

The Breeding Birds of Tommy Thompson Park

2022



Cooper's Hawk Nestlings (J. Nishikawa)

Toronto and Region Conservation Authority



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Table of Contents

1. Introduction

1.1 Study Area (Tommy Thompson Park)	1
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2. Colonial Waterbirds and Managed Waterfowl

2.1 Project Background.....	1
2.2 Results in 2022	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 2022	
3.2.1 Point Count Results.....	5
3.2.1.1 Point Count Station Vegetation Survey	5
3.2.1.2 Point Count Observations	9
3.2.2 Nest Searching and Monitoring Results.....	12
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	19
3.2.2.6 Parasitism by Brown-headed Cowbirds.....	19
3.3 The Overall Picture in 2022.....	21

4. Acknowledgments..... 22

References..... 22

Appendices

A Description of Point Count Stations (Habitat Pictures and Maps)	25
B Map of TTP Breeding Bird Zones	34
C Species Accounts	35
D Map of 2022 Landbird Nest Locations	53
E Breeding Status Codes for Each Species Detected in 2022	54
F Breeding Bird Report Methodologies and Protocols	55
G Notes to Annual Breeding Bird Reports 2005 to 2022	59

Tables and Figures

Colonial Waterbirds and Managed Waterfowl

Tables

2.1	Colonial Waterbird Nests at TTP, 2012 – 2022	4
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Figures

2.A	Colonial Waterbird Nesting Areas, 2022	2
2.B	Cormorant Nest Count at Tommy Thompson Park 2007 – 2022	3
2.C	Black-crowned Night-Heron Nest Count at Tommy Thompson Park 1998 – 2022	3

Landbirds and Non-colonial Waterbirds

Tables

3.1	2010 - 2022 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 2022	12
3.4	Total Nests by Species from 2013 to 2022	13
3.5	Nest Productivity from 2013 to 2022	16
3.6	Summary of Species Detected During Breeding Season from All Studies	19
3.7	Brown-headed Cowbird Parasitism Rates from 2013 to 2022	20
3.8	Species Recorded Only by Point Counts Versus Species Recorded Only by Nests	22
F.1	Point Count Station Information	56
F.2	Primary Habitat Type by Zone	57

Figures

3.A	Annotated Map of Tommy Thompson Park with Point Count Station Locations	5
3.B	Total Bird Abundance per Point Count Station	9
3.C	Species Richness per Point Count Station	11
3.D	Nest Density by Zone	15
3.E	Known Nest Failure Rate Trend	16
3.F	Predation Rates of the Most Numerous Breeding Species	17
3.G	Trend in Percent of Total Nests for the Most Numerous Breeding Species	17
3.H	Brown-headed Cowbird Parasitism Rate Trend	21

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 constructed 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, 332 species have been recorded at the park. In 2000, the Leslie Street Spit/TTP was named an Important Bird Area by BirdLife International due to the globally significant populations of nesting colonial waterbirds, the continentally significant numbers of overwintering waterfowl, and nationally significant numbers of migratory birds. The designation was upgraded to Key Biodiversity Area in 2022.

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 2022, five species of colonial waterbirds nested at Tommy Thompson Park, namely one species of tree-nester (Great Egret), three species of ground-nesters (Common Tern, Herring Gull and Ring-billed Gull), and one species which nests both in trees and on the ground (Double-crested Cormorant).

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

2.2 Results in 2022

In 2022 Double-crested Cormorants nested in trees on Peninsulas B and C, and on the ground on Peninsulas A and B. There was one confirmed Great Egret nest attempt on Peninsula C; however, it was abandoned before peak breeding season when the colonial waterbird counts are conducted. Though Black-crowned Night-Herons were observed in suitable nesting habitat, there were no nest attempts observed. Ring-billed Gull nesting was recorded on Peninsulas A and B, but a suspected predation event caused the gulls to abandon their nests in mid-June, leading to no successful Ring-billed Gull nesting in 2022. A couple of Herring Gull nests were observed on Peninsula B. The nesting areas of cormorants are illustrated in Figure 2.A. Common Terns successfully nested on two artificial nesting rafts in Embayment D and one in Cell 3. Two rafts, one in Embayment D and one in Cell 3, were new in spring 2022. Caspian Tern nesting was not attempted in 2022.

