

# The Breeding Birds of Tommy Thompson Park

2021



American Redstart Nest (I. Sturdee)

## Toronto and Region Conservation Authority



Prepared by  
Don Johnston and Jack Alvo

February, 2022

# Table of Contents

## 1. Introduction

1.1 Study Area (Tommy Thompson Park) .....	1
--	---

## 2. Colonial Waterbirds and Managed Waterfowl

2.1 Project Background.....	1
2.2 Results in 2021 .....	2
2.2.1 Managed Waterfowl .....	4

## 3. Landbirds and Non-colonial Waterbirds

3.1 Project Background.....	5
3.1.1 Rationale.....	5
3.1.2 Change in Data Reporting.....	5
3.2 Results in 2021 .....	
3.2.1 Point Count Results.....	5
3.2.1.1 Point Count Station Vegetation Survey .....	5
3.2.1.2 Point Count Observations .....	8
3.2.2 Nest Searching and Monitoring Results.....	11
3.2.2.1 Changes in Nest Density for Each Zone .....	15
3.2.2.2 Nest Productivity.....	15
3.2.2.3 Nest Predation .....	16
3.2.2.4 Most Numerous Breeding Species.....	17
3.2.2.5 Species Detected During the Breeding Season from All Studies .....	17
3.2.2.6 Parasitism by Brown-headed Cowbirds.....	18
3.3 The Overall Picture in 2021.....	20

4. Acknowledgments.....	21
-------------------------	----

References.....	21
-----------------	----

## Appendices

A Description of Point Count Stations (Habitat Pictures and Maps) .....	24
B Map of TTP Breeding Bird Zones .....	33
C Species Accounts .....	34
D Map of 2021 Landbird Nest Locations .....	48
E Breeding Status Codes for Each Species Detected in 2021 .....	49
F Breeding Bird Report Methodologies and Protocols .....	50
G Notes to Annual Breeding Bird Reports 2005 to 2021 .....	64

# Tables and Figures

## Colonial Waterbirds and Managed Waterfowl

### Tables

2.1	Colonial Waterbird Nests at TTP, 2008 – 2021 .....	4
-----	--	---

### Figures

2.A	Colonial Waterbird Nesting Areas, 2021 .....	2
2.B	Double-crested Cormorant Nests at TTP by Sub-colony, 1998 – 2021 .....	3
2.C	Black-crowned Night-Heron Nests at TTP by Sub-colony, 1998 – 2021 .....	3

## Landbirds and Non-colonial Waterbirds

### Tables

3.1	2010 - 2019 Point Count Station Vegetation Analysis .....	7
3.2	Point Count Species List and Total Birds Detected by Species Within 100 Metres .....	10
3.3	Species Reaching New Nest Highs in 2021 .....	12
3.4	Total Nests by Species from 2012 to 2021 .....	13
3.5	Nest Productivity from 2012 to 2021 .....	16
3.6	Summary of Species Detected During Breeding Season from All Studies .....	18
3.7	Brown-headed Cowbird Parasitism Rates from 2012 to 2021 .....	19
3.8	Species Recorded Only by Point Counts Versus Species Recorded Only by Nests .....	20
4.1	2021 Effort by Nest Searching Project Participants (hours) .....	21
F.1	Point Count Station Information .....	51
F.2	Primary Habitat Type by Zone .....	52

### Figures

3.A	Annotated Map of Tommy Thompson Park with Point Count Station Locations .....	6
3.B	Total Bird Abundance per Point Count Station .....	9
3.C	Species Richness per Point Count Station .....	11
3.D	Nest Searching Effort per Zone from 2012 to 2021 .....	12
3.E	Nest Density by Zone .....	15
3.F	Known Nest Failure Rate Trend .....	16
3.G	Trend in Percent of Total Nests for the Most Numerous Breeding Species .....	16
3.H	Trend in Percent of Total Nests for the Most Numerous Breeding Species .....	17
3.I	Brown-headed Cowbird Parasitism Rate Trend .....	18

# 1. Introduction

## 1.1 Study Area



**TTP Aerial View (TRCA, 2014)**

Tommy Thompson Park (TTP) is located on the Leslie Street Spit, a 471-ha, 5-km long man-made peninsula extending into Lake Ontario in Toronto. When construction of the Spit began in 1959 by the Toronto Harbour Commission (now PortsToronto), the intention was to create new lands for port related facilities. However, for a variety of reasons port related expansion did not occur and natural succession was allowed to progress. As such, the Province of Ontario awarded Toronto and Region Conservation Authority (TRCA) the responsibility of creating a Master Plan for a public park. Landform construction was ongoing until 2015, and while the final size of the Spit (including waterlots) is complete, occasional works will be required into the future to maintain shoreline stability.

Over the years, the Spit evolved into the largest area of natural habitat on the Toronto waterfront, both through natural succession and habitat enhancement projects by TRCA. A variety of vegetation communities, including successional forests, meadows, coastal wetlands and sand dunes, provide diverse habitats for a wide range of species. Gulls and terns began nesting in the early 1970s, and continued nesting by these species and night-herons earned TTP the designation of an *Environmentally Significant Area* in 1982. Further, in 2015, this designation was extended to the entire Spit due to rare species and/or rare communities, and significant ecological functions.

The diverse habitats at the park, along with the geographical position have made it a critical site for birds throughout the year. To date, 326 species have been recorded at the park, with another seven currently under review by the Ontario Rare Birds Committee. In 2000, the Leslie Street Spit/TTP was named an *Important Bird Area* by BirdLife International. This designation is due to the globally significant populations of nesting colonial waterbirds, the continentally significant numbers of overwintering waterfowl, and nationally significant numbers of migratory birds.

## 2. Colonial Waterbirds and Managed Waterfowl

### 2.1 Project Background



Colonial waterbirds have a long history at Tommy Thompson Park and are one of the reasons the park was designated a globally significant *Important Bird Area* in 2000 (Wilson et al., 2001).

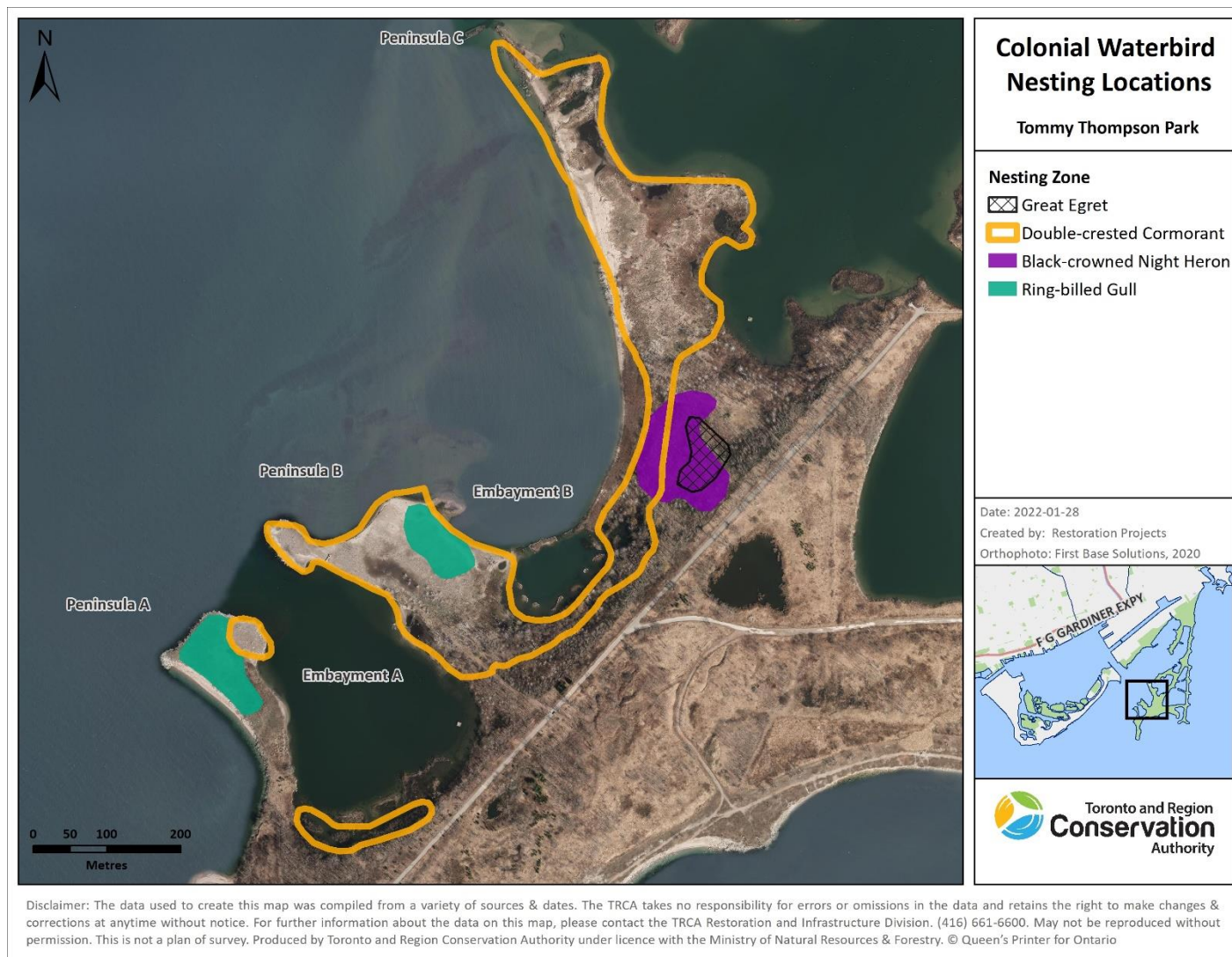
In 2021, seven species of colonial waterbirds nested at Tommy Thompson Park, namely two species of tree-nesters (Black-crowned Night-Heron and Great Egret), four species of ground-nesters (Caspian Tern, Common Tern, Herring Gull and Ring-billed Gull), and one species which nests both in trees and on the ground (Double-crested Cormorant).

**Black-crowned Night-Herons on Nest  
(D. Johnston)**



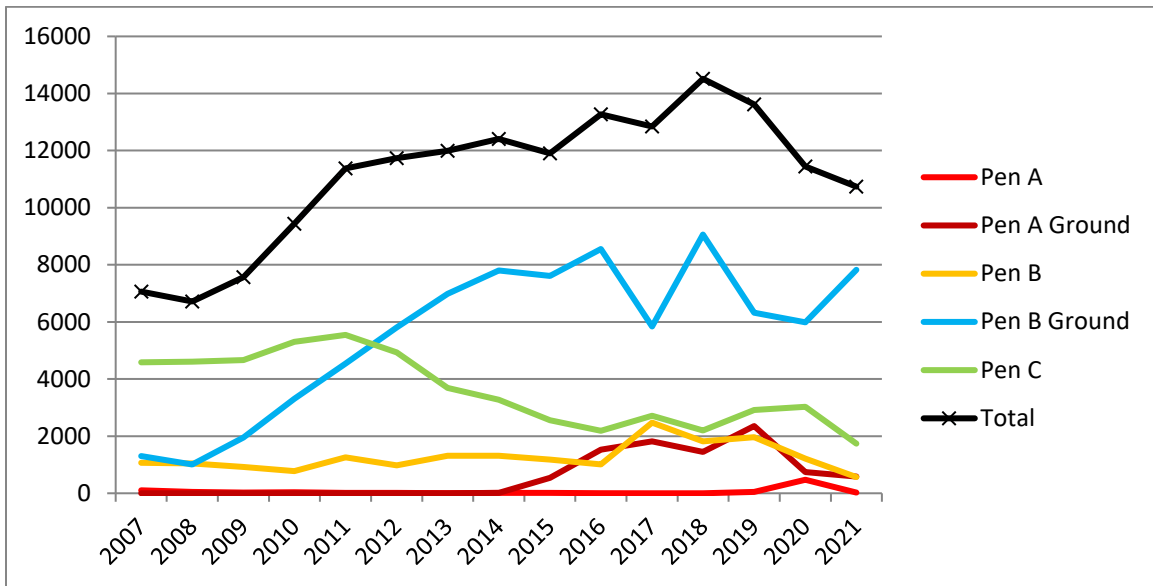
## 2.2 Results in 2021

In 2021 Double-crested Cormorants nested in trees on Peninsulas A, B and C, and on the ground on Peninsulas A and B. Black-crowned Night-Herons nested in trees between the bases of Peninsulas B and C, and Great Egrets nested at the base of Peninsula C. Ring-billed Gull nesting was recorded on Peninsulas A and B, along with a few Herring Gull nests. The nesting areas of cormorants, night-herons, egrets and Ring-billed Gulls are illustrated in Figure 2.A. Common Terns attempted nesting on the artificial nesting raft in Embayment D but abandoned early in the season. A few Common Tern nests were recorded in the Cell 2 wetland. Caspian Tern nesting was attempted on Peninsula B but failed due to predation.



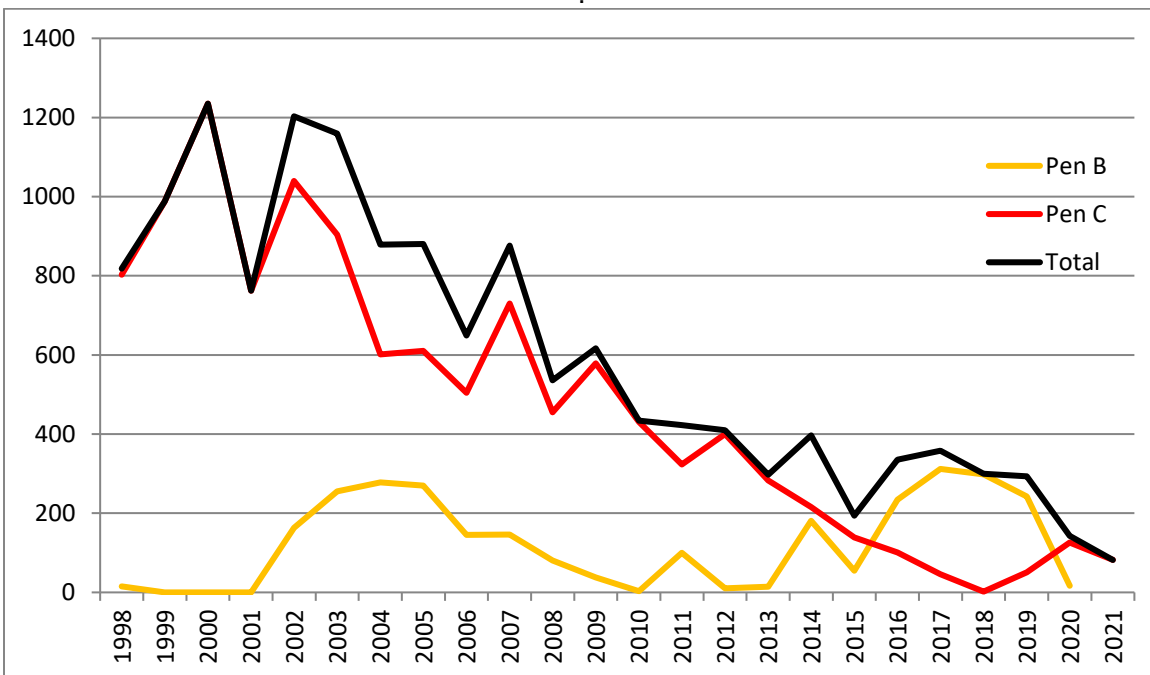
**Figure 2.A. Colonial Waterbird Nesting Areas, 2021**

Cormorant nests numbered 10,737, including 8,410 ground nests (Figure 2.B), which represented 78 per cent of the population. The total number of tree-nests decreased by 454 on Peninsula A, 647 on Peninsula B, and 1,295 on Peninsula C compared to 2020. Tree nesting density decreased in all locations with 2.22 nests/tree on Peninsula A, 6.60 nests/tree on Peninsula B and 5.04 nests/tree on Peninsula C.



**Figure 2.B. Cormorant Nest Count at Tommy Thompson Park 2007 to 2021**

Black-crowned Night-Heron nests numbered 82, a decrease of 43 per cent compared to 2020 (Table 2.1). Most night-heron nesting occurred between the bases of Peninsulas B and C, where they face less competition from cormorants.



**Figure 2.C. Black-crowned Night-Heron Nest Count at Tommy Thompson Park 1998 to 2021**



**Double-crested Cormorants on Nest (D. Johnston)**

**Table 2.1. Colonial Waterbird Nests at TTP, 2011 – 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
DCCO	11,374	11,741	11,990	12,409	11,908	13,275	12,841	14,515	13,614	11,446	10,737
BCNH	423	410	297	397	194	335	358	300	293	143	82
GREG	7	8	4	6	6	6	11	5	10	20	4
RBGU	32,000*	32,000*	35,000*	35,000*	35,000*	35,000*	NC	15,000*	NC	NC	3,700
HEGU	NC	NC	NC	NC	NC	NC	NC	NC	0	NC	<10
COTE	54	24*	0	179	176	142	142	70	90	84*	3
CATE	0	5*	98	263	NC	56 <sup>a</sup>	0	0	0	0	16 <sup>a</sup>

a - Nesting attempts failed

\*- Estimate

NC – no count



**Great Egrets on Nest (D. Johnston)**

## 2.2.1 Managed Waterfowl

Canada Geese and Mute Swans regularly nest at TTP and are monitored and managed by TRCA. The Mute Swan is an introduced species and all nests encountered are managed to reduce reproduction. Canada Goose nests are also managed due to the high number of human-wildlife conflicts on the Toronto waterfront. Management includes egg adding by removal or oiling to eliminate or reduce reproduction. In 2021, 18 Canada Goose nests were managed and one abandoned Mute Swan nest was recorded at TTP.

