be estimated	B	Outside boundary		2	Estimate Individuals	
	3	Full chorus, not abundance estimate	C	Inside/outside boundary	Abundance	Any #	Individuals if counted	

Declination: _____

Heading: 180



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656(____)(____) Date: 28APR2020 Station #: Flag 11 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 647421 Northing: 6750111 GPS Unit ID: ____ Photos: ____

Start Time: 2205 End Time: 2208 Temp: 8 °C Wind Speed: 10 Wind Dir: E Cloud: 25

Visibility (circle): good fair poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: ____

Habitat Description: ____

Incidental Wildlife: ____

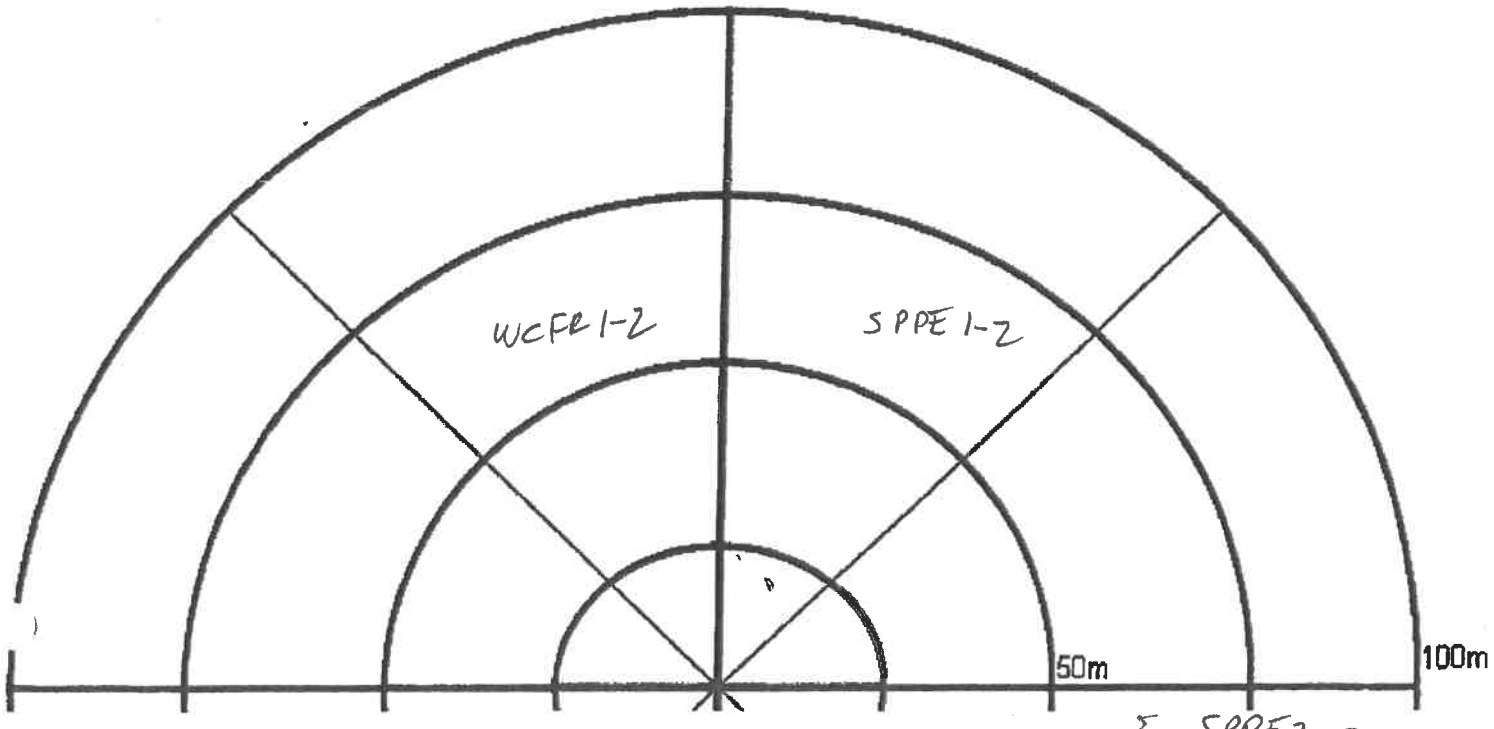
Comments: (other noises) ____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-4		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	1 (2) 3	1-2	2-7	1	2
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	1 (2) 3	1-2	2-7	1	2
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: ____

Heading: 90°



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (____)(____) Date: 28APR2020 Station #: FP0609 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 417086 Northing: 4756390 GPS Unit ID: _____ Photos: _____

Start Time: 2159 End Time: 2202 Temp: 8 °C Wind Speed: 15 Wind Dir: E Cloud: 25

Visibility (circle): ~~good~~ ~~fair~~ poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

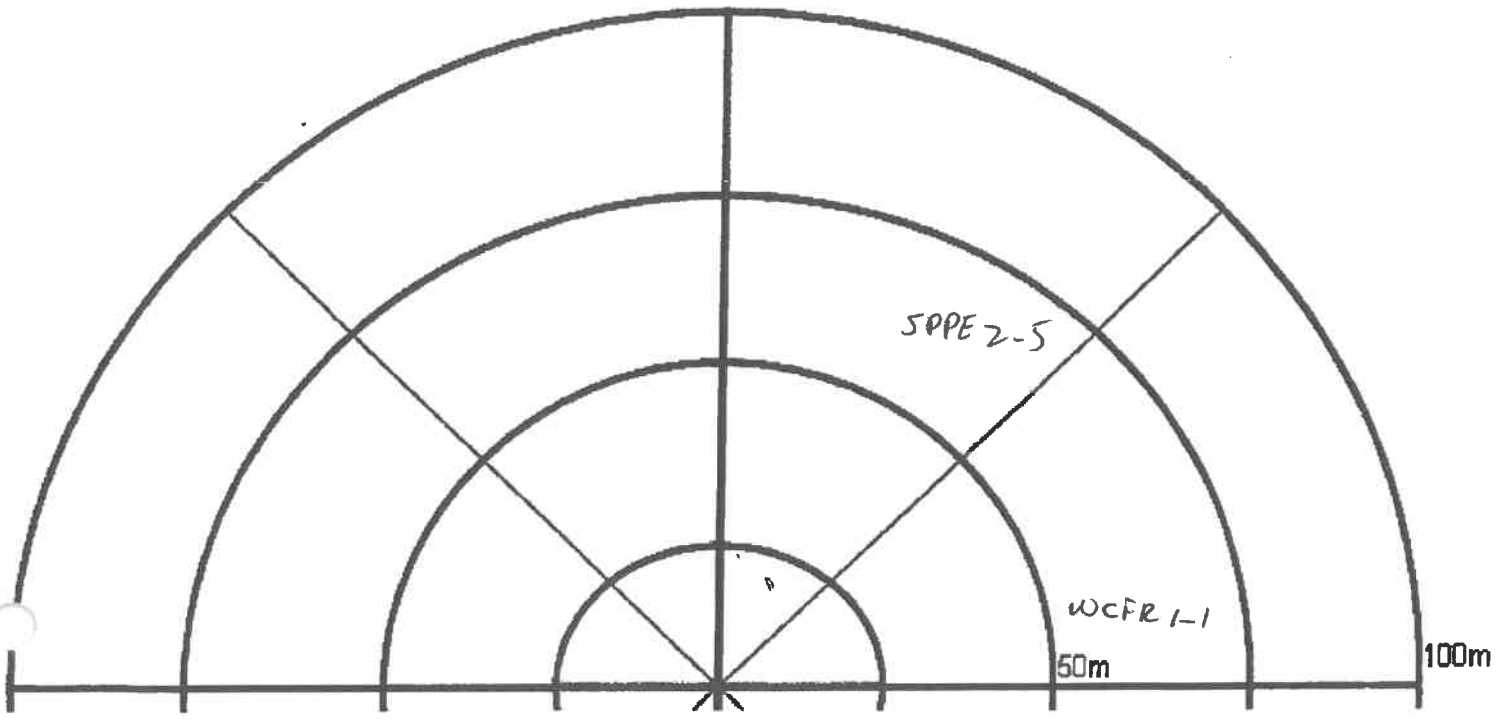
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-5		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	1 2 3	1-1	4	1	1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 (2) 3	2-5	2-5	2	2
WOFO	1 ~~2~~ 3	1 2 3				

Call Levels:	1	Individuals do not overlap, can be counted	Direction:	A	Inside boundary	Scale	1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:
0



SPPE 2-5 AMTO 2-5

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771654( )( ) Date: 28APR2020 Station #: PRO610 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646120 Northing: 4756366 GPS Unit ID: _____ Photos: _____

Start Time: 2152 End Time: 2155 Temp: 8 °C Wind Speed: 9 Wind Dir: E Cloud: 30

Visibility (circle): good fair ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

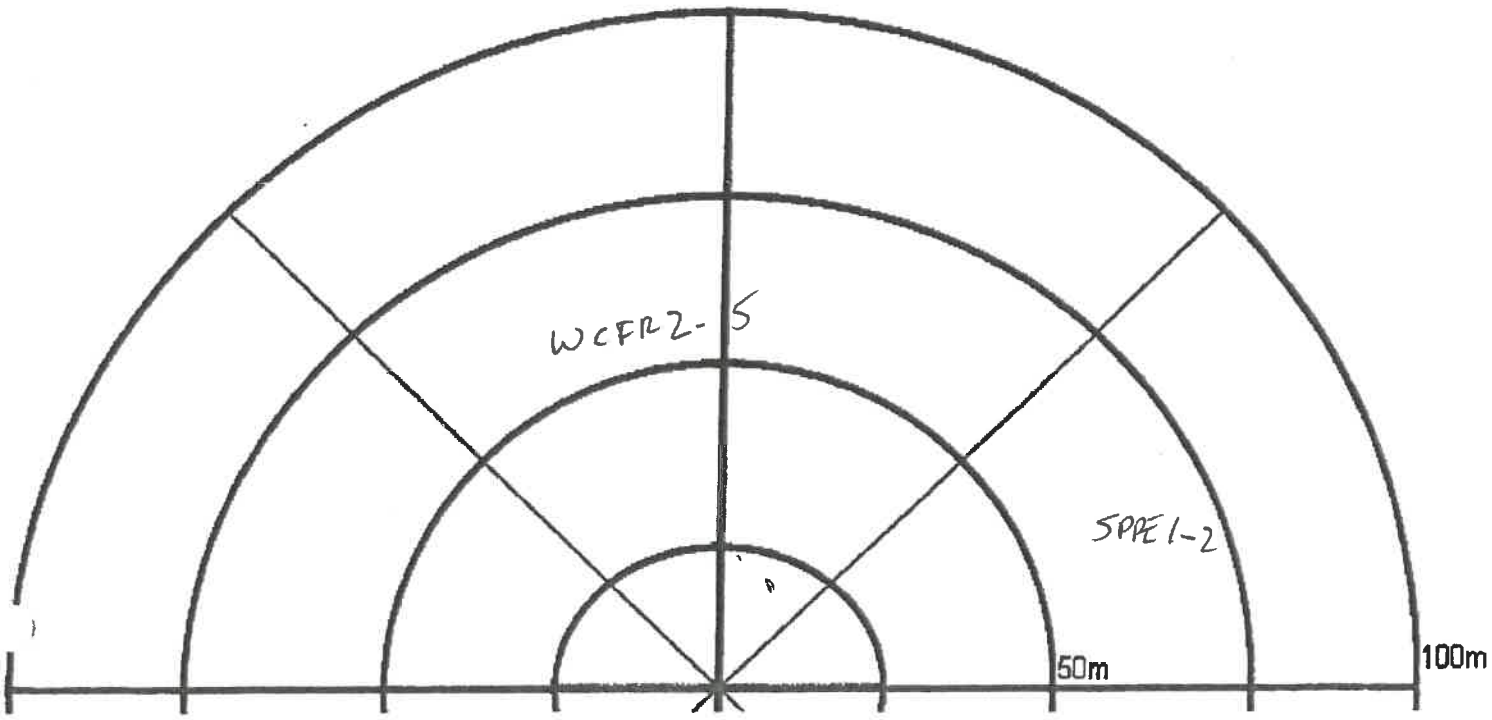
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-3		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	1 2 3	2-5		2	
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	1 2 3	1-2		1	
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 0



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (3000)( ) Date: 28APR2020 Station #: FP0604 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646224 Northing: 4752411 GPS Unit ID: _____ Photos: _____

Start Time: 2142 End Time: 2145 Temp: 9 °C Wind Speed: 12 Wind Dir: E Cloud: 40

Visibility (circle): ~~good~~ ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

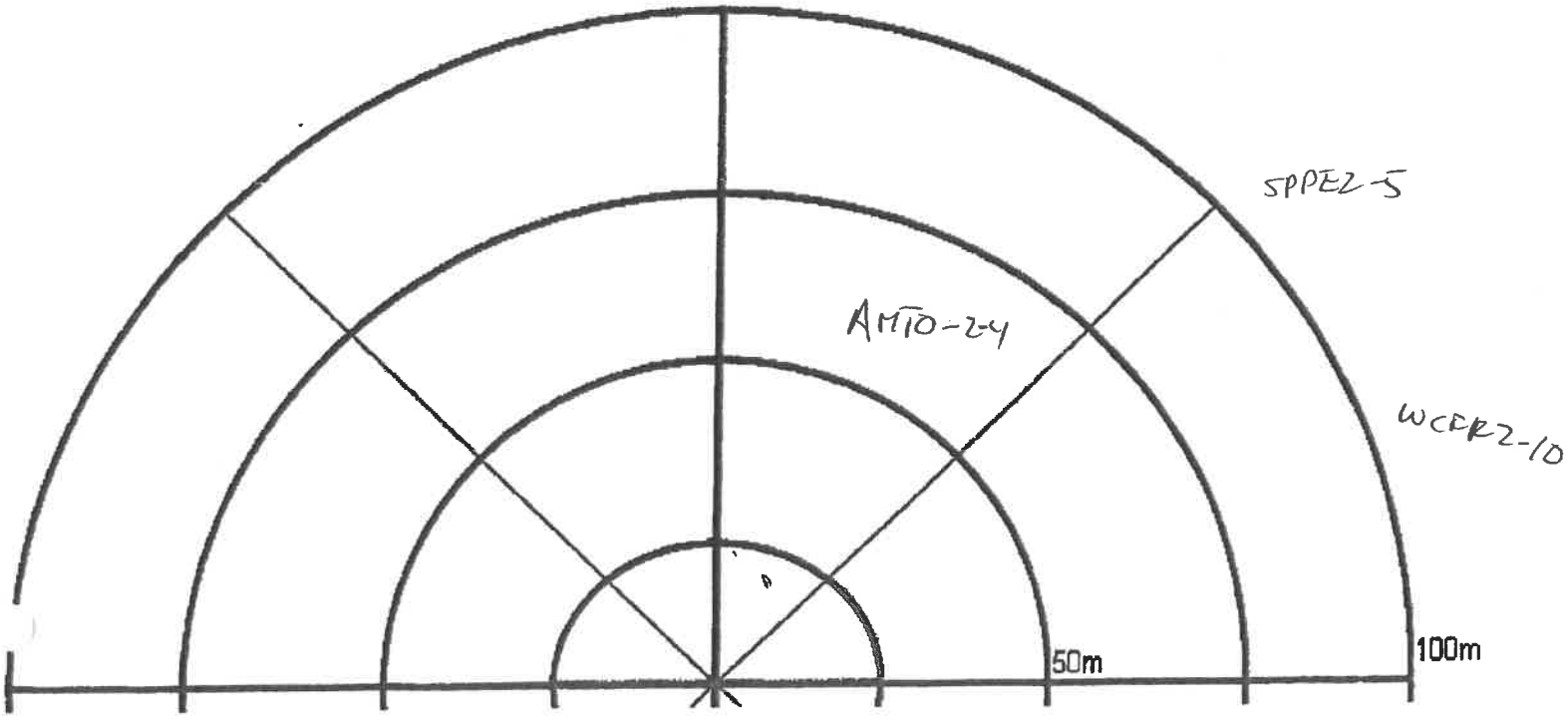
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	1 2 3	2-4		2	
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 (2) 3		2-10		2
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 2 3	1 (2) 3		2-5		2
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance intimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 0



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 177656 (3000)( ) Date: 28APR2020 Station #: FR0602 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646734 Northing: 4752187 GPS Unit ID: _____ Photos: _____

Start Time: 2120 End Time: 2123 Temp: 10 °C Wind Speed: 10 Wind Dir: E Cloud: 30

Visibility (circle): ~~good~~ ~~fair~~ ~~poor~~ Precipitation: ~~none~~ light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

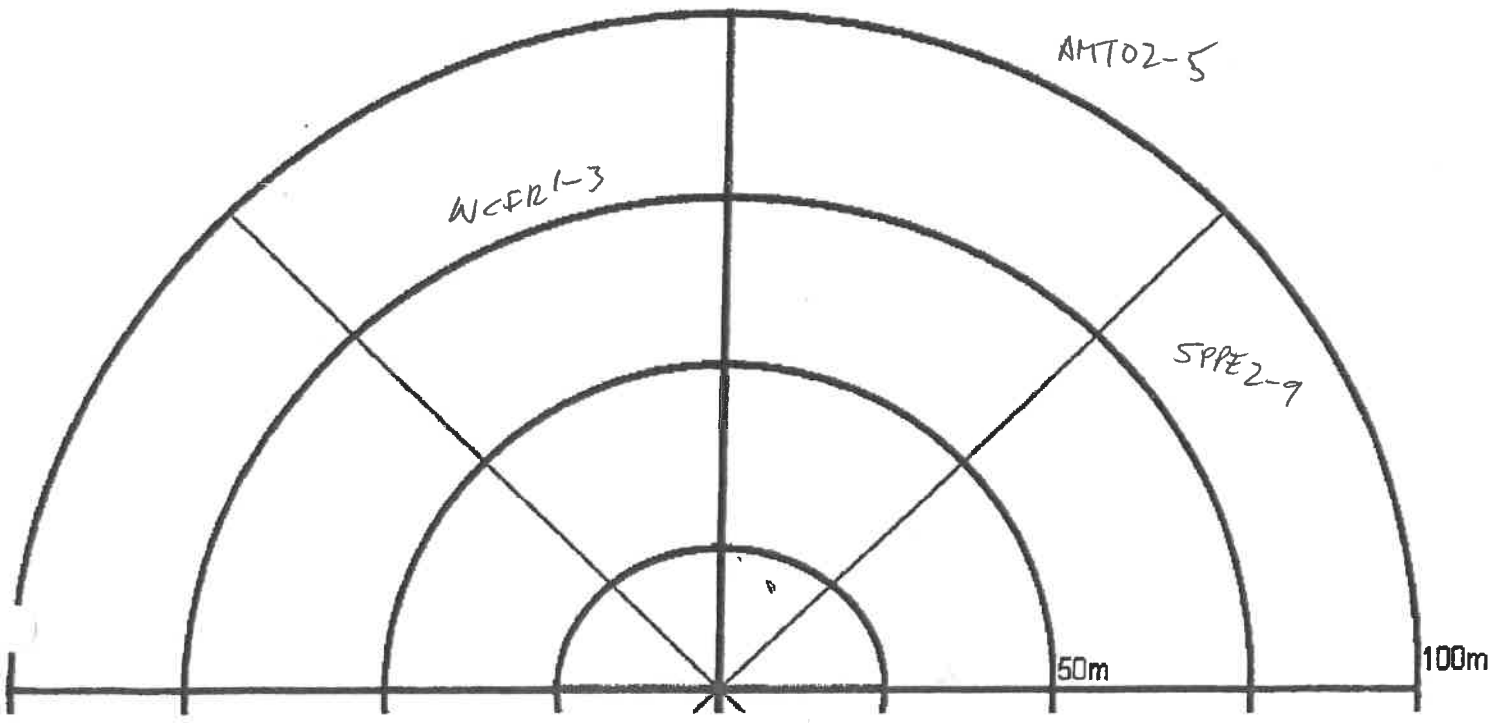
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-5		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	1 2 3	1-3		1	
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	2-9		2	
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance:	Any #	Individuals if counted

Declination: _____

Heading: 0



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656( )( ) Date: 28 APR 2026 Station #: FROC12 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646823 Northing: 6752049 GPS Unit ID: _____ Photos: ~

Start Time: 2108 End Time: 2112 Temp: 11 °C Wind Speed: 12 Wind Dir: E Cloud: 25

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: ~~none~~ light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

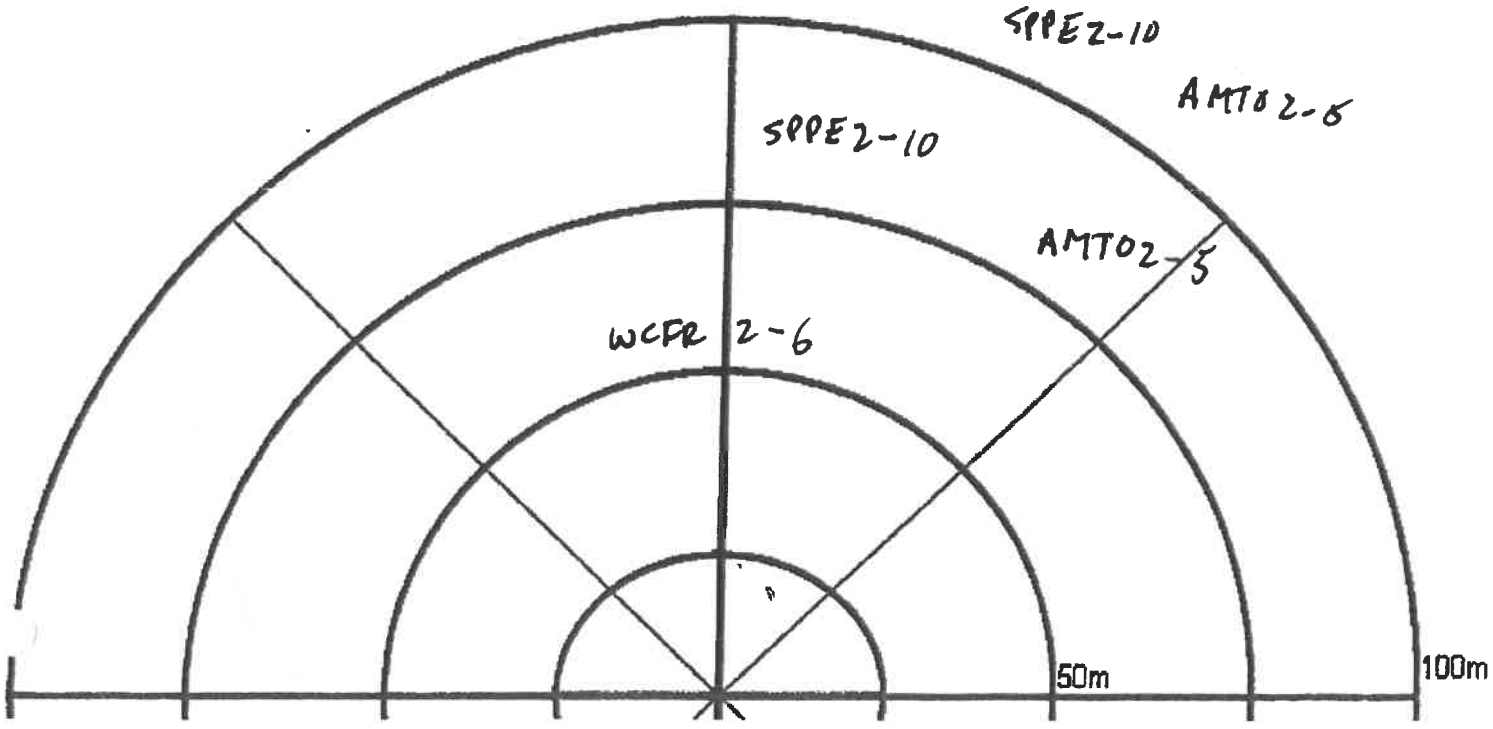
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	1 (2) 3	2-5	2-5	2	2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	1 2 3	2-6		2	
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 (2) 3	2-10	2-10	2	2
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 90