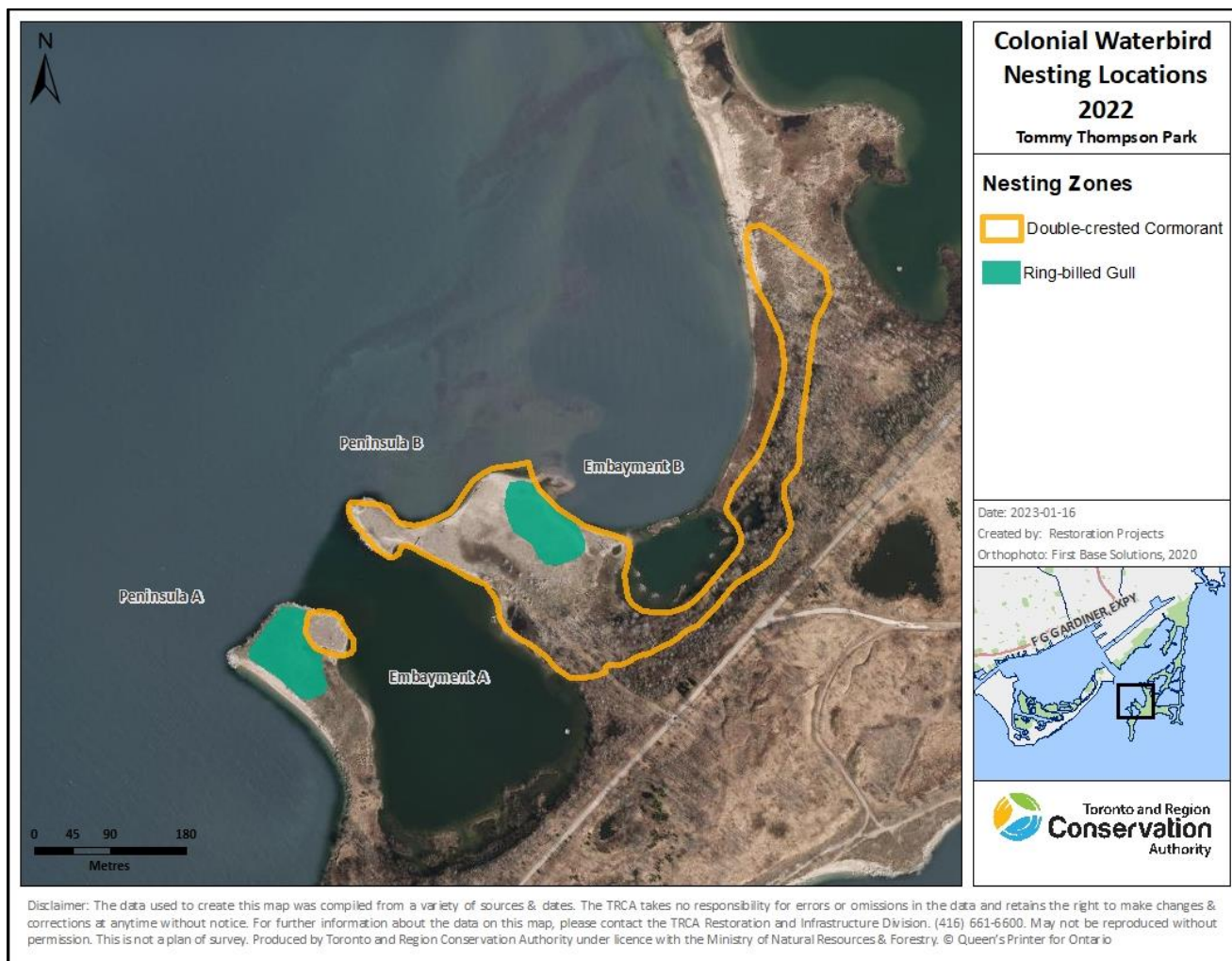


Figure 2.A. Colonial Waterbird Nesting Areas, 2022

Cormorant nests numbered 8,860, including 7,782 ground nests (Figure 2.B), which represented 88% of the population. The total number of tree-nests decreased across all peninsulas, with zero nests on Peninsula A, 96 on Peninsula B, and 982 on Peninsula C. Tree nesting density decreased in all locations, with 1 nest/tree on Peninsula B and 4.93 nests/tree on Peninsula C. Overall, the total number of cormorant nests decreased by 17% compared to 2021.