### **3. Landbirds and Non-colonial Waterbirds**

#### **3.1 Project Background**

Until 2005, comparatively little effort had been put toward TTP's nesting bird species other than the colonial waterbirds of the previous section. The project detailed in this section of the report was initiated in 2005 as a method of monitoring and documenting landbirds and non-colonial waterbirds for the site.

##### **3.1.1 Rationale**

The project is organized around monitoring of breeding landbird and non-colonial waterbird density and diversity in response to habitat succession and restoration. Regular surveys of breeding landbird and non-colonial waterbird species at TTP provide the following:

- \* Relative abundance data
- \* Detailed and accurate nest records
- \* A measurement of breeding bird abundance and diversity in relation to landscape level change
- \* Assessment of nesting success including parasitism and predation rates
- \* Data that can help steer habitat restoration work

This project is appropriate for TRCA because the labour and material costs are low, and the expertise is both readily available and able to provide monitoring of avian response to habitat restoration efforts. TRCA volunteers, with some staff support, have carried out the project annually in spring and summer since 2005.

##### **3.1.2 Change in Data Reporting**

Commencing with the 2016 Breeding Bird Report, project data are presented on a rolling 10-year basis. (Data from earlier years, commencing with 2005, the first year of the project, are available in earlier annual reports.)

#### **3.2 Results in 2021**

##### **3.2.1 Point Count Results**

###### **3.2.1.1 Point Count Station Vegetation Survey**

Table 3.1 depicts the result of the triennial vegetation surveys conducted in 2010 and 2019 for each station. In addition, Appendix A contains a habitat map and photographs for each station in 2019. (The habitat maps and photographs from 2010 can be found in the Breeding Bird Reports of 2010 – 2012, those from 2013 can be found in the reports of 2013 – 2015, and those from 2016 can be found in the reports of 2016 – 2018.) See Figure 3.A and Appendix A for station locations, and an explanation of the Point Count protocol can be found in Appendix F.

As can be seen from Table 3.1, several changes in habitat occurred between 2010 and 2019. This is not surprising, however, since most of TTP is intentionally left to naturally succeed on its own. Changes of note:

Station 2: The meadow areas observed in 2010 have been completely overtaken by dogwood and willow.

Station 3: Some meadow has been replaced by the Martin Goodman Trail and the Link Trail.

Station 4: A portion of the meadow has been replaced by a wider Link Trail, as well as forest and thicket expansion.

Station 5: The area along the shoreline has been largely rebuilt, resulting in less shoreline and water, and more reeds. The dogwood and forest have also increased significantly.

Station 8: Some thicket has been replaced by forest growth and wetland.



Station 9: Station 9 is located within the previous tree-nesting cormorant colony, and the result of the birds' excrement has been the loss of many trees and other vegetation. As the trees were lost, the tree nests largely disappeared within the Station area, and the previously barren soil has started to show signs of regeneration.



**Figure 3.A**      **Annotated Map of TommyThompson Park with Point Count Stations**

**Table 3.1. 2010 - 2019 Point Count Station Vegetation Analysis**

2010 OBSERVATIONS									
	Point Count Station								
	1	2	3	4	5	6	7	8	9
% of Major Habitats Within 100 m Radius of Each Point Count Station									
Meadow (tree cover ≤ 25%; shrub cover ≤ 25%)	55	40	70	95	10		85	5	5
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	15	20	20		65	20		20	20
Deciduous Forest (tree cover ≥ 60%)	25	40	5		10	50		65	60
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	5								
Vegetation Sub-total (see detail below)	100	100	95	95	85	70	85	90	85
Sand Dune/Sand Barren (incl active shorelines)						5			
Roads/Trails			5	5	5		10		
Lake Ontario Shoreline (open water)					10	25	5	10	15
Non-vegetation Sub-total			5	5	15	30	15	10	15
Total of All Habitats	100	100	100	100	100	100	100	100	100
Dominant Vegetation Within 100 m of Each Point Count Station									
Poplars (e.g., Eastern Cottonwood)	20	35	5	5	10	40	5	55	45
Dogwoods (e.g., Red-osier Dogwood)	10	15	10		20	15		5	15
Honeysuckles						10			
Shrub Willows	10	5	5	5	30	5	5	5	
Grasses and Sedges	55	40	65	60	15		45	20	10
Goldenrods and Asters		5	10	20	10		20		5
Reeds (e.g., Cattails, Bulrushes)	5			5				5	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)							10		10
Vegetation Sub-total	100	100	95	95	85	70	80	90	85
2019 OBSERVATIONS									
	Point Count Station								
	1	2	3	4	5	6	7	8	9
% of Major Habitats Within 100 m Radius of Each Point Count Station									
Meadow (tree cover ≤ 25%; shrub cover ≤ 25%)	51		56	72	4	3	81	5	44
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	7	59	22	2	67	23		9	20
Deciduous Forest (tree cover ≥ 60%)	22	41	9	6	18	51	3	70	16
Dead Deciduous Forest									1
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	18			9	5		2	5	
Vegetation Sub-total (see detail below)	98	100	87	89	94	77	86	89	81
Sand Dune/Sand Barren (incl active shorelines)								2	3
Roads, Trails and other man-made areas	2		13	11	4		14		
Lake Ontario Shoreline (open water)					2	23		9	16
Non-vegetation Sub-total	2		13	11	6	23	14	11	19
Total of All Habitats	100	100	100	100	100	100	100	100	100
Dominant Vegetation Within 100 m of Each Point Count Station									
Trees (e.g., Eastern Cottonwood)	25	35	5	5	15	40	7	60	10
Dogwoods (e.g., Red-osier Dogwood)	18	40	13		50	15		3	20
Honeysuckles						12			
Shrub Willows		5	5	5	20	5	5	4	
Grasses and Sedges	25	20	32	40	4	5	44	15	6
Goldenrods and Asters	10		5	30			10		
Reeds (e.g., Cattails, Bulrushes, Phragmites)	20			8	5		5	7	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)			27	1			15		45
Vegetation Sub-total	98	100	87	89	94	77	86	89	81

While some Point Count locations have not seen a major change in vegetation over the course of the project, others have demonstrated significant change. The following photographs demonstrate one station (4) which is an example of the former and two stations (2 and 9) which are examples of the latter. The south view at Station 4 (dry meadow) continues to see little change over the life of the project other than changes in the make-up of the ground cover.





2010



2016



2019

Station 2 (forest – north view) showed significant shrub growth between 2010 and 2016 and has now become completely surrounded by tall shrubs.



2010



2016



2019

Station 9 (forest – north view) is located within the Double-crested Cormorant colony, and the effect of the birds' excrement on both the trees and the ground-level vegetation can be seen in 2016. In 2021, with the trees and nests almost gone in this view, excrement is no longer a problem, and ground cover is returning.



2010



2016



2019

### 3.2.1.2 Point Count Observations

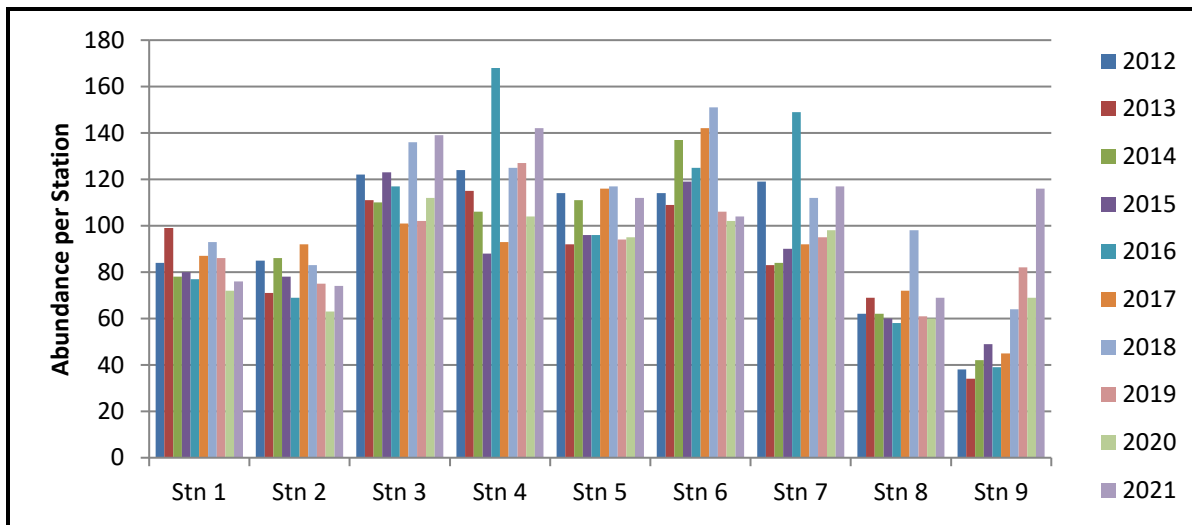
The total number of birds recorded at all Point Count stations was 949, the second highest of the past 10 years. In support of this total, the number of birds recorded for the following nine species was the highest of the past 10 years: American Goldfinch, American Robin, Barn Swallow, Black-capped Chickadee, Common Grackle, House Wren, Song Sparrow, Tree Swallow and Warbling Vireo.

A summary of abundance per species detected by Point Counts (<100 meters) is presented in Table 3.2. Some of the unusually high numbers (e.g., 106 Bank Swallows in 2016, 68 Barn Swallows in 2018 and 78 Barn Swallows in 2021) are attributable to one or a few large flocks recorded in one or more of the visits. The higher than usual number of Mallards in 2019 and 2021 is a result of the area around Station 9 becoming more open and permitting a view of Embayment C. As shown in Table 3.2, 30 species were detected for all counts in 2021, which is 12% below the average of 33 species for the past 10 years.

Several Point Count observations from previous reports continue to apply:

- The number of Brown-headed Cowbirds observed continues to be much lower than the numbers observed in earlier years of the project, which corresponds to the lower rate of nest parasitism by these birds (see Section 3.2.2.6.).
- Since the nests of Song Sparrows are very difficult to find, this species is recorded much more frequently on Point Counts than the number of nests actually found would suggest.
- Cedar Waxwing nests are generally more numerous than Point Count sightings as the waxwings are late nesters and are not present in large numbers when Point Counts are conducted.
- Eastern Kingbird Point Count sightings are always lower than the number of nests would suggest because very few Point Count stations are close to kingbirds' preferred habitat. Similarly, Point Count sightings of Red-winged Blackbirds and Yellow Warblers have become fewer than the number of their nests would suggest as the growth in the number of nests has largely occurred in areas separate from the Point Count locations.
- Prior to 2015, swallows were recorded differently by different project participants during the Point Counts, such that swallow numbers in Table 3.2 are understated for the years 2012 – 2014.

As can be seen in Figure 3.B below, only three stations (1, 2 and 6) were below the most recent 10-year average for their station (91%, 94% and 86%, respectively). These three stations have seen significant growth in thick adjacent vegetation in recent years, which would have contributed to the decrease in bird activity. In keeping with the significant decrease in vegetation at Station 9, the number of birds recorded there has increased dramatically the last few years (2021 being 201% of the most recent 10-year average).



**Figure 3.B. Total Bird Abundance per Point Count Station**



**American Goldfinch Nest (left) (S. Birkett)**

**American Robin Nest (right) (D. Johnston)**



**Table 3.2. Point Count Species List and Total Birds Detected by Species Within 100 Metres**

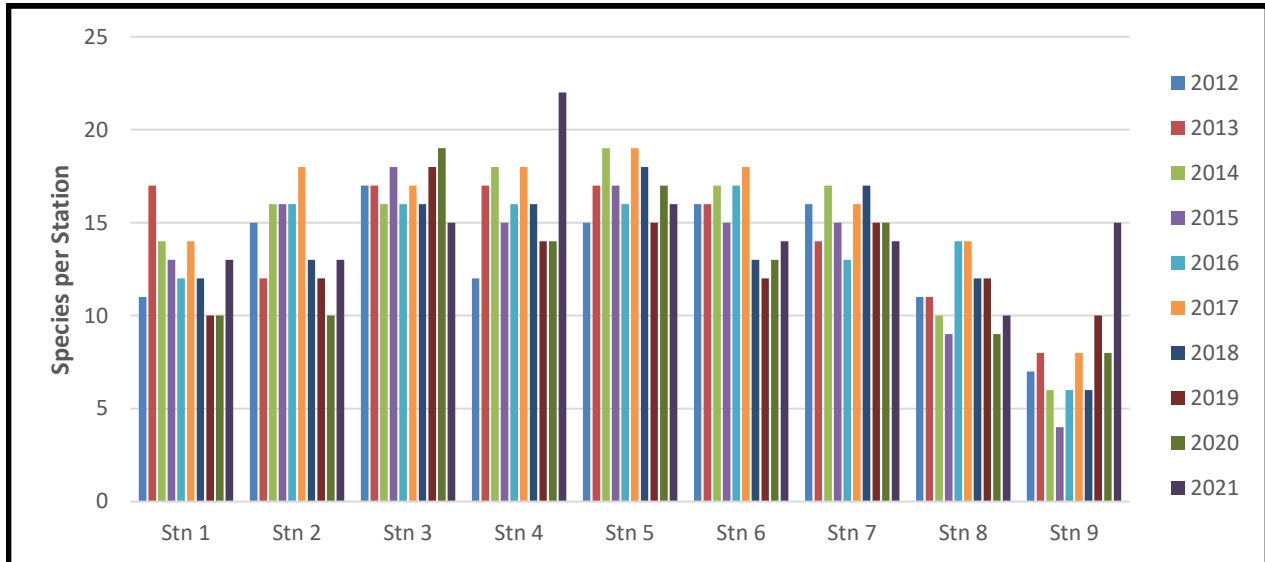
Species	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG
AMGO	8	14	19	7	37	36	19	19	30	44	23
AMKE						1				1	
AMRE								2	1		
AMRO	40	22	15	25	23	27	26	19	27	41	27
AMWO		1							1		
BANS	35	7	22	4	106	7	9	3	8	4	21
BAEA		*									
BAOR	22	26	21	25	15	23	19	9	18	6	18
BARS	31	22	15	55	48	41	68	76	46	75	48
BCCH	1	3		5	7	2	3			8	3
BEKI			1					1			
BGGN			3	2	3	2				1	1
BHCO	17	12	5	3	6	7	3		5	6	6
BLJA	1					1		1	*		
BLPW								1			
BRTN		1	3	1				1			1
CANG			*			7		3			1
CEDW	47	17	16	12	18	12	1	12	3	8	15
CHSW		3	2	2				1	5		1
CLSW							*	1	6	3	1
COGR	8	12	5	17	5	11	14	6	9	18	11
COHA				1					1		
COYE			4			1		3			1
DOWO	1	1	1			2	1	4	1	1	1
EAKI	12	7	2	9	3	6	8	2	3	7	6
EAWP	6	8	6	9	7	2	2				4
EUST	39	8	44	9	46	18	18	4	5	39	23
GADW		*	2			*	2	1	1		1
GBHE						*					
GCFL					1		1				
GRCA	21	16	21	12	18	22	18	33	16	22	20
HOWR		2	1		1		1		1	7	1
KILL	2	5	4	5	2	7		2	2	1	3
LEFL	8	10	4	5	1	3	6	7	1		5
MALL	*	*	2			5	1	11	*	11	3
MODO		3			1	2	1				1
NOCA	2	5	3	3	10	21	17	4	7	8	8
NOFL						2	4				1
NOMO			1	1		1				1	
NRWS	*	4	*	9	10	5	7	6	5	1	5
OROR	1	1	1		2	2	5	1		1	1
RBNU					1						
REVI			1								
RWBL	295	265	276	247	192	214	316	215	237	233	249
SAVS					1						
SOSP	50	66	47	51	59	57	102	93	81	114	72
SPSA	2	1	5	7	2	2	1	8	2	4	3
TEWA					1						
TRES	11	25	30	52	41	54	37	47	46	65	41
TRFL			2			2		2			1
WAVI	50	53	46	32	46	27	44	40	29	24	39
WIFL	16	17	20	18	16	27	24	15	10	22	19
Yewa	136	146	166	155	169	181	201	177	168	173	167
<b>Birds</b>	<b>862</b>	<b>783</b>	<b>816</b>	<b>783</b>	<b>898</b>	<b>840</b>	<b>979</b>	<b>830</b>	<b>775</b>	<b>949</b>	<b>851</b>
<b>Species</b>	<b>28</b>	<b>34</b>	<b>37</b>	<b>29</b>	<b>32</b>	<b>38</b>	<b>32</b>	<b>35</b>	<b>32</b>	<b>30</b>	<b>33</b>

\* Species observed beyond 100m and/or flying over



Species richness, or diversity, is shown in Figure 3.C below. In 2021, only Stations 4 (at 136% of average) and 9 (192%) experienced diversity that was higher than the most recent 10-year average for those stations. Again, similar to the abundance experience, Station 9 diversity continues to be enhanced by the decrease in vegetation in the area. The other stations were all lower than their 10-year average, but within 14% of the average.

For most of the past 10 years, both the bird abundance and species diversity at Stations 8 and 9 have suffered in comparison to the other stations due to the presence of thick vegetation and/or the lack of biodiversity. This continues to apply to Station 8 with its dense vegetation and nesting Double-crested Cormorants and Black-crowned Night-Herons. Due to the improving biodiversity at Station 9, however, abundance and diversity are both beginning to resemble those of Stations 1 – 7.