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (3000)( ) Date: 28APR2020 Station #: PRO601 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646478 Northing: 4752058 GPS Unit ID: — Photos: —

Start Time: 2056 End Time: 2059 Temp: 11 °C Wind Speed: 9 km Wind Dir: E Cloud: 80

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: ____

Habitat Description: _____

Incidental Wildlife: _____

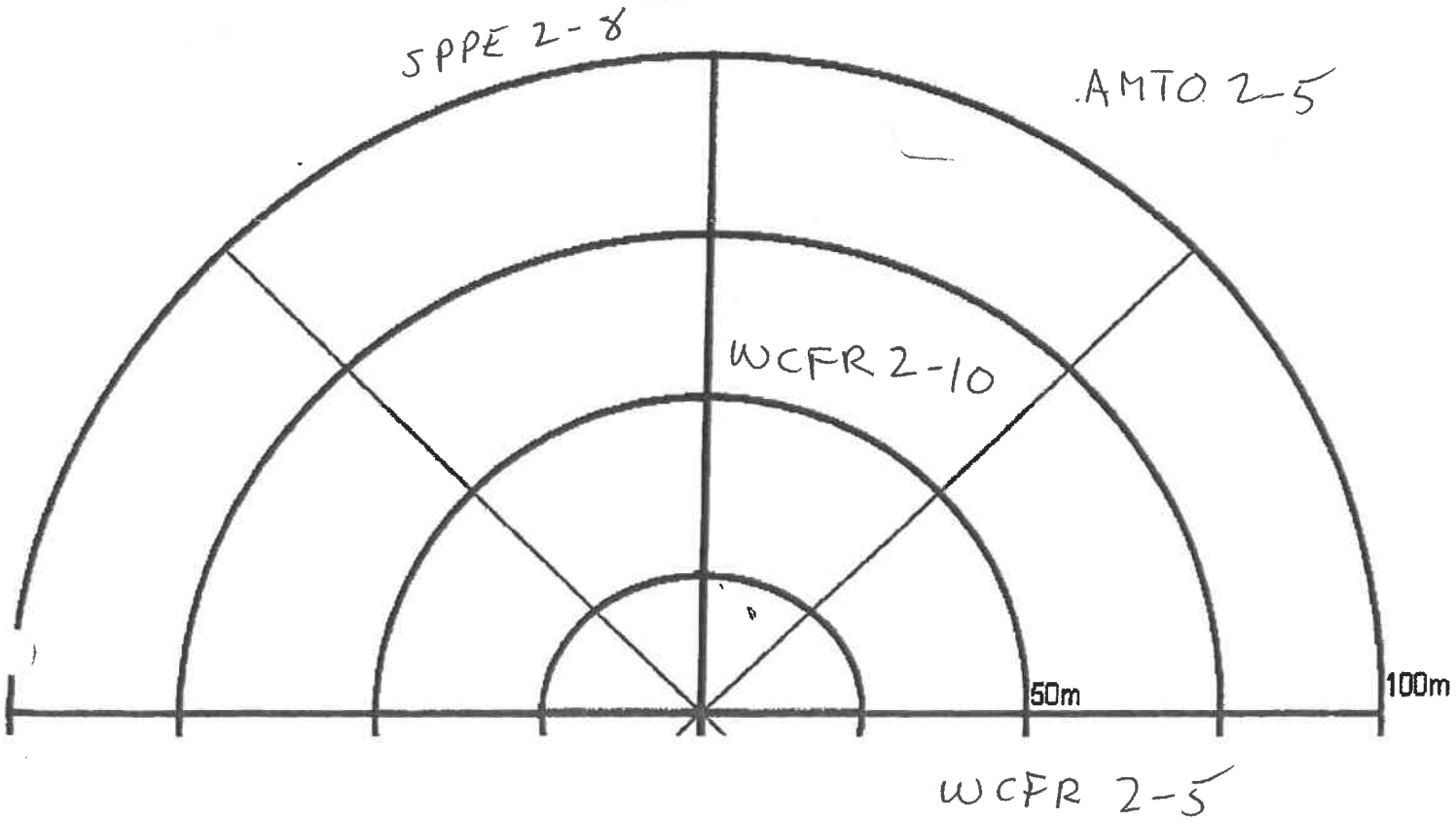
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-5		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	1 (2) 3	2-10	2-5	2	2
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 2 3	1 (2) 3		2-8		2
WOFO	1 2 3	1 2 3				

Call Levels:			Direction			Scale		
	1	Individual: do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 90



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1791656 (3000)( ) Date: 28 APR 2020 Station #: FR0603 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646501 Northing: 4752294 GPS Unit ID: _____ Photos: _____

Start Time: 2045 End Time: 2048 Temp: 12 °C Wind Speed: 9 km/h Wind Dir: E Cloud: 80

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: deciduous swamp

Incidental Wildlife: see notebook

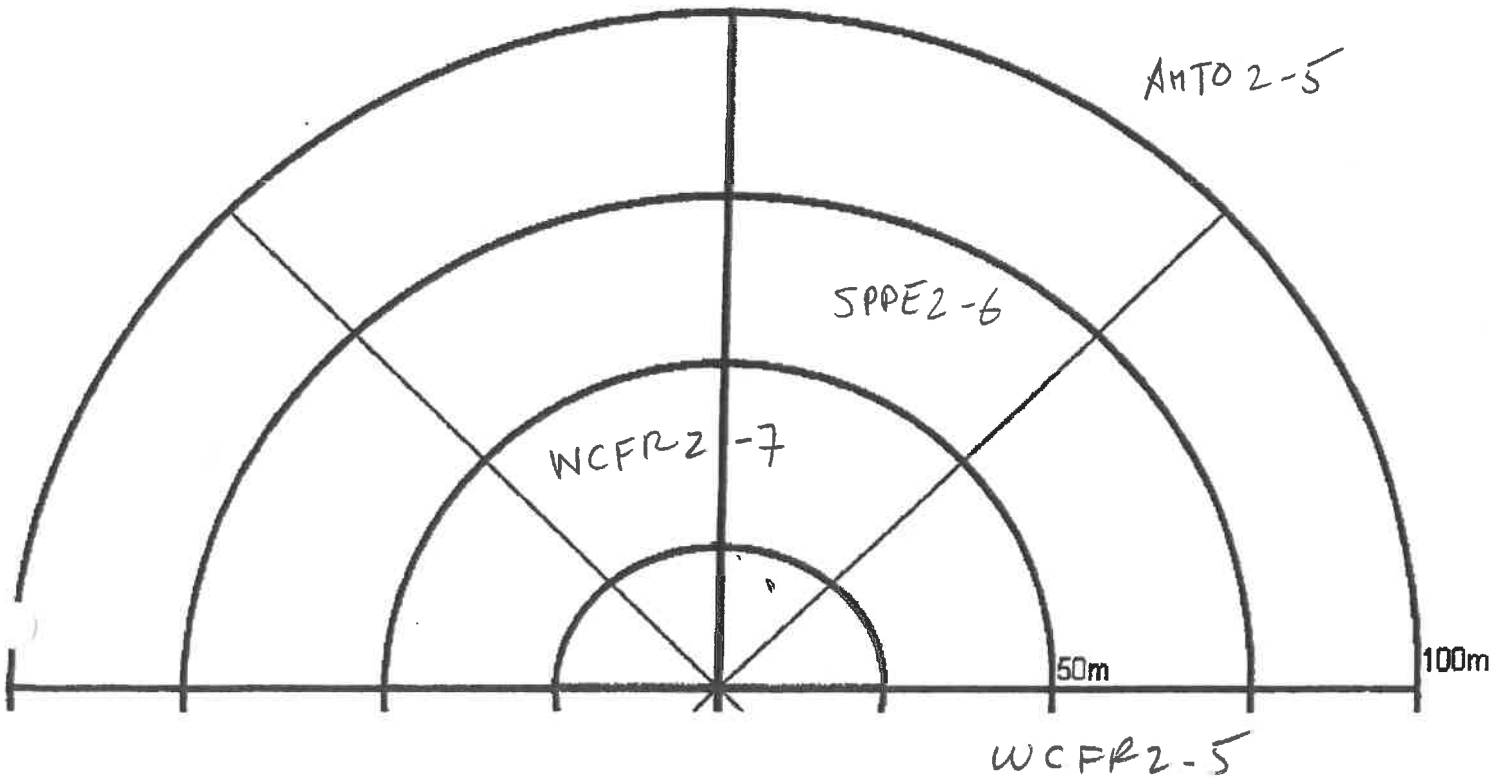
Comments: (other noises)

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		2-5		2
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	1 (2) 3	2-7	2-5	2	2
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	2-6		2	
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: 180



SASKATOON TERRESTRIAL GROUP — Project No: 1771656 — Proj Title: Port Colborne

Vegetation Inventory Form — Personnel: LO — Plot No.:

Golder Associates
145 1st Ave. N. Saskatoon, Sask. S7K 1W6, Phone (306) 665 7989, Fax (306) 665 3342

Date: 28 APR 2020

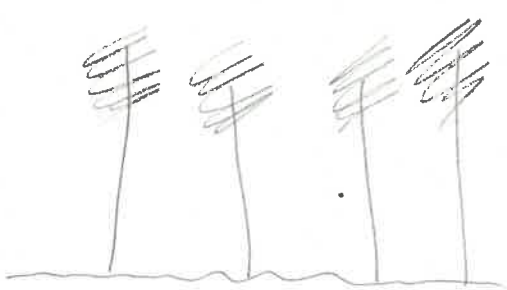
Start Time	1800	Wpt. ID	051	Plot Size	Field Guide	NAB AWI WCAB SWAB	
End Time		NAD	(83) 27	10 x 10 m X	Other:		
Photos	0459	Zone	17T	15 x 15 m	Ecosite		Veg Type
	0463	Easting	646589	Other: X			
Elevation (m)	184	Northing	4752360				

Slope (%)	Aspect (deg.)	Slope Position				Moisture Regime					Nutrient Regime		
\	\	crest	upper	mid	lower	very xeric	xeric	subxeric	submesic	mesic	very poor	poor	(medium)
		toe	(depress)	level		subhygric	hygric	subhydric	(hydric)	aquatic	rich	very rich	saline

Surface Expression	Drainage Class	Riparian Subclass	Riparian Flood Hazard	Surface Substrate (add to 100%)
X Depressional	very rapidly drained	N/A	No Hazard	20 Water
Hummocky	rapidly drained	Active Channel	Rare	5 Mineral Soil
Inclined	well drained	Inactive Channel	Expected	0 Bedrock
Level	moderately well drained	Terrace	X Frequent	0 Cobbles/Stones
Ridged	imperfectly drained	Floodplain	**Surface Shape**	15 Decaying Wood
Subdued	poorly drained	Bank	X Straight	60 Organic Matter
Undulating	X very poorly drained	Fringe	Convex	
Other:		Other:	X Concave	

% Total Cover	Density Live Stems (# in plot)			Snags (# in Plot)			% Woody Debris
> 25 cm DBH	> 8 cm	> 25 cm	> 35 cm	> 4 ≤ 8 cm	> 8 cm	> 35 cm	> 8 cm
60	8	12	2	3	1	0	15

Species Collected:									
1)	Sample ID		Photo		5)	Sample ID		Photo	
2)	Sample ID		Photo		6)	Sample ID		Photo	
3)	Sample ID		Photo		7)	Sample ID		Photo	
4)	Sample ID		Photo		8)	Sample ID		Photo	
					9)	Sample ID		Photo	



...e Diagram

Comments:

Soil - saturated, many pools of standing water.
Soil texture: clay.
Majority of trees are 10-25 cm dbh ~16 m tall, with scattered very large oaks and maples up to ~80-90 cm dbh.

Part Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog 13 Surveyor: LO Page: __ of __

Datum: 83 Zone: 17 Easting: 647130 Northing: 4751401 GPS Unit ID: _____ Photos: _____

Start Time: 2246 End Time: 2249 Temp: 13 °C Wind Speed: 25 Wind Dir: W Cloud: 50

Visibility (circle): ~~good~~ ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

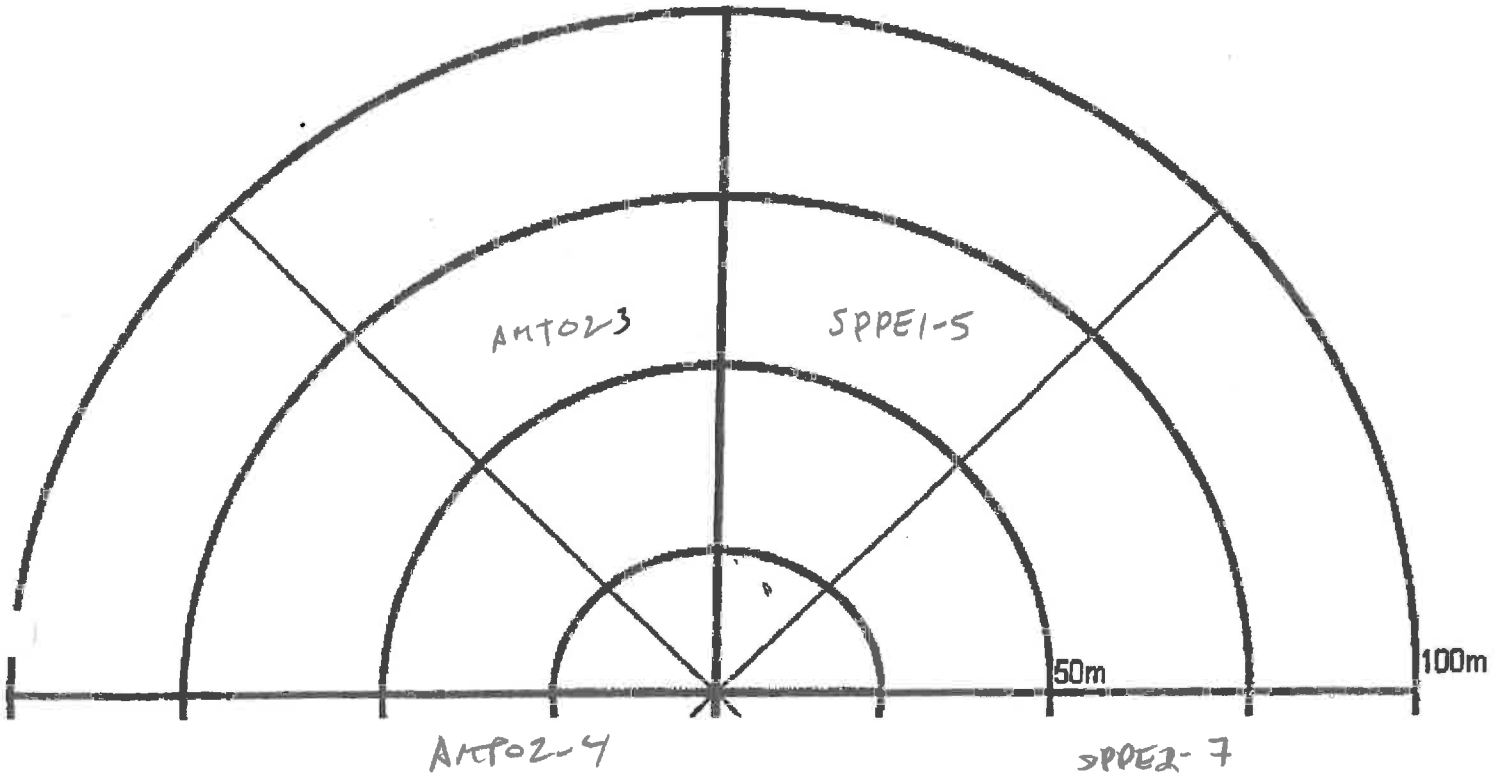
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	1 (2) 3	3	4	2	2
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	1 (2) 3	5	7	1	2
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals: do not overlap, can be counted		A	Inside boundary		1	Count Individuals:
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: _____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog 06 Surveyor: LO Page: __ of __

Datum: 83 Zone: 17T Easting: 646825 Northing: 4751345 GPS Unit ID: _____ Photos: _____

Start Time: 2231 End Time: 2242 Temp: 13 °C Wind Speed: 25 Wind Dir: NW Cloud: 50

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

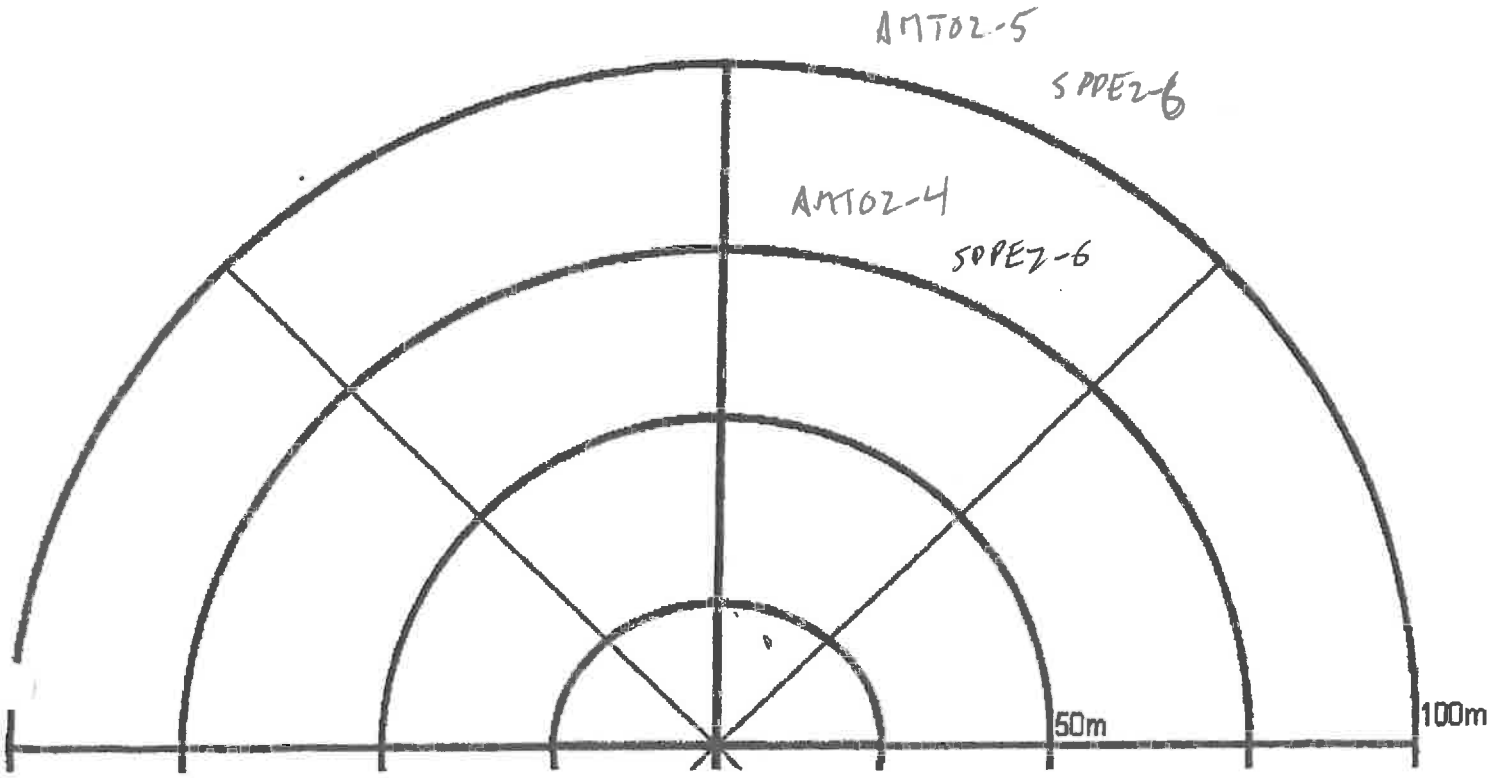
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	1 (2) 3	4	5	2	2
~~BOFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 (2) 3	6	6	2	2
WOFO	1 2 3	1 2 3				

Call Levels:			Direction:			Scale:		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside/outside boundary	Abundance:	Any #	Individuals if counted

Declination: _____

Heading: _____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (____)(____) Date: 19 May 2020 Station #: Frog07 Surveyor: CO Page: __of__

Datum: 83 Zone: 17T Easting: 646787 Northing: 4750941 GPS Unit ID: _____ Photos: _____

Start Time: 2230 End Time: 2233 Temp: 14 °C Wind Speed: 25 Wind Dir: W Cloud: 100

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

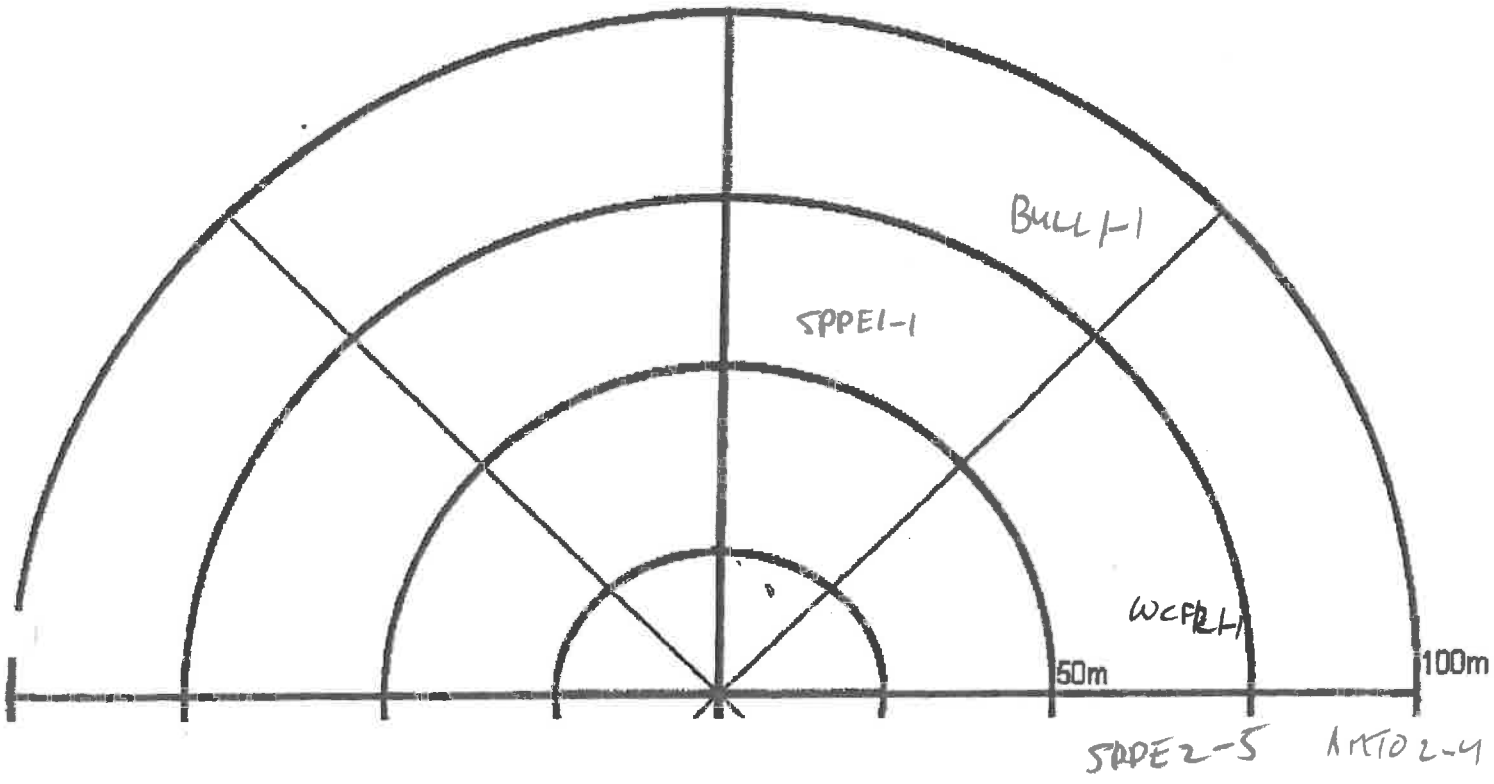
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		4		2
~~BCFR~~	1 2 3	1 2 3				
BULL	(1) 2 3	1 2 3	1		1	
CHFR	(1) 2 3	1 2 3	1			
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	(2) 3	1	5	1	2
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: _____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog 10 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646120 Northing: 4750366 GPS Unit ID: _____ Photos: _____