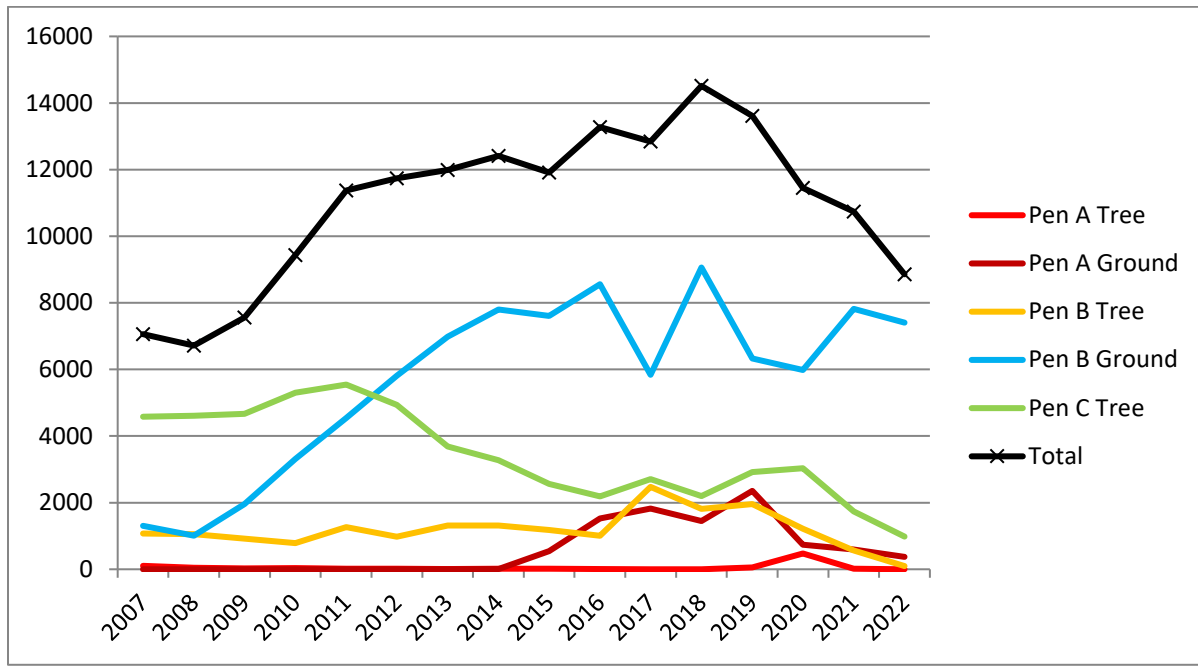


Figure 2.B. Cormorant Nest Count at Tommy Thompson Park 2007 to 2022

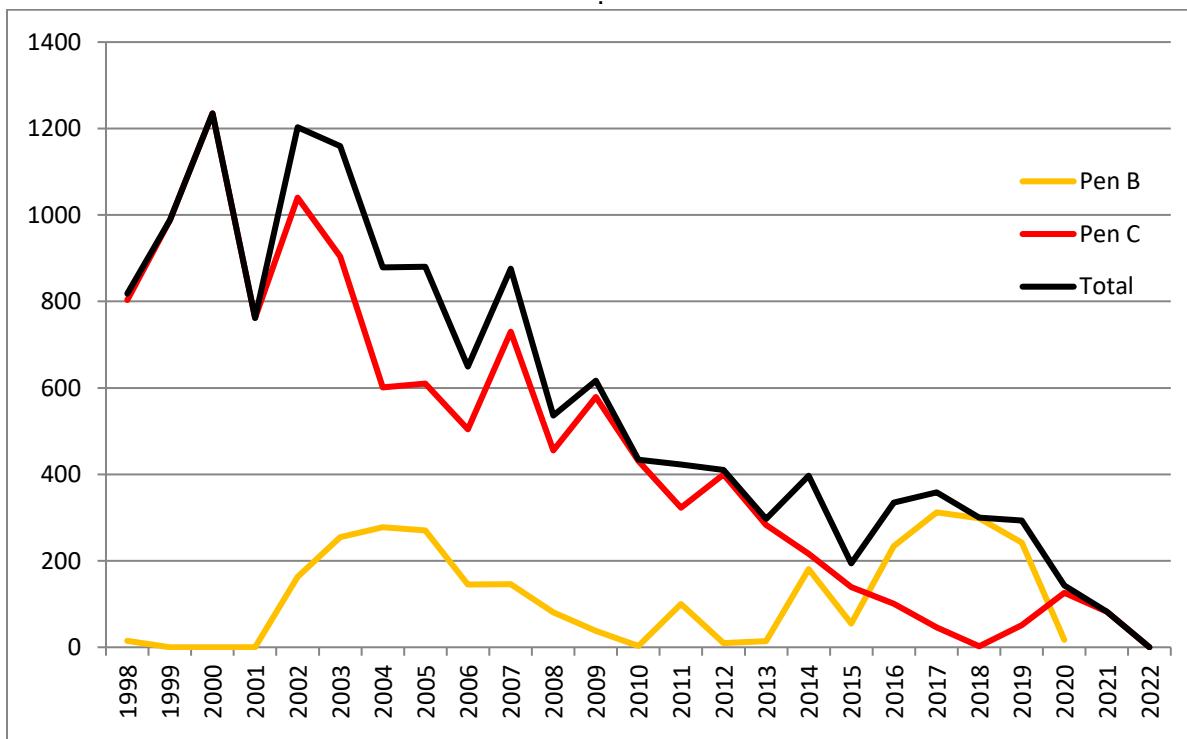
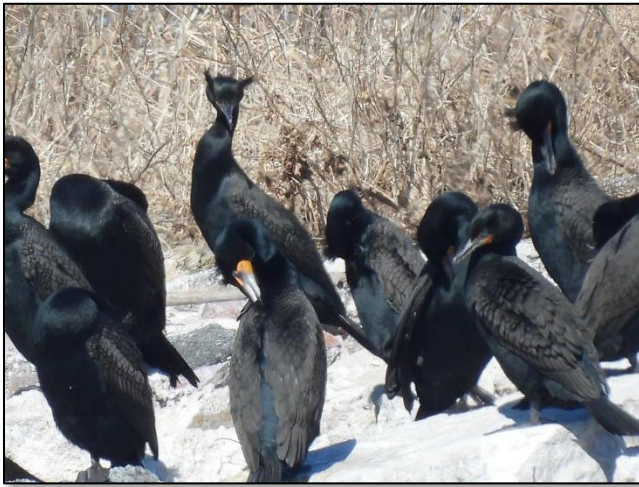