**Figure 3.C. Species Richness per Point Count Station**

### 3.2.2 Nest Searching and Monitoring Results

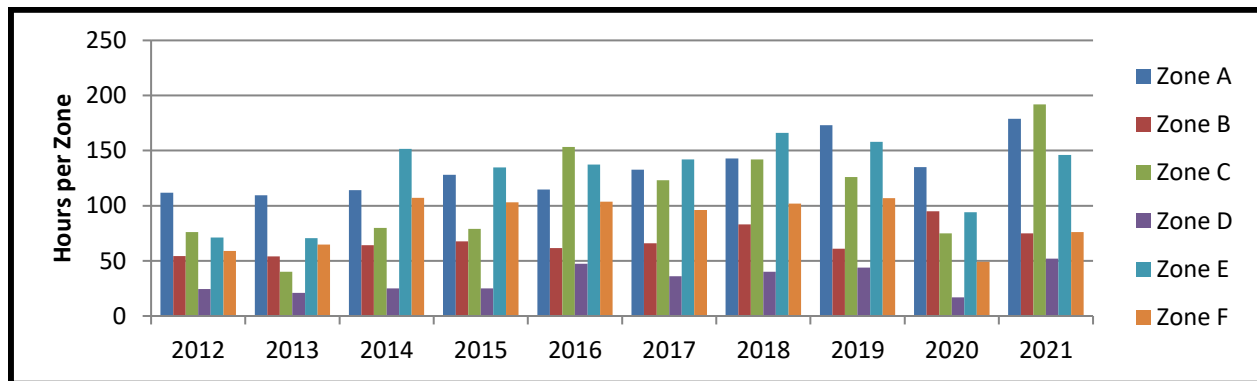
In 2021, six volunteers contributed a total of 718 hours to the project (see Table 3.9). This is the most time devoted to the project in any year and was a major contributor to the number of nests being found.

Figure 3.D shows the breakdown of effort per zone. As can be seen, the greatest level of effort was expended in Zones A, C and E. Zones B, D and F received less attention as they are the smallest zones (once the colonial waterbird nesting areas are subtracted from F) and their habitat is also less suitable for nesting, thereby requiring less time spent monitoring the nests. Zone B is bisected by both the multi-use trail and a walking trail, both of which result in considerable pedestrian, bicycle and vehicle traffic. Zone D is exposed along its length to east winds and erosion, which have resulted in minimal suitable nesting habitat. Zone F was badly flooded in the flood years of 2017 and 2019, resulting in the growth of dense shrubbery in many areas.



**Downy Woodpecker Excavating Nest (J. Alvo)**

See Appendix B for a map of the TTP breeding bird survey zones.



**Figure 3.D. Nest Searching Effort per Zone from 2012 to 2021 (hours)**

In 2021, 1,058 nests were discovered, the third highest total of the project. Of the total, 769 nests were monitored and reported to Project Nestwatch (see Tables 3.4 and 3.5).

The reasons for the continued high number of nests compared to the early years of the project include: (a) extensive tree and shrub planting by TRCA over recent years; (b) the natural spreading and maturation of appropriate breeding habitat in some areas, particularly dogwood, honeysuckle and reeds, which represent the most common hosts for Red-winged Blackbirds and Yellow Warblers, the most prolific non-colonial-waterbird nesters at TTP; (c) the ever-increasing nest-searching skills in the project participants; and (d) the discovery of areas rich in nests that had not been explored until recent years.

Table 3.3 lists those species realizing new nest highs for the project in 2021.

**Table 3.3. Species Reaching New Nest Highs in 2021**

Species	Previous High	Number of Nests in 2021
American Robin	125	129
Cliff Swallow	24	46
Common Grackle	7	11
Downy Woodpecker	3	5
Eastern Kingbird	27	39
Eastern Phoebe	1	2
Northern Mockingbird	2	3
Tree Swallow	28	35



**Red-winged Blackbird Nest (D. Johnston)**



**Willow Flycatcher Nest (S. Birkett)**

**Table 3.4. Total Nests by Species from 2012 to 2021**

<b>Species</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>AVG</b>
American Goldfinch	13	17	18	16	23	26	14	13	19	14	16
American Redstart										1	
American Robin	93	93	89	78	113	125	104	122	106	129	105
American Woodcock	1			1		1				1	
Baltimore Oriole	16	15	35	17	18	24	16	13	14	15	18
Bank Swallow					15	16		1		1	3
Barn Swallow	11	26	31	24	29	49	51	51	54	39	37
Belted Kingfisher			1								
Black-billed Cuckoo			1		1						
Black-capped Chickadee	1	2	1		2	2		2			1
Blue-gray Gnatcatcher	2	4	6	7	6	4	4	4	2	2	4
Brown Thrasher	2	1	2	2		2	1		1		1
Canvasback			1							1	
Carolina Wren										1	
Cedar Waxwing	23	19	37	40	49	33	35	18	36	35	33
Cliff Swallow							24	11	13	46	9
Common Grackle	2	3	2	5	5	1	7	6	4	11	5
Downy Woodpecker	1	1		1	2	3	1		1	5	2
Eastern Kingbird	27	21	20	27	24	25	21	14	21	39	24
Eastern Phoebe									1	2	
Eastern Wood-Pewee	1		1								
European Starling	5	8	4	5	3	1	2		2	3	3
Gadwall	4	1	2	1	1				1	2	1
Gray Catbird	21	24	34	30	46	33	21	35	20	24	29
House Finch							2	3		1	1
House Wren						1	3	2	3	2	1
Killdeer	4	3	4	3	4	5	1		1	7	3
Least Bittern						2			1		
Least Flycatcher			3	2			1		2	2	1
Mallard	9	8	5	5	8	5	2	6	3	1	5
Mourning Dove	1				1	1	3				1
Northern Cardinal	1	1	3	2	4	14	12	5	6	12	6
Northern Flicker			1		1	5	3	2	1		1
Northern Mockingbird							2			3	1
N. Rough-winged Swallow			1	2		2		5			1
Orchard Oriole	2	3	2	1	2	1	3	4	5	4	3
Red-winged Blackbird	268	310	361	404	356	464	418	357	287	323	355
Song Sparrow	3	2	8	10	7	4	10	4	8	9	7
Spotted Sandpiper	5	6	3	6	3	5	4	2	2	1	4
Tree Swallow	5	12	13	20	20	28	15	18	20	35	19
Trumpeter Swan			1	1	1	1	2	2	2	2	1
Virginia Rail								2			
Warbling Vireo	12	13	31	12	18	21	18	19	27	27	20
Willow Flycatcher	14	13	18	15	19	18	15	19	20	23	17
Wood Duck							1				
Yellow Warbler	86	127	164	189	237	253	211	320	235	235	206
<b>Total</b>	<b>633</b>	<b>733</b>	<b>902</b>	<b>926</b>	<b>1,018</b>	<b>1,175</b>	<b>1,027</b>	<b>1,060</b>	<b>918</b>	<b>1,058</b>	<b>945</b>
<b>Total Effort (hours)</b>	<b>397</b>	<b>360</b>	<b>542</b>	<b>538</b>	<b>618</b>	<b>596</b>	<b>676</b>	<b>669</b>	<b>555</b>	<b>718</b>	<b>567</b>
<b>Efficiency (nests/hour)</b>	<b>1.59</b>	<b>2.04</b>	<b>1.67</b>	<b>1.72</b>	<b>1.65</b>	<b>1.97</b>	<b>1.52</b>	<b>1.59</b>	<b>1.65</b>	<b>1.47</b>	<b>1.67</b>

Note: A Trumpeter Swan nest was observed in 2014, but not included in these reports until 2015 when another nest was observed and reported to Project NestWatch, The unreported 2014 nest has been included in subsequent reports for completeness.

The following nesting activities in 2021 are noteworthy:

- Two new species nested at TTP in 2021: American Redstart and Carolina Wren. These species have been recorded regularly in suitable habitat during the breeding season in recent years, so evidence of nesting was anticipated. There are now 75 species confirmed to have nested at TTP.
- A pair of Cooper Hawks started building a nest in the Baselands, but in the end, it was never used. This species is known to build a number of nests before choosing one to use. This was the first known attempt by the species to nest at TTP.
- Barn Swallow nests decreased somewhat from recent years, but this Threatened species continued to take advantage of the buildings at TTP with appropriate overhangs to achieve 39 nests.
- Cliff Swallows started building their nests under the Nature Centre overhang in 2018, and in 2021 reached 46 nests, and increase of 92% over its previous high. This species is double-brooded, helping to account for the number of nestings.
- Common Grackle nests reached 11 in 2021, 57% more than the previous high. Grackles take pains to avoid disclosing the location of their nests, but a number were found in the tops of conifers.
- There were 39 Eastern Kingbird nests in 2021, which was 44% more than the previous high. These nests are often high in the trees and well hidden.
- An Eastern Phoebe pair nested twice, and a Northern Mockingbird pair nested three times, the first two nests having been predated.
- Tree Swallow nests increased by 25% over the previous high. In addition to the several nest boxes erected by TRCA, this species lives up to its name and takes advantage of nest cavities created in trees by woodpeckers.
- The 27 Warbling Vireo nests matched the total of 2020, falling just short of the previous high of 31 (in 2014). This is well above the average for the past 10 years. These tiny nests, almost always high in the trees, can be extremely difficult to locate.

Nest-searching efficiency figures (Table 3.4) can be misleading, as they are highly dependent on an area's vegetation (e.g., forest versus shrubland), the species found in the dominant habitat (e.g., shrub nesters versus high tree nesters) and the time spent on monitoring as opposed to finding nests. The efficiency realized in 2021 was well below the 10-year average, which is to be expected as the newer volunteers introduced in the last few years gain experience. It was also probably the case in 2021 that more time was spent proportionately monitoring nests than in previous years.



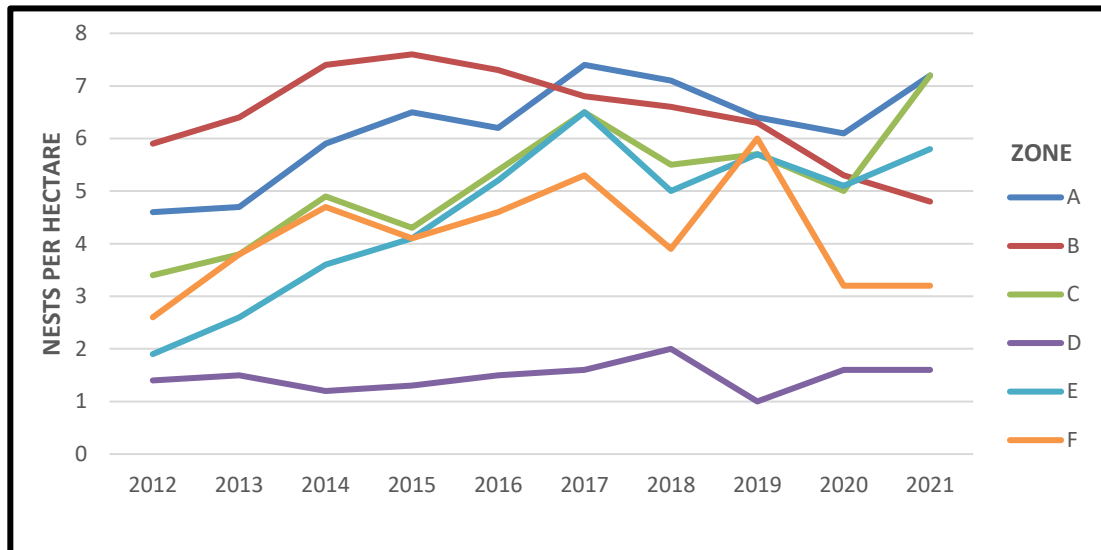
**Red-winged Blackbird Nestlings (S. Birkett)**



**Yellow Warbler Nestlings (J. Alvo)**



### 3.2.2.1 Changes in Nest Density for Each Zone



**Figure 3.E Nest Density by Zone**

In Figure 3.E, the nest density for each zone is determined by the number of nests per hectare. (In this chart, the number of hectares for Zone F has been reduced to eliminate the area occupied by the colonial waterbirds.) A map of the zones can be found in Appendix B.

- The nest density in 2021 continued to converge for Zones A, C and E, and increased for all three after a drop in 2020 due to the late start to nest searching that year. All three zones achieved a density of 6 - 7 nests per hectare.
- The density in Zone B decreased slightly from 5.3 nests per hectare in 2020 to 4.8 in 2021, presumably as a result of the removal of phragmites in Embayment D. As the phragmites will be replaced by native species over time, the density should eventually return to the levels of Zones A, C and E.
- The nest density in Zones D and F in 2021 were essentially unchanged from 2020 at 1.5 and 3.2, respectively. As described in previous reports, the vegetation in Zone D has suffered in recent years from the Cell 2 construction and storm damage along the eastern side of TTP, and the nest density is unlikely to increase until the biodiversity improves. The sharp decrease in Zone F in 2020 was possibly linked to the significant flooding in this zone in 2017 and 2019. This flooding resulted in several trees dying while many dogwoods and willows flourished, creating very dense shrubbery in some areas, possibly too dense for birds looking to nest.

### 3.2.2.2 Nest Productivity

In 2021, 769 nests were recorded online with Project NestWatch (Table 3.5). In terms of nest productivity, of the 518 nests which had known outcomes, 87 (or 17%) failed, meaning that 431 (or 83%) were successful in fledging young. The remaining 251 nests which were monitored and reported to NestWatch, but had unknown outcomes, represented 33% of the nests reported to NestWatch. (The nests with unknown outcomes included all ground nests from Gadwall, Killdeer, Mallard, Song Sparrow and Spotted Sandpiper, which, commencing in 2012, were not monitored once found.)

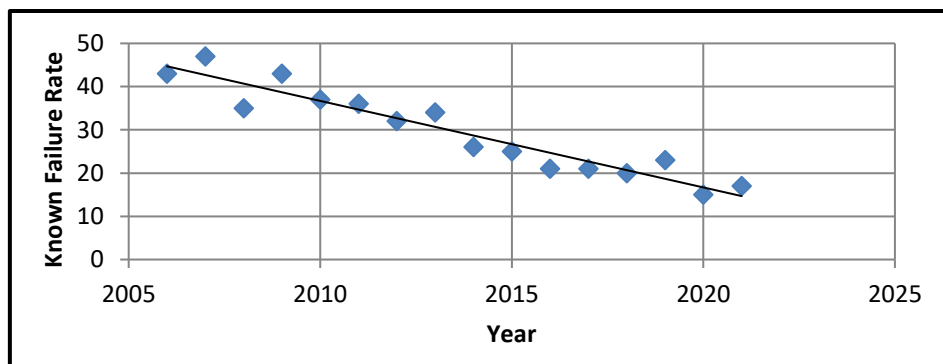
As can be seen in Table 3.5, the 2021 nest failure rate of 17% is the second lowest of the past 10 years. Of the 87 failures, 37 occurred at the egg stage, 12 at the young stage and 38 at either the egg or the young stage.



**Table 3.5. Nest Productivity from 2011 to 2021**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG
Nests discovered	633	733	902	926	1,018	1,175	1,027	1,060	918	1,058	945
Nests monitored & reported to NestWatch	464	549	690	657	702	801	663	736	564	769	660
• Unknown outcome	213	266	232	226	211	301	244	243	165	251	235
• Known outcome	251	283	458	431	491	500	421	493	399	518	425
➤ Successful	171	186	338	323	388	394	335	382	338	431	329
➤ Failed	80	97	120	108	103	106	86	111	61	87	96
➤ Failure rate	32%	34%	26%	25%	21%	21%	20%	23%	15%	17%	23%

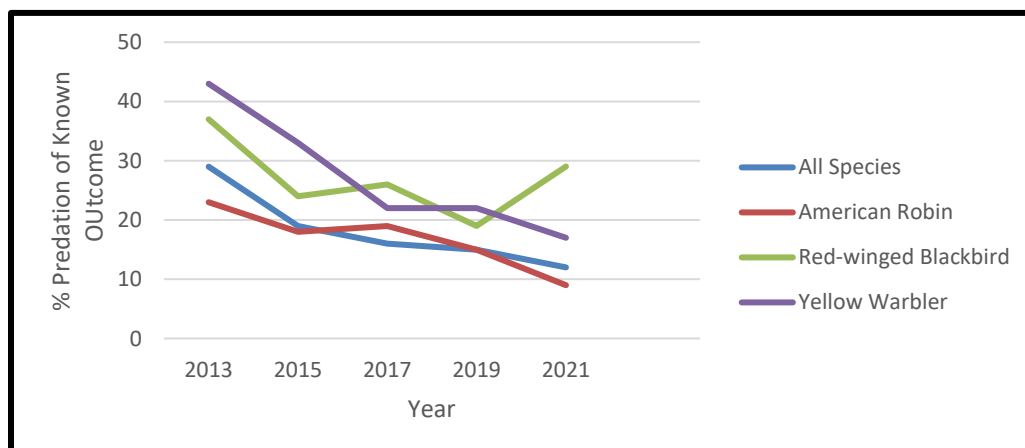
Figure 3.F demonstrates how the known nest failure rate continues to trend downward. Since the failure rate was relatively flat at 20 - 23% for the period 2016 - 2019, it will be interesting to see whether the lower rate achieved in 2020 and 2021 will be maintained in future years.



**Figure 3.F. Known Nest Failure Rate Trend**

### 3.2.2.3 Nest Predation

Nest predation continues to be the most common cause of nest failure. Possible predators at TTP, in addition to other bird species, include raccoons, gartersnakes, mink, coyotes and, rarely, squirrels.



**Figure 3.G. Predation Rates of the Most Numerous Breeding Species**

Of the 87 failed nests noted in Table 3.5 for 2021, a total of 61 nests were predated, representing 12% of nests with a known outcome. As in 2020, eight species had at least one nest predated in 2021, with the most common being Red-winged Blackbird at 29% of nests with a known outcome, Yellow Warbler at 17%, and American Robin at 9%.