Start Time: 2218 End Time: 2221 Temp: 14 °C Wind Speed: 20 Wind Dir: W Cloud: 100

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

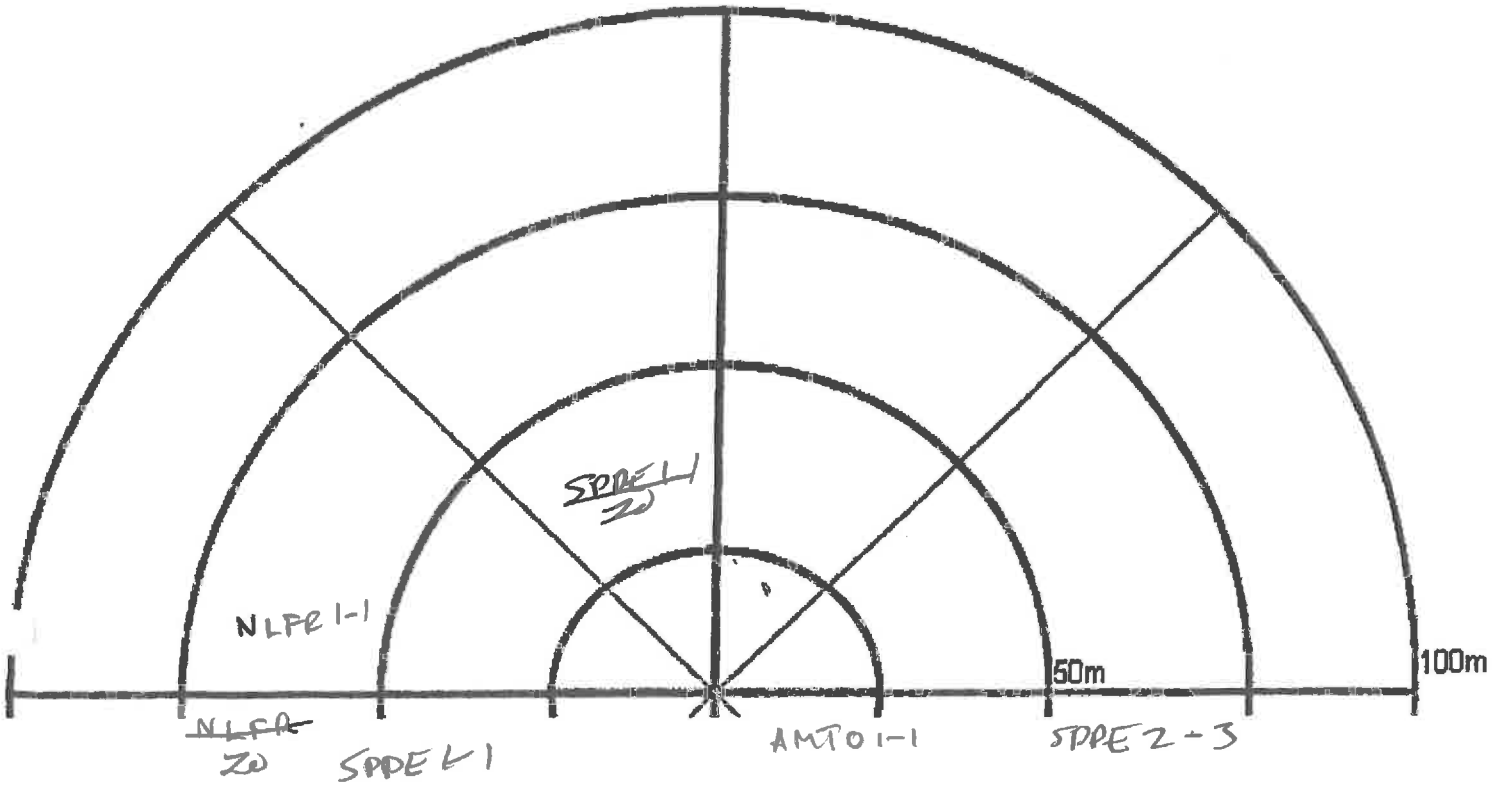
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	(1) 2 3		1		1
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	(1) 2 3	1 2 3	1		1	
SPPE	1 2 3	1 (2) 3		4		2
WOFO	1 2 3	1 2 3				

Call Levels:	1	Individuals do not overlap, can be counted	Direction	A	Inside boundary	Scale	1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: _____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (____)(____) Date: 19 May 2020 Station #: Frog 09 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 647086 Northing: 4750390 GPS Unit ID: _____ Photos: _____

Start Time: 2212 End Time: 2215 Temp: 15 °C Wind Speed: 20 Wind Dir: W Cloud: _____

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

Comments: (other noises) _____

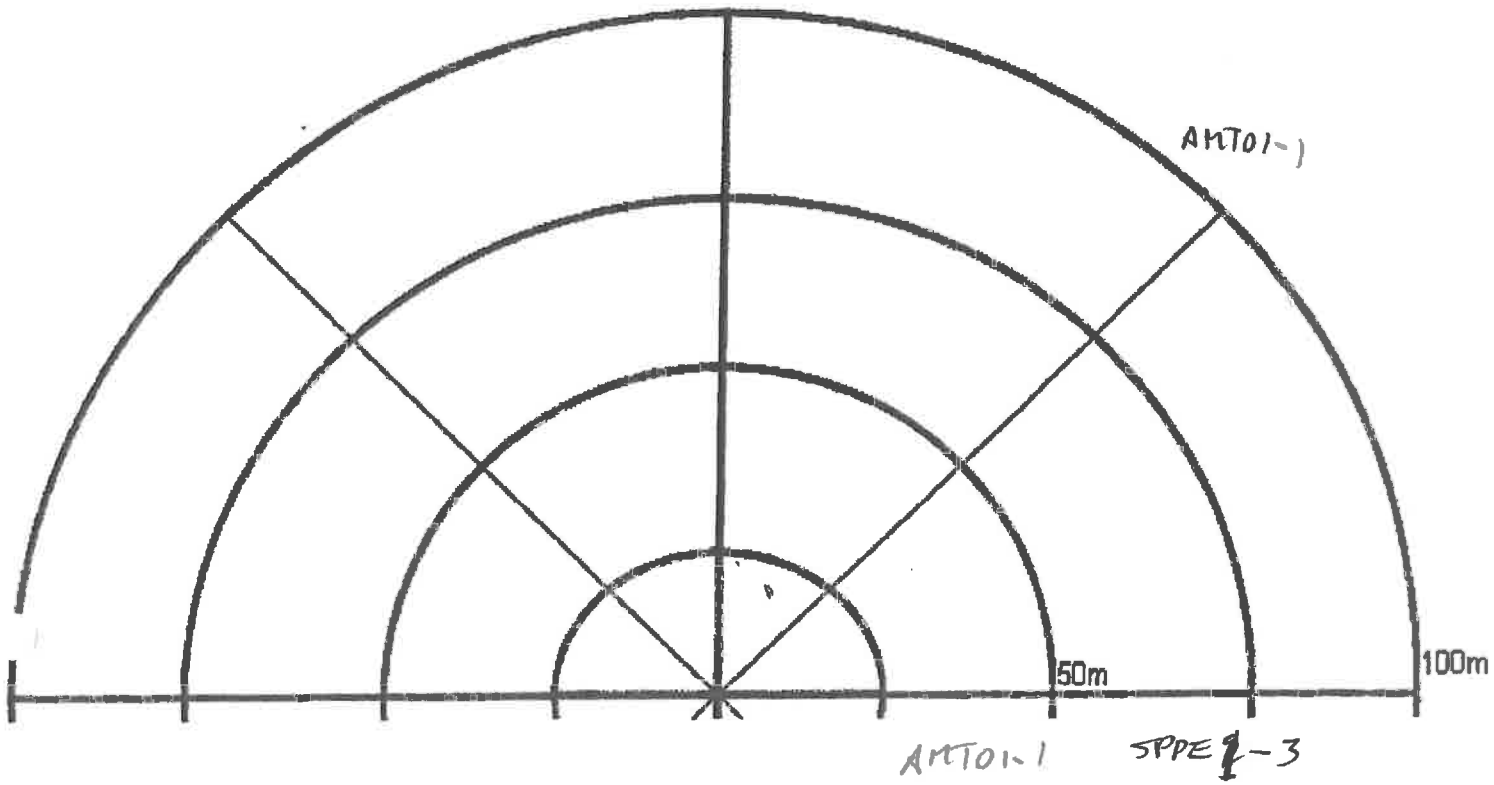
Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	(1) 2 3		2		1
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 2 3	(1) 2 3		3		1
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:

_____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771666( )( ) Date: 19 May 2020 Station #: Frog1 Surveyor: LO Page: of

Datum: 83 Zone: 17T Easting: 647421 Northing: 4750111 GPS Unit ID: Photos:

Start Time: 2209 End Time: 2207 Temp: 14 °C Wind Speed: 20 Wind Dir: W Cloud: 100

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth:

Habitat Description:

Incidental Wildlife:

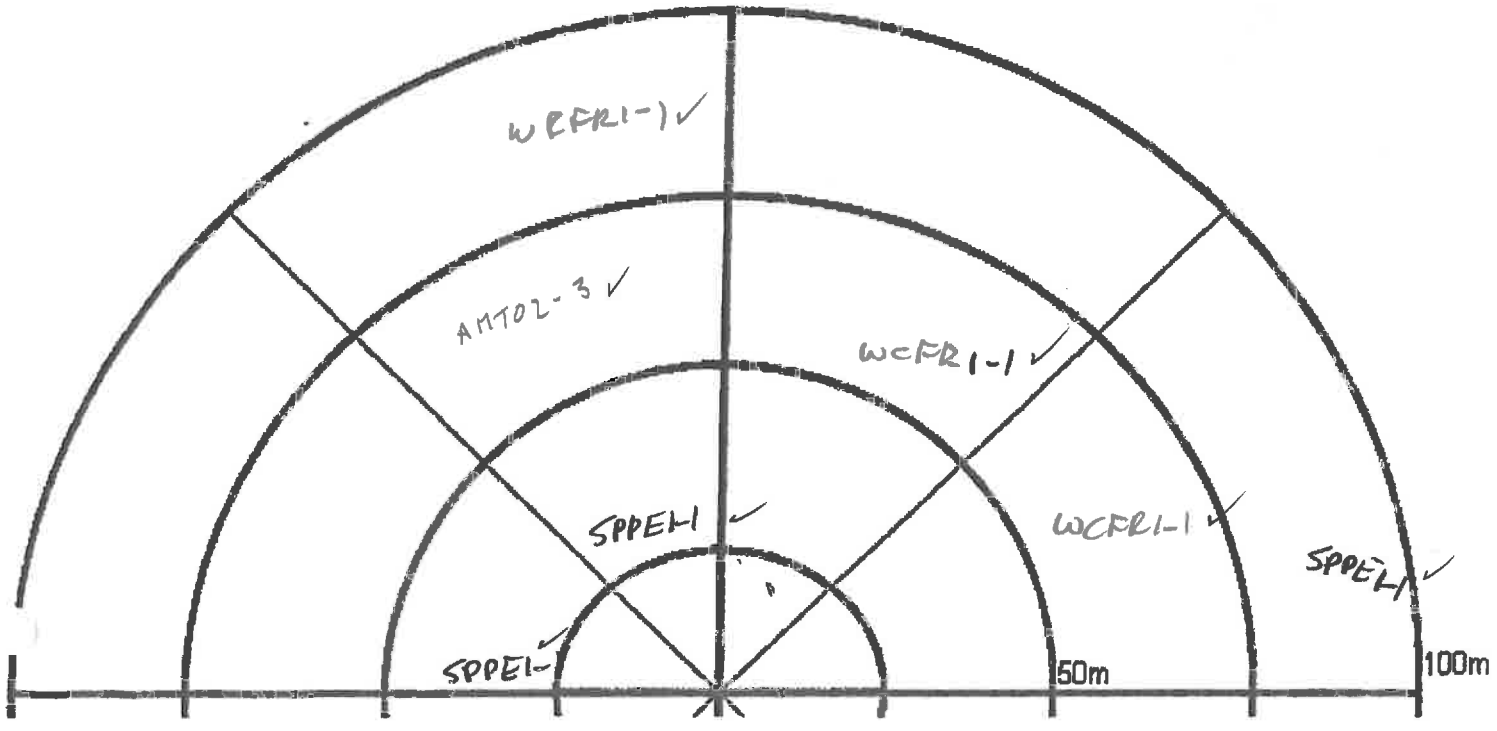
Comments: (other noises)

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 (2) 3	(1) 2 3	3	1	2	1
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	(1) 2 3	3	1	1	1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	1 (2) 3	3	4	1	2
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance intimate		C	Inside-outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading:



WCFR1-1 ✓ AMTO1-1 ✓ SPPE2-4 ✓

Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog 08 Surveyor: LO Page: __of__

Datum: 83 Zone: 17T Easting: 646963 Northing: 4752423 GPS Unit ID: — Photos: _____

Start Time: 2153 End Time: 2156 Temp: 14 °C Wind Speed: 20 Wind Dir: W Cloud: 100

Visibility (circle): good ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

Comments: (other noises) _____

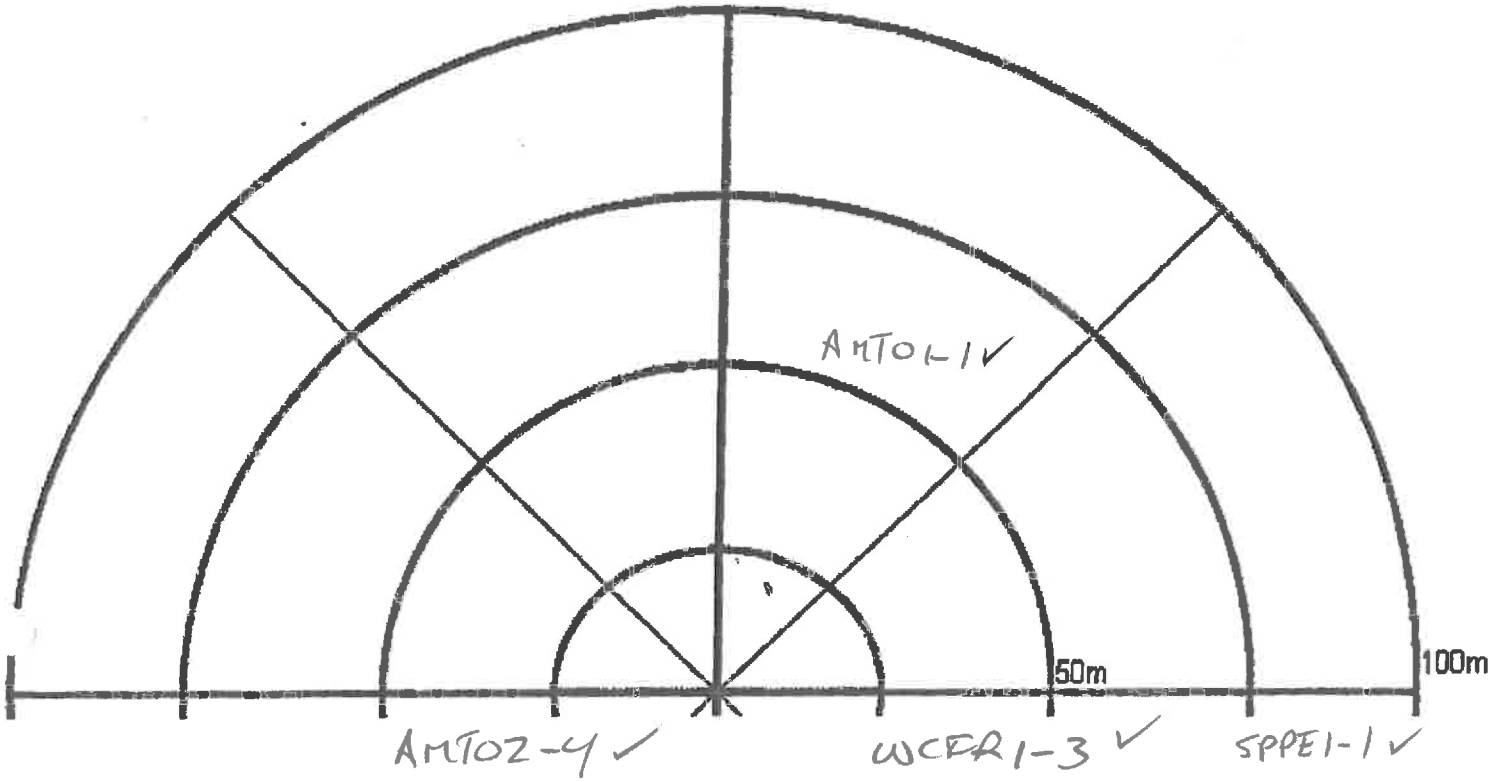
Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	(1) 2 3	1 (2) 3	1	4	1	2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	(1) 2 3		3		1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 2 3	(1) 2 3		1		1
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside-outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:

_____



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog 03 Surveyor: LO Page: of

Datum: 83 Zone: 17 Easting: 646501 Northing: 4752294 GPS Unit ID: Photos:

Start Time: 2138 End Time: 2147 Temp: 16 °C Wind Speed: 30 Wind Dir: NW Cloud: 100

Visibility (circle): ~~good~~ ~~fair~~ ~~poor~~ Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth:

Habitat Description:

Incidental Wildlife:

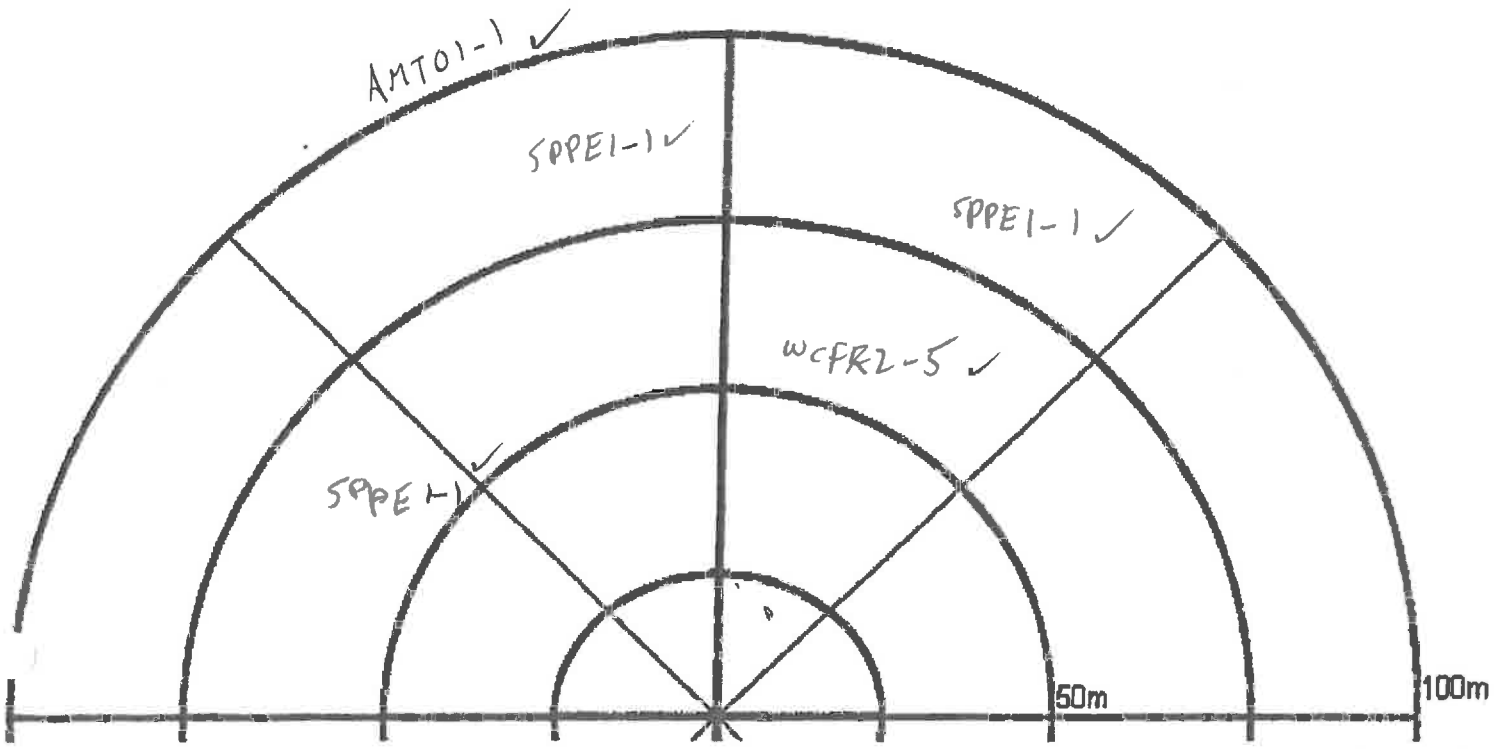
Comments: (other noises)

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	(1) 2 3		1		1
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 (2) 3	(1) 2 3	5	3	2	1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	(1) 2 3	3	1	1	1
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading:



SPPE 1-1 ✓ WCFR 1-3 ✓

Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656( )( ) Date: 19 / 20 May 2020 Station #: Frog 12 Surveyor: LO Page: of

Datum: 83 Zone: 17T Easting: 646823 Northing: 4752049 GPS Unit ID: Photos:

Start Time: 2116 End Time: 2119 Temp: 15 °C Wind Speed: 24 kph Wind Dir: NW Cloud:

Visibility (circle): good fair poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth:

Habitat Description:

Incidental Wildlife:

Comments: (other noises)