Figure 2.C. Black-crowned Night-Heron Nest Count at Tommy Thompson Park 1998 to 2022



Double-crested Cormorants (J. Alvo)

Table 2.1. Colonial Waterbird Nests at TTP, 2012 – 2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
DCCO	11,741	11,990	12,409	12,073	13,275	12,841	14,515	13,614	11,446	10,737	8,860
BCNH	410	297	397	194	335	358	300	293	143	82	0
GREG	8	4	6	6	6	11	5	10	20	4	1 ^a
RBGU	32,000*	35,000*	35,000*	35,000*	35,000*	NC	15,000*	NC	NC	3,700 ^a	2,927 ^a
HEGU	NC	NC	NC	NC	NC	NC	NC	0	NC	<10	<10
COTE	24*	0	179	176	142	142	70	90	84*	3	127
CATE	5*	98	263	NC	56 ^a	0	0	0	0	16 ^a	0

a - Nesting attempts failed

*- Estimate

NC – no count



Common Tern with Fish (L. Freeman)

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 eliminate 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 2022, 17 Canada Goose nests and 4 Mute Swan nest were managed 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 by TRCA. 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 2022

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 2022 for each station. In addition, Appendix A contains a habitat map and photographs for each station in 2022. (The habitat maps and photographs from 2010 can be found in the Breeding Bird Reports of 2010 – 2012, those from 2013 in the reports of 2013 – 2015, those from 2016 in the reports of 2016 – 2018, and those from 2019 in the reports of 2019 - 2021.) See Figure 3.A and Appendix A for station locations and Appendix F for the Point Count protocol.

As can be seen from Table 3.1, several changes in habitat occurred between 2010 and 2022. This is not surprising, however, since much of TTP is intentionally left to naturally succeed on its own. Changes of note:

- One of the most striking changes since 2010 has been the loss of meadow in Stations 1 – 4, particularly in Station 2 where no meadow now exists. Grasses and sedges have been overtaken by dogwood and willows in some areas, as well as by herbs such as goldenrod and asters and miscellaneous herbs such as vetch and nettles in other areas. Station 4 has additionally experienced a noticeable increase in phragmites.
- Since 2010, Station 3 has lost land to the Martin Goodman and Link trails, while Station 4 has also lost a portion to the Link trail.
- Station 5 has seen a considerable expansion of the forested area, as well as the amount of dogwood.
- The forested area in Station 8 has increased as the grasses and sedges have again shrunk.

- Station 9 is located within the previous tree-nesting cormorant colony, and the result of the birds' excrement has been the loss of most of the trees as well as, initially, any other vegetation. As the trees and nests largely disappeared within the Station area, the previously barren soil has started to again support vegetation, primarily miscellaneous herbs.



Figure 3.A. Annotated Map of Tommy Thompson Park with Point Count Stations

Table 3.1. 2010 - 2022 Point Count Station Vegetation Analysis

It is important to recognize that the habitat breakdown in this table is based on field observations, so the percentages included in the table should be viewed with an appropriate margin of error in mind.

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
2022 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%)	35		53	64	9	2	88	5	45
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	33	59	21	3	58	23		9	15
Deciduous Forest (tree cover ≥ 60%)	22	41	11	6	26	52	5	72	18
Dead Deciduous Forest									3
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	8			16	1		2	3	
Vegetation Sub-total (see detail below)	98	100	85	89	94	77	95	89	81
Sand Dune/Sand Barren (incl active shorelines)								2	3
Roads, Trails and other man-made areas	2		14	11	4		5		
Lake Ontario Shoreline (open water)			1		2	23		9	16
Non-vegetation Sub-total	2	0	15	11	6	23	5	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)	22	41	13	5	20	40	9	60	10
Dogwoods (e.g., Red-osier Dogwood)	29	59	28	1	40	15	2	3	17
Honeysuckles			2			12			
Shrub Willows	3			3	24	5	5	4	9
Grasses and Sedges	11			30		5	43	15	5
Goldenrods and Asters	25		8	34	4		10		
Reeds (e.g., Cattails, Bulrushes, Phragmites)	8			16	1		6	7	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)			34		5		20		40
Vegetation Sub-total	98	100	85	89	94	77	95	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 (8 and 9) which are examples of the latter.