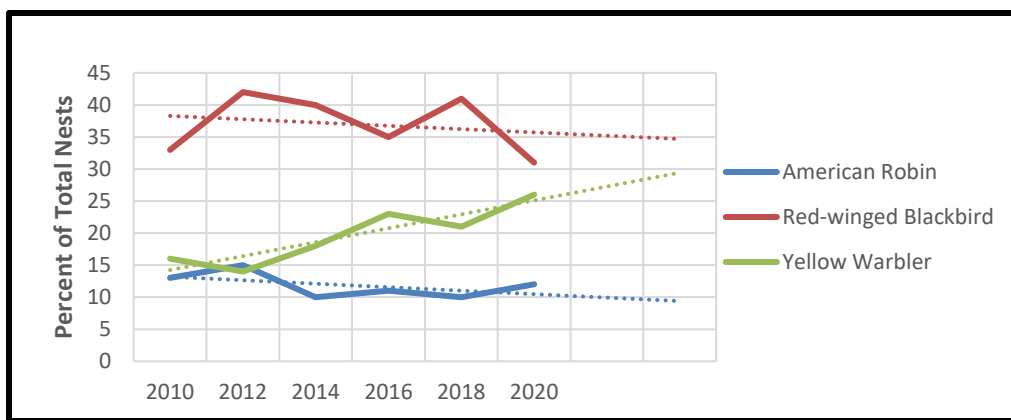
Figure 3.G depicts the recent trend in predation rates for Red-winged Blackbirds, Yellow Warblers and American Robins, as well as the rate for all species combined. As can be seen, the trend in each case has been downwards (with the possible exception of blackbirds), although it is difficult to find any reason for this.

#### 3.2.2.4 Most Numerous Breeding Species

From the beginning of the project, the top three landbird nesters have been Red-winged Blackbirds, Yellow Warblers and American Robins. While the number of American Robin nests has been fairly consistent in recent years at close to 10% of all nests, Red-winged Blackbirds and Yellow Warblers have seen notable changes in their proportion of the total nests.

After peaking at 44% in 2015, the proportion of Red-winged Blackbird nests has been steadily decreasing for undetermined reasons, reaching 31% of total nests in both 2020 and 2021. The proportion of Yellow Warbler nests, on the other hand, jumped from 15% of all nests in 2011 to a peak of 30% in 2019, before falling off to 22% in 2021.

Red-winged Blackbirds and Yellow Warblers both prefer to nest in shrubs at TTP, particularly dogwood and honeysuckle. Increases in both of these shrubs in recent years could help to explain the increase in Yellow Warbler nests but make the decrease in Red-winged Blackbird nests puzzling. Despite the falloff in the proportion of Yellow Warbler nests since 2019, the overall trends depicted in Figure 3.H anticipate that Yellow Warblers may eventually surpass Red-winged Blackbirds as a percentage of all nests. It will be interesting to see how the number of nests of these two species evolves in future years.



**Figure 3.H. Trend in Percent of Total Nests for the Most Numerous Breeding Species**

#### 3.2.2.5 Species Detected During the Breeding Season from all Studies

As can be seen in Table 3.6, the 46 confirmed breeders in 2021 are the highest of the last 10 years, and the 77 total species detected in 2021 are also the highest of the last 10 years. These numbers are a good reflection of the general health of TTP for a diversity of species. Of particular note are the 12 “possible breeding species”; it is encouraging to see this number of species showing signs of possible breeding activity.

The first section of Table 3.6 provides a breakdown of the 46 confirmed breeders in 2021. Nests of 36 species of landbirds, including Brown-headed Cowbird, were found in 2021. To this was added Wood Duck, which was confirmed as a breeder by the presence of recently fledged young. When the seven confirmed colonial waterbird nesters (i.e., Black-crowned Night-Heron, Caspian Tern, Common Tern, Double-crested Cormorant, Great Egret, Herring Gull and Ring-billed Gull), as well as the managed waterfowl (i.e., Canada Goose and Mute Swan), are added, the total becomes 46 species nesting at TTP in 2021.

**Table 3.6. Summary of Species Detected During Breeding Season from All Studies**

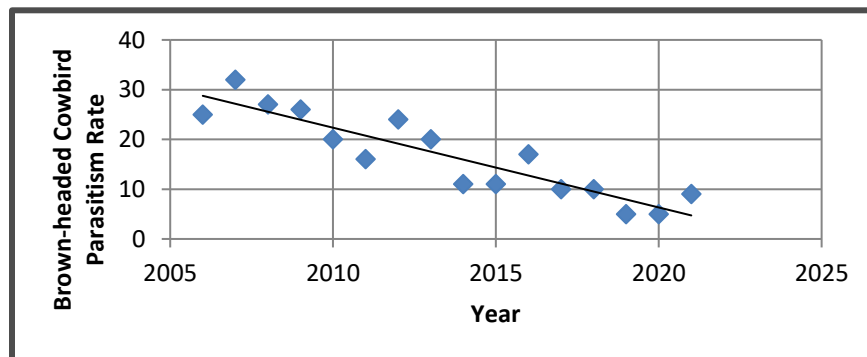
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AVG
Breeding Species:											
Colonial Waterbirds	7	7	7	5	7	5	6	5	5	7	6
Managed Waterfowl	2	2	2	2	2	2	2	2	2	2	2
Sub-total	9	9	9	7	9	7	8	7	7	9	8
Landbirds	29	26	32	29	30	33	33	29	35	36	31
Nests confirmed by young	2	5	2	3	0	1	3	4	3	1	2
Sub-total	31	31	34	32	30	34	36	33	38	37	34
Confirmed Breeding Species (total of above)	40	40	43	39	39	41	44	40	45	46	42
Probable Breeding Species	3	5	5	3	4	3	2	6	2	4	4
Possible Breeding Species	6	4	8	14	11	8	5	4	7	12	8
Other Species Observed	17	11	8	15	12	17	20	20	17	15	15
<b>Total Species Detected</b>	66	60	64	71	66	69	71	70	71	77	69

### 3.2.2.6 Parasitism by Brown-headed Cowbirds

Brown-headed Cowbird parasitism is a major issue for small landbird populations in more open habitats and forest fragments. In 2021, a total of 28 nests of five species was parasitized by Brown-headed Cowbirds (Table 3.7). (For purposes of this report, a nest was considered parasitized if a cowbird egg was observed, regardless of what happened to that egg.) The parasitism rates in Table 3.7 were calculated as the ratio of parasitized nests to the total parasitized and non-parasitized nests. (Note that nests of parasitized species were not included in this table unless evidence of parasitism, or lack thereof, could be confirmed.)

The overall rate of parasitism in 2021 of 9% was higher than the previous two years, but still below the most recent 10-year average of 12%. Red-winged Blackbirds, which have seen the highest number of parasitized nests over the past 10 years, experienced their second lowest rate of parasitism at 8% in 2021. Yellow Warblers have experienced the second highest number of parasitized nests over the 10 years.

The overall parasitism rate in 2021 of 9% continued the 10-year downward trend, particularly in the period 2017 – 2021, as demonstrated in Table 3.7 and Figure 3.I. This trend is paralleled in the Point Counts, where cowbird numbers have been declining since 2014. As mentioned in earlier reports, possible explanations for this downward trend include (i) a reduction in the cowbirds' preferred foraging habitat at TTP due to the increase in tall herbaceous vegetation, and (ii) an overall decline in cowbird populations in Ontario, with the exception of the Carolinian region, as noted in the Atlas of the Breeding Birds of Ontario, 2001 – 2005 (p. 602).

**Figure 3.I. Brown-headed Cowbird Parasitism Rate Trend**

**Table 3.7. Brown-headed Cowbird Parasitism Data and Rates from 2011 to 2021.**

Brown-headed Cowbird Parasitism											
		American Goldfinch	American Robin	Gray Catbird	House Finch	Northern Cardinal	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	Totals
2012	Nests checked*	8	17	19	0	1	77	2	8	33	165
	No. parasitized	0	0	0	0	0	30	0	2	7	39
	% parasitized	0%	0%	0%	0%	0%	39%	0%	25%	21%	24%
2013	Nests checked*	9	26	20	0	1	145	2	11	75	289
	No. parasitized	1	1	0	0	0	33	0	1	22	58
	% parasitized	11%	4%	0%	0%	0%	23%	0%	9%	29%	20%
2014	Nests checked*	10	27	27	0	3	134	6	13	96	316
	No. parasitized	0	0	0	0	0	22	0	2	11	35
	% parasitized	0%	0%	0%	0%	0%	16%	0%	15%	11%	11%
2015	Nests checked*	5	18	21	0	2	181	7	7	82	323
	No. parasitized	0	0	1	0	0	27	1	0	8	37
	% parasitized	0%	0%	5%	0%	0%	15%	14%	0%	10%	11%
2016	Nests checked*	7	38	18	0	4	133	3	12	123	338
	No. parasitized	0	0	1	0	0	26	0	1	28	56
	% parasitized	0%	0%	6%	0%	0%	20%	0%	8%	23%	17%
2017	Nests checked*	12	45	20	0	7	182	4	12	128	410
	No. parasitized	1	0	0	0	1	24	1	1	12	40
	% parasitized	8%	0%	0%	0%	14%	13%	25%	8%	9%	10%
2018	Nests checked*	6	34	10	2	6	153	6	9	73	299
	No. parasitized	0	0	0	1	1	14	3	0	10	29
	% parasitized	0%	0%	0%	50%	17%	9%	50%	0%	14%	10%
2019	Nests checked*	5	38	17	1	4	135	3	13	135	351
	No. parasitized	0	0	0	0	0	14	0	1	4	19
	% parasitized	0%	0%	0%	0%	0%	10%	0%	8%	3%	5%
2020	Nests checked*	11	17	9	0	2	99	5	12	83	238
	No. parasitized	0	0	0	0	0	4	0	1	6	11
	% parasitized	0%	0%	0%	0%	0%	4%	0%	8%	7%	5%
2021	Nests checked*	9	53	10	0	2	119	4	8	101	305
	No. parasitized	0	1	2	0	0	9	2	0	14	28
	% parasitized	0%	2%	20%	0%	0%	8%	50%	0%	14%	9%
AVG	Avg nests checked *	8.2	31.3	17.1	0.3	3.2	135.8	4.2	10.5	92.9	303.4
	Avg parasitized	0.2	0.2	0.4	0.1	0.2	20.3	0.7	0.9	12.2	35.2
	Avg % parasitized	2%	1%	2%	33%	6%	15%	17%	9%	13%	12%

\* Nests checked includes only those nests where parasitism could be observed and/or monitored; therefore, not all nests on site are included in this total



It should be noted that Table 3.7 above includes only the nine species where at least one instance of parasitism has been observed during the project. While it is not possible to monitor for parasitism in nests which are too high, no evidence of parasitism was confirmed in 2021 for 18 additional species which represented a total of 130 nests.

**Yellow Warbler Nest with a Brown-headed Cowbird Egg (S. Birkett)**

### 3.3 The Overall Picture in 2021

The most valuable aspect of this project will be its ability to reveal changes in breeding bird abundance and diversity over time at TTP. Breeding avifauna will respond to changes in habitat distribution, composition and structure due to natural succession and habitat creation. Although the most recent years have seen a few unexpected nests (e.g., Least Bittern, Virginia Rail), the breeding bird communities (i.e., non-colonial waterbirds and landbirds) are largely typical of early successional environments. Dominant species in the past 10 years of Point Counts continue to be Red-winged Blackbird, Yellow Warbler and Song Sparrow, all of which require basic habitat conditions with a few fundamental components to thrive. The next most numerous species on Point Counts are Barn Swallow, Tree Swallow and Warbling Vireo, with the swallows being particularly significant given that all swallow species in Ontario faced population declines in recent years.

Looking at the past 10 years of data from all sources, some conclusions and trends continue to emerge. As noted in previous reports, Eastern Meadowlark and Savannah Sparrow have virtually disappeared from both the Point Counts and confirmed nests. Herbaceous vegetation at TTP is becoming denser and more widespread, which has an adverse effect on nesting suitability for these and other ground-nesting species.

With the addition of American Redstart and Carolina Wren in 2021, there are now 75 species confirmed to have bred at Tommy Thompson Park. (Note that the number of confirmed breeders in past reports has been inconsistent. The current total of 75 has now been confirmed.) This total of 75 is made up of the 49 species confirmed since the current project commenced, the seven colonial waterbirds described in Section 2 of this report (Black-crowned Night-Heron, Caspian Tern, Common Tern, Double-crested Cormorant, Great Egret, Herring Gull and Ring-billed Gull), the two managed waterfowl species also described in Section 2 (Canada Goose and Mute Swan), and the 17 species known to have bred at TTP before the commencement of the current project, but not since. Some of the 17 historical breeding records are unlikely to recur (e.g., California Gull, Wilson's Phalarope). A complete record of all bird species known to have bred at TTP is included in Appendix C, Species Accounts.

Current habitat conditions remain appropriate for nesting by some additional species, so it is anticipated that the list of known breeding species may well continue to grow. Natural succession, along with the habitat creation and restoration projects carried out by TRCA throughout TTP, such as the conversion of Cell 2 to marshland, are also expected to increase the variety of habitats suitable for species not yet on the confirmed breeders list.

It is always interesting to note the species detected during Point Counts, but for which breeding was not confirmed, versus those species not detected during Point Counts, but for which breeding was confirmed (Table 3.8). A variety of reasons exists to explain why a species could be recorded by one method, but not the other: (i) low abundance at TTP in breeding season (e.g., Trumpeter Swan), (ii) secretive habits (e.g., Least Bittern), (iii) well-hidden nests (e.g., Black-capped Chickadee), (iv) nests or normal habitat not located near Point Count stations (e.g., Canvasback), and (v) nests not normally located at TTP (e.g., Chimney Swift).

**Table 3.8 Species Recorded Only by Point Counts Versus Species Recorded Only By Nest**

Point Count-recorded Species but No Nest Found	Species With Nest Found but Not Recorded During Point Counts
Black-capped Chickadee Brown-headed Cowbird * Northern Rough-winged Swallow	American Woodcock Canvasback Carolina Wren Eastern Phoebe Gadwall House Finch Least Flycatcher Trumpeter Swan

\*Brown-headed Cowbirds do not build their own nest



## 4. Acknowledgements

The colonial waterbird and managed waterfowl data were collected and presented by TRCA staff, who also produced all of the maps in the report, as well as providing valuable assistance in editing the report.

The landbird and non-colonial waterbird section of this report is the result of the ongoing efforts of several dedicated volunteers. The 2021 Point Count observations were collected by Jack Alvo, Lynne Freeman, Don Johnston and Ian Sturdee, and the volunteer contributions to the nest searching phase of the project in 2021 are enumerated in Table 3.9.

**Table 4.1 2021 Effort by Nest Searching Project Participants**

<b>Name</b>	<b>Total Hours</b>
Jack Alvo	110
Stephanie Birkett	95
Lynne Freeman	141
Don Johnston	127
Ian Sturdee	143
Paul Xamin	102
<b>Total</b>	<b>718</b>



**Least Flycatcher (left) and Warbling Vireo (right) on Nest (J. Alvo)**

## References

- Baichich, Paul J. and Harrison, Colin J. O. 2005. Nests, Eggs, and Nestlings of North American Birds. Princeton University Press, Princeton, 347 pp.
- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage and A.R. Couturier (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xx11 + 706 pp.
- Canadian Wildlife Service. Herring Gull monitoring. Unpublished raw data.
- Dupuis-Desormeaux, Marc et al. First record of Least Bittern nesting at Tommy Thompson Park in Toronto, Ontario. Ontario Birds Volume 35 Number 3 December 2021 pp 146 – 150
- Harrison, Hal H. A Field Guide to the Birds' Nests - United States East of the Mississippi River. Houghton Mifflin Company Boston New York, 1975, 257 pp (The Peterson Field Guide Series)

Jarvie, S., H. Blokpoel, and T. Chipperfield. 1999. A geographic information system to monitor nest distributions of Double-crested Cormorants and Black-crowned Night-Herons at shared colony sites near Toronto, Canada. Pages 121-129 *In* Symposium on Double-crested Cormorants: Population Status and Management Issues in the Midwest (M.E. Tobin, ed.). USDA Tech. Bull. No. 1879. 164pp.

Kirchin, Michael J., Giuseoee E. Fiorino, Greg P. Grabas and Douglas C. Tozer, Changes in abundance of Least Bitterns in Ontario, 1995 – 2019. Ontario Birds, Volume 38 Number 3 December 2010; pp 114 - 129

McFarland, Casey, Matthew Monjello & David Moskowitz. 2021. Peterson Field Guide to North American Bird Nests. Houghton Mifflin Harcourt Publishing Company, New York. 500 pp.

Metropolitan Toronto and Region Conservation Authority. 1982. Environmentally Significant Areas Study (ESA No. 120, Tommy Thompson Park). MTRCA.

Metropolitan Toronto and Region Conservation Authority. 1994. Environmentally Significant Areas Study Update. MTRCA.

Metropolitan Toronto and Region Conservation Authority. 1996. Reefrafts for Common Terns and Fish: Guidelines for Design, Construction and Operation. Environment Canada.

Peck, G.K, M. K. Peck, & C. M. Francis. 2001. Ontario Nest Records Scheme Handbook. ONRS. Toronto, Ontario.

Toronto and Region Conservation Authority. 2008. Double-crested Cormorant Management Strategy, May 2008. Authority Meeting Recommendation #110/08.

Toronto and Region Conservation Authority. 2006. The Breeding Birds of Tommy Thompson Park Project.

Toronto and Region Conservation Authority. 2006. The Breeding Birds of Tommy Thompson Park 2006.

Toronto and Region Conservation Authority. 2008. The Breeding Birds of Tommy Thompson Park 2007.

Toronto and Region Conservation Authority. 2010. The Breeding Birds of Tommy Thompson Park 2008.

Toronto and Region Conservation Authority. 2010. The Breeding Birds of Tommy Thompson Park 2009.

Toronto and Region Conservation Authority. 2011. The Breeding Birds of Tommy Thompson Park 2010.

Toronto and Region Conservation Authority. 2011. The Breeding Birds of Tommy Thompson Park 2011.

Toronto and Region Conservation Authority. 2012. The Breeding Birds of Tommy Thompson Park 2012.