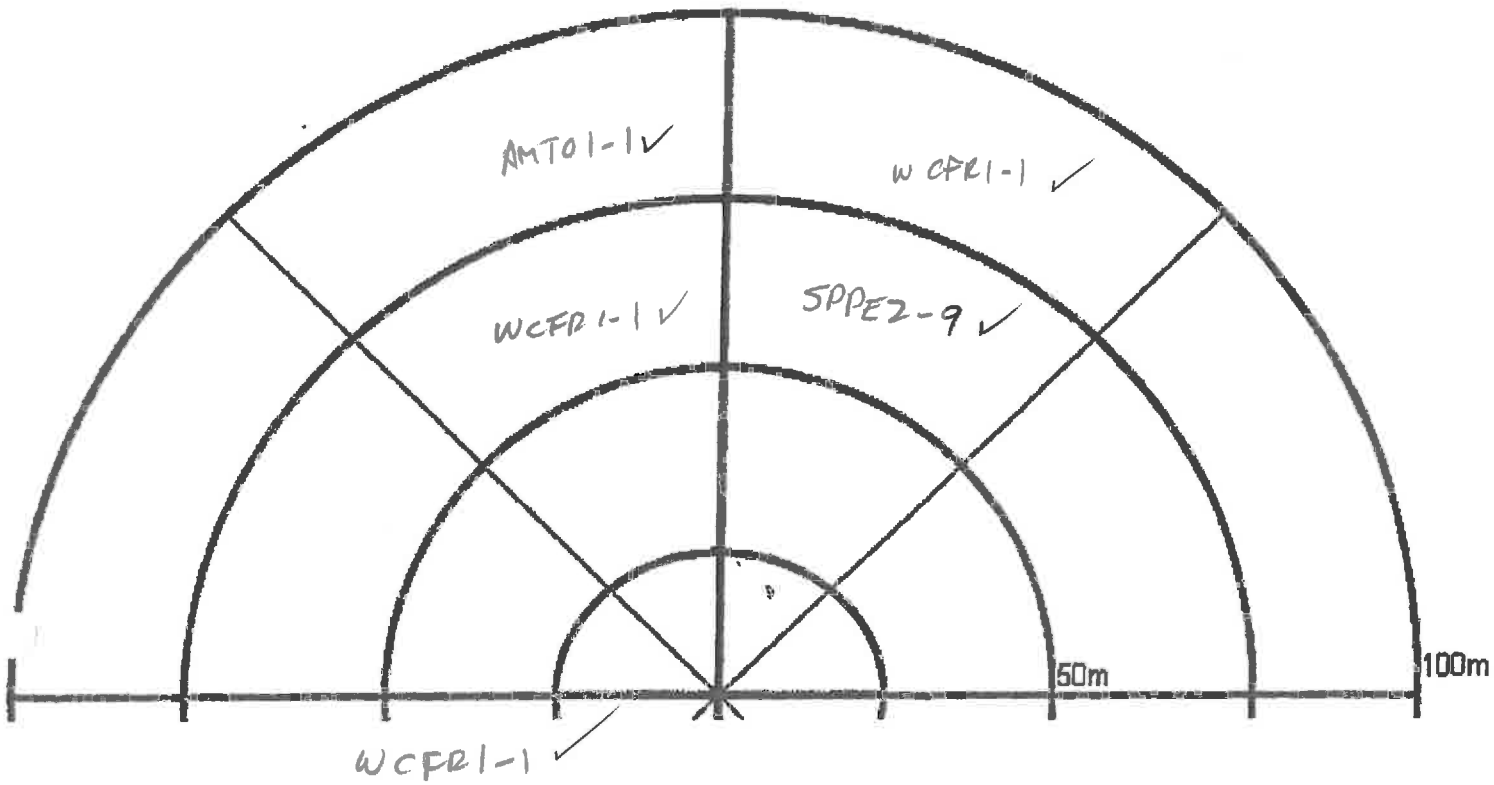
AMWO

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	(1) 2 3	1 2 3	1		1	
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	(1) 2 3	2	1	1	1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	9		2	
WOFO	1 2 3	1 2 3			1	

Call Levels	1	Individuals: do not overlap, can be counted	Direction	A	Inside boundary	Scale	1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance intimate		C	Inside-outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading:



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 ( )( ) Date: 19 May 2020 Station #: Frog04 Surveyor: LO Page: __of__

Datum: 83 Zone: 17 Easting: 646724 Northing: 4752408 GPS Unit ID: _____ Photos: _____

Start Time: 2148 End Time: 2151 Temp: 14 °C Wind Speed: 25 Wind Dir: NW Cloud: 100

Visibility (circle): good fair poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

Comments: (other noises) _____

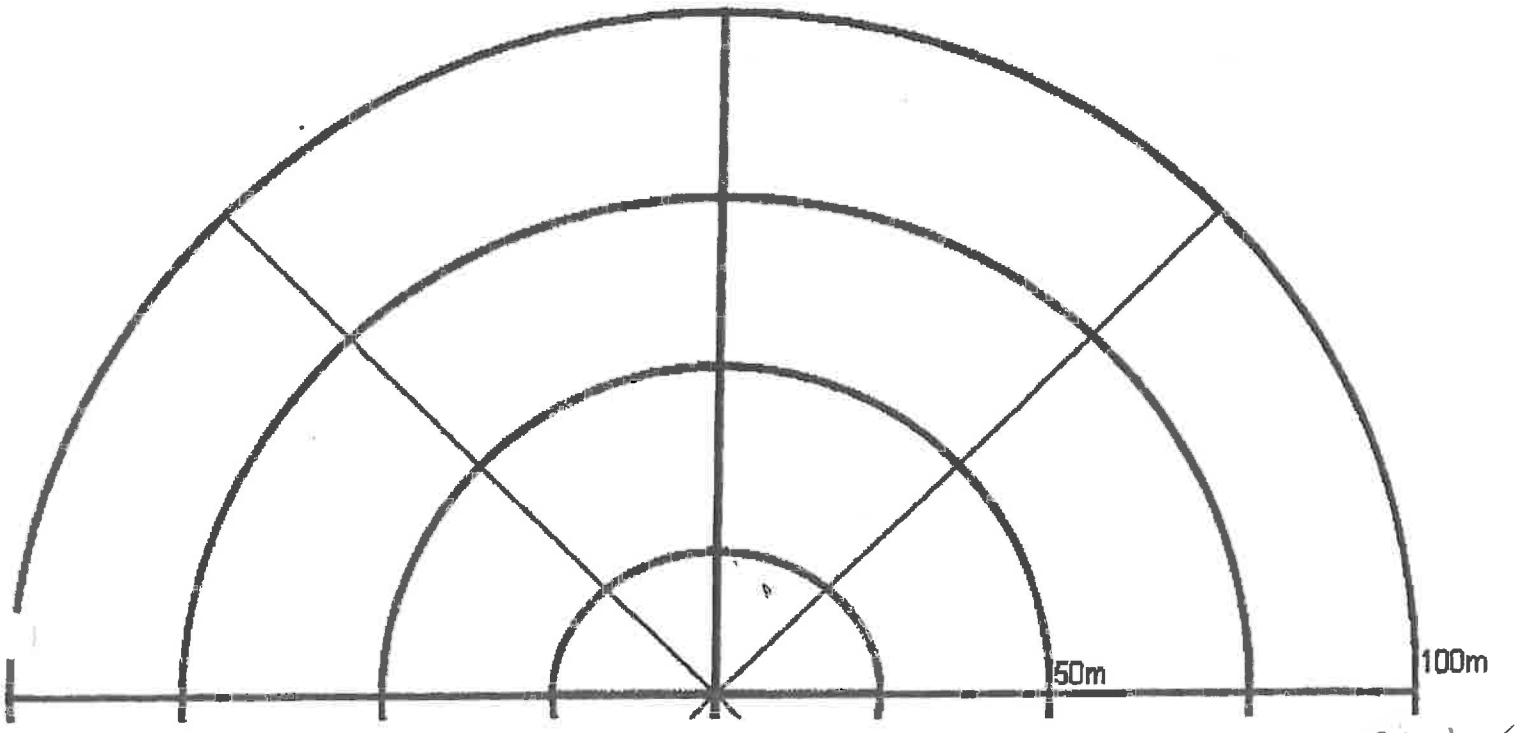
Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 (2) 3		5		2
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	(1) 2 3		1		1
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading:

_____



AMTO2-5 ✓ WCFR1-1 ✓

Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771658 ( ) Date: May 19 2020 Station #: Frog 01 Surveyor: LO Page: of

Datum: 83 Zone: 17T Easting: 4164 78 Northing: 4752058 GPS Unit ID: Photos:

Start Time: 2128 End Time: 2131 Temp: 14 °C Wind Speed: 30 Wind Dir: NW Cloud: 100

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth:

Habitat Description:

Incidental Wildlife:

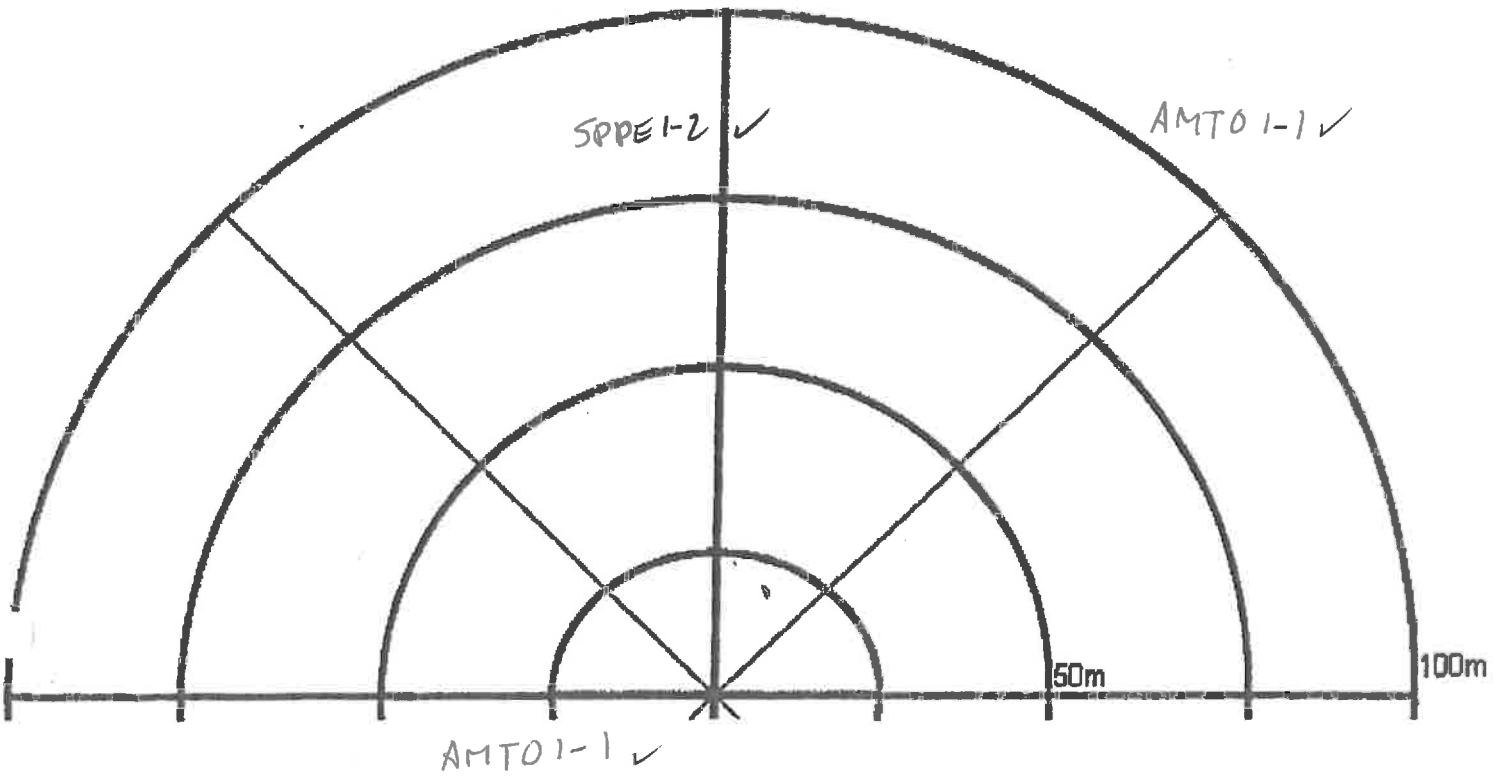
Comments: (other noises)

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	(1) 2 3		2		1
~~BGFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	(1) 2 3	1 2 3	2		1	
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, no abundance estimate		C	Inside-outside boundary	Abundance	Any #	Individuals if counted

Declination:

Heading:



Port Colborne

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 177456 ( )( ) Date: 19 May 2020 Station #: Frog02 Surveyor: LO Page: __ of __

Datum: 83 Zone: 17 Easting: 646734 Northing: 4752187 GPS Unit ID: _____ Photos: _____

Start Time: 2109 End Time: 2112 Temp: 15 °C Wind Speed: 25 Wind Dir: NW Cloud: 100

Visibility (circle): good fair poor, Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description: _____

Incidental Wildlife: _____

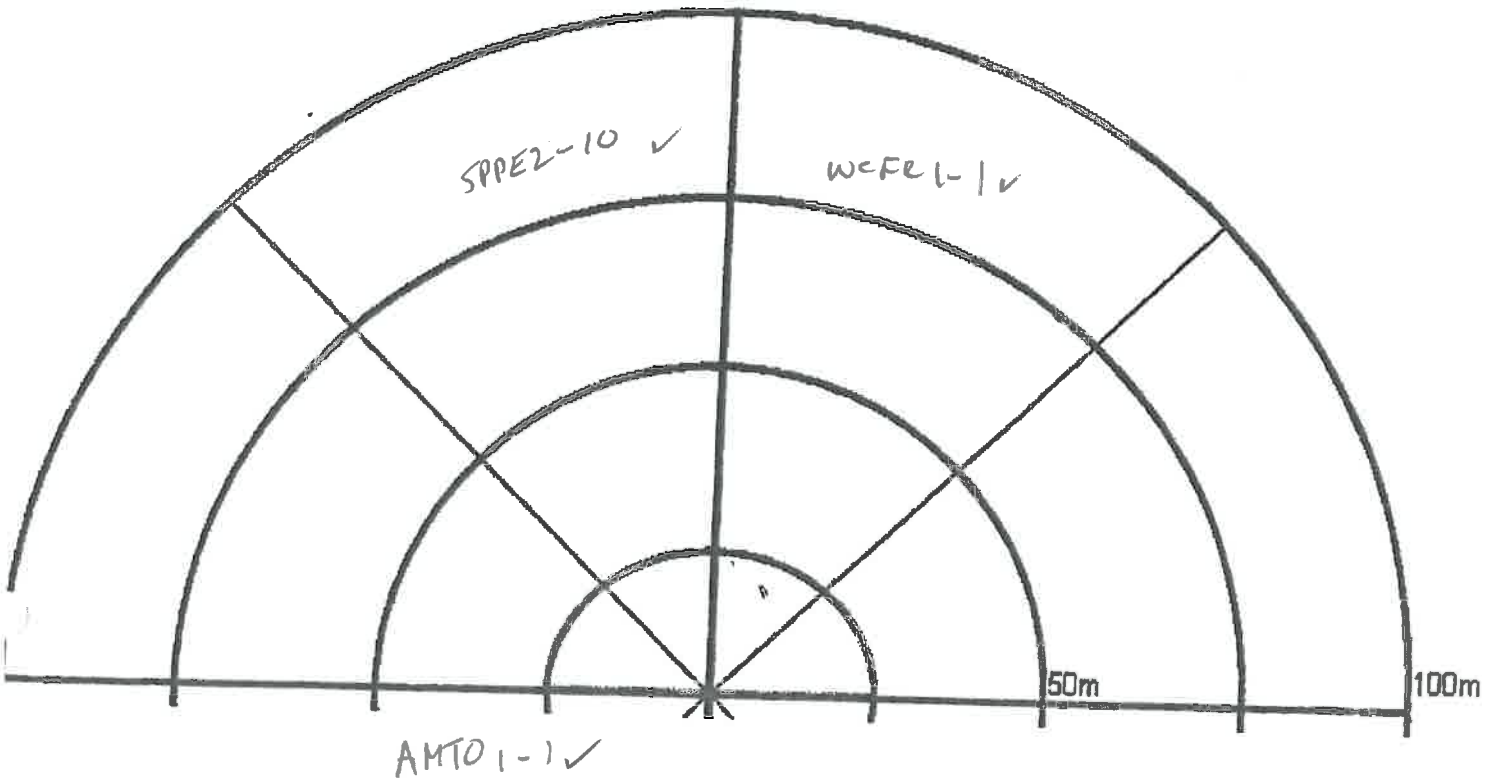
Comments: (other noises) _____

Species	Direction A	Direction B	Abundance A	Abundance B	Scale A	Scale B
AMTO	1 2 3	(1) 2 3		1		1
~~BCFR~~	1 2 3	1 2 3				
BULL	1 2 3	1 2 3				
CHFR	(1) 2 3	1 2 3	1		1	
CGTF	1 2 3	1 2 3				
~~FOTO~~	1 2 3	1 2 3				
GRFR	1 2 3	1 2 3				
MIFR	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3				
SPPE	1 (2) 3	1 2 3	10		2	
WOFO	1 2 3	1 2 3				

Call Levels			Direction			Scale		
	1	Individuals do not overlap, can be counted		A	Inside boundary		1	Count Individuals
	2	Individuals sometimes overlap, abundance can't be estimated		B	Outside boundary		2	Estimate Individuals
	3	Full chorus, not abundance estimate		C	Inside/outside boundary	Abundance	Any #	Individuals if counted

Declination: _____

Heading: _____



Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 171656 (3000) Date: June 15 2020 Station #: 11902 Surveyor: AG/AL Page: __of__

Datum: 83 Zone: 17 Easting: 646734 Northing: 4752188 GPS Unit ID: _____ NTS Map: _____

Start Time: 21:54 End Time: 21:57 Temp: 14 °C Wind Speed: 12 km/h Wind Dir: S Cloud: 60%

Visibility (circle): (good) fair poor Precipitation: (none) light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

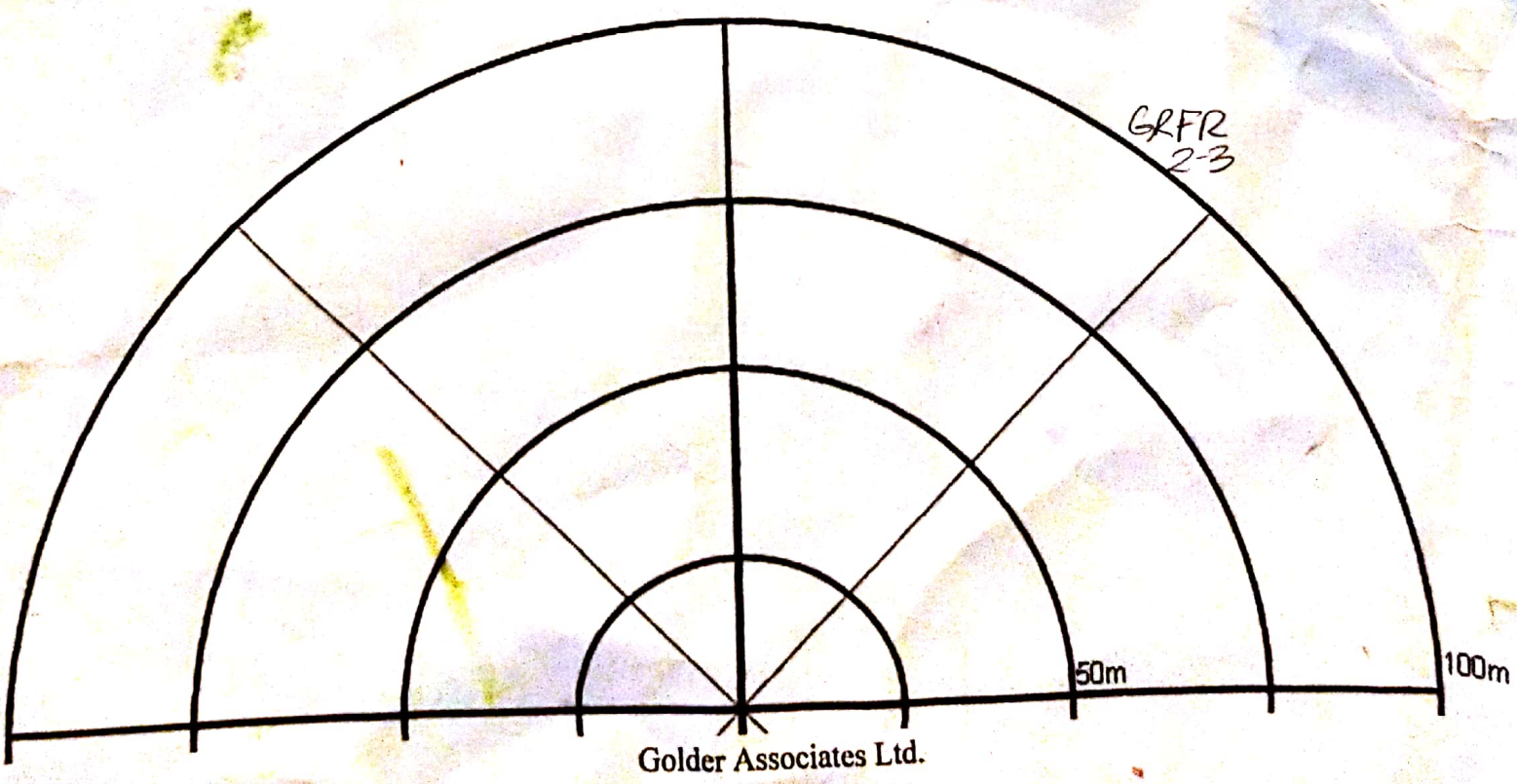
Comments: (other noises)

Species	From Observer			Abundance (FC=Full Chorus)			
	A (0<100m)	B (>100m)	C (Both)	A	B	C Scale A	C Scale B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	1 2 3	1 2 3	1 2 3				
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	1 2 3	1 (2) 3	1 2 3		2-3		2
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3	1 2 3				

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (3000) Date: June 15 2020 Station #: Fim 12 Surveyor: AG/AL Page: 2 of 12

Datum: 83 Zone: 17T Easting: 646823 Northing: 475664 GPS Unit ID: ______ NTS Map: ______

Start Time: 2:36 End Time: 2:39 Temp: 19 °C Wind Speed: 12km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: ______

Habitat Description:

Incidental Wildlife:

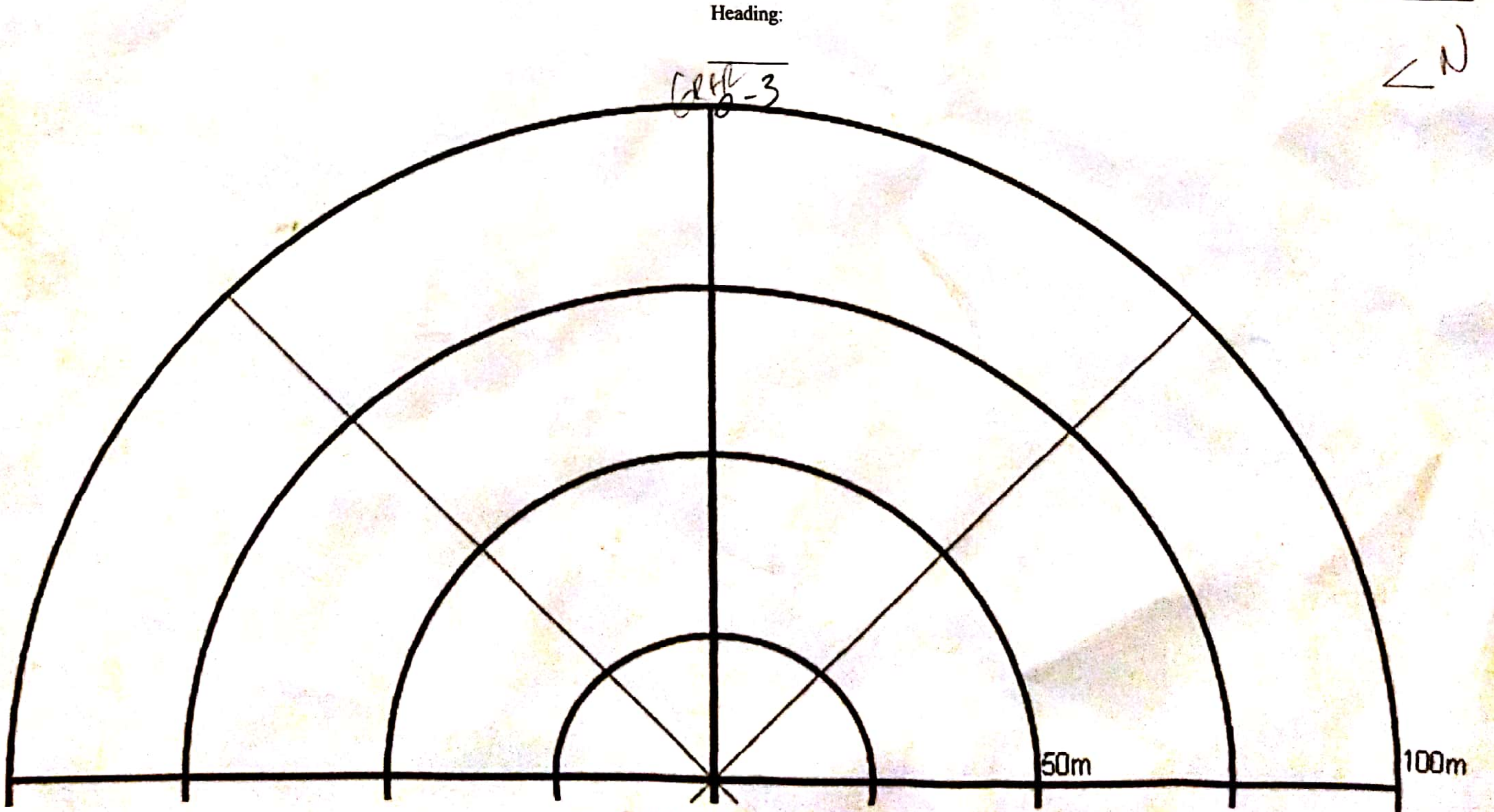
Comments: (other noises)