The south view at **Station 4** (dry meadow) is an example of a station which has seen little change over the life of the project other than changes in the make-up of the ground cover.



2010



2016

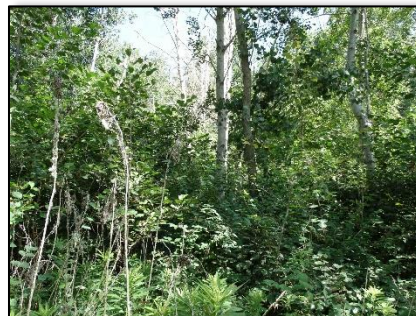


2022

Station 8 (forest – north view) showed moderate change between 2010 and 2016, but by 2022 has been seriously degraded as the Peninsula C cormorant colony has expanded into the area and the birds' excrement has started destroying the vegetation.



2010



2016



2022

Station 9 (forest – north view) was within the Peninsula C cormorant colony in 2010, and the effect of the birds' excrement on both the trees and the ground-level vegetation can be seen in 2016. By 2022, the trees and nests are gone from the north side of the station, ground cover has taken over.



2010



2016



2022

3.2.1.2 Point Count Observations

The total number of birds recorded at all Point Count stations was 990, the highest of the past 10 years. Species for which the total recorded was the highest of the past 10 years were: American Robin, Belted Kingfisher, Eastern Kingbird, Tree Swallow and Yellow Warbler. The higher number of Tree Swallows recorded was due in large part to 60 birds being recorded on one visit at station 9.

A summary of abundance per species detected by Point Counts (<100 meters) is presented in Table 3.2. As with the Tree Swallows in 2022, some of the unusually high numbers of swallows in some previous years 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 was a result of the area around Station 9 becoming more open and permitting a view of Embayment C. As shown in Table 3.2, 33 species were detected for all counts in 2022, which is slightly above the average of 32 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 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 2013 and 2014.

As can be seen in Figure 3.B below, bird abundance was good at all stations in 2022, and no station was more than 10% below its most recent 10-year average. Abundance at Stations 7 and 9 was noticeably higher, particularly at Station 9, where the dramatic increase over the last 10 years has continued in parallel with the vegetation recovery resulting from the gradual loss of the cormorant tree nests. The increase in abundance at Station 7 is difficult to explain, as the vegetation has not changed significantly in that area.