Toronto and Region Conservation Authority. 2014. The Breeding Birds of Tommy Thompson Park 2013.

Toronto and Region Conservation Authority. 2015. The Breeding Birds of Tommy Thompson Park 2014.

Toronto and Region Conservation Authority. 2016. The Breeding Birds of Tommy Thompson Park 2015.

Toronto and Region Conservation Authority. 2017. The Breeding Birds of Tommy Thompson Park 2016.

Toronto and Region Conservation Authority. 2018. The Breeding Birds of Tommy Thompson Park 2017.

Toronto and Region Conservation Authority. 2019. The Breeding Birds of Tommy Thompson Park 2018.

Toronto and Region Conservation Authority. 2020. The Breeding Birds of Tommy Thompson Park 2019.

Toronto and Region Conservation Authority. 2021. The Breeding Birds of Tommy Thompson Park 2020.

Wilson, W.G., E.D. Cheskey and IBA Steering Committee. 2001. Leslie Street Spit - Tommy Thompson Park Important Bird Area Conservation Plan. Canadian Nature Federation, Bird Studies Canada, Federation of Ontario Naturalists.

**Appendices**

## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

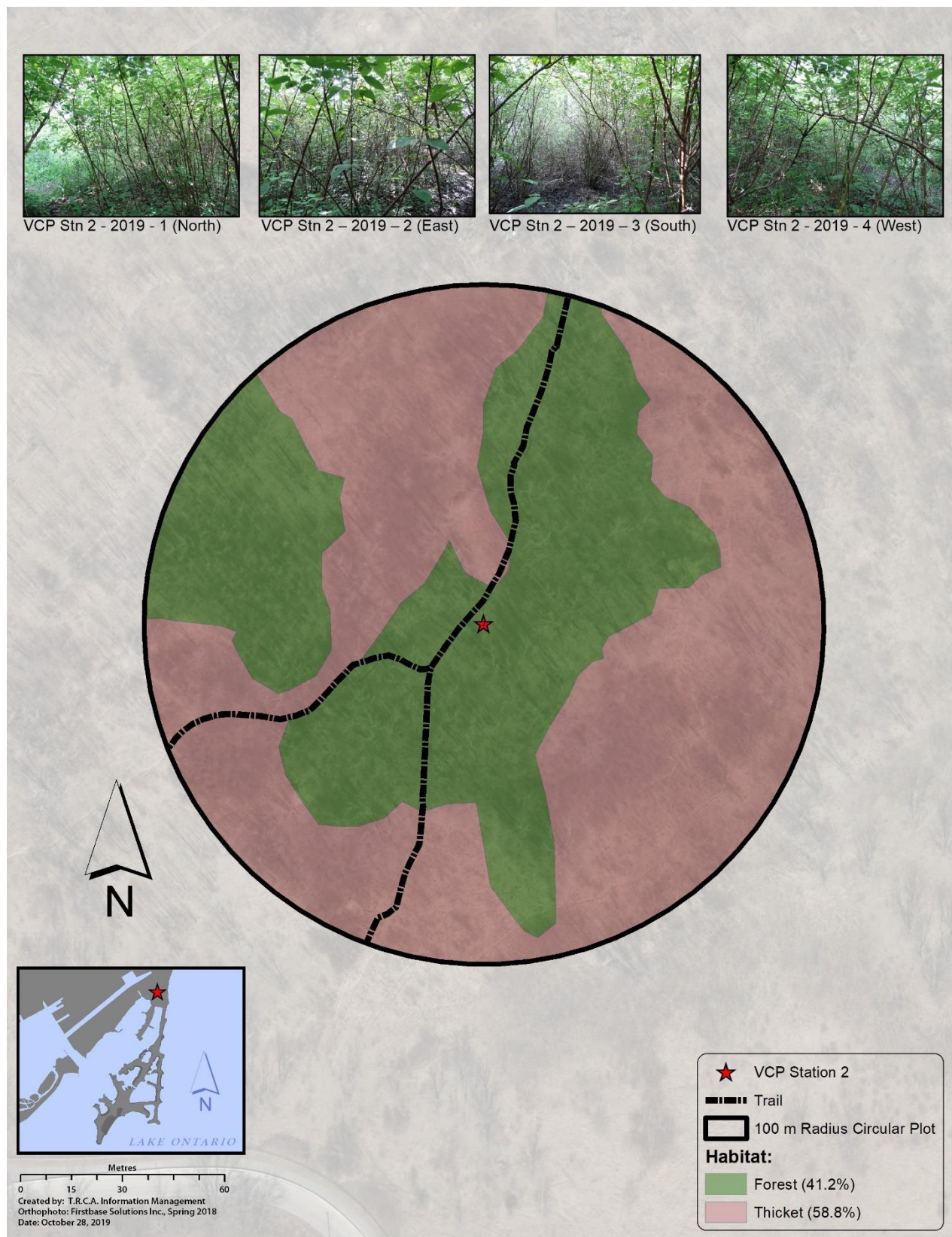
### Station 1





## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

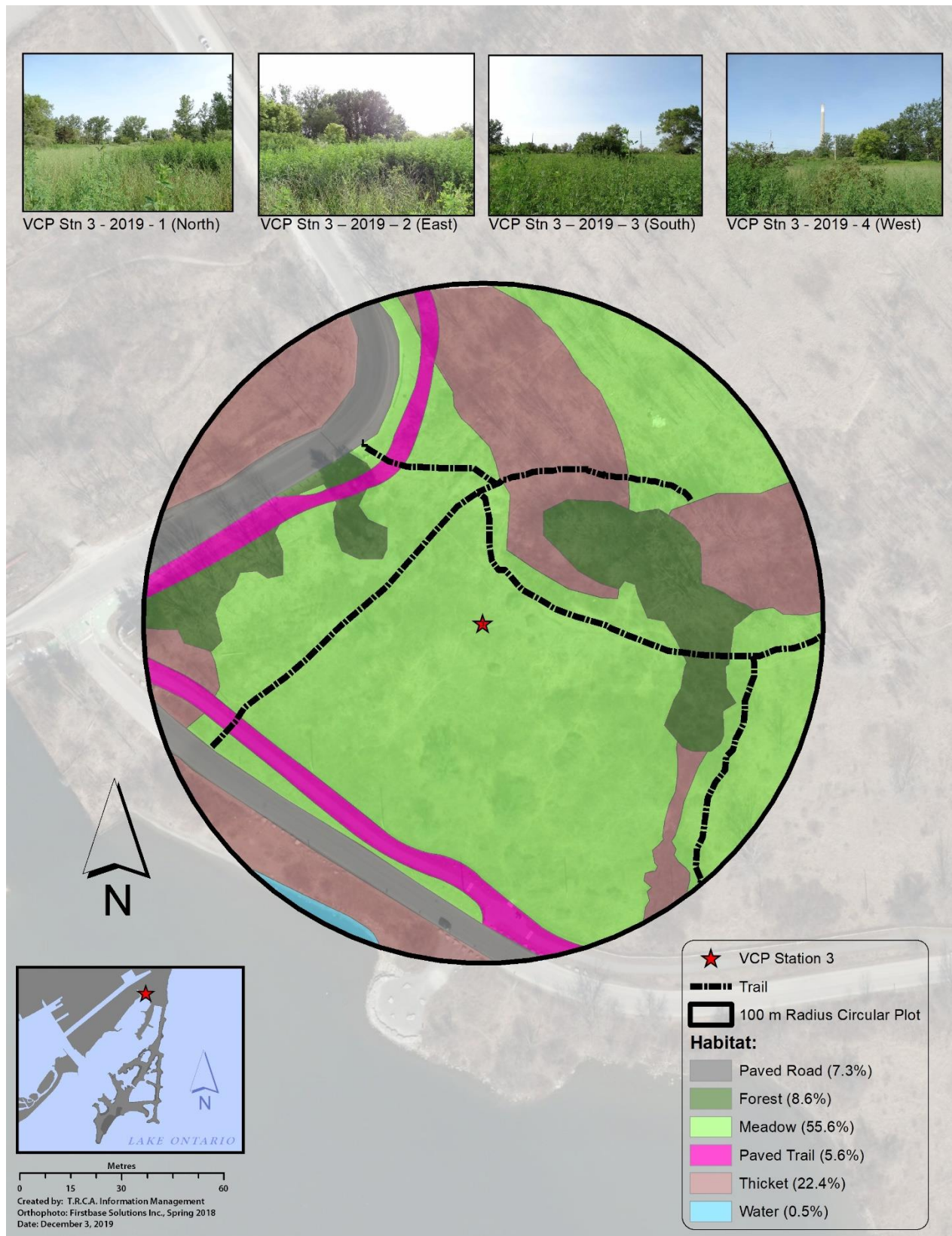
### Station 2





## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

### Station 3



## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

### Station 4





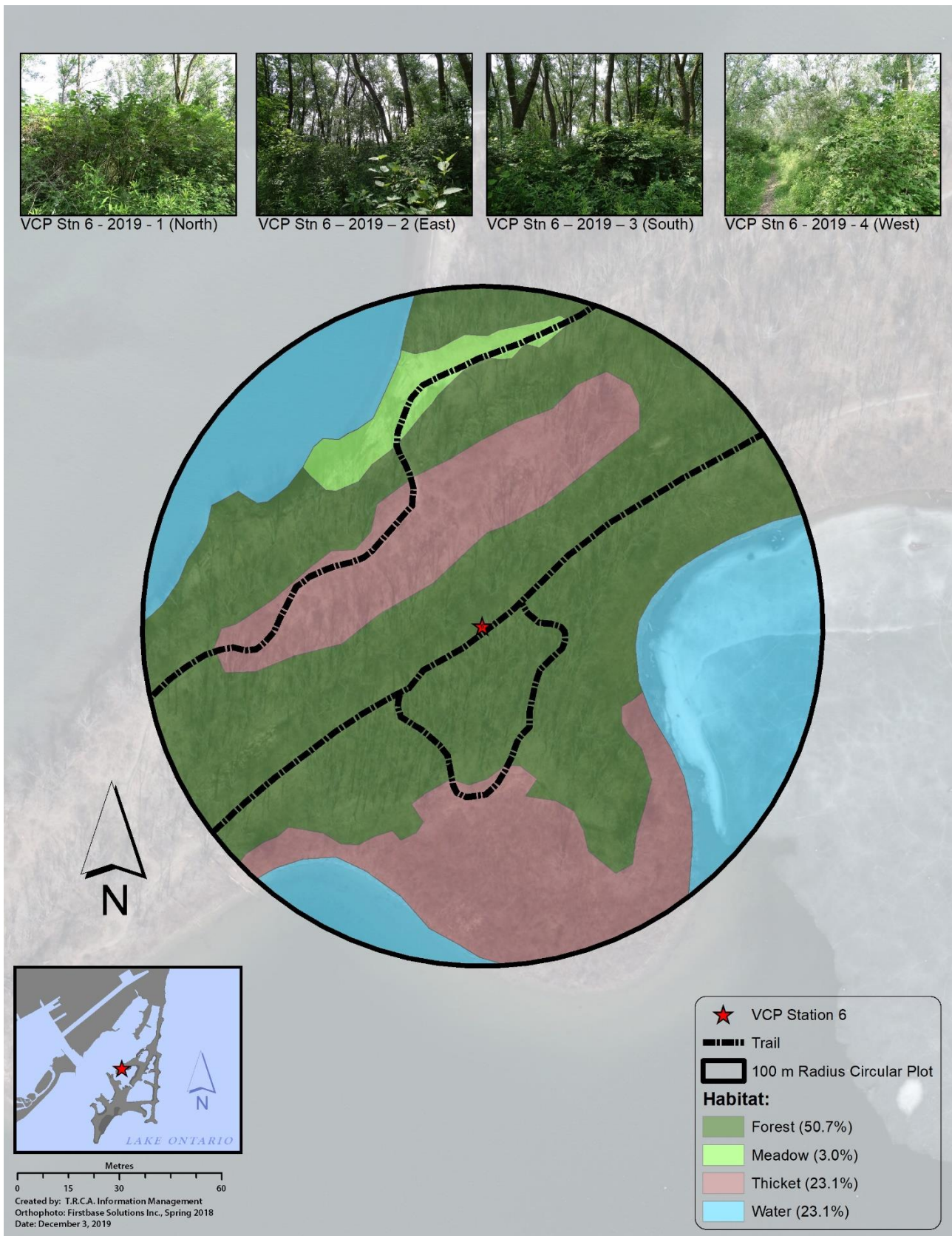
## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

### Station 5



## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

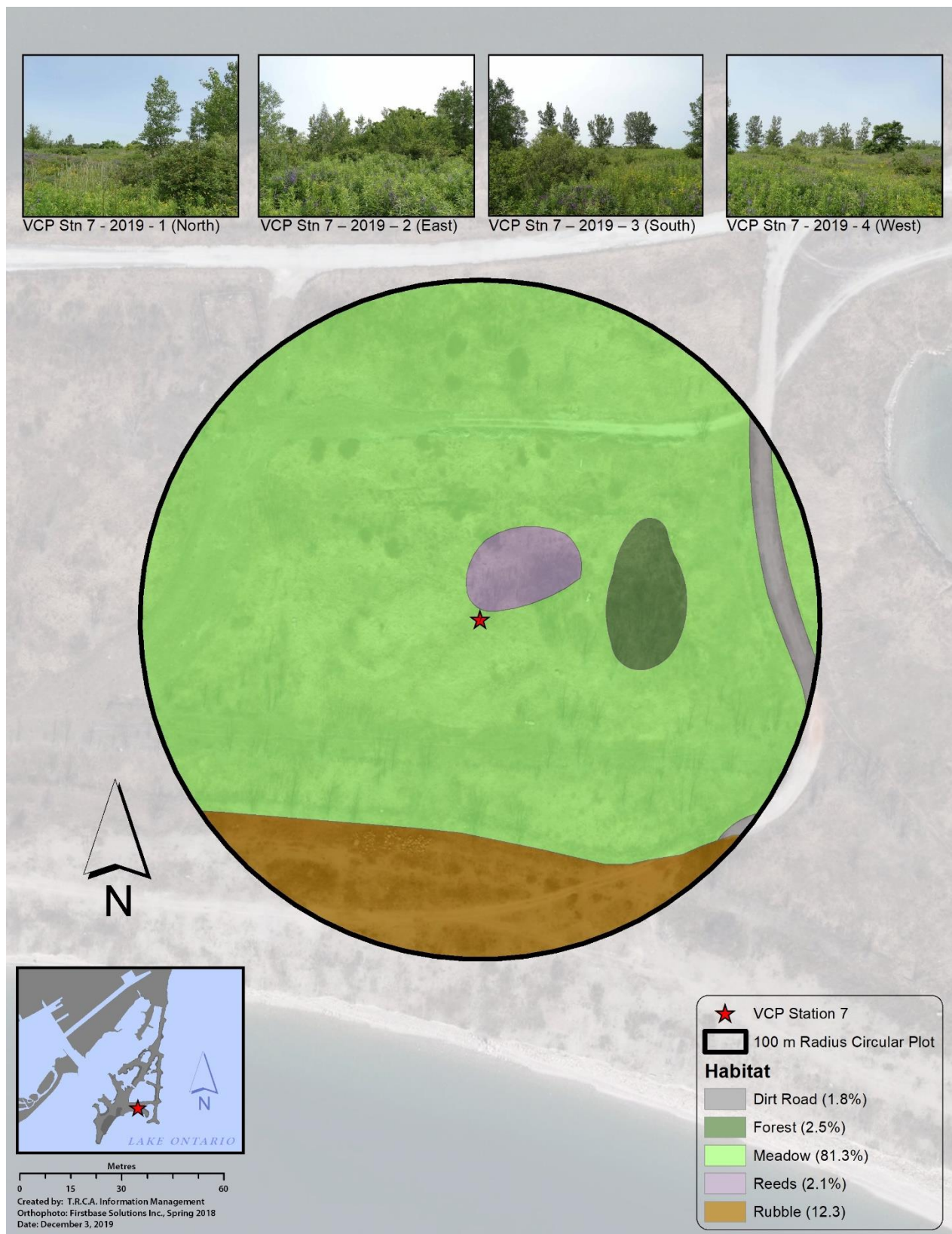
### Station 6





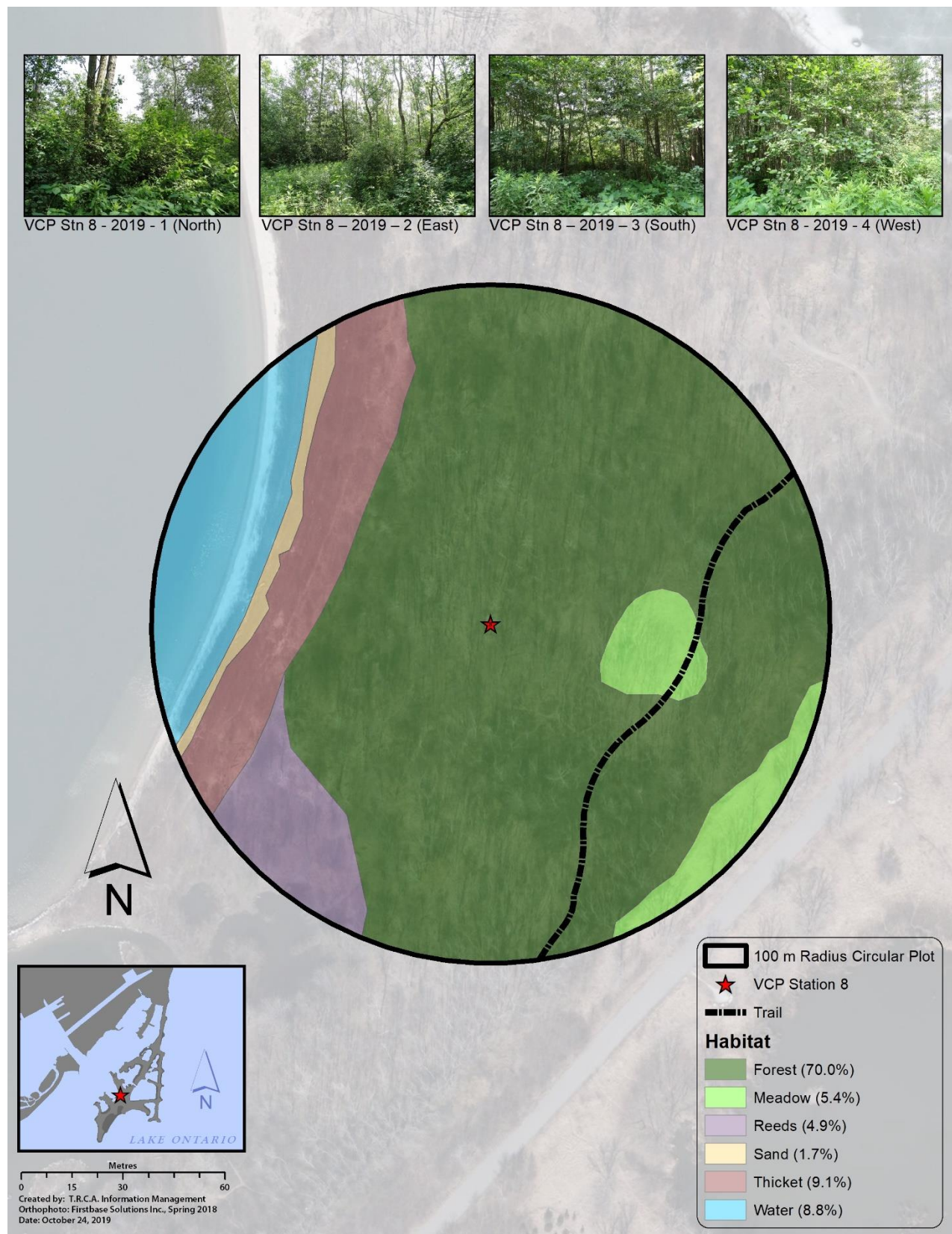
## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