Species	From Observer A (0<100m)	From Observer B (>100m)	From Observer C (Both)	Abundance (FC=Full Chorus) A	Abundance B	Scale A	Scale B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	1 2 3	1 2 3	1 2 3				
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	1 2 3	1 (2) 3	1 2 3	2-3			2
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3	1 2 3				

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: ______

Heading: ______



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Anuran Call Count Study – Fixed Point Observation Datasheet

Golder Associates

Project #: 1771656(3000)( ) Date: June15 2020 Station #: Trog01 Surveyor: AG/AL Page: 3 of 12

Datum: 83 Zone: 17 Easting: 064417 Northing: 475208 GPS Unit ID: ______ NTS Map: ______

Start Time: 22:51 End Time: 2:57 Temp: 19 °C Wind Speed: 12Km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: ______

Habitat Description:

Incidental Wildlife:

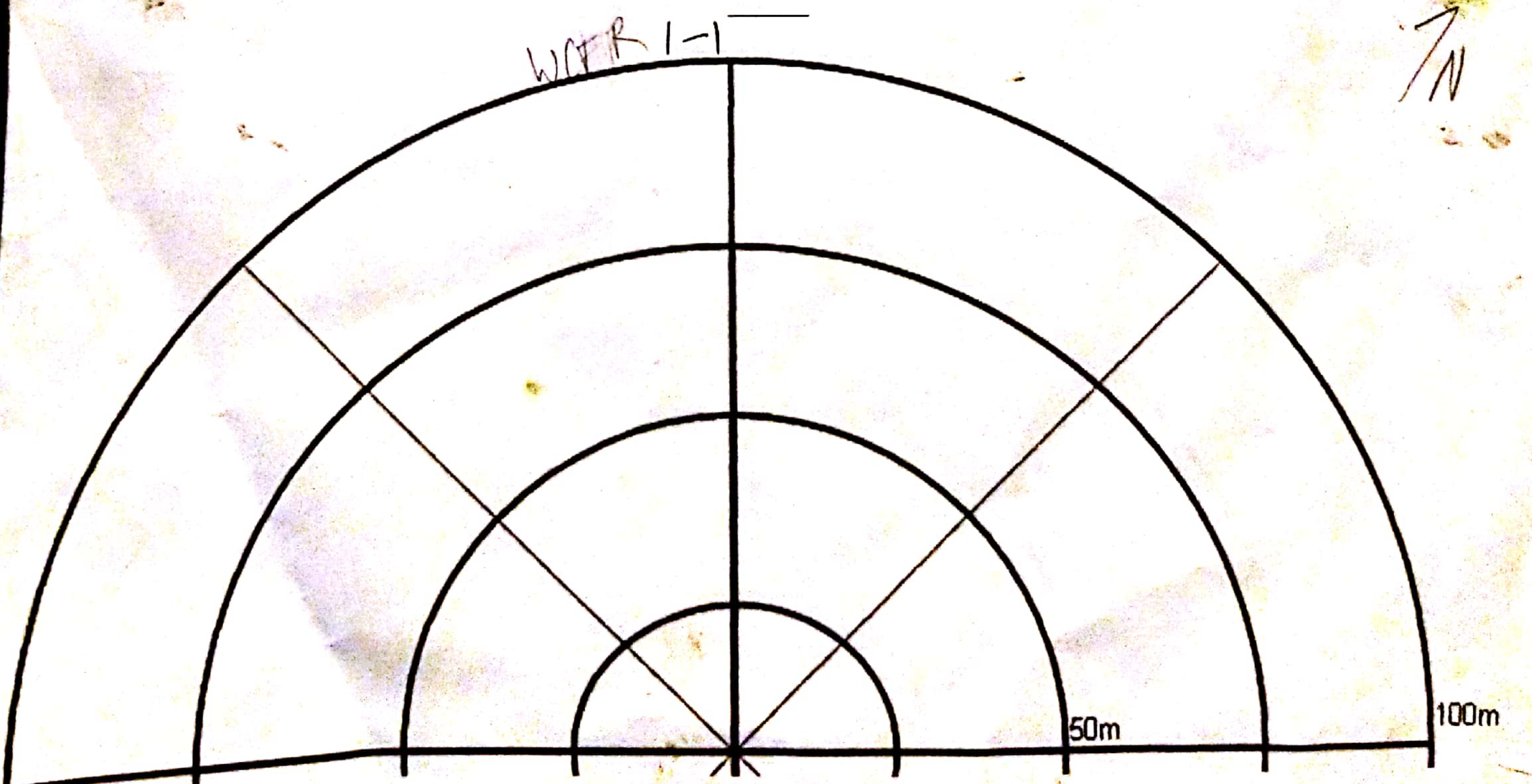
Comments: (other noises)

Species	From Observer A (0<100m)	From Observer B (>100m)	From Observer C (Both)	Abundance (FC=Full Chorus) A	Abundance B	Scale? A | B
AMTO✓	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR✓	1 2 3	(1) 2 3	1 2 3		1-1	1
CGTF	1 2 3	1 2 3	1 2 3			
FOTO✓	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE✓	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer			Call Levels			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: ______

Heading: ______



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Golder Associates

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (3000) X(______) Date: June 15 2020 Station #: Frog03 Surveyor: AG/AL Page: 4 of 12

Datum: 83 Zone: 17 Easting: 646601 Northing: 475204 GPS Unit ID: ______ NTS Map: ______

Start Time: 23:35 End Time: 23:38 Temp: 19 °C Wind Speed: 12 Km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: ______

Habitat Description:

Incidental Wildlife:

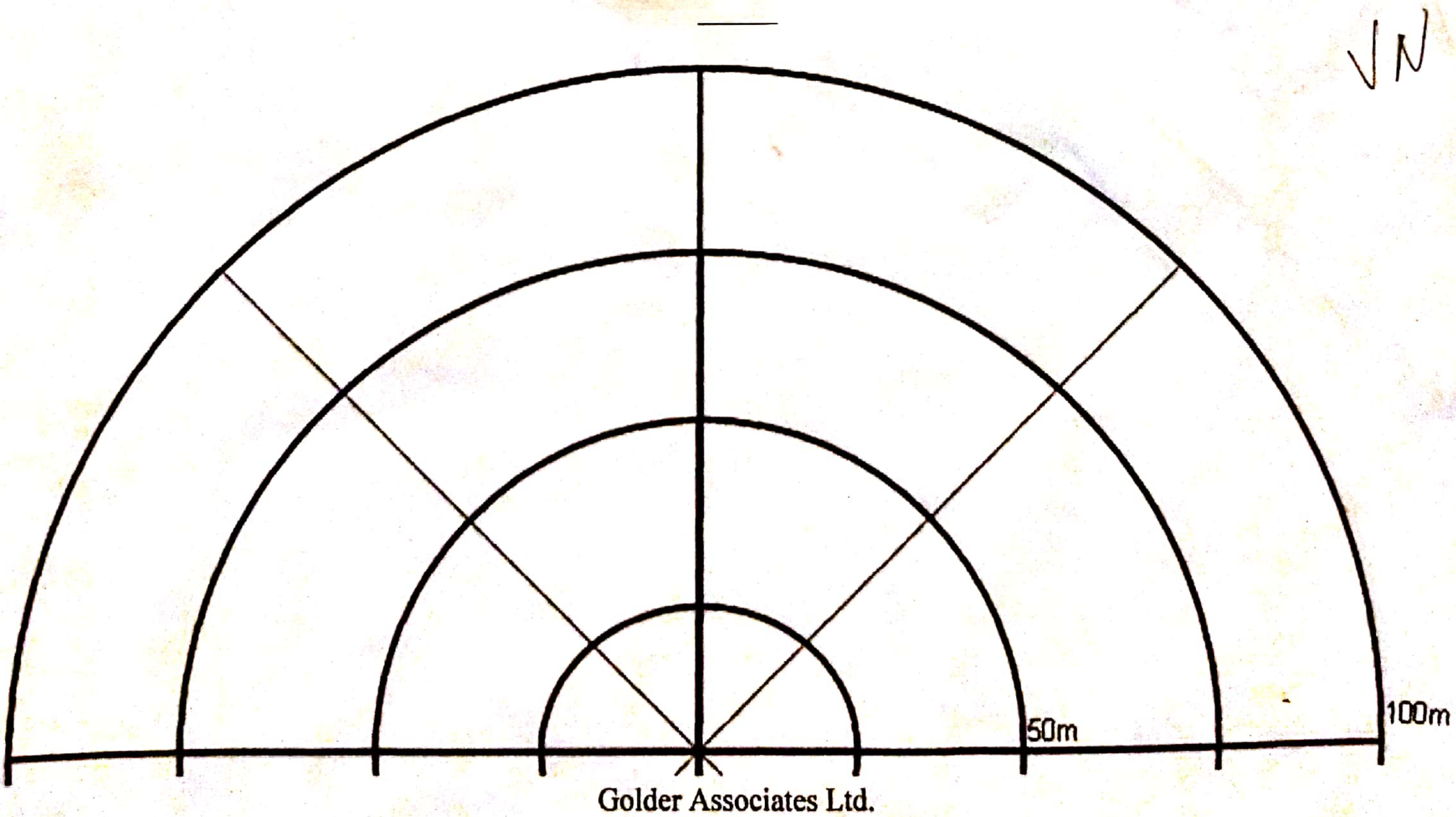
Comments: (other noises)
no frogs heard

Species	From Observer A (0<100m)	From Observer B (>100m)	From Observer C (Both)	Abundance (FC=Full Chorus) A	Abundance B	Scale? A/B
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
CGTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer			Call Levels			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: ______

Heading: ______



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 17716Sb (3002) Date: June 15 2020 Station #: Frog04 Surveyor: AB/AL Page: 5 of 12

Datum: 83 Zone: 17T Easting: 641624 Northing: 7554[illegible] GPS Unit ID: _____ NTS Map: _____

Start Time: 23:58 End Time: 24:01 Temp: 19 °C Wind Speed: 12 km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

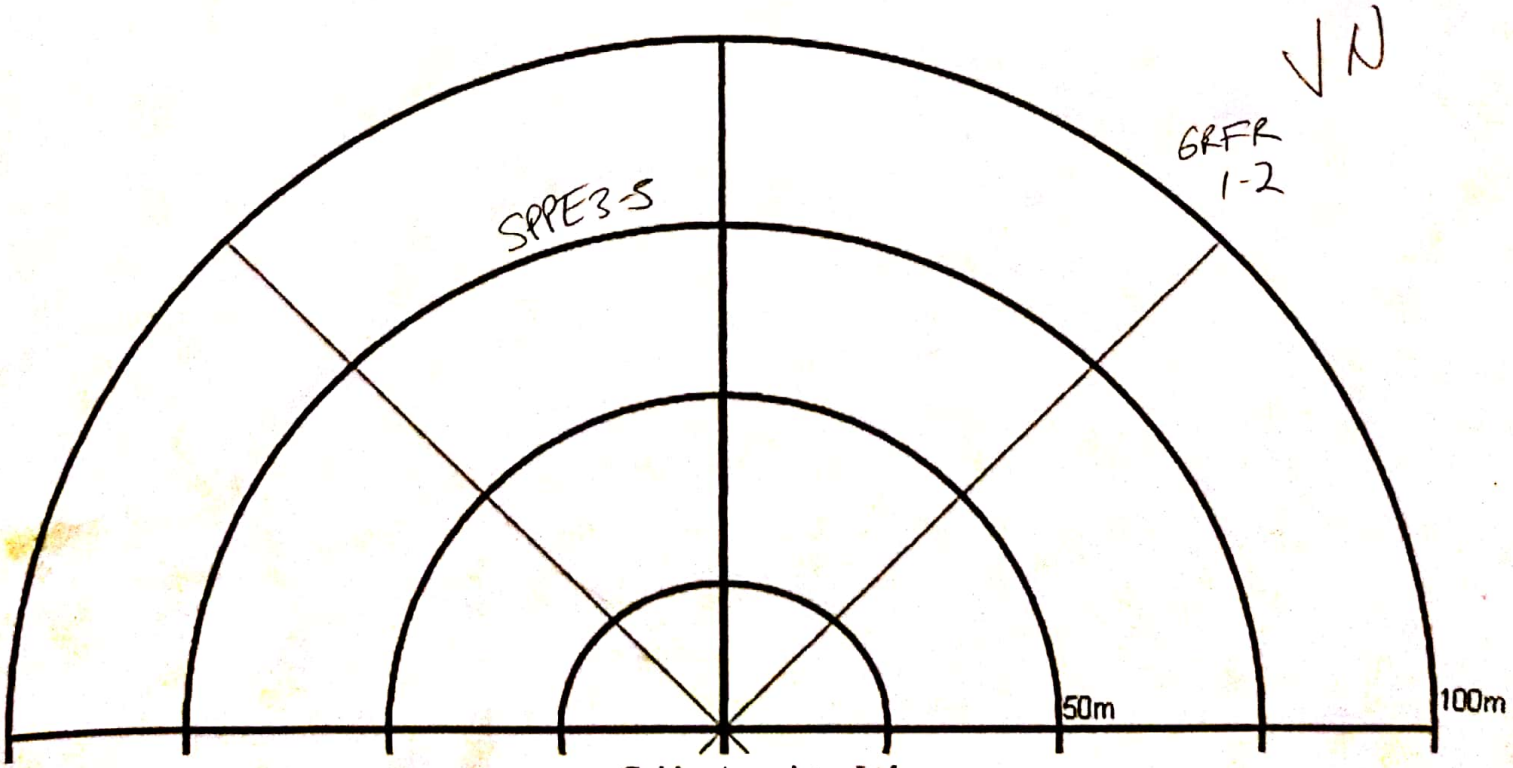
Comments: (other noises)

Species	From Observer A (0<100m)	From Observer B (>100m)	From Observer C (Both)	Abundance (FC=Full Chorus) A	Abundance (FC=Full Chorus) B	Scale A	Scale B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	1 2 3	1 2 3	1 2 3				
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	1 2 3	(1) 2 3	1 2 3	2			1
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 (3)	1 2 3	1 2 3	5		3	
WOFO	1 2 3	1 2 3	1 2 3				

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 17716-5k(3000) Date: June 15 2020 Station #: Fig 10 Surveyor: NG/AL Page: 6 of 12

Datum: 83 Zone: 17T Easting: 646120 Northing: 4750[illegible] GPS Unit ID: _____ NTS Map: _____

Start Time: 24:11 End Time: 24:14 Temp: 19 °C Wind Speed: 0km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

_____

_____

_____

_____

Incidental Wildlife:

_____

_____

_____

_____

Comments: (other noises)

_____

_____

_____

_____

_____

_____

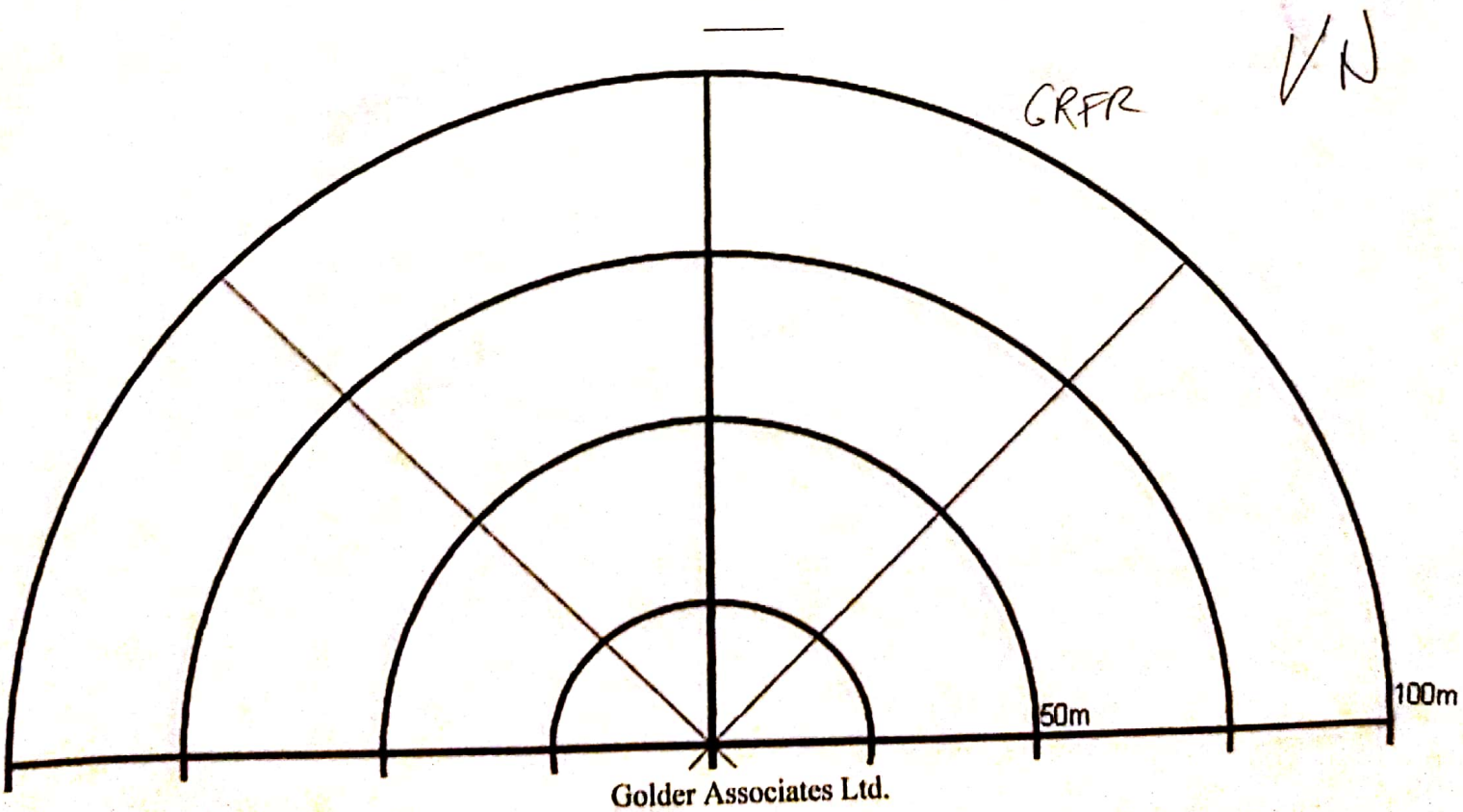
Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100m)	B (>100m)	C (Both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
CGTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 (2) 3	1 2 3	2-2		
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading:

_____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 177656 (3000) Date: June 15 2020 Station #: Ing09 Surveyor: AG/AL Page: 7 of 12

Datum: 83 Zone: 17T Easting: 0647086 Northing: 4752390 GPS Unit ID: _____ NTS Map: _____

Start Time: 21:17 End Time: 21:19 Temp: 19 °C Wind Speed: 12 km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

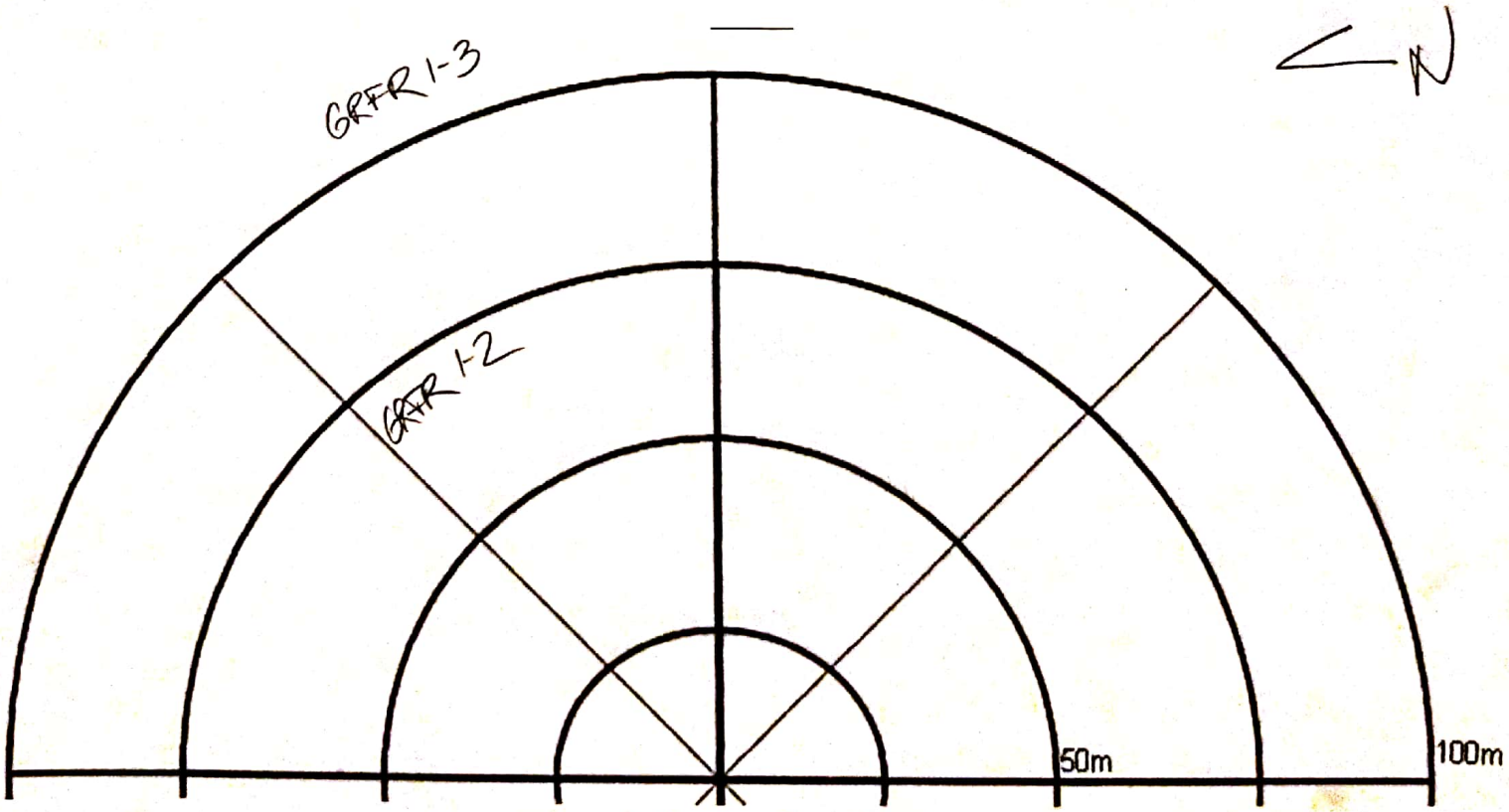
Comments: (other noises)
Lots of traffic

Species	From Observer			Abundance (FC=Full Chorus)			
	A (0<100m)	B (>100m)	C (Both)	A	B	Scan A	Scan B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	1 2 3	1 2 3	1 2 3				
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	(1) 2 3	(1) 2 3	1 2 3	2	3	1	1
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3	1 2 3				

From Observer			Call Levels:			Abundance		
	A	Inside 100m		1	Individuals do not overlap, can be counted		Any #	Individuals if counted or estimated
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1791656 (3000X) Date: June 15 2020 Station #: Tina 11 Surveyor: AG/AL Page: 8 of 12