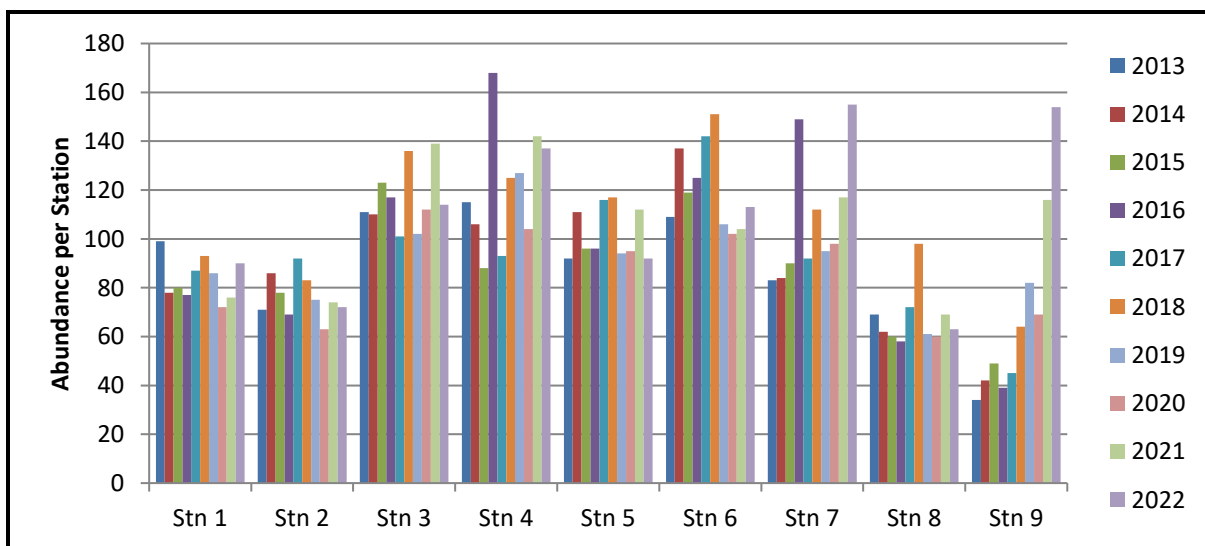


Figure 3.B. Total Bird Abundance per Point Count Station

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

Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
American Goldfinch	14	19	7	37	36	19	19	30	44	41	27
American Kestrel					1				1		
American Redstart							2	1			
American Robin	22	15	25	23	27	26	19	27	41	50	28
American Woodcock	1							1		2	
Baltimore Oriole	26	21	25	15	23	19	9	18	6	13	18
Bank Swallow	7	22	4	106	7	9	3	8	4	1	17
Barn Swallow	22	15	55	48	41	68	76	46	75	49	50
Black-capped Chickadee	3		5	7	2	3			8		3
Belted Kingfisher		1					1			3	1
Blue-gray Gnatcatcher		3	2	3	2				1		1
Brown-headed Cowbird	12	5	3	6	7	3		5	6	6	5
Blue Jay					1		1	*			
Brown Thrasher	1	3	1				1				1
Canada Goose		*			7		3				1
Cedar Waxwing	17	16	12	18	12	1	12	3	8	7	11
Cliff Swallow						*	1	6	3	1	1
Common Grackle	12	5	17	5	11	14	6	9	18	10	11
Cooper's Hawk			1					1		5	1
Common Yellowthroat		4			1		3			1	1
Downy Woodpecker	1	1			2	1	4	1	1	6	2
Eastern Kingbird	7	2	9	3	6	8	2	3	7	13	6
Eastern Wood-Pewee	8	6	9	7	2	2				2	4
European Starling	8	44	9	46	18	18	4	5	39	19	21
Gadwall	*	2			*	2	1	1			1
Great Blue Heron					*						
Great Crested Flycatcher				1		1					
Gray Catbird	16	21	12	18	22	18	33	16	22	31	21
House Wren	2	1		1		1		1	7	9	2
Killdeer	5	4	5	2	7		2	2	1	1	3
Least Flycatcher	10	4	5	1	3	6	7	1		1	4
Mallard	*	2			5	1	11	*	11	3	3
Mourning Dove	3			1	2	1					1
Northern Cardinal	5	3	3	10	21	17	4	7	8	8	9
Northern Flicker					2	4					1
Northern Mockingbird		1	1		1				1	1	1
N. Rough-winged Swallow	4	*	9	10	5	7	6	5	1	2	5
Orchard Oriole	1	1		2	2	5	1		1	2	2
Red-breasted Nuthatch				1							
Red-eyed Vireo		1									
Red-winged Blackbird	265	276	247	192	214	316	215	237	233	214	241
Savannah Sparrow				1							
Song Sparrow	66	47	51	59	57	102	93	81	114	97	77
Spotted Sandpiper	1	5	7	2	2	1	8	2	4	1	3
Tree Swallow	25	30	52	41	54	37	47	46	65	150	55
Trail's Flycatcher		2			2		2				1
Warbling Vireo	53	46	32	46	27	44	40	29	24	39	38
Willow Flycatcher	17	20	18	16	27	24	15	10	22	19	19
Yellow Warbler	146	166	155	169	181	201	177	168	173	183	172
Birds	780	814	782	897	840	979	828	770	949	990	861
Species	32	36	28	31	38	32	33	31	30	33	32

* Species observed beyond 100m and/or flying over

Species richness, or diversity, is shown in Figure 3.C below. In 2022, only three stations (4, 6 and 9) experienced diversity that was higher than their most recent 10-year average. As with abundance, Station 9 diversity continues to be enhanced by the increase in vegetation in the area. The other seven stations were all lower than their most recent 10-year average, but within 13% 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. Due to the improving biodiversity at Station 9, however, abundance and diversity are both now very similar to those of Stations 1 – 7.