### Station 7



## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

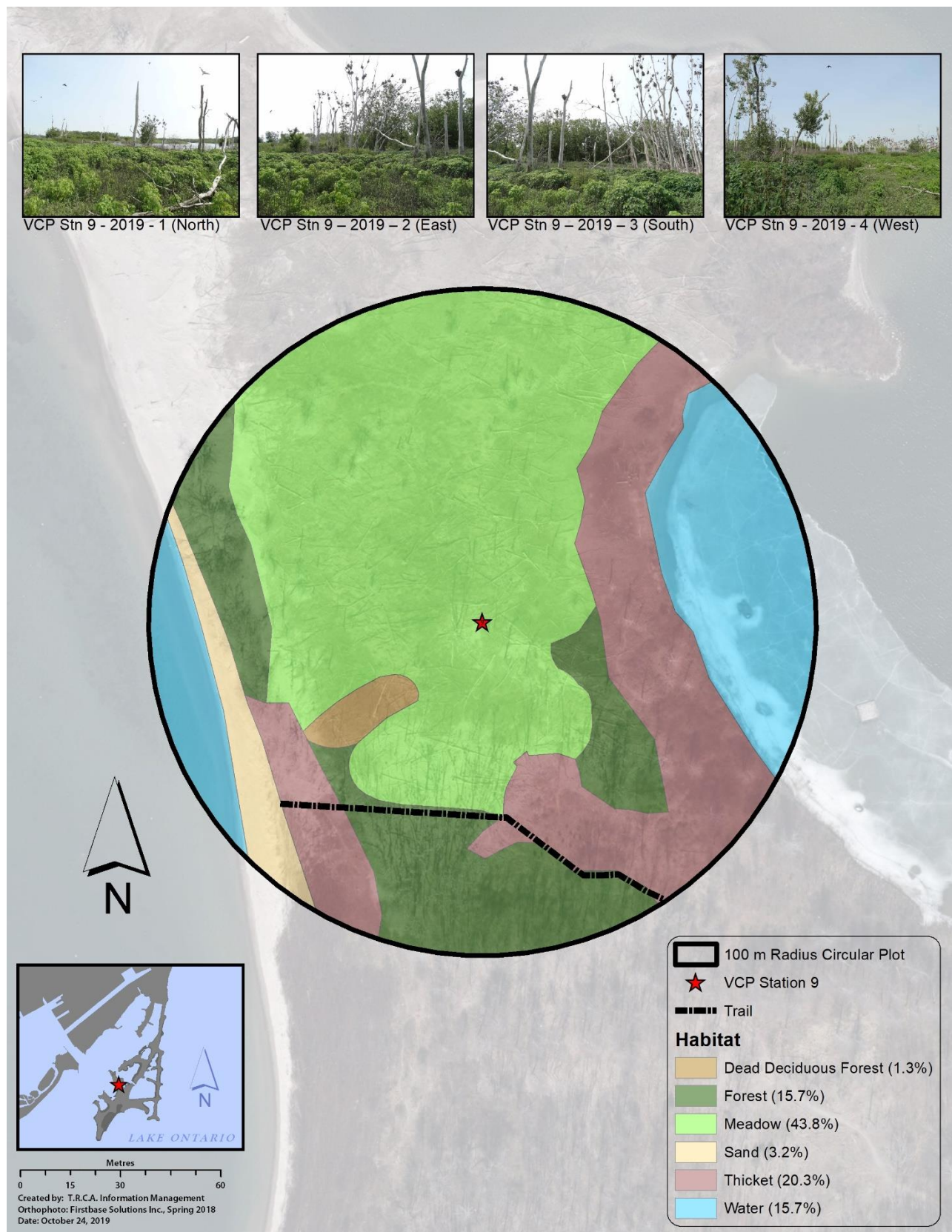
### Station 8



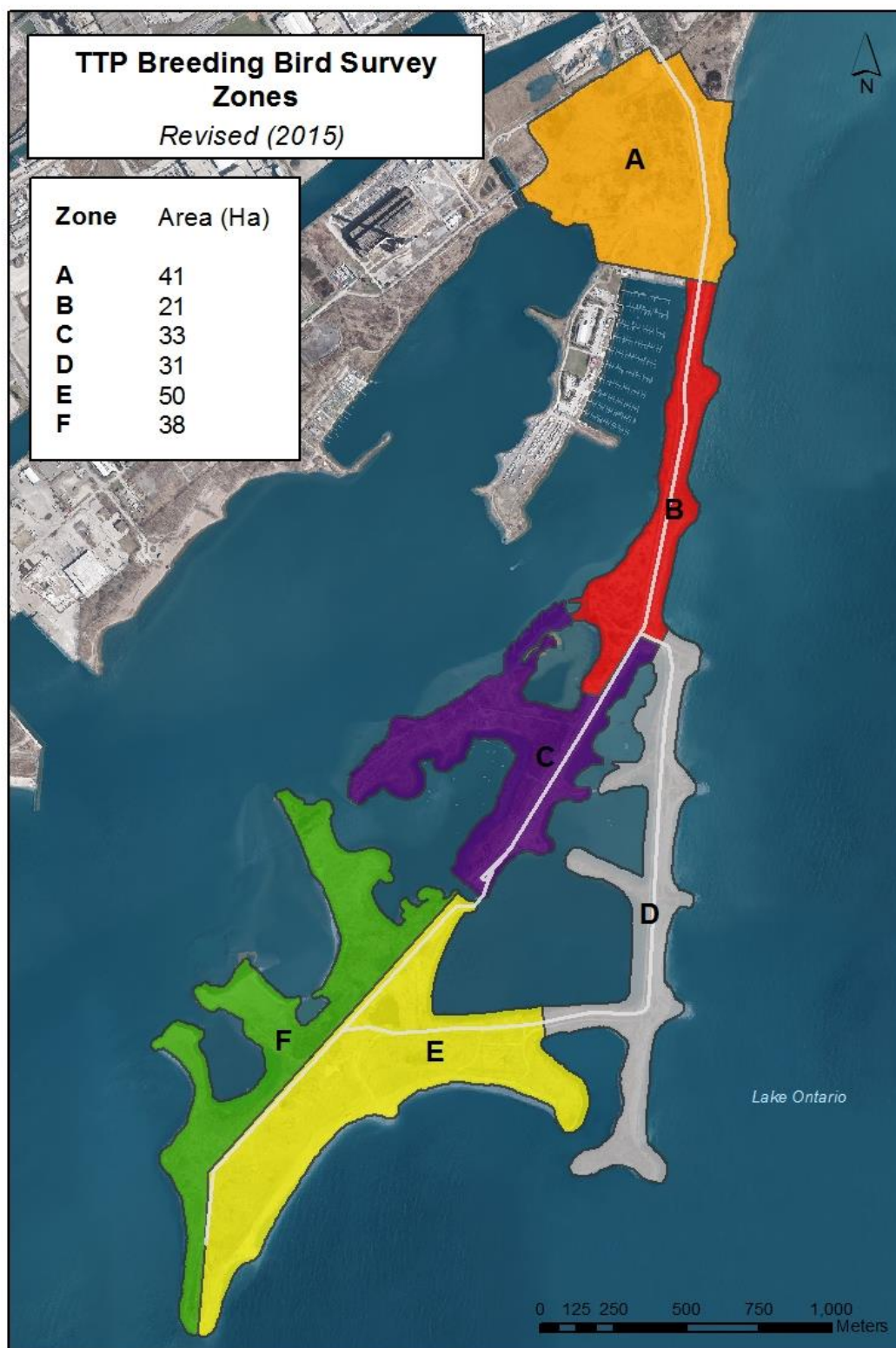


## Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

### Station 9



## Appendix B: Map of TTP Breeding Bird Survey Zones



This map was updated in 2015 to reflect a minor change in zone alignment; changes in the TTP land base due to lake-filling activities; and mapping tool refinements. This has resulted in area increases to every zone except Zone B and an overall area increase of 11.5%. The land base at TTP is expected to continue to change as habitat creation and enhancement work continues.

## Appendix C: Species Accounts

The following accounts include all species confirmed as breeders at TTP, whether in 2021 or previously, as well as any other species recorded in 2021 whose breeding range includes TTP. The species recorded in 2021 are listed below as observed, or as possible, probable or confirmed breeders, and those highlighted in red have not yet been confirmed as breeders at TTP. Species observed, but clearly out of their breeding range (e.g., most shorebirds) are not included here. For TTP locations specified below, please consult Figure 3.A, an annotated map of the park.

**Alder Flycatcher** (2021 - observed) This species has never been confirmed as a breeder at TTP. In 2021, a bird found around Cells 2 and 3 in May was presumably a late migrant.



**American Black Duck** (2021 - observed) Known to have bred historically at TTP. In 2021, a bird was observed in Cell 2 in June.

(J. Alvo)



**American Crow** (2021 - absent) Known to have bred historically at TTP.

(D. Johnston)



**American Goldfinch** (2021 - confirmed) This species is a regular late breeder at TTP, nesting in both shrubs and trees. In 2021, 14 nests were discovered, which is slightly below the most recent 10-year average.

(D. Johnston)



**American Kestrel** (2021 – absent) Known to have bred historically at TTP.

(J. Alvo)



**American Redstart** (2021 - confirmed) In 2021, this species nested for the first time at TTP. Singing males have been present throughout the breeding season in most recent years, so it was anticipated that nesting might finally be confirmed. Unfortunately, the nest, which was found in the Baselands, was predated.





**American Robin** (2021 - confirmed) Common nesting species in forested areas throughout TTP. In 2021, 129 nests were recorded, the highest total of this project. This species is one of the first to nest each year, and birds often have two or even three broods.

(D. Johnston)

**American Woodcock** (2021 - confirmed) This species is found regularly throughout much of TTP during the spring and summer. In 2021, a single nest was found in the Baselands. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests much less likely.)



**Baltimore Oriole** (2021 - confirmed) Common nesting species in forest areas of TTP. A total of 15 nests was recorded in 2021, slightly below the average of the past 10 years of this project.

(D. Johnston)

**Bank Swallow** (2021 - confirmed) In 2021, a nest was confirmed by observing adults entering and leaving the nest.



**Barn Swallow** (2021 - confirmed) Barn Swallows are regular nesters at TTP under the eaves and roofs of buildings. In 2021, 39 nests were found, down from recent years, but still slightly above the most recent 10-year average. This species, listed as Threatened on the Ontario Species at Risk list, continues to take advantage of buildings constructed by TRCA in 2011/2012.

(D. Johnston)



**Belted Kingfisher** (2021 - observed) As this species is known to breed in the area, a bird observed in May around Embayment D may have been visiting from a nearby site.

(J. Alvo)

**Black-billed Cuckoo** (2021 – possible) In 2021, birds were observed calling in June on the Flats where the species nested in previous years.



**Blackburnian Warbler** (2021 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in late May on Peninsula C was presumably a late migrant.

(J. Alvo)





**Black-capped Chickadee** (2021 - probable) A regular but uncommon cavity nester at TTP, with nests often difficult to locate. In 2021, a pair was observed in suitable nesting habitat during the breeding season.

(J. Alvo)



**Black-crowned Night-Heron** (2021 - confirmed) 82 nests were confirmed in 2021, which is 57% lower than 2020. At their peak in 2000, an estimated 30% of the Canada-wide population of Black-crowned Night-Herons were breeding at TTP.

(D. Johnston)



**Blue-gray Gnatcatcher** (2021 - confirmed) In 2021, two nests were found, slightly below the most recent 10-year average. These very small nests are always difficult to find and often moved if the birds believe the nest has been discovered.

(I. Sturdee)

**Blue Jay** (2021 - observed) This species has never been confirmed as a breeder at TTP. The birds observed in 2021 in several locations were presumably late migrants.



**Blue-winged Teal** (2021 – absent) Known to have bred historically at TTP.

(J. Alvo)



**Brown-headed Cowbird** (2021 - confirmed) In 2021, a total of 28 nests of American Robin (1), Gray Catbird (2), Red-winged Blackbird (9), Song Sparrow (2) and Yellow Warbler (14), were found to have been parasitized by cowbirds. This was a higher rate of parasitism than the previous two years, but still lower than the most recent 10-year average.

(J. Alvo)



**Brown Thrasher** (2021 – probable) Brown Thrasher is a regular but uncommon nester at TTP. In 2021, a pair was observed in suitable habitat in the Baselands during their breeding season.

(J. Alvo)

**California Gull** (2021 – absent) Known to have bred historically at TTP.



**Canada Goose** (2021 - confirmed) There were 18 nests confirmed in 2021 and these were managed according to the TRCA Canada Goose Management Strategy.

(J. Alvo)



**Canvasback** (2021 - confirmed) In 2021, a nest was found in Goldfish Pond for the second year in a row (although this one was unfortunately predated), and evidence of a second nest was confirmed by the presence of young in Triangle Pond.

(J. Alvo)



**Carolina Wren** (2021 – confirmed). In 2021, this species was confirmed as a breeder at TTP for the first time. A nest was found on Peninsula D, and a second nest was confirmed by the presence of young on Peninsula B. Birds have been present year-round on Peninsula B in recent years, and confirmation of breeding had been anticipated.

(J. Alvo)



**Caspian Tern** (2021 - confirmed) This species is an intermittent ground-nester at TTP. In 2021, nesting was attempted on Peninsula B but failed due to predation. There were 16 nests in total, the first since 2016.

(J. Alvo)



**Cedar Waxwing** (2021 - confirmed) A common late nester at TTP, usually at mid-level heights in trees. A total of 35 nests was found in 2021, slightly above the most recent 10-year average for this project.

(D. Johnston)



**Chipping Sparrow** (2021 – possible) This species has never been confirmed as a breeder at TTP. In 2021, a bird was observed singing territorially in late April in suitable habitat in the Baselands.

(J. Alvo)



**Cliff Swallow** (2021 - confirmed) This species nested at TTP for the first time in 2018. A total of 46 nests, including second broods, was recorded in 2021 under the eaves of the Nature Centre. This total was an impressive 92% higher than the previous high.

(J. Alvo)



**Common Grackle** (2021 - confirmed) Common Grackle is a regular nester in low numbers at TTP, although nests are often well hidden in trees. In 2021, 11 nests were found, the highest total of this project.

(D. Johnston)



**Common Raven** (2021 – observed) This species has never been confirmed as a breeder at TTP, although a pair has nested immediately nearby TTP in recent years. Single birds, as well as a pair, were seen from time to time foraging in TTP in 2021.

(D. Johnston)



**Common Tern** (2021 – confirmed) In 2021, Common Terns attempted nesting on the artificial nesting raft in Embayment D but abandoned it early in the nesting season. Three nests were recorded in the Cell 2 wetland.

(J. Alvo)



**Common Yellowthroat** (2021 - possible) Known to have bred historically at TTP. Singing males have been present throughout the breeding season in most recent years, and in 2021, males were observed performing territorial songs in suitable nesting habitat in several locations during their breeding season. A female was also observed near Embayment D late in the breeding season.

(J. Alvo)



**Cooper's Hawk** (2021 - observed) This species has never been confirmed as a breeder at TTP. In 2021, a pair was observed starting to build a nest in the Baselands, although it was never used. This species is known to build a number of nests before choosing one to use.

(I. Sturdee)



**Double-crested Cormorant** (2021 - confirmed) 10,737 nests were confirmed in the tree and ground nest colonies at TTP in 2021. The overall population decreased 6% from 2020. The percent of the overall colony represented by ground nesting increased to 78% from 59% in 2020. The birds at TTP represent the largest breeding colony of Double-crested Cormorants in North America. Cormorants are managed for spatial distribution, where ground nesting is encouraged and tree nesting is discouraged, following the Tommy Thompson Park Double-crested Cormorant Management Strategy.