Datum: 83 Zone: 17T Easting: 647421 Northing: 4750149 GPS Unit ID: ______ NTS Map: ______

Start Time: 21:24 End Time: 21:27 Temp: 19 °C Wind Speed: 12km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: ______

Habitat Description:

Incidental Wildlife:

Comments: (other noises)

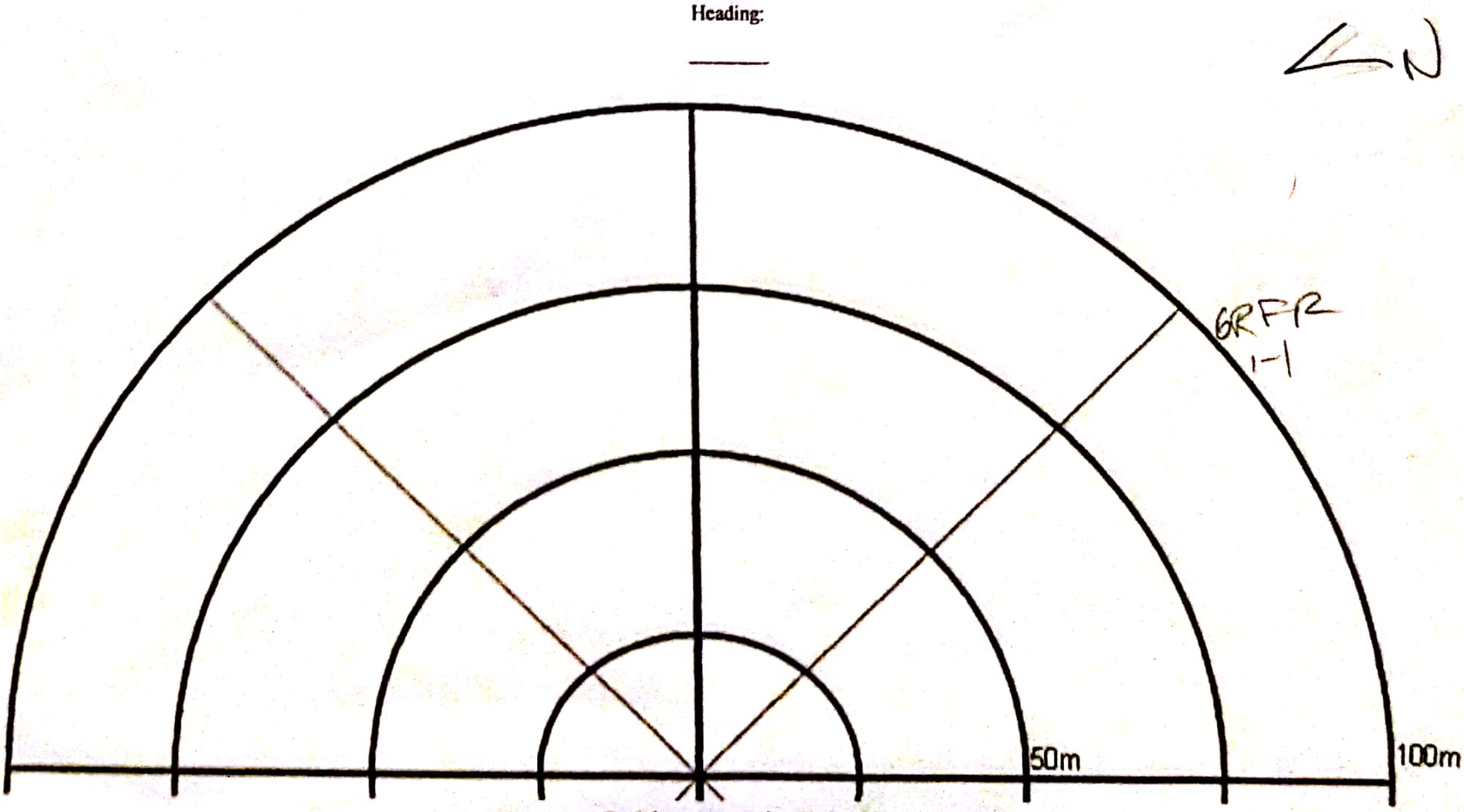
highway traffic in distance

Species	From Observer A (0<100m)	From Observer B (>100m)	From Observer C (Both)	Abundance (FC=Full Chorus) A	Abundance B	Abundance C Scale A	Abundance C Scale B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	1 2 3	1 2 3	1 2 3				
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	1 2 3	(1) 2 3	1 2 3		1		1
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3	1 2 3				

From Observer			Call Levels			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: ______

Heading: ______



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 17716-6 (3000 X) Date: June 15 2020 Station #: Frog 07 Surveyor: AG / AL Page: 9 of 12

Datum: 83 Zone: 17T Easting: 646787 Northing: 4753947 GPS Unit ID: _____ NTS Map: _____

Start Time: 24:36 End Time: 24:39 Temp: 19 °C Wind Speed: 12 km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

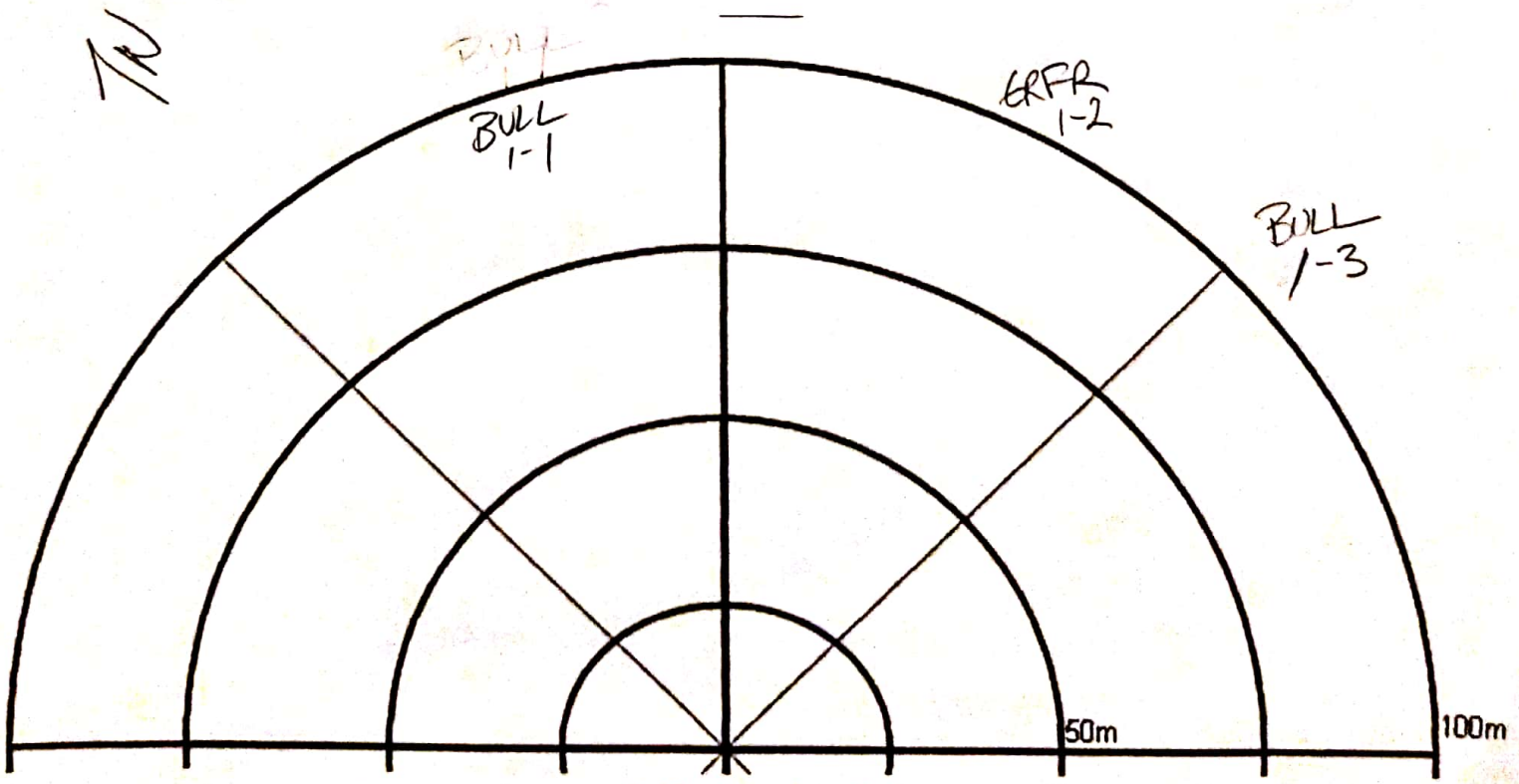
Comments: (other noises)
Road traffic

Species	From Observer			Abundance (FC=Full Chorus)			
	A (0<100m)	B (>100m)	C (Both)	A	B	C Scale A	C Scale B
AMTO	1 2 3	1 2 3	1 2 3				
BCFR	1 2 3	1 2 3	1 2 3				
BULL	(1) 2 3	(1) 2 3	1 2 3	1-1	1-3	1	1
WCFR	1 2 3	1 2 3	1 2 3				
CGTF	1 2 3	1 2 3	1 2 3				
FOTO	1 2 3	1 2 3	1 2 3				
GRFR	1 2 3	(1) 2 3	1 2 3	1	1-2	1	
MIFR	1 2 3	1 2 3	1 2 3				
NLFR	1 2 3	1 2 3	1 2 3				
PIFR	1 2 3	1 2 3	1 2 3				
SPPE	1 2 3	1 2 3	1 2 3				
WOFO	1 2 3	1 2 3	1 2 3				

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 177656 (3000) Date: June 15 2020 Station #: Frog 06 Surveyor: AG/ML Page: 10 of 12

Datum: 83 Zone: 17T Easting: 646825 Northing: 4750845 GPS Unit ID: _____ NTS Map: _____

Start Time: 24.47 End Time: 24.50 Temp: 9 °C Wind Speed: 12km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

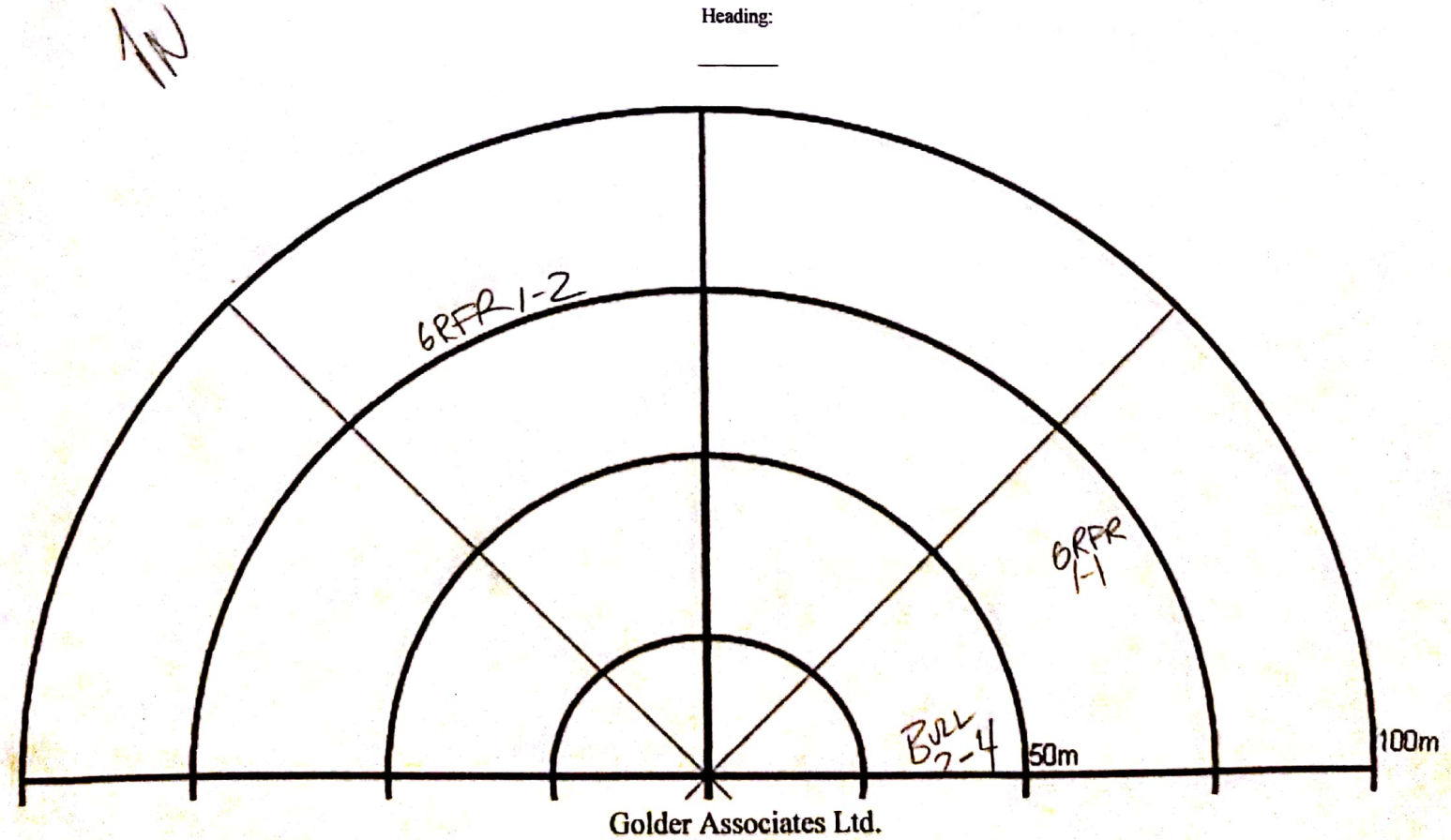
Comments: (other noises)

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100m)	B (>100m)	C (Both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3	2-4		
WCFR	1 2 3	1 2 3	1 2 3			
CGTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	(1) 2 3	1 2 3	1 2 3	1-2		
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 1771656 (3000) ( ) Date: Jun 15 2020 Station #: Fog 13 Surveyor: AG/AL Page: 1 of 12

Datum: 83 Zone: 17T Easting: 647180 Northing: 7 5140 GPS Unit ID: _____ NTS Map: _____

Start Time: 4:55 End Time: 5:58 Temp: 19 °C Wind Speed: 2Km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

Comments: (other noises)

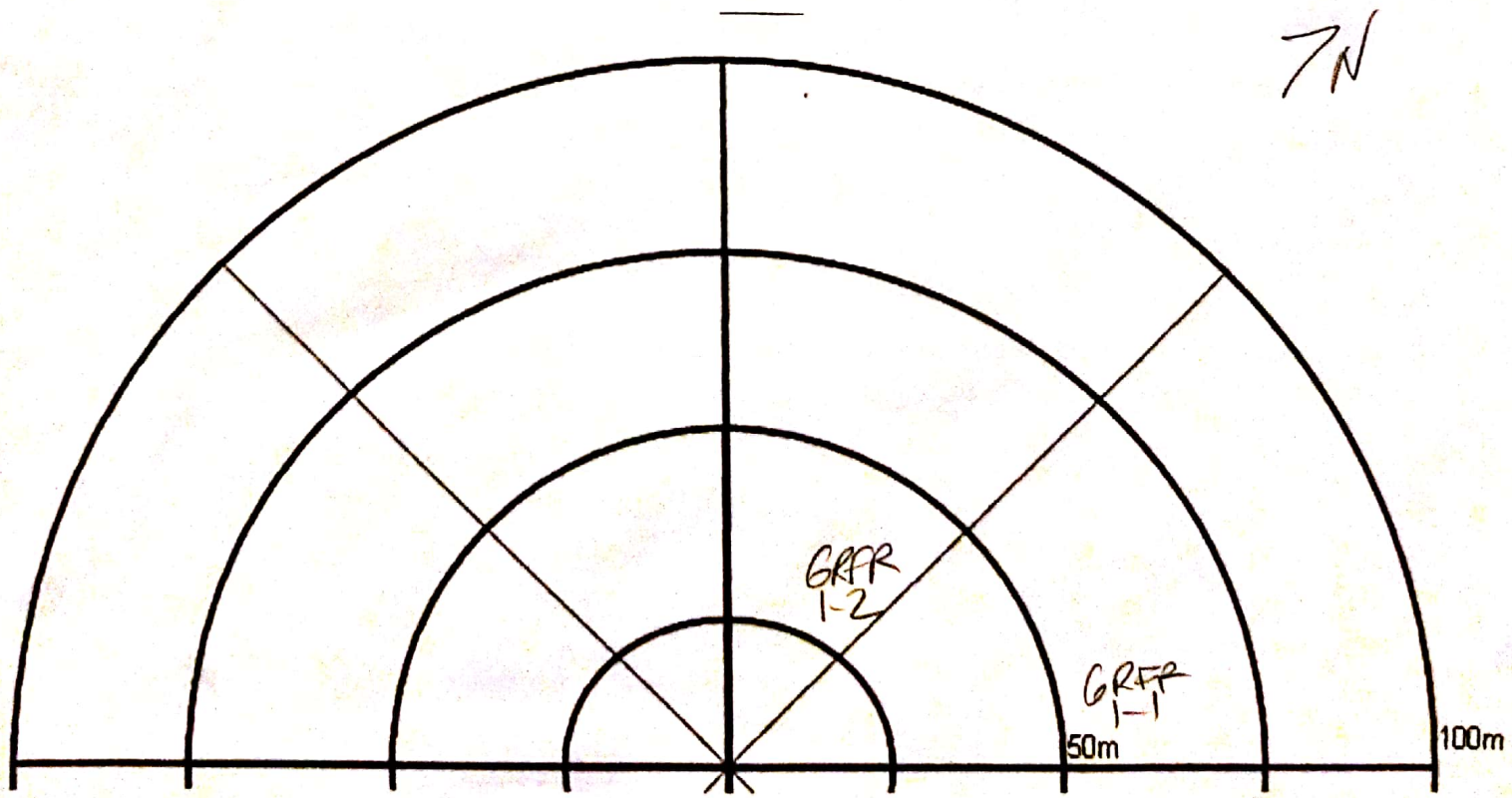
Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100m)	B (>100m)	C (Both)	A	B	C Scale A / B
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
CGTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	(1) 2 3	1 2 3	1 2 3	1-3		1
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer			Call Levels:			Abundance		
	A	Inside 100m		1	Individuals do not overlap, can be counted		Any #	Individuals if counted or estimated
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading:

_____



Golder Associates Ltd.

Anuran Call Count Study – Fixed Point Observation Datasheet

Project #: 177656 (3000) ( ) Date: June 15 2020 Station #: Frog CB Surveyor: AG/AL Page: 12 of 12

Datum: WGS Zone: 17T Easting: 646963 Northing: 4752483 GPS Unit ID: _____ NTS Map: _____

Start Time: 1:13 End Time: 1:16 Temp: 19 °C Wind Speed: 12km Wind Dir: S Cloud: 60%

Visibility (circle): good fair poor Precipitation: none light rain rain storm snow sleet hail other Snow Depth: _____

Habitat Description:

Incidental Wildlife:

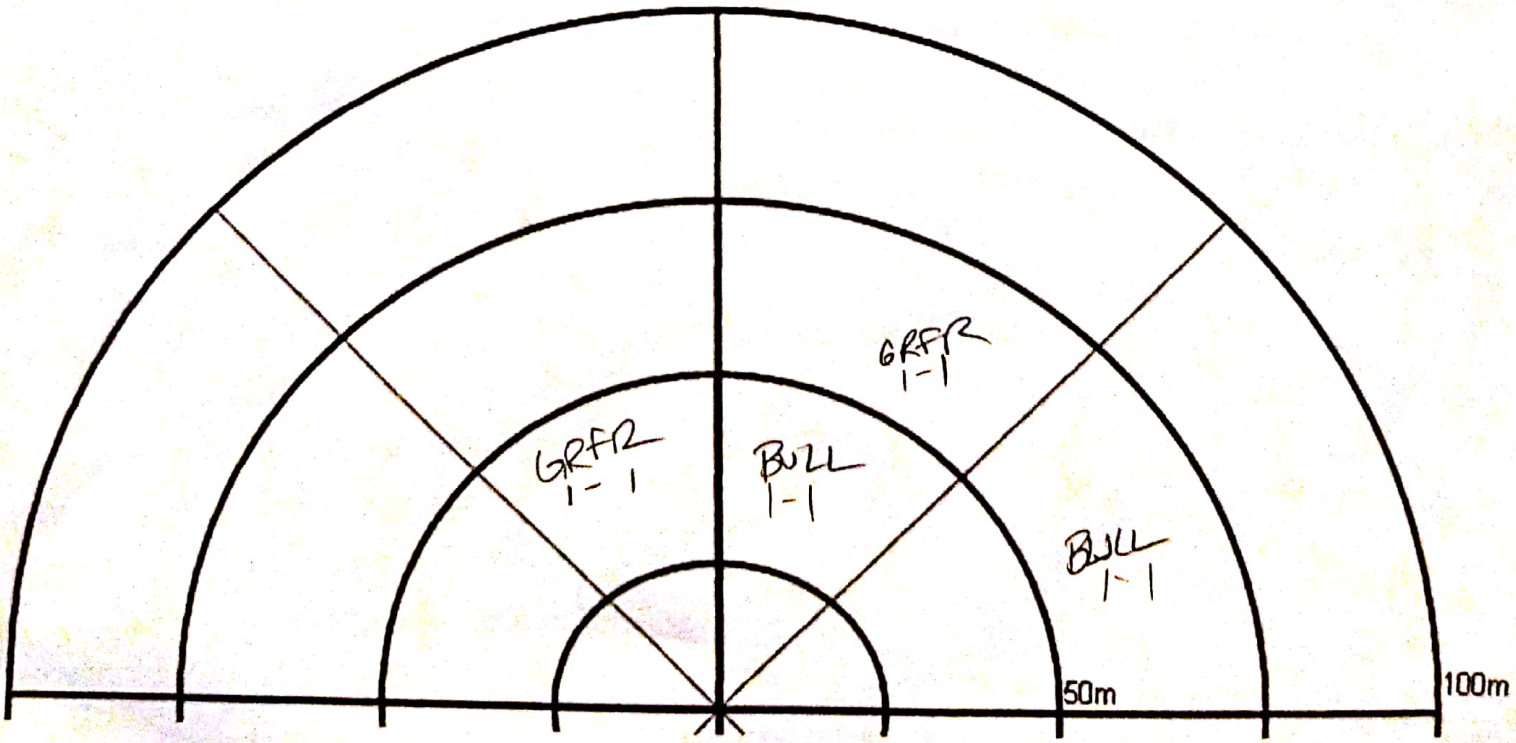
Comments: (other noises)

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100m)	B (>100m)	C (Both)	A	B	C (Scale A / B)
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	(1) 2 3	1 2 3	1 2 3	1-2		2
WCFR	1 2 3	1 2 3	1 2 3			
CGTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	(1) 2 3	1 2 3	1 2 3	1-2		2
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:			Call Levels:			Abundance	Any #	Individuals if counted or estimated
	A	Inside 100m		1	Individuals do not overlap, can be counted			
	B	Outside 100m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100m		3	Full chorus, not abundance estimate			

Declination: _____

Heading: _____



Golder Associates Ltd.

APPENDIX F

CV's

Golder Associates Ltd. – Mississauga

Principal, Senior Ecologist

Heather Melcher is a Principal, Senior Ecologist and Project Manager/Director with Golder Associates. Heather has over 18 years of experience working in a number of sectors including transportation, oil and gas, transmission, land development, power, aggregates and mining. Her experience lies in designing, managing and carrying out environmental impact assessments within provincial and federal frameworks and environmental land use policies for projects of various size and complexity. She leads a team of ecologists and multi-disciplinary project teams to holistically assess potential project impacts through integration of components. Heather works closely with provincial and federal agencies to help her clients navigate changing planning and species at risk (SAR) legislation. Heather has experience developing rehabilitation plans for disturbed sites and biodiversity plans that integrate the ecology of a smaller site into the regional system as well as developing compensation habitat plans and mitigation plans for SAR. Heather is also a recognized expert witness for Local Planning Appeal Tribunal (LPAT) hearings in Ontario.