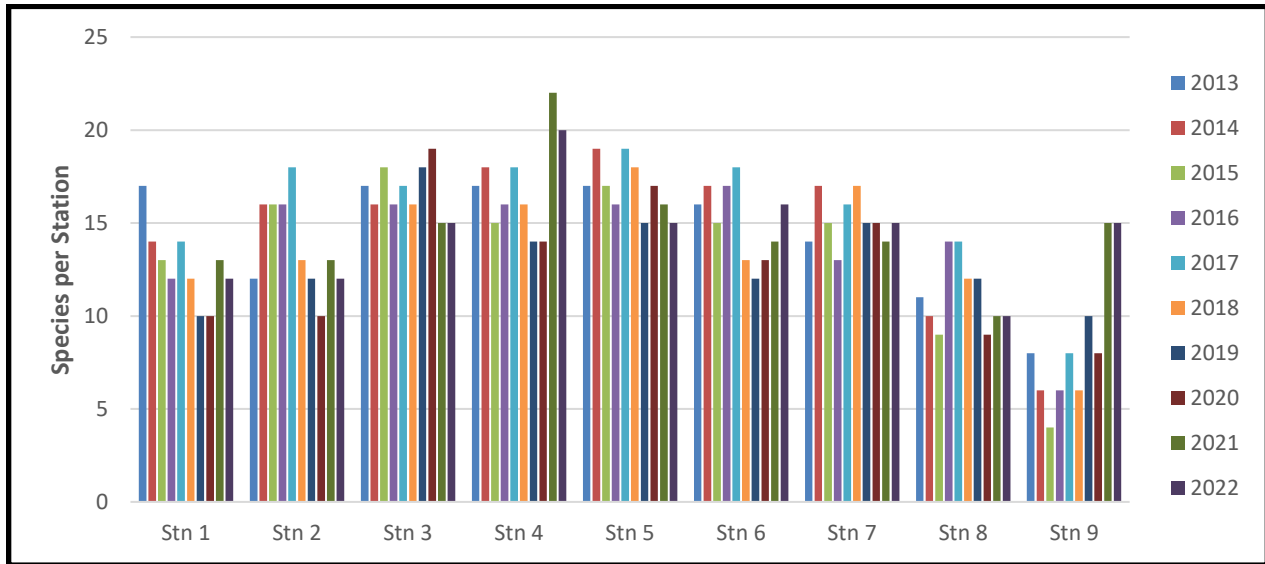


Figure 3.C. Species Richness per Point Count Station



Young Spotted Sandpiper (J. Nishikawa)



Young Barn Swallows (J. Nishikawa)

3.2.2 Nest Searching and Monitoring Results

In 2022, 1,236 nests were discovered, by far the highest total of the project. Of the total, 941 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 introduction of several new project participants, which has helped to ensure a more thorough examination of the whole of TTP.

Table 3.3 lists those species realizing new nest highs for the project in 2022.

Table 3.3. Species Reaching New Nest Highs in 2022

Species	Previous High	Number of Nests in 2022
American Robin	129	159
Bank Swallow	16	22
Canvasback	1	2
Common Grackle	11	18
Northern Cardinal	14	17
Song Sparrow	10	12

The following nesting activities in 2022 are noteworthy:

- Three new species nested at TTP in 2022: Cooper's Hawk, Hairy Woodpecker and Swamp Sparrow. A pair of Cooper's Hawks had tried to nest in 2021, so there was an expectation that they would try again, but the other two species were unexpected. There are now 78 species confirmed to have nested at TTP.
- Most swallow species continued to do well at TTP in 2022.
 - A previously undiscovered Bank Swallow nesting location was found on a steep bank on the south edge of the Flats, resulting in the identification of 22 nests, a new high for the project.
 - Barn Swallow numbers remained above the average for the past 10 years.
 - Cliff Swallow nest numbers were down from the project high in 2021 as there was insufficient mud to encourage second nesting, but 2022 still realized the second highest total since they started nesting at TTP in 2018.
 - Tree Swallow nests matched the project high of 35 realized in 2021.
 - Although Northern Rough-winged Swallow nesting was suspected, no nests were confirmed in 2022 as they typically nest in low numbers at TTP and on banks difficult to access.
- Common Grackle nests reached a new high of 18 in 2022. This continues the gradual increase over the past few years since this species started building their secretive nests in maturing conifers planted a few years ago by TRCA.
- Northern Cardinals reached a new high of 17 nests. Their nest numbers seem to fluctuate from year to year but have been gradually trending up. This species will abandon a nest if they feel threatened, so project participants must avoid any disturbance when a nest is located.
- Song Sparrow nests reached a new high of 12. Most nests of this species are found on the ground by chance, following the change in protocol in 2012 to avoid seeking ground nests, but the occasional nest is also found in shrubs or even trees.
- Yellow Warbler nests reached 318, only two less than the highest total of the project which was achieved in 2019. For the last 10 years, this species' proportion of the total nests at TTP has been gradually increasing and is approaching that of the Red-winged Blackbirds, the most common nester at TTP (other than colonial waterbirds).