(D. Johnston)



**Downy Woodpecker** (2021 - confirmed) A regular breeder in tree cavities at TTP, but in low numbers. In 2021, five nests were found, the highest total of this project.

(J. Alvo)



**Eastern Kingbird** (2021 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2021, a total of 39 nests was found, a new high for this species for the project and 44% more than the previous high.

(D. Johnston)

**Eastern Meadowlark** (2021 - absent) In 2010, a nest was found in the Baselands meadow habitat, although it was not successful. The change in protocol with regard to ground-nesting birds will make locating nests in future more difficult.

**Eastern Phoebe** (2021 – confirmed) In 2020, this species bred at TTP for the first time. In 2021, a nest was again found on a ledge at the TTPBRS banding station, and the pair had a second brood.



(J. Alvo)





**Eastern Wood-Pewee** (2021 – possible) In 2021, males were observed performing possible territorial songs in suitable nesting habitat in several locations at TTP during their breeding season.

(J. Alvo)



**European Starling** (2021 - confirmed) Starlings are an abundant species at TTP although their breeding density is difficult to estimate. The species is known to nest in man-made structures and natural cavities throughout the area. In 2021, three nests were found, equaling the most recent 10-year average.

(D. Johnston)



**Field Sparrow** (2021 - possible) This species has never been confirmed as a breeder at TTP. In 2021, up to four birds were observed singing territorially in May and June in suitable nesting habitat in the Baselands.

(J. Alvo)



**Gadwall** (2021 - confirmed) Gadwall has been a regular ground-nesting species at TTP. In 2021, two nests were located. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(D. Johnston)

**Gray Catbird** (2021 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. In 2021, 24 nests were found, which was 17% below the most recent 10-year average.



**Great Black-backed Gull** (2021 - absent) Known to have bred historically at TTP.

(D. Johnston)



**Great Blue Heron** (2021 - observed) Known to have bred historically at TTP. In 2021, a bird was seen in Embayment D in late June and early July.

(D. Johnston)



**Great-crested Flycatcher** (2021 - possible) This cavity-nesting species has never been confirmed as a breeder at TTP. In 2021, singing males were recorded in a number of locations at TTP in suitable breeding habitat

(J. Alvo)



**Great Egret** (2021 - confirmed) There were four nests confirmed in 2021, all on Peninsula C, a drop from 20 in 2020.

(D. Johnston)



**Green Heron** (2021 - observed) Known to have nested historically at TTP. In 2021, a bird was observed feeding in Triangle Pond.

(J. Alvo)



**Green-winged Teal** (2021 – absent) In 2017, this species was confirmed as a breeding species at TTP for the first time. Not seen in 2021.

(D. Johnston)



**Herring Gull** (2021 – confirmed) A breeder at TTP in small numbers in some years. In 2021, nesting was attempted on Peninsulas B and C, but fewer than 10 nests were confirmed.

(D. Johnston)



**Hooded Merganser** (2021 – observed) This species has never been confirmed as a breeder at TTP. In 2021, a bird was observed in Embayment D in May, and birds were also found in Embayment C in June.

(D. Johnston)



**Horned Lark** (2021 - absent) Known to have bred historically at TTP.

(J. Alvo)



**House Finch** (2021 - confirmed) Nesting by this species at TTP has been sporadic. During this project, up to three nests have been found in 2007, 2018 and 2019. In 2021, one nest was found in the Baselands.

(J. Alvo)



**House Sparrow** (2021 - possible) Known to have bred historically at TTP. This species is known to nest in cavities immediately north of TTP. In 2021, birds were recorded singing in suitable nesting habitat in the Baselands during their breeding season.

**House Wren** (2021 - confirmed) Believed to be a regular cavity nester at TTP, but in very low numbers. In 2021, two nests were found, one more than the 10-year average.

(J. Alvo)



**Killdeer** (2021 - confirmed) Killdeer is a regular ground-nesting species at TTP in open areas with low vegetation. In 2021, seven nests were found, the highest total of the most recent 10 years. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(J. Alvo)

**Least Bittern** (2021 – possible) This species, listed as Threatened both provincially and federally, was confirmed as a breeding species at TTP for the first time in 2017. It has appeared every year since, and in 2021 a bird (or birds) was observed feeding in Cell 2 and Goldfish Pond, although no nest was found.



**Least Flycatcher** (2021 - confirmed) A regular but uncommon breeder in very low numbers at TTP. In 2021, two nests were found, one more than the most recent 10-year average.

(J. Alvo)



**Mallard** (2021 - confirmed) Mallard is a regular ground-nester at TTP. One nest was found in 2021. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(D. Johnston)



**Marsh Wren** (2021 – observed) This species has never been confirmed as a breeder at TTP. In 2021, a male observed singing in Cell 2 in May was presumably a late migrant

**Mourning Dove** (2021 – possible) Mourning Dove nests have been scarce at TTP in recent years. In 2021, birds were seen in June in suitable breeding habitat in the Baselands and the Cell 1 area.

(J. Alvo)



**Mute Swan** (2021 - confirmed) This species is seen regularly in the waters around TTP, including in the winter. In 2021, one abandoned nest was recorded. Nests of this species are managed to eliminate reproduction.

(D. Johnston)

**Northern Bobwhite** A known escapee may have bred at TTP in 1980, but the species has not otherwise been recorded in the park. This species is listed here for the sake of completeness, but it is not included in the total of known breeding species at TTP.





**Northern Cardinal** (2021 - confirmed) A regular nester at TTP, although in varying numbers. In 2021, 12 nests were found, twice the most recent 10-year average. The nests of this species are usually well hidden in dense shrubs and may be abandoned if the adults believe they have been discovered.

(D. Johnston)



**Northern Flicker** (2021 - probable) Northern Flicker is an uncommon but regular cavity-nesting species at TTP. In 2021, a bird was observed visiting a nest hole on Peninsula D during the breeding season.

(D. Johnston)



**Northern Mockingbird** (2021 - confirmed) In 2021, a pair of birds was recorded nesting three times in the Baselands, the first two nestings being predated.

(J. Alvo)



**Northern Rough-winged Swallow** (2021 - probable) Nests have been detected in some recent years in the steep banks on the south shore of the Flats. A pair was seen in that area in May in 2021, and other birds were seen elsewhere at TTP.

(J. Alvo)



**Northern Saw-whet Owl** (2021 – observed) This species has never been confirmed as a breeder at TTP. A bird was observed on the Toplands in mid-May in 2021.

(D. Johnston)



**Orchard Oriole** (2021 - confirmed) This species has been a regular nester at TTP in recent years, although in low numbers. Four nests were found in 2021, the same as in 2019 and the second highest total for the project.

(J. Alvo)

**Purple Martin** (2021 – observed) This species has never been confirmed as a breeder at TTP. In 2021, birds were observed foraging on three occasions in various areas at TTP, possibly migrants or visiting from nearby nesting sites, such as the allotment gardens adjacent to TTP.

**Red-bellied Woodpecker** (2021 - observed) This species has never been confirmed as a breeder at TTP. In 2021, a bird was seen or heard a number of times in spring in the Sunken Woods.



**Red-eyed Vireo** (2021 - possible) This species has never been confirmed as a breeder at TTP. In 2021 there were several sightings of singing males in May and June, possibly indicating the presence of territories.

(J. Alvo)



**Redhead** (2021 - absent) Known to have bred historically at TTP.

(D. Johnston)



**Red-winged Blackbird** (2021 - confirmed) The most abundant nesting species at TTP (excluding colonial waterbirds), found throughout TTP. In 2021, 323 nests were found, a rebound from 297 in 2020, but still well below most recent years. No reason has been determined for the lower numbers in 2020 and 2021.

(I. Sturdee)



**Ring-billed Gull** (2021 - confirmed) In 2021, nesting was recorded on Peninsulas A and B, although there were only 3,700 nests, considerably fewer than most recent years.

(D. Johnston)

**Ring-necked Pheasant** (2021 - absent) Known to have bred historically at TTP.

**Rock Pigeon** (2021 - observed) Known to have bred historically at TTP. In 2021, birds were seen in various locations.



**Savannah Sparrow** (2021 - absent) Prior to the start of this project, Savannah Sparrow was a common ground nester in the Baselands, along the Neck and in some areas of the Flats and Toplands. No nests have been found during the project. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(J. Alvo)

**Short-eared Owl** (2021 – observed) This species has never been confirmed as a breeder at TTP. A bird was observed on the Endikement Tip in May in 2021.



**Song Sparrow** (2021 - confirmed) Song Sparrow is one of the most abundant nesting species at TTP, although few of its well-concealed nests are ever found. In 2021, nine nests were found in a variety of habitats, slightly above the 10-year average. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely, although not all Song Sparrow nests are on the ground.)

(J. Alvo)

**Sora** (2021 - absent) Known to have bred historically at TTP. Recent sightings at TTP suggest that the habitat development around Cells 1 and 2 may be starting to attract this species.



**Spotted Sandpiper** (2021 - confirmed) A regular ground nester at TTP in open areas near water. Only one nest was found in 2021, the lowest of the most recent 10 years. (The 2012 change in protocol with regard to ground-nesting birds making locating nests less likely.)

(J. Alvo)



**Tree Swallow** (2021 - confirmed) Tree Swallow is a common breeder at TTP. In 2021, 35 nests were found in nest boxes and natural cavities around TTP. This is the highest number found during this project and 25% more than the previous high.

(J. Alvo)



**Trumpeter Swan** (2021 - confirmed) Trumpeter Swans have nested in the wetlands at Tommy Thompson Park since 2013. There were two successful nests in 2021, in Cell 1 and Embayment D, with four cygnets each.

(D. Johnston)

**Virginia Rail** (2021 - absent) Although known to have bred historically at TTP, no nest had been found during the project until 2019, when two nests were found in the Baselands.



**Warbling Vireo** (2021 - confirmed) A common nesting species in forested areas in TTP, usually high in the trees, where the nest can often be found by hearing the male singing on the nest. In 2021, 27 nests were found, the same as 2020 and the second highest total for the past 10 years.

(J. Alvo)

**White-breasted Nuthatch** (2021 - possible) This species has never been confirmed as a breeder at TTP. A bird recorded in 2021 was in suitable nesting habitat during its breeding season.



**Willow Flycatcher** (2021 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2021, 23 nests were found, the highest total for the past 10 years.

(J. Alvo)

**Wilson's Phalarope** (2021 - absent) Known to have bred historically at TTP.



**Wood Duck** (2021 - confirmed) This cavity-nesting species was confirmed in 2012 as a breeder at TTP for the first time. Nesting in 2021 was confirmed by the presence of recently fledged young in both Triangle Pond and Embayment D.

(J. Alvo)



**Yellow Warbler** (2021 - confirmed) Yellow Warblers are common to abundant through much of TTP, usually nesting in dogwoods and honeysuckle. The number of nests has been increasing over the last few years, and a total of 235 nests was found in 2021, the same as in 2020 and 14% above the most recent 10-year average.

(J. Alvo)



## Appendix D: Map of 2021 Landbird Nest Locations \*



\* Excludes colonial waterbirds, Canada Goose and Mute Swan nests

## Appendix E: Breeding Status Codes for Each Species Detected In 2021

OBSERVED	POSSIBLE	PROBABLE	CONFIRMED
Alder Flycatcher	American Black Duck	Black-capped Chickadee	American Goldfinch
Belted Kingfisher	Black-billed Cuckoo	Brown Thrasher	American Redstart
Blackburnian Warbler	Chipping Sparrow	Northern Flicker	American Robin
Blue Jay	Common Yellowthroat	N. Rough-winged Swallow	American Woodcock
Common Raven	Eastern Wood-Pewee		Baltimore Oriole
Cooper's Hawk	Field Sparrow		Bank Swallow
Great Blue Heron	Great-crested Flycatcher		Barn Swallow
Green Heron	House Sparrow		Black-crowned Night-Heron
Hooded Merganser	Least Bittern		Blue-gray Gnatcatcher
Marsh Wren	Mourning Dove		Brown-headed Cowbird
Northern Saw-whet Owl	Red-eyed Vireo		Canada Goose
Purple Martin	White-breasted Nuthatch		Canvasback
Red-bellied Woodpecker			Carolina Wren
Rock Pigeon			Caspian Tern
Short-eared Owl			Cedar Waxwing
			Cliff Swallow
			Common Grackle
			Common Tern
			Double Crested Cormorant
			Downy Woodpecker
			Eastern Kingbird
			Eastern Phoebe
			European Starling
			Gadwall
			Gray Catbird
			Great Egret
			Herring Gull
			House Finch
			House Wren
			Killdeer
			Least Flycatcher
			Mallard
			Mute Swan
			Northern Cardinal
			Northern Mockingbird
			Orchard Oriole
			Red-winged Blackbird
			Ring-billed Gull
			Song Sparrow
			Spotted Sandpiper
			Tree Swallow
			Trumpeter Swan
			Warbling Vireo
			Willow Flycatcher
			Wood Duck
			Yellow Warbler

<b>Observed</b>	Species observed in its breeding season (no evidence of breeding)
<b>Possible Status</b>	Singing male present or breeding calls heard in breeding season in suitable nesting habitat Species observed in breeding season in suitable nesting habitat
<b>Probable Status</b>	Nest building or excavation of nest hole Pair observed in their breeding season in suitable nesting habitat Permanent territory presumed through registration of territorial song on at least 2 days, one week or more apart at the same place
<b>Confirmed Status</b>	Adults leaving or entering nest site in circumstances indicating occupied nest Adult carrying food for young Recently fledged young or downy young Nest containing eggs Nest with young seen or heard

## **Appendix F: Breeding Bird Report Methodologies and Protocols**

### **1. Colonial Waterbird Population Estimate Methodology**

Population estimates for tree nesting waterbirds, Double-crested Cormorants and Common Terns are conducted annually, while population estimates for Ringed-billed Gulls typically occur every 5 to 10 years with the 10-year survey coinciding with the Canadian Wildlife Service (CWS) decadal census. Individual Herring Gull nests are monitored by the CWS for ongoing contaminant research, and TRCA does not usually undertake a population census for this species. Caspian Terns are typically counted each year; however, they were absent from 2004 to 2011 and were not counted in 2012 due to their proximity to the ground nesting cormorant colony. Since 2014 Caspian Terns are counted following the Ground Nest Survey Methodology. Population estimates for any species may also be undertaken more frequently in relation to other projects/studies or to address a population concern. All estimates and analysis are conducted by trained TRCA staff and researchers, using in-field techniques. Upon completion of the survey Microsoft Excel is used to store and analyze the population data.

#### **1.1 Tree Nest Survey Methodology**

Each spring an annual census is conducted during mid-June, at the peak nesting period to determine the number of breeding Double-crested Cormorant, Black-crowned Night-Heron and Great Egret pairs, and their nest distribution. Active nests of these species are counted by a team of observers who move systematically through the colony recording the tree number, tree species and number of nests of each bird species. As noted in Jarvie et al. (1999), each tree containing a nest is marked with a circular 2.5 cm metal tag bearing a unique number (National Band and Tag #85, 0.050 mm thick) attached with a single 5 cm galvanized roofing nail which is left out approximately 2.5 cm to allow for the growth of the tree without damage. Coordinates of each tree are recorded by GPS. All new nest trees are tagged, and coordinates recorded. Every tree evaluated is marked with tree marking paint to identify that it has been counted. The tree coordinates and associated nest data are mapped with ArcView GIS software. Additionally, a sample of nest trees are evaluated in the late summer to assess their health.

#### **1.2 Ground Nest Survey Methodology**

The census for Common Tern and Ring-billed Gull is conducted at the peak nesting period, typically the last week of May or the first week of June to determine their breeding population. The Common Tern colonies nest on three floating reef-rafts and one artificial island. The colonies can be subject to predation/disturbance pressures that can result in asynchronous nesting, making it difficult to obtain a reliable estimate of the breeding population. Therefore, depending on the circumstances of the sub-colony, multiple population counts may be conducted throughout the breeding season. The reef-rafts are approximately 24m<sup>2</sup>, so all nests could be counted, noting the nest contents, by walking or canoeing the periphery of the raft. The artificially created tern island in the Cell One wetland is approximately 120m<sup>2</sup> and was more challenging to count because of its size and tall vegetation. Observers carefully walked the island in a grid pattern and noted nests and nest contents. Since 2016, a single population count has been conducted for Common Tern colonies in mid-June by aerial photography from a helicopter or drone. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest.

Ring-billed Gulls are surveyed at least every 10 years with the CWS decadal surveys, however CWS also monitors individual Herring Gull nests annually. Because of the large nesting area, the colony is divided into smaller, discrete sections, and all active nests are counted by section using the rope transect method. Ropes are used to delineate 1m wide transects and observers carefully walk the transect counting all active nests with a manual handheld tally counter and marking each nest with survey paint to identify that it has been counted. Herring Gull nests are recorded on a field data sheet and not included in the tally counter. The ropes are then moved to the next transect line until all active nests within the colony are counted. In years where individual nests are not counted, trained staff undertake population estimates of the Ring-billed Gull nesting area.

Double-crested Cormorant ground nest estimates occur once management has largely stopped to account for birds that may have attempted to tree nest and instead ground nested. Nest counts for both cormorants and Caspian Terns are undertaken at the peak nesting period using aerial photography from a helicopter or

drone. This method minimizes disturbance to the ground nesting colonies. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest.

## 2. Landbird and Non-colonial Waterbird Methodology

Starting in 2005, a combination of variable circular plot (VCP) counts, nest-searching and casual observations was employed from April – August each year (VCP counts restricted to June and July).

VCP counts provide a more sophisticated approach to determining species density than standard Point Counts. VCP counts assume a series of concentric bands around a central point, with birds being recorded according to the band in which they are seen or heard. With Point Counts, there are no bands, although in some cases birds may not be counted beyond a certain distance from the central point.