Education

M.Sc. Applied Marine Science, University of Plymouth, Devon, UK, 1998

B.Sc. (Honours) Biology, Laurentian University, Sudbury, Ontario, 1996

Certifications

PADI Master Scuba Diver Trainer, 2000

Small Craft Boat Operator, 2003

Small Non-pleasure Vessel Basic Safety - MED A3, 2011

Canadian Red Cross First Aid and CPR, 2012

WHMIS Training, 1990, 2001, 2004, 2016

Languages

English – Fluent

Employment History

Golder Associates Ltd. – Mississauga, Ontario
Principal, Senior Ecologist (2004 to Present)

Project manager, project director and/or technical lead or advisor on multi-disciplinary projects of varying size and complexity. Leads a team of ecologists in Ontario and responsible for business development as a global client lead.

ESG International – Guelph, Ontario
Ecologist/Environmental Planner (2002 to 2003)

Specialized in resource management and land use planning. Worked with clients, residential and commercial land developers, land planners and regulatory agencies to obtain permits and approvals, specifically within the framework of Niagara Escarpment and Oak Ridges Moraine legislation. Compiled, assessed and reported on marine data collected for international projects.

CBCL Ltd – Halifax, Nova Scotia
Ecologist/Environmental Planner (2001 to 2002)

Intermediate project manager responsible for designing and implementing environmental effects monitoring, environmental impact assessment, and natural heritage projects. Developed and implemented marine and freshwater fisheries and benthic investigations, aquatic habitat assessments, and water quality and sediment assessments. Liaised with clients and regulatory agencies (federal and provincial), to obtain development permits and approvals.

Southeast Environmental Association – Montague, Prince Edward Island
Bacterial Water Quality Project Coordinator (2000 to 2002)

Responsible for collection of freshwater samples and laboratory analysis of faecal coliform bacteria to determine the effects of livestock farming runoff on the shellfish industry. Liaised with landowners and the agricultural engineer to establish effective remediation efforts, and developed education initiatives involving the general public, farmers and shell fishers. Reported to a multi-stakeholder board.

PROJECT EXPERIENCE – CONSTRUCTION MATERIALS

Scotian Materials Limited
Halifax, Nova Scotia, Canada

Senior Technical Lead (biophysical) for the provincial environmental assessment to support the expansion of an existing quarry. Studies completed to support the project included fish and fish habitat, species at risk, flora and fauna and wetland surveys. The technical lead for the impact assessment for the natural environment and the completion of supporting permit/approval applications. Scope included the completion of wetland and wildlife management plans.

EWL Ltd., Gordon Lake Quarry and Borrow Area
Kenora, Ontario, Canada

Natural environment component lead for permit applications under the Aggregate Resources Act (ARA). The aggregate areas are in support of rehabilitation activities associated with the decommissioning of the former Gordon-Werner Lake Mine. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components, and developed a Natural Environment Level 1/2 (NEL 1/2) technical report. Responsible for negotiations with the Ministry of Natural Resources and Forestry (MNRF) and Ministry of Environment, Conservation and Parks (MECP) regarding woodland caribou and SAR bats. Prepared and submitted permitting applications under the Endangered Species Act (ESA), developed mitigation plans and coordinated with construction team.

Lafarge Canada Inc., McGill Pit
Kemptville, Ontario, Canada

Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components and completed a comprehensive, integrated impact assessment. Developed progressive and final rehabilitation plans, participated in agency and public consultation and produced an NEL 1/2 report and municipal Environmental Impact Study (EIS) report. Led negotiations with the MNRF regarding SAR issues and developed mitigation and habitat compensation plans for butternut. Participated in an Ontario Municipal Board (OMB) hearing as an expert witness.

Colacem Cement
L'Orignal, Ontario, Canada

Natural environment component lead for the Colacem Cement Plant assessment. Designed and coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with physical resource components. Developed an EIS for the municipal approval process. Worked with MNRF and South Nation Conservation on significant natural heritage feature and SAR issues and with Fisheries and Oceans Canada (DFO) on a Fisheries Act authorization for removal of fish habitat. Currently preparing for participation in a LPAT (formerly the OMB) hearing as an expert witness.

CBM Ltd. (a division of Votorantim Cimentos), Dance Pit Extension
North Dumfries, Ontario, Canada

Project manager and natural environment technical advisor for an above water pit licence application under the ARA. Worked with the natural environment component lead to collect, analyse, interpret and integrate terrestrial and aquatic data with hydrogeological and surface water components. Developed a rehabilitation plan, consulted with the Grand River Conservation Authority, the MNRF and MECP, the Region of Waterloo, the Municipality of North Dumfries and the City of Cambridge, and participated in agency and public consultation. Coordinated and managed the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise, air quality, visual assessment and vibration specialists, public consultation and Indigenous community engagement specialists, and archaeologists. Managed and tracked overall project budget and schedule.

CBM Ltd. (a division of Votorantim Cimentos), Lanci Pit Expansion
Aberfoyle, Ontario, Canada

Project manager and natural environment technical advisor for an above water pit licence application under the ARA. Worked with the natural environment component lead to analyse, interpret and integrate terrestrial and aquatic data with hydrogeological and surface water components. Developed a rehabilitation plan, consulted with the Grand River Conservation Authority, the MNRF, the municipality, and participated in agency and public consultation. Coordinated and managed the activities of a multi-disciplinary team including hydrogeologists, surface water engineers, noise scientists, archaeologists, and an Indigenous Community engagement team. Managed and tracked overall project budget and schedule.

Cavanagh Construction Ltd., Henderson II Quarry
Ottawa, Ontario, Canada

Natural environment component lead for a below water quarry licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreted and integrated data with hydrogeological and surface water components and completed a comprehensive integrated impact assessment. Developed a rehabilitation plan, participated in agency and public consultation and developed an NEL 1/2 report and municipal EIS report. Led negotiations with the MNRF regarding SAR issues and developed compensation plans.

Tackaberry Sand and Gravel Ltd., Perth Quarry
Perth, Ontario, Canada

Natural environment component lead for a below water quarry licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis, interpreting and integrated data with hydrogeological and surface water components. Developed a rehabilitation plan, participated in agency and public consultation and developed an NEL 1/2 report and municipal EIS. Led negotiations with the MNRF regarding SAR issues and developed compensation plans for the removal of habitat. Worked with Rideau Valley Conservation Authority and Mississippi Valley Conservation Authority on headwater drainage feature assessment and mitigation plans.

Greenfield Aggregates Sherk Pit
Waterloo, Ontario, Canada

Natural environment component lead for a below water pit licence application under the ARA. Analysed and integrated terrestrial and aquatic data with hydrogeological and surface water components, completed a comprehensive and integrated impact assessment. Developed a rehabilitation plan and an NEL 1/2 report and municipal EIS report. Participated in consultation with the Region and the Ecological and Environmental Advisory Committee (EEAC).

Lafarge Canada Inc., French Settlement Pit
Ottawa, Ontario, Canada

Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and municipal EIS report. Consulted with regulatory agencies and participated in public consultation process.

Lafarge Canada Inc., Sunningdale Pit
London, Ontario, Canada

Natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Consulted with regulatory agencies and participated in public consultation process. Developed mitigation and habitat compensation plans under the ESA for barn swallow.

Lafarge Canada Inc., Limebeer Pit
Caledon, Ontario, Canada

Project manager and natural environment component lead for a below water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Consulted with regulatory agencies, participated in public consultation process. Coordinated and managed the activities, schedule and budget of a multi-disciplinary team including hydrogeologists, groundwater modelling experts, surface water engineers, and noise and air quality specialists.

Lafarge Canada Inc., Avening Pit Extension
Creemore, Ontario, Canada

Project manager and natural environment component lead for an above water pit licence application under the ARA. Coordinated aquatic and terrestrial field data collection and analysis. Interpreting and integrated data with hydrogeological and surface water components. Completed a comprehensive and integrated impact assessment. Developed a progressive and final rehabilitation plan and an NEL 1/2 report and EIS. Coordinated and managed the activities, schedule and budget of a multi-disciplinary team including hydrogeologists, surface water engineers, and noise and air quality specialists.

Floyd Preston Ltd.
Eastern Ontario, Canada

Natural environment component lead for a quarry licence application under the ARA. Liaised with client, coordinated field data collection, mentored intermediate staff in data analysis and interpretation and prepared an NEL 1 report.

PROJECT EXPERIENCE – SPECIES AT RISK

EWL Management Ltd Madawaska Mine Decommissioning
Faraday, Ontario, Canada

Natural environment component lead for SAR permitting for bats, including little brown myotis (Myotis lucifugus), northern myotis (Myotis septentrionalis) and tricolor bat (Perimyotis subflavus). Prepared and submitted permitting documents under the ESA, led consultation with the MNRF and MECP, developed a mitigation plan and provided direction to the construction team.

TransCanada - Various Sites in Ontario
Ontario, Canada

Natural environment component lead for multi-year annual SAR and migratory bird monitoring at numerous sites across Ontario since 2012. In support of TransCanada's right-of-way maintenance brushing program. Provide SAR advice and liaise with MNRF to develop construction monitoring protocols for SAR and migratory birds. Lead crews to complete monitoring on an annual basis.

Lafarge Canada Ltd.
Various Locations, Ontario, Canada

Natural environment component lead for multi-year annual SAR monitoring and reporting at aggregate sites across Ontario following registration. Species surveys include Blanding's turtle, loggerhead shrike, least bittern and gray ratsnake. Developed survey protocols with several MNRF district offices and lead crews to complete monitoring.

Leader Resources Services Ltd.
Various Locations, Ontario, Canada

Project manager for a number of wind power projects under the Ontario Renewable Energy Approvals Act (REA). Worked with the client and the MNRF to develop protocols and coordinate field surveys. Completed and submitted ESA permitting applications and compensation plans.

Lafarge Canada Ltd.
Various Locations, Ontario, Canada

Project manager and natural environment component lead for a number of licence applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the ARA. Developed survey protocols, consulted with the MNRF, registered for activities under the ESA (Notice of Activity), completed Information Gathering Forms (IGF), prepared and submitted permit applications and developed compensation plans.

PROJECT EXPERIENCE – TRANSMISSION

Hydro One Circuit B5C/B6C Line Refurbishment EA
Westover to Burlington, Ontario, Canada

Natural environment component lead for a provincial Class Environmental Assessment for a 40 km line refurbishment. Designed the field program (terrestrial and aquatic), analysed and integrated data with other physical resource disciplines. Completed a comprehensive and integrated impact assessment. Led consultation with regulatory agencies including two district MNRF offices, Hamilton Conservation Authority, Conservation Halton, Grand River Conservation Authority, Niagara Escarpment Commission, and participating in the public consultation process. Provided input into alternatives assessment for temporary hydro line bypass and developed reports.

Wataynikaneyap Power Phase 2 Transmission Line
Northwestern Ontario, Canada

Senior advisor and technical reviewer for the wildlife component of permitting. Worked with the permitting lead and the wildlife component lead to design field programs, consult and negotiate with the MNRF and Environment and Climate Change Canada/Canadian Wildlife Service (ECCC/CWS), and prepare technical supporting documents for permitting and permit applications under the ESA, the Public Lands Act, and the federal Species at Risk Act (SARA). Provided senior leadership and technical guidance and review for all deliverables.

Nextbridge East-West Tie Transmission Line
Wawa to Thunder Bay, Ontario, Canada

Senior advisor and technical reviewer for wildlife permitting for the construction and operation of a 450 km transmission corridor. Worked with the permitting lead and the wildlife component lead to design field programs, consult and negotiate with the MNRF and ECCC/CWS, and prepare technical supporting documents for permitting and permit applications under the ESA, the Public Lands Act, and the SARA. Provided senior leadership and technical guidance and review for all deliverables.

PROJECT EXPERIENCE – TRANSPORTATION

MTO Calamity Creek Highway 11 Culvert Replacement Group 'C' Class EA
Temiskaming, Ontario, Canada

Acting environmental manager for the replacement of the Calamity Creek Culvert (47-273/C) located on Highway 11 in the City of Temiskaming Shores, District of Temiskaming. Regular consultation with the MTO, the contractor and Golder's internal team including ecologists, surface water engineers, archaeologists, cultural heritage specialists, and hydrogeologists. Deliverables included a Consultation Plan, an Environmental Screening Document (ESD), which documented the results of all factor-specific environmental studies and consultation undertaken for the project, and an Environmental Management Plan (EMP), which detailed how the environmental mitigation and monitoring commitments made in the ESD would be implemented during construction.

Ninth Line Municipal Class EA
Halton Region, Ontario, Canada

Senior natural environment technical lead. Led a team of ecologists, analysed and interpreted terrestrial and aquatic data and completed impact assessment. Liaised with prime engineering firm and agencies including the municipality and the MNRF. Provided senior technical review of natural environment study report and permitting documents.

Regional Road 57 Municipal Class EA
Clarington, Ontario, Canada

Senior natural environment technical lead. Led a team of ecologists, analysed and interpreted terrestrial and aquatic data and completed impact assessment. Liaised with prime engineering firm and agencies. Provided senior technical review of natural environment study report.

Markham GO Station Road Realignment Municipal Class EA
Markham, Ontario, Canada

Senior natural environment technical lead. Led a team of ecologists, analysed and interpreted terrestrial and aquatic data and completed impact assessment. Liaised with prime engineering firm and agencies. Provided senior technical review of natural environment study report.

PROJECT EXPERIENCE – SERVICING/INFRASTRUCTURE

Peel Wastewater Treatment Plan
Region of Peel, Ontario, Canada

Project manager and senior advisor and technical reviewer for the natural environment component for a Schedule C Environmental Assessment for the capacity expansion of the central Mississauga wastewater system. Managed a multi-disciplinary team including natural environment, archaeology, cultural heritage, and geotechnical engineering. Designed the natural environment field program and worked with the component lead to analyse and intepret data. Provided senior leadership and technical guidance and review for all natural environment deliverables.

Niagara Falls Wastewater Servicing Strategy
Niagara Falls, Ontario, Canada

Natural environment component lead for a Class Environmental Assessment for a Niagara Falls wastewater servicing strategy for a new south Niagara Falls wastewater treatment plant. Developed ecological matrices for determining the short-list of alternative sites, including constraints anlayses, designed field program and managed a team of ecologists. Analysed, interpreted and integrated data with physical resource components. Completed impact assessment, developed reports and participated in the public consultation process.

Clarksburg Master Servicing Plan
Clarksburg, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Cambridge Zone 3
Cambridge, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment for regional water system upgrades in Cambridge and North Dumfries. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Town of Blue Mountains Water Supply Master Plan
Blue Mountains, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class B Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Region of Peel East to West Wastewater Diversion Strategy
Peel Region, Ontario, Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

PROJECT EXPERIENCE – WASTE

County of Simcoe Landfills and Transfer Stations
Various Sites in the County of Simcoe, Ontario, Canada

Senior natural environment technical lead for a number of landfill sites. Assisted the County with landuse planning, due diligence for new properties, approvals and permits for expansions and changing uses. Coordinated field investigations including wetland boundary delineation. Consulted with Conservation Authorities, Niagara Escarpment Commission and MNRF.

Humberstone Landfill
Niagara, Ontario, Canada

Senior advisor and technical reviewer for a provincial EA in support of a landfill expansion. Worked with the natural environment component lead to design field programs, consult with provincial agencies and prepare technical reports. Provided senior leadership and technical guidance and review for all deliverables.

Capital Region Resource Recovery Centre (CRRRC)
Ottawa, Ontario, Canada

Natural environment component lead for a provincial EA for a resource recovery centre on a 175 hectare site), including a landfill, contaminated soil management and recycling components. Designed the field program (terrestrial and aquatic), analysed and integrated data with other disciplines, completed an impact assessment. Consulted with regulatory agencies including the Conservation Authority, MNRF and DFO. Provided input to the project design, obtained permits and participated in the public consultation process.

PROJECT EXPERIENCE – RENEWABLE ENERGY

Trillium Power Wind Corporation
Lake Ontario, Ontario, Canada

Project manager and natural environment lead for an offshore wind power project in Lake Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Coordinated and managed a multi-disciplinary team comprised of noise specialists, biologists, archaeologists, public consultation specialists, aboriginal engagement specialists, visual impact assessment specialists and geophysicists. Designed terrestrial and aquatic field surveys, including avian, bat and fisheries assessments. Led provincial and federal agency consultation and participated in public open houses. Impact assessment and reporting, designed to satisfy both provincial and federal (CEAA) requirements, was underway when the project was curtailed.

Leader Resources Services Corporation
Various Locations, Ontario, Canada

Project manager and project director/senior technical advisor for four wind farm projects under O. Reg. 359/09 REA in Huron County, Ontario. Coordinated and managed a multi-disciplinary team comprised of noise specialists, natural heritage specialists, archaeologists, cultural heritage specialists, public consultation specialists and aboriginal engagement specialists. Led regulatory agency consultation specifically regarding SAR, avian and bat issues, and participated in public consultation process. Directed and reviewed all baseline natural environment impact assessment, mitigation and monitoring reporting, including species at risk, waterbodies, and wildlife/habitat (with a focus on birds and bats). Completed REA-specific project reports.

Mann Engineering/EffiSolar
Various Locations, Ontario, Canada

Natural heritage component lead for four 10 MW ground-mounted PV solar farms in southeastern Ontario under O. Reg. 359/09 REA. Designed and coordinated field programs for terrestrial and aquatic ecosystems, including SAR. Completed impact assessment, mitigation and monitoring plans and reports and led provincial agency consultation.

SkyPower Corp.
Various Locations, Ontario, Canada

Project manager for eight wind power park projects in Renfrew County, Prince Edward County and Parry Island, Ontario. Designed and coordinated natural environment field programs, including terrestrial (avian, bats, SAR, wildlife/habitats) and aquatic. Managed a multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators. Led provincial agency and public consultation. Completed natural environment impact assessment, mitigation and monitoring plans and reports and REA-specific project reports.

Algonquin Power
Amherst Island, Ontario, Canada

Project manager and natural environment component lead for wind power project in Prince Edward County. Designed and coordinated field programs for terrestrial (avian, bats, SAR) and aquatic ecosystems. Managed a multi-disciplinary team including hydrogeologists, biologists, surface water engineers, noise and air quality experts, socio-economic and public consultation coordinators. Led provincial and federal agency consultation and participated in public consultation. Completed natural environment impact assessment, mitigation and monitoring plans and reports and REA-specific project reports.

SkyPower Corp.
Various Locations, Ontario, Canada

Project manager for four solar power projects across Ontario, including Napanee and Norfolk. Designed, coordinated and conducted field programs and data collection. Coordinated and managed the activities of a multi-disciplinary team including noise, archaeology, and surface water. Completed screening reports to provincial and municipal standards.

OptiSolar Inc.
Various Locations, Ontario, Canada

Project manager for three solar power projects across Ontario, including Sarnia, Tilbury and Petrolia. Designed, coordinated and conducted field programs and data collection, coordinated and managed the activities of a multi-disciplinary team including noise, archaeology, surface water, traffic and natural environment. Completed screening reports to provincial and municipal standards.

PROJECT EXPERIENCE – NUCLEAR

Canadian Waste Management Office (NWMO) Deep Geologic Repository (DGR) Project Follow-up Monitoring
Kincardine, Ontario, Canada

Project manager and senior technical lead for multi-year follow-up wildlife and vegetation monitoring at the DGR site. The scope of work included SAR turtle visual encounter surveys (VES; also known as basking surveys), SAR snake emergence and egg-laying surveys, rare plant surveys, data comparisons between years of data collection, and reporting.

Canadian Nuclear Laboratories (CNL) Whiteshell Research and Development Complex Decommissioning EA
Pinawa, Manitoba, Canada

Natural environment component lead for a federal EA. Developed Valued Ecosystem Components (VEC) and pathways of effects assessment. Analysed existing conditions terrestrial and aquatic data for the regional, local and site study area including for SAR, provided recommendations for additional permitting and mitigation for potential effects to wildlife and sensitive habitats. Provided input to construction design and developed technical reports.
Natural environment component lead for a federal EA. Developed Valued Ecosystem Components (VEC) and pathways of effects assessment. Analysed existing conditions terrestrial and aquatic data for the regional, local and site study area including for SAR, provided recommendations for additional permitting and mitigation for potential effects to wildlife and sensitive habitats. Provided input to construction design and developed technical reports.

Canadian Nuclear Laboratories (CNL) Port Hope Remediation
Port Hope, Ontario, Canada

Natural environment component lead for permitting for remediation of Port Hope Harbour, Ganaraska River and other watercourses in Port Hope. Liased with the Ganaraska River Conservation Authority, MNRF, DFO, and Canadian Nuclear Safety Commission, completed pathways of effects assessment, impact assessment and prepared applications and obtaining permits for dredging, bank stabilization, sediment remediation, SAR, and removal and work on Crown lands.

Bruce Power Units 3&4 Restart
Kincardine, Ontario, Canada

Worked with a team to establish VEC and appropriate study areas. Coordinated field technicians and interpreted data on fish impingement, entrainment, fishing pressure and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to determine the potential for warm water discharges to affect waterfowl use of nearby areas, and evaluated effects on the white-tailed deer population due to vehicle strikes. Prepared technical reports.

Pickering Nuclear 'A' Return to Service Follow-up and Monitoring
Pickering, Ontario, Canada

Multi-year monitoring program. Coordinated aquatic field technicians and interpreted data on impingement, entrainment, fishing pressure, waterfowl surveys, and temperature and velocity effects on aquatic habitat and biota, including bass spawning surveys. Worked with a team of biologists to evaluate the effects of wildlife-vehicle interactions on nearby roadways on terrestrial biota populations. Prepared annual monitoring reports.

PROJECT EXPERIENCE – MINING

EWL Management Ltd. Dyno Mine Rehabilitation
Bancroft, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of decommissioned uranium mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, and risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment workplan. Tasks included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. In addition, collection of small mammal and plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

EWL Management Ltd. Coldstream \ Mine Rehabilitation
Thunder Bay, Ontario, Canada

Natural environment component lead for an environmental and health risk assessment of a decommissioned copper mine. Worked with a multi-disciplinary team including surface water engineers, geotechnical engineers, and risk specialists. Designed and coordinated bioscience field technicians to carry out the natural environment work plan. Tasks included fish habitat assessment and characterization of the aquatic environment, and collection of benthic, fish, sediment and aquatic plant tissue samples in affected and reference lakes and watercourses in support of the human health and ecological risk assessment. In addition, collection of plant tissue samples and characterization of wildlife habitat was included. Responsible for analysis and interpretation of data, as well as report preparation and liaising with stakeholders and government agencies.