From 2005 to 2020, data were collected following the VCP protocol. However, since the VCP density calculations are complex and labour intensive, they were never employed. Instead, the data were treated as standard Point Count data, with no distinction as to in which band the birds were recorded. Commencing in 2021, it was decided to stop recording data following the VCP methodology and to start using standard Point Count methodology.

In addition to the Point Counts, nest searching and monitoring are employed to provide valuable data on breeding success, nesting ecology and relative density of nesting attempts. Casual observations are recorded to augment the monitoring.

### 2.1 Point Count Protocol

Nine Point Count station locations were initially set up based on the proportion of individual habitat types within the entire land area, and these locations have remained constant.

Between approximately June 15 and July 8, each of the nine stations is visited six times on a rotational schedule such that time of day is equally represented at all stations. All Point Counts are conducted between 7:00 am and 10:00 am and last 5 minutes at each station. The protocol involves recording start time, finish time, date and visit number for each of the stations. Temperature, percentage cloud cover and wind speed are also recorded. Counts are completed on days with fair weather conditions such that visibility is high, wind speed is low to moderate (0-15 kph) and precipitation is absent. All birds detected, including flyovers, are recorded in categories, i.e., either within 100m or beyond 100m.

As a result of the vegetation analysis completed in 2019, it was determined that the dominant habitat has changed over time for Stations 1 (from Thicket to Meadow), 2 (from Forest to Thicket) and 9 (from Forest to Mixed). Much of the thicket at Station 1 has become wetland since 2010 as a result of the recent high-water levels and new growth of phragmites. Station locations are now distributed in the following manner: two in forest habitats, four in meadow communities, two in an extensive shrub thicket (termed “shrubland”) which is bordered by forest, and one with a mixed habitat (with no habitat dominating). A summary of station information is presented below in Table F.1. The location of each station is shown in Figure 3.A, an annotated map of Tommy Thompson Park, and in Appendix A.

**Table F.1. POINT COUNT Station Information**

Station	UTM Zone	Easting	Northing	Location	Dominant Habitat
1	17	635198	4834430	Baselands	Meadow
2	17	635206	4834217	Baselands	Shrubland
3	17	634930	4834149	Baselands	Meadow
4	17	635300	4833940	Baselands	Meadow
5	17	635101	4832683	Neck	Shrubland
6	17	634360	4832165	Peninsula D	Forest
7	17	634726	4831138	Flats	Meadow
8	17	634220	4831453	Peninsula C	Forest
9	17	634215	4831680	Peninsula C	Mixed



## 2.2 Point Count Station Vegetation Protocol

The habitats at the study area are relatively young in age and may be altered or enhanced through TRCA's habitat restoration efforts, as well as natural succession. Changes in the habitats over time will also lead to changes in the bird communities and should be documented to help understand and interpret these data. Descriptions of the habitats for each of the Point Count stations were initiated in 2010, repeated in 2013, 2016 and 2021, and should continue to be repeated every three years to help quantify changes in the vegetation communities. See Table 3.1 of the report for the most recent station vegetation analysis.

In any year in which the vegetation analysis is completed, stations are surveyed once during the nesting season (June or July) to record the dominant habitat (meadow, thicket, deciduous forest, mixed forest, wetland, sand dune/sand barren, roads/trails and Lake Ontario/open water), as well as the dominant group of vegetation. Surveyors estimate major type of habitat by percentage via a field visit and orthophoto interpretation. Habitat types must sum to 100% per station. The dominant habitat types are sketched out from a bird's-eye perspective. Dominant groups of vegetation communities are estimated for each station, but do not necessarily need to sum to 100%, as vegetation that is sub-dominant or areas without vegetation are not included in this total. See Appendix A for station maps.

## 2.3 Nest Searching and Monitoring Protocol

The nest searching survey method is valuable to bird conservation because it provides indicators of breeding success and parasitism/predation rates. As shown in Appendix B, the entire land area encompassing Tommy Thompson Park/Leslie Street Spit was divided into six survey zones (i.e., A – F). Participants are assigned zones to avoid overlap in data collection, and effort is recorded separately for each zone. Table F.2 describes the primary habitat for each zone.

**Table F.2. Primary Habitat Type by Zone**

<b>Zone</b>	<b>Primary Habitat Type</b>
A	forest, meadow
B	meadow, shrubland, forest
C	forest
D	meadow, shrubland, barrens (lakefill)
E	Meadow, barrens (lakefill)
F	meadow, forest

Starting in mid to late April and continuing until late August, the zones (excluding colonial waterbird nesting areas) are searched carefully for evidence of nesting, focusing primarily on the woodland and shrubland edges favoured by species nesting at TTP. Once the nest of any landbird or non-colonial waterbird is discovered, the UTM co-ordinates are determined by GPS and recorded in field notebooks, along with a description of the nest and the habitat. Following discovery of a nest, and to the extent that time and personnel are available, the nest is monitored to determine the outcome, as well as any incidence of parasitism.

Commencing in 2012, a change in protocol was adopted with regard to ground-nesting birds. In order to avoid providing a trail which would lead predators to ground nests, project participants no longer actively seek and monitor such nests. As a result, only ground nests found accidentally are recorded, and no follow-up monitoring to determine nest outcome is conducted. Species affected by this change include American Woodcock, Belted Kingfisher, Canvasback, Eastern Meadowlark, Gadwall, Killdeer, Mallard, Savannah Sparrow, Song Sparrow and Spotted Sandpiper. These species represented 7% of nests found from 2005 to 2011, inclusive, and 2% of nests found since 2011, so the change in protocol has had some effect, although these species have never represented a significant portion of the nests that are found each year.

While most nest records gathered are submitted to Project NestWatch at Birds Canada, nests with no breeding evidence detected during one or more visits are typically not. Researchers are able to access NestWatch data via Birds Canada's NatureCounts tool. Past Breeding Bird Reports are available at [www.ttpbrs.ca](http://www.ttpbrs.ca).

## Appendix G: Notes to Annual Breeding Bird Reports 2005 to 2021

These notes are meant to assist researchers to take into account changes that have occurred in protocols and treatment of data over the life of the project from 2005 to 2018.

ONRS stands for **Ontario Nest Record Scheme**, administered by the Royal Ontario Museum, where nests were reported in the early years of the project. Nest reporting has transitioned to **Project Nestwatch**, administered by Bird Studies Canada (BSC). Researchers are able to access Project NestWatch data via BSC's **NatureCounts** tool. As of 2021, Bird Studies Canada has changed its name to Birds Canada.

Past Breeding Bird Reports are available at [www.ttpbrs.ca](http://www.ttpbrs.ca). Data spreadsheets which include nests not reported to Project Nestwatch can be obtained through TRCA (Toronto and Region Conservation Authority).

### 2005

Pages 1 to 3- detailed Tommy Thompson Park habitat overview; not repeated in subsequent reports.

The **Toronto Harbour Commission** changed its name to **The Toronto Port Authority** and then to **Ports Toronto** (see also 2016 Notes).

### 2006

Results Pages 5 and 6- an attempt to establish two smaller grids, C1 and E1 of similar habitat (the larger zones A to F are all mixed habitats) was:

**“Splitting the study area into specific zones and recording time spent in each zone allows us to assess nesting density on a spatial scale and determine species distribution. This is taken one step further by establishing grids that delineate smaller areas with a relatively homogenous habitat type. The grid in zone C (peninsula D) is primarily mixed age poplar forest while the grid in zone E (toplands) is primarily meadow. These grids therefore provide samples of nesting density and species composition within primary habitats at Tommy Thompson Park. These standardized samples will be very powerful when compared to results ten or more years from now. A breakdown of nests per species for each zone/grid is presented below in Table 8.”**

### 2008

Page 7- Nest Searching Protocol- proposal rejected:

**“The nest searching survey method is valuable to bird conservation because it provides indicators of breeding success and parasitism/predation rates. The protocol used in 2008 essentially followed the 2007 protocol. It involved exhaustive area searches of as much of the TTP area as time and personnel permitted. To satisfy the requirement of standardizing effort, a suggestion was made to limit nest searching and monitoring effort to five specific periods during the breeding season. This suggestion was not accepted for practical reasons (weather, volunteer availability), but as a compromise, the date of each visit (detection and subsequent nest checks) was recorded. This way any subset of the database could be extracted if desirable for standardizing.”**

Page 7- Nest Searching Protocol- change to method of recording data:

**“From 2008 on, the use of ONRS nest cards was discontinued in favour of recording information in field notebooks and submitting the same to ONRS online. Consequently, no unique ONRS numbers appear in Appendix B listing the data submitted to ONRS. However, each submitted record can still be identified by a combination of unique codes, such as observer code, waypoint number or UTM coordinates. “**

Page 7- Nest Searching Protocol- use of subsets C1 and E1 discontinued:



**“Starting in 2008, nests located in Grids C1 and E1 were no longer recorded separately from the rest of Zones C and E, respectively, as had been done in 2006 and 2007.”**

Page 11- New Table 9- Brown-headed Cowbird parasitism species data and rates from 2005 to 2008:

**“The rate of parasitism among known host species at TTP is shown below in Table 9. (For purposes of this report, a nest was considered parasitized if a Cowbird egg was observed, regardless of what happened to that egg.) In previous reports only a total parasitism rate was presented. With the larger data sets available in 2007 and 2008, it is reasonable to present parasitism rates by individual species. The parasitism rates were calculated as the ratio of parasitized nests to the parasitized and not parasitized nests. Nests of the parasitized species where evidence of parasitism could not be determined were not considered in the calculation.”**

## **2009**

Results Page 9- extension of nest searching period:

**“The nest searching period covered 111 days in 2008 (April 30 to August 19), and in 2009 it was extended to 131 days (April 10 to August 19), an 18% increase.”**

## **2010**

Section 2 Page 1- Colonial Waterbird Report was merged with the Breeding Bird Report:

**“Colonial waterbirds have a long history at Tommy Thompson Park and are one of the reasons the park was designated a globally significant Important Bird Area in 2000 (Wilson et al., 2000). Six species of colonial waterbirds breed at Tommy Thompson Park; three species are predominately tree nesters: Double-crested Cormorant, Black-crowned Night-Heron and Great Egret, and three species are ground nesters: Ring-billed Gull, Herring Gull and Common Tern”**

Section 3.2.1.1 Page 6- introduced vegetation surveys in POINT COUNT count circles:

**“The habitats at the study area are relatively young in age and may be altered or enhanced through TRCA’s habitat restoration efforts, as well as natural succession. Changes in the habitats over time will also lead to changes in the bird communities and should be documented to help understand and interpret these data. Descriptions of the habitats for each of the POINT COUNT stations were initiated in 2010 and should be repeated every three years to help quantify changes in the vegetation communities.”**

## **2011**

Section 3.3.2 Page 12- extension of nest searching period- repeated statement from 2009 report and amended start and end dates, but date changes were not considered material (see 2009).

**“Prior to 2009, the nest searching period was approximately May 1 – August 30, but this was extended in 2009 to approximately April 1 – September 15 in order to include more early and late nesters.”**

## **2012**

Section 3.2.2 Page 8- ground nesting protocol change:

**“Commencing in 2012, a change in protocol was adopted with regard to ground-nesting birds. In order to avoid providing a trail which would lead predators to ground nests, project participants no longer actively seek such nests. As a result, only ground nests found accidentally are recorded, and no follow-up monitoring to determine nest outcome is conducted. Species affected by this change include American Woodcock, Belted Kingfisher, Eastern Meadowlark, Gadwall, Killdeer, Mallard, Savannah Sparrow, Song Sparrow and Spotted Sandpiper. These species represented 6.2% of nests found over the first seven years of surveys and 4.1% of nests found in 2012, so there have never been many such nests found, and the change in protocol does not appear to have had a**

major impact on the number of such nests found, as they have always been notoriously difficult to locate”

## **2014**

Section 3.1.2 Page 6- change in Data Reporting- dropped earlier years from tables:

**“Commencing with the 2013 Breeding Bird Report, data from 2005 will no longer be included. While the project effort in 2005 established the methodology and determined the viability of the project, the work was completed with minimum resources, with the result that the thoroughness of TTP coverage (and consequently the number of nests detected) was not comparable to subsequent years. (Data from 2005 are still available in all annual reports prior to 2013.)”**

Section 3.3.1.1 Page 8- POINT COUNT Station Vegetation Survey- dropped 2010 Vegetation Survey from this report:

**“In both 2010 and 2013, a vegetation survey was completed for each station, resulting in the vegetation descriptions found in Table 3.3 below. In addition, Appendix B contains a habitat sketch and photographs for each station in 2013. (The habitat sketches and photographs from 2010 can be found in the Breeding Bird Reports of 2010 – 2102.)”**

## **2015**

3.3.1.2 page 11- POINT COUNT count advisory:

**“Prior to 2015, swallows were recorded differently by different project participants during the POINT COUNT counts, with the result that swallow numbers in Table 3.4 are somewhat understated for the years 2006 – 2014.”**

Table 3.5 page 13- Trumpeter Swan Nest

**“Note: A Trumpeter Swan nest was observed in 2014, but not included in the 2014 report. As another nest was observed in 2015 and reported to ONRS, it was decided to include the unreported 2014 nest in this report for completeness”**

## **2016**

Section 1.1 Page 1 first paragraph- Toronto Port Authority changed name to Ports Toronto

**“Although construction of the landform continues to the present day by *Ports Toronto* to mitigate shoreline erosion, the final size of the Spit (including the waterlots) is complete at approximately 500 hectares.”**

Section 2.2.2 Page 2 – change in Common Tern nest counting methodology

**“Since 2016, a single population count has been conducted for Common Tern colonies in mid-June by aerial photography from a helicopter. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest.”**

Section 3.1.2 Page 6- change data reporting to rolling 10-year basis:

**“Commencing with the 2016 Breeding Bird Report, project data will be presented on a rolling 10-year basis. (Data from earlier years, commencing with 2005, the first year of the project, are available in earlier annual reports.)”**

Section 3.2.2 Page 8- ONRS and Project Nestwatch:

**“While most nest records gathered are submitted to Project NestWatch at Bird Studies Canada, nests discovered after nesting is complete are typically not. Researchers are able to access Project NestWatch data via BSC’s NatureCounts tool. Past Breeding Bird Reports are available at**

**www.ttpbrs.ca.” CHANGED from 2015 3.2 page 6 “While most nest records gathered are submitted to the Ontario Nest Records Scheme (ONRS), nests discovered after nesting is complete are typically not.”**

### **2017**

3.3.2 page 16- continued annual increases in number of nests:

**“Additional reasons for the continued annual increase in nests include: (a) extensive tree and shrub planting by TRCA over recent years; (b) the natural spreading and maturation of appropriate breeding habitat in some areas, particularly dogwood, honeysuckle and reeds, which three represent the most common hosts for Redwinged Blackbirds and Yellow Warblers, the most prolific non-colonial-waterbird nesters at TTP; (c) the everincreasing nest-searching skills in the project participants; (d) the availability of more volunteer effort; and (e) the discovery of areas rich in nests that had not been explored until recent years.”**

### **2018**

Table 8 Page 19- changed Other Species Observed

**“In Table 3.8, all years of the project are shown because the “Other Species Observed” has been adjusted to eliminate species that would never breed at TTP, such as most shorebirds and north-nesting warblers. In previous reports, these northern breeders were included in the “Other Species Observed” tally. As can be seen in Table 3.8, the 44 confirmed breeders and 71 total species detected in 2018 are at the high end of the numbers recorded over the entire project to date. (In the first two years of the project, as is apparent in Table 3.8, species were more likely to be categorized as Possible Breeders rather than Other Species Observed, as has been the practice since 2007 when there is no evidence of breeding intent observed.)”**

### **2019**

Sections dealing with Colonial Waterbird and Managed Waterfowl Population Estimate Methodology and Landbird and Non-colonial Waterbird Methodology moved to new Appendix F – Breeding Bird Report Methodologies and Protocols

Appendix F, Section 2.3 (4th paragraph) – Bird Studies Canada changed its name to Birds Canada

**“While most nest records gathered are submitted to Project NestWatch at Birds Canada, nests with no breeding evidence detected during one or more visits are typically not. Researchers are able to access NestWatch data via Birds Canada’s NatureCounts tool.”**

### **2020**

The protocol followed for the “NEST” category in the “Nest Record Spreadsheet 2021” that is used to record data for this report (but not included in the report itself other than in Table 3.4) is: If a nest is built and not used then it is recorded as a “NEST”. The rationale is that this information is “data” and is more useful if it is recorded, rather than ignored, provided a nest that has been built can be correctly identified as to species. These nests are not always lined. Examples are American Robin which sometimes constructs nests which it does not use; House Wren/Marsh Wren when the male builds a nest to attract a mate but is unsuccessful, and a woodpecker that excavates a nest cavity that is not used for nesting.

If the nest is used for nesting then it becomes an active nest, subject to Nest Outcome codes in the categories of Success, Failure and Unknown.



## 2021

In 2018 (see above), the Other Birds Observed category shown in Table 3.6 and Appendix E was adjusted to eliminate species that were never expected to breed at Tommy Thompson Park. However, this change was overlooked in 2019 and 2020, such that the number of Other Birds Observed was overstated. The number has now been corrected for those years.

In Appendix F, the Variable Circular Plot (VCP) protocol was changed to a standard Point Count protocol, effective with the 2021 report:

**“VCP counts provide a more sophisticated approach to determining species density than standard Point Counts. VCP counts assume a series of concentric bands around a central point, with birds being recorded according to the band in which they are seen or heard. With standard Point Counts, there are no bands, although in some cases birds may not be counted beyond a certain distance from the central point.**

**From 2005 to 2020, data were collected following the VCP protocol. However, since the VCP density calculations are complex and labour intensive, they were never employed. Instead, the data were treated as standard Point Count data, with no distinction as to in which band the birds were recorded. Commencing in 2021, it was decided to stop recording data following the VCP methodology and to start using standard Point Count methodology.”**