PROJECT EXPERIENCE – OIL & GAS

Enbridge Bayview Avenue Pipeline Replacement Ontario, Canada	Natural environment component lead for pipeline replacement project. Coordinated SAR screening, natural heritage feature mapping, site investigations, impact assessment, tree inventory, DFO self-assessment, consultation with MECP, registration of activities (NoA) under the Endangered Species Act and development of mitigation plan. Worked with team to obtain Toronto and Region Conservation Authority (TRCA) permits.
Enbirdge Pipelines Inc. Line 9 Southern Ontario, Canada	Project manager for natural environment component of pipeline maintenance project in southern Ontario. Coordinated SAR screening and natural heritage feature mapping, site investigations, identification of permit requirements and constraint mapping in support of brushing and other maintenance activities.
TransCanada Bear Creek Rehabilitation Ontario, Canada	Natural environment component lead for Bear Creek rehabilitation following washout and exposure of the pipeline in the creek bed. Completed baseline existing conditions reporting including fish and fish habitat, SAR and riparian habitat to meet Conservation Authority, MNRF and DFO requirements. Worked with Golder's hydrology team to obtain Conservation Authority permits, develop a rehabilitation plan suitable for the existing conditions and fish community, and recommended appropriate mitigation during construction.
TransCanada Greater Golden Horseshoe Facilities Modifications Ontario, Canada	Natural environment component lead for an environmental and socio-economic assessment for modifications to a number of facilities under the National Energy Board (NEB). Responsibilities included designing the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysing data, completing the baseline and effects assessment, liaising with agencies and permitting.
TransCanada Eastern Mainline Project Ontario, Canada	Vegetation and wetland component lead for an environmental and socio-economic assessment for a 392 km new construction pipeline in southern Ontario under the National Energy Board (NEB). Designed the field program, analysed data, completed the baseline and effects assessment and reporting. Consulted and negotiated with the MNRF, Environment and Climate Change Canada (ECCC) and local Conservation Authorities, prepared permit applications, and addressed Information Requests (IRs).
TransCanada Parkway West Connection Milton, Ontario, Canada	Natural environment component lead for an environmental and socio-economic assessment for a new pipeline connection under the NEB. Designed the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysed data, completed the baseline and effects assessment, led consultation with agencies and obtained permits.
TransCanada Vaughan Mainline Extension Ontario, Canada	Senior technical reviewer and advisor for the vegetation, wetland and wildlife components for an environmental and socio-economic assessment for a new construction pipeline in southern Ontario under the NEB. Consulted with provincial and federal agencies, designed and coordinated baseline, construction and post-construction monitoring programs and developed environmental protection plans.

TransCanada Kings North Connection
Ontario, Canada

Senior technical reviewer and advisor for the vegetation, wetland and wildlife components for an environmental and socio-economic assessment for a new construction pipeline in southern Ontario under the NEB. Consulted with provincial and federal agencies, designed compensation habitat for SAR, designed and coordinated baseline, construction and post-construction monitoring programs and developed environmental protection plans.

TransCanada LNG Facility
Trois Rivieres, Quebec, Canada

Aquatic technical component lead. Designed and conducted inland fisheries field programs for a liquefied natural gas facility and associated distribution pipelines. The programs included aquatic habitat assessments of all watercourse pipeline crossings, and an assessment of habitat and water quality of inland lakes in the vicinity of the facility. Interpreted data and prepared technical reports.

TRAINING

Microsoft Project Level 1 Training
2008

Royal Ontario Museum (ROM) Fish ID Workshop
2005

Introduction and Intermediate MapInfo Professional Training
2000

PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI)

Director, Ontario Stone Sand and Gravel Association (OSSGA) Board of Directors

PUBLICATIONS

Conference Proceedings

Melcher, Heather and Amber Sabourin. 2019. *The Use of Remote Sensing in Natural Environment Surveys*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Niagara Falls, Canada.

Melcher, Heather. 2015. *Bats and the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Toronto, Canada.

Melcher, Heather. 2014. *Changes to the Ontario Endangered Species Act and Implications to the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Ottawa, Canada.

Other

Melcher, Heather. 2001; 2002. Effects of Agricultural Inputs of Faecal Coliforms on the Shellfish Industry in Prince Edward Island. Annual Monitoring Report. Prince Edward Island.

Education

B.A. High Honours Environmental Studies, Carleton University, Ottawa, Ontario, 2007

Certifications

Butternut Health Assessor (#709), August 2019

Ontario Wetland Evaluation System, June 2015

Ecological Land Classification for Southern Ontario, September 16, 2013

Argo Operator Course, Level 1, November 16, 2013

Transportation of Dangerous Goods (TDG), June 2014

H2S Alive , 22 July 2013

Standard First Aid CPR/AED Level C, January 2017

ATV Training Course, Canada Safety Council, April 16, 2012

Small Non-pleasure Vessel Basic Safety (MED A3), September 16 2011

Surface Miner Core Modules Training , Jan 17 2011

Pleasure Craft Operators Card, August 2011

Advanced Wilderness First Aid, October 2009

Golder Associates Ltd. – Cambridge

Terrestrial Ecologist

Luke Owens is a terrestrial ecologist and has worked with Golder Associates since 2010. He has over ten years of experience as an ecologist having worked throughout Ontario, the bottomlands of west Tennessee, and the Sierra Nevada mountains of California.

His experience as a field biologist includes field work conducting avian monitoring, delineating and evaluating wetlands using the Ontario Wetland Evaluation System (OWES), ecological land classification, botanical inventory and rare plant surveys, as well as wildlife surveys for multiple taxa including bats, birds, amphibians, reptiles, invertebrates and mammals.
Luke has worked as a bioacoustician using audio recording equipment and bioacoustic analysis software to survey avian and amphibian and bat communities.

Luke is experienced in desktop ecological assessments including: SAR screenings, bat data analysis, mitigation planing, aerial photo interpretation, report writing and data management.

Luke also uses his skills as a bat bander to help out with an ongoing Canadian Wildlife Service funded research project, and with yearly public bat banding demonstrations for the Grand River Conservation Authority.

Employment History

Golder Associates Ltd. – Cambridge, Ontario
Terrestrial Ecologist (2010 to Present)

PRBO Conservation Sciences – Chester, California
Avian Field Technician (2009 to 2010)

Conducted avian point counts to survey the bird communities of the actively managed National Forest Service Lands of the Sierra Nevada mountains of northeastern California.
Conducted vegetation surveys within the avian study areas.
Was responsible for data management.

University of Tennessee – Jackson, Tennessee
Avian and Amphibian Field Technician (2008 to 2008)

Conducted avian point counts to survey the bird communities of restored bottomland hardwood forests of the west Tennessee bottomlands.
Conducted bioacoustic recording and analysis of the amphibian communities of west Tennessee bottomlands.
Conducted vegetation surveys within the avian and amphibian study areas.

Languages

English – Fluent

Was responsible for data management.

Bird Studies Canada – Cochrane District, Ontario
Avian field technician/bioacoustician (2006 to 2006)

Surveyed avian communities of the actively managed boreal forest using omni-directional bioacoustic recordings.
Conducted vegetation surveys within the avian study area.

PROJECT EXPERIENCE – BIOLOGICAL SCIENCES

WWTP Class EA Niagara Niagara Falls, Ontario, Canada 2020	Designed and implemented breeding bird surveys workplan for a proposed wastewater treatment plant in southern Ontario. Work included breeding bird point counts.
CBM Caledon Quarry Caledon, Ontario, Canada 2020	Designed and implemented breeding bird survey workplan for a proposed quarry development in southern Ontario. Work included breeding bird point counts.
Alamos Island Gold Mine Expansion Dubreuilville, Ontario, Canada 2020	Designed and implemented terrestrial ecology baseline surveys for a proposed mine expansion in northern Ontario. Surveys included: marsh bird surveys, breeding bird surveys, eastern whip-poor-will surveys, bat acoustic surveys, anuran call count surveys and vegetation classification surveys.
Marten Falls Community Access Road Cochrane District, Ontario, Canada (June - September 2019)	Conducted breeding bird surveys, vegetation surveys and deployed bat detectors, trail cameras and, autonomous recording units for eastern whip-poor-will along the route of a proposed all-season road. Completed bat data analysis and reporting.
Pickle Lake Electricity Transmission Corridor Kenora District, Ontario, Canada (May 2017 to August 2017)	Conducted bat maternity roost habitat and bat hibernacula habitat surveys, breeding bird surveys, detailed plant community surveys and rare plant surveys along the route of a proposed electricity corridor in northwestern Ontario. I was also responsible for planning the field work including logistics and survey site selection.
Clarington Wind Resource Area Durham Region, Ontario, Canada (August 2012 - October 2013)	Conducted landbird migration surveys and breeding bird surveys at a proposed wind power project in southern Ontario.
Madawaska Mine Bancroft, Ontario, Canada (2019)	Developed a mitigation plan for species at risk bats as part of a mine closure program. The mitigation plan included, timing restrictions, bat gate design, and monitoring activities.
Confidential Site and Client Algoma District, Ontario, Canada (November 2019 -ongoing)	Conducting feasibility study and preliminary design for a purpose-built bat hibernaculum.
Correctional Service of Canada -Atlantic Region Bat Study Nova Scotia and New Brunswick, Canada (2017)	Lead investigator on a bat habitat and acoustic study at four penitentiaries in Atlantic Canada. The study included background records review, consultation with agencies and academics, field surveys at the institutions and the completion of the report.

Gordon Lake Mine Ontario, Canada	Conducted bat hibernation habitat assessment. Deployed stationary bat detectors to survey the bat population during swarming season.
Faro Mine Faro, Yukon, Canada (August 2019)	Conducted rare plant surveys, bank swallow surveys and arctic ground squirrel surveys at a closed mine site.
Barkerville Gold Mine Wells, British Columbia, Canada (July 2019)	Conducted bat habitat surveys and deployed bat detectors and trail cameras along proposed electrical transmission corridor.
Osisko Hammond Reef Gold / CMC Hammond Reef Atikokan, Ontario, Canada (March 2017 - December 2017)	Conducted rare plant surveys and plant community classification surveys. Deployed stationary bat detectors throughout the study area. Conducted bat bio-acoustic driving transects. Conducted bat swarming surveys at potential bat hibernacula. Analysed bat acoustic data.
Port Colborne Quarry Expansion Port Colborne, Ontario, Canada (April 2017 - June 2019)	Conducted bat acoustics surveys, rare plant surveys, plant community classification, breeding bird surveys, grassland bird surveys, turtle surveys and anuran call count surveys.
Lafarge Dundas North Quarry Extension Dundas, Ontario, Canada (August 2018 - January 2019)	Project manager and field work lead for an ongoing wetland vegetation monitoring program at a Provincially Significant Wetland adjacent to the Lafarge Dundas North Quarry.
Keele Valley Landfill Toronto, Ontario, Canada (July 2018 - April 2019)	Completed an invasive species management plan for a closed landfill site.
Lafarge Brechin and Point Anne SAR monitoring 2016 Belleville and Brechin, Ontario, Canada (May 2016 - December 2016)	Managed Species at Risk Surveys at Lafarge Quarry sites as part of a SAR mitigation plan.
Primero Grey Fox mine Timmins, Ontario, Canada (June 2015)	Field crew lead, conducted breeding bird surveys, bat habitat surveys, bat acoustic monitoring and vegetation community surveys.
Barrick Herrick Quarry Hemlo, Ontario, Canada (August 2015 -January 2016)	Natural Heritage Study at proposed Quarry, including plant community classification, wildlife habitat assessment and rare plant surveys.

Lafarge Woodstock Quarry Natural Environment Study Ontario, Canada (March 2016 - August 2016)	Conducted bat roost habitat assessments and bat acoustic surveys, breeding bird surveys, plant community classification and rare plant surveys. Authored Natural Environment Study Report.
SCS Sutton -Schell Lumber Sutton, Ontario, Canada	Project manager and lead field work lead for an Environmental Impact Study on a commercial development in Sutton, Ontario.
Palmer Carpin Beach Wetland Evaluation Sault Ste. Marie, ON, Canada (July 2015 - November 2015)	Field crew lead, conducted wetland evaluation under the OWES system, upland community vegetation surveys, and bat habitat surveys.
Lafarge Blight-Campbell Pit Thorndale, Ontario, Canada	Project manager for Avian Species at Risk mitigation plan for the Lafarge Blight-Campbell Pit.
Lafarge Brechin Quarry Brechin, Ontario, Canada	Project manager for an ongoing Species at Risk grassland bird monitoring program at Lafarge Brechin Quarry.
Lafarge Dundas South Quarry Extension Dundas, Ontario, Canada	Project manager and field work lead for a Species at Risk Study and Mitigation Plan for a licenced expansion property at the Lafarge Dundas South Quarry.
Lafarge Point Anne Quarry Belleville, Ontario, Canada	Project manager for an ongoing Species at Risk turtle monitoring program at Lafarge Point Anne Quarry.
Upper Canada Mall EIS Newmarket, Ontario, Canada (January 2019 - March 2019)	Completed an Environmental Impact Study for an Official Plan amendment in Newmarket Ontario.
TCPL Eastern Mainline Project Natural Environment Baseline Study Various locations, Ontario, Canada (March 2014 - May 2015)	Conducted wildlife surveys for turtles, and frogs along a proposed pipeline right of way.

TCPL KNC Pipeline Construction Environmental Monitoring Vaughan, Ontario, Canada (February 2016 - September 2016)	Environmental monitoring during pipeline construction including amphibian monitoring, bat acoustics, and water quality monitoring.
Osisko Hammond Reef Bat Survey Atikokan, Ontario, Canada (June 2013 - November 2013)	Conducted a bat acoustic survey of potential maternity roost and hibernation habitat at a proposed mine.
Lafarge West Paris Paris, Ontario, Canada (June 2013 - December 2013)	Conducted species at risk surveys at a proposed quarry expansion property.
TCPL Vaughan Mainline Expansion Pipeline Construction Water Quality Monitoring Vaughan, Ontario, Canada (January 2017 - March 2017)	Conducted water quality monitoring during pipeline construction.
LRSC Peer Review Clarington Durham Region, Ontario, Canada (January 2012)	Assisted with a peer review of a natural heritage study for a proposed wind power development.
Trelawney Gold Baseline Environmental Study Gogama, Ontario, Canada (April 2012 - June 2012)	Conducted wildlife surveys for a baseline study for a proposed gold mine in northern Ontario.
TCI Tupper Lake Wind Project Lansing, Michigan, USA (March 2011 - May 2011)	Conducted avian migration surveys at a proposed wind power development.
Globest AR/ Moblan Chibougamou, Quebec, Canada (2011)	Conducted aquatic habitat and fisheries survey and winter track count surveys at a proposed lithium mine in northern Quebec.

Leader Arran Wind Farm Huron County, Ontario, Canada (April 2011 - June 2011)	Assisted with Natural Heritage Assessment studies including breeding bird surveys and ecological land classification.
Nextera Bluewater, Gosen Wind Power Developments Huron County, Ontario, Canada (January 2011 - December 2011)	Assisted with natural heritage baseline studies at proposed wind power developments in Huron County.
Town of Shelburne Shelburne, Ontario, Canada (June 2012 - July 2012)	Conducted breeding bird and species at risk surveys at a proposed water main line.
Pickle Lake Phase 2 Electricity Transmission Corridor Project Kenora District, Ontario, Canada	Conducted avian point counts, plant community and rare plant surveys and bat habitat surveys.
MTO Northeast Aggregates Ontario, Canada	Conducted bat acoustic data analysis on for several project sites in northeastern Ontario.
East West Tie, NextBridge Ontario, Canada	Conducted bat acoustics and bat habitat surveys at potential hibernacula sites along a proposed electricity transmission corridor. Analysed bat acoustics data and prepared baseline bat study report.
MTO Highway 7a Terrestrial Impact Assessment Ontario, Canada	Conducted ecological land classification and species at risk surveys in support of the terrestrial ecology impact assessment at two culvert locations near Port Perry.
Scoped Environmental Impact Study of Utilities Installation and Dewatering - Spring Street, Innisfil, Ontario. Ontario, Canada	Completed a scoped Environmental Impact Study in support of utilities installation at a road reconstruction project in Innisfil, Ontario.
The Green Organic Dutchman -Jerseyville EIS Jerseyville, Ontario, Canada	Conducted wetland delineation and staked wetland boundary.

Farhi -EIS Aberfolyle, Ontario, Canada	Conducted wetland delineation, plant community classification and breeding bird surveys.
Longworth Avenue Road Expansion Clarington, Ontario, Canada	Conducted wetland delineation, plant community classification, breeding bird surveys, and grassland bird surveys.
Markham Road EA - Blue Plan Ontario, Canada	Conducted tree inventory and breeding bird surveys at a municipal infrastructure project in Markham.
Zwick's Island -Bay of Quinte Sediment Sampling Belleville, ON, Canada	Conducted a lakebed sediment sampling field program in the Bay of Quinte.
North York Sand & Gravel Ontario, Canada	Conducted tree inventory, breeding bird surveys, ecological land classification, and species at risk habitat evaluation at a prosed quarry expansion property in Durham Region.
TCPL Vaughan Mainline Expansion Ontario, Canada	Conducted a tree inventory along the proposed right-of-way for a new pipeline project in the Greater Toronto Area.
TCPL Pipeline Construction SAR Monitoring and Snake Relocation Vaughan, Ontario, Canada	Relocated over 100 snakes (milksnakes, eastern gartersnakes) to the Toronto Wildlife Centre when demolition of an old foundation unearthed a large hibernacula.
HydroOne Transmission Line Maintenance SAR Monitoring Windsor, Ontario, Canada	Oversaw the installation of snake exclusion fencing and monitored construction activities for threats to species at risk snakes.
Plains Midstream Canada Windsor Storage Terminal Windsor, Ontario, Canada	Conducted eastern fox snake habitat assessment.
Lafarge Carpenter - Dobinson London, Ontario, Canada	Conducted breeding bird and grassland bird surveys, turtle basking surveys and Queensnake surveys at proposed quarry expansion property.
Lafarge West Paris Paris, Brant County, Ontario, Canada	Conducted Barn swallow surveys and snake hibernacula surveys at agricultural properties licenced for aggregate extraction.

Barrie Landfill Ontario, Canada	Conducted bat maternity roost habitat assessment.
Churchill Wind Resource Area Lampton County, Ontario, Canada	Conducted bat maternity roost surveys.
MTO Northeast (various sites) Ontario, Canada	Field crew lead, conducted breeding bird surveys, vegetation community surveys, and bat acoustic monitoring at 3 sites in northeastern Ontario.
Cenovus Christina Lake and Narrows Lake Athabasca, Alberta, Canada	Field crew lead, conducted breeding bird surveys as part of a biological monitoring program.
TCPL Eastern Mainline Project Southern Ontario, Canada	Conducted breeding bird and amphibian surveys along proposed pipeline route.
TCPL Kings North Connection Vaughan, Ontario, Canada	Conducted soil surveys, breeding bird surveys, turtle surveys and amphibian surveys along proposed pipeline route.
CNRL Bitumen Release Cold Lake Air Weapons Range, Alberta, Canada	Conducted wildlife monitoring activities at the Primrose Lake bitumen release site on the Cold Lake Air Weapons Range, Alberta.
Lafarge Limebeer Pit Caledon, Ontario, Canada	Conducted breeding bird surveys, anuran call count surveys, basking turtle surveys and nesting turtle surveys.
IAMGOLD Ontario, Canada	Conducted breeding bird surveys and turtle basking surveys at proposed mine site near Gogama Ontario.
Lafarge Manitoulin Manitoulin Island, Ontario, Canada	Conducted nest searches and species at risk searches.
Cliffs FPF Site Sudbury District, Ontario, Canada	Conducted breeding bird surveys.
Akzo Nobel -DIL Site Perry Sound, Ontario, Canada	Conducted vegetation community classification and Species at Risk habitat assessment on former industrial site.
Clarington Wind Resource Area Durham Region, Canada	Conducted weekly bird migration monitoring August to October and March to May.

Riding Mountain National Park Dauphin, Manitoba, Canada	Conducted rare plant survey, species-at-risk habitat assessment, and fisheries assessment at a proposed road realignment in a national park.
Leeder Wind Resources Majestic and Meyer Wind Resource Area Huron County, Ontario, Canada	Conducted breeding bird surveys, stream assessments and ecological land classification surveys.
Lafarge Sunningdale Quarry London, Ontario, Canada	Assessed habitat for eastern meadowlark, bobolink and barn swallow potential.
Lafarge Brechin and Kirkfield Quarries Simcoe County, Ontario, Canada	Conducted loggerhead shrike surveys.
Tansley Quarry Burlington, Ontario, Canada	Conducted eastern meadowlark, bobolink and barn swallow surveys.
CBM Dance Pit Cambridge, Ontario, Canada	Conducted breeding bird surveys.
Lafarge Soares Quarry Dundas, Ontario, Canada	Conducted habitat assessment for eastern meadowlark, barn swallow and bobolink. Conducted breeding bird surveys.
OPG Sir Adam Beck Hyro-electric Reservoir Ontario, Canada	Assisted with fisheries program associated with the dewatering and geotechnical investigation of this OPG reservoir. Fish salvage and relocation.
Tupper Lake Michigan, U.S.A	Conducted Avian Use Surveys and training new hire in avian survey methods.
Cliffs North/South transportation corridor Ontario, Canada	Conducted detailed vegetation inventory surveys.
Suncor/Camlachie Lampton County, Ontario, Canada	Conducted Breeding Bird Surveys.
Arran Wind Resource Area Bruce County, Ontario, Canada	Conducted breeding bird surveys.

Suncor/Camlachie/Cedar Point Lampton County, Ontario, Canada	Conducted Ecological Land Classification surveys and water course assessments.
Quixote 1, and Quixote 2 Wind Resource Area Grey and Huron Counties, Ontario, Canada	Conducted fall Migration Avian Use Surveys and area searches.
Twenty-two Degrees Wind Resource Area Huron County, Ontario, Canada	Conducted fall migration Avian Use Surveys and area searches.
Acciona/Arnow Ontario, Canada	Conducted ELC assessments and water course assessments.
Bruce North Wind Resource Area Grey County, Ontario, Canada	Conducted fall migration Avian Use Surveys and area searches.
Boralex Wind Resource Area Essex County, Ontario, Canada	Conducted raptor fall migration surveys, and Tundra Swan surveys.
Skyway Wind Resource Area Grey County, Ontario, Canada	Conducted Avian Use Surveys and avian area searches.
Arran Wind Resource Area Grey Country, Ontario, Canada	Conducted Fall migration Avian Use Surveys and avian area searches.
Churchill Wind Resource Area Lampton County, Ontario, Canada	Conducted Winter Avian Use Surveys and avian area searches.

TRAINING

Bat Acoustic Survey Techniques Workshop
Bat Survey Solutions, April 7, 2017

BCI Advanced Capture Techniques Workshop
Bat Conservation International, May 17, 2012

Courtship and Rivalry in Birds
eCornell, The Cornell Lab of Ornithology, March 2nd 2011

WHIMIS
fall 2015

Construction Safety Training System (CSTS)
June 2014

Canadian Pacific Contractor Safety Program
eRailsafe Canada, October 21, 2013

Canadian National Contractor Safety Program
eRailsafe Canada, October 21, 2013

Helicopter hover exit training
Whisk Air, July 2011

Helicopter Safety Training
July 2011

Bear Aware Safety training
June 2014

Technical Writing
Golder U, February 23 2012

Surface Miner Core Modules
MTCU Program, January 17, 2011

Health & Safety Module 2: Hazard Assessment and Control
Golder U, December 8, 2010

Golder 101
Golder U, February 10, 2011

Health & Safety Module 1: Safety Basics
Golder U, December 7, 2010

SUPPLEMENTAL SKILLS

Bioacoustic recording and analysis.
Using both hand held and autonomous recording units I have surveyed for bats, birds and amphibians.

Bat banding
Has seven years of experience in bat capture and bat banding techniques.

Species at Risk Surveying
Has surveyed for various species at risk including: bats, Blanding's turtle, eastern fox snake, queensnake, least bittern, loggerhead shrike, bobolink, eastern meadowlark, bank swallow, eastern whip-poor-will and barn swallow.

Wetland evaluation and delineation
Has experience delineating wetlands and evaluating wetlands under the OWES system.

Plant Community Classification
Experienced in the classification of plant communities using the following systems: ELC for southern Ontario, FEC northeast, northwest and central regions, Ecosites of Ontario.

Plant identification
Can identify and survey plants of various bioregions of Ontario.

Soil classification
Has experience and training for soil classification.

Point Counting
Is an expert in the identification of birds by vocalization and sight, has 8 years of experience conducting multi-species point counts.

Amphibian monitoring
Experienced in salamander and frog survey methods.

Fisheries survey techniques
Some experience in the following fisheries techniques; gill netting, seine netting, fyke netting, aquatic habitat mapping and creel surveying.

Winter Track Count Surveying
Has experience identifying wildlife by observing tracks and signs.

PROFESSIONAL AFFILIATIONS

Field Botanists of Ontario

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