Table 3.4. Total Nests by Species from 2013 to 2022

Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
American Goldfinch	17	18	16	23	26	14	13	19	14	14	17
American Redstart									1		
American Robin	93	89	78	113	125	104	122	106	129	159	112
American Woodcock			1		1				1		
Baltimore Oriole	15	35	17	18	24	16	13	14	15	13	18
Bank Swallow				15	16		1		1	22	6
Barn Swallow	26	31	24	29	49	51	51	54	39	44	40
Belted Kingfisher		1									
Black-billed Cuckoo		1		1							
Black-capped Chickadee	2	1		2	2		2				1
Blue-gray Gnatcatcher	4	6	7	6	4	4	4	2	2	6	5
Brown Thrasher	1	2	2		2	1		1			1
Canvasback		1							1	2	
Carolina Wren									1		
Cedar Waxwing	19	37	40	49	33	35	18	36	35	31	33
Cliff Swallow						24	11	13	46	28	12
Common Grackle	3	2	5	5	1	7	6	4	11	18	6
Cooper's Hawk										1	
Downy Woodpecker	1		1	2	3	1		1	5	2	2
Eastern Kingbird	21	20	27	24	25	21	14	21	39	32	24
Eastern Phoebe								1	2	2	1
Eastern Wood-Pewee		1									
European Starling	8	4	5	3	1	2		2	3		3
Gadwall	1	2	1	1				1	2	1	1
Gray Catbird	24	34	30	46	33	21	35	20	24	34	30
House Finch						2	3		1		1
House Wren					1	3	2	3	2	2	1
Killdeer	3	4	3	4	5	1		1	7	2	3
Least Bittern					2			1			
Least Flycatcher		3	2			1		2	2	3	1
Mallard	8	5	5	8	5	2	6	3	1	3	5
Mourning Dove				1	1	3					1
Northern Cardinal	1	3	2	4	14	12	5	6	12	17	8
Northern Flicker		1		1	5	3	2	1			1
Northern Mockingbird						2			3	2	1
N. Rough-winged Swallow		1	2		2		5				1
Orchard Oriole	3	2	1	2	1	3	4	5	4	5	3
Red-winged Blackbird	310	361	404	356	464	418	357	287	323	385	367
Song Sparrow	2	8	10	7	4	10	4	8	9	12	7
Spotted Sandpiper	6	3	6	3	5	4	2	2	1	1	3
Tree Swallow	12	13	20	20	28	15	18	20	35	35	22
Trumpeter Swan		1	1	1	1	2	2	2	2	2	1
Virginia Rail							2				
Warbling Vireo	13	31	12	18	21	18	19	27	27	24	21
Willow Flycatcher	13	18	15	19	18	15	19	20	23	16	18
Wood Duck						1					
Yellow Warbler	127	164	189	237	253	211	320	235	235	318	229
Total	733	902	926	1,018	1,175	1,027	1,060	918	1,058	1,236	1,005

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.

Examples of the Diversity of Nests Found in 2022



**Blue-gray Gnatcatcher
(D. Johnston)**



Canvasback (J. Alvo)



Gray Catbird (S. Birkett)



European Starling (D. Johnston)



Tree Swallows (J. Nishikawa)



**Yellow Warbler Constructing Nest
(J. Alvo)**

3.2.2.1 Changes in Nest Density for Each Zone

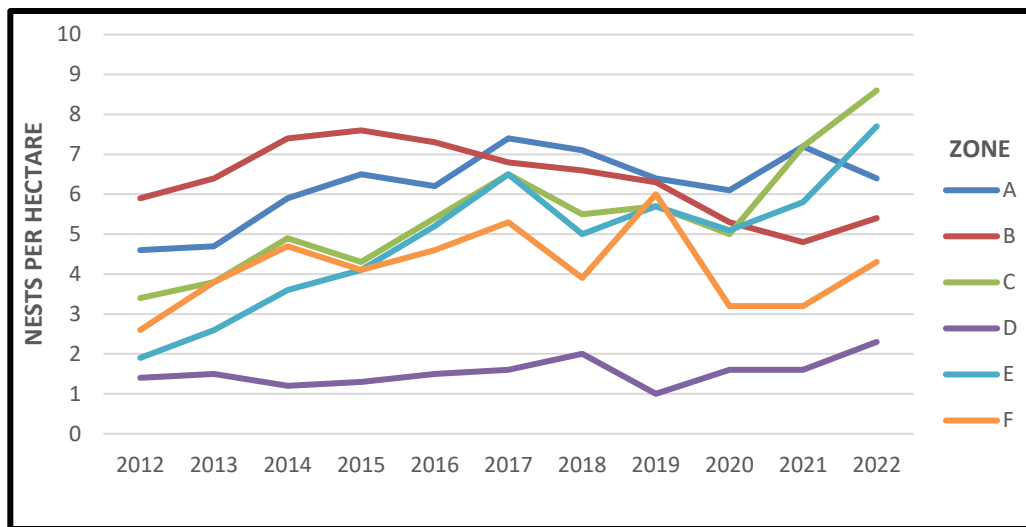


Figure 3.D. Nest Density by Zone

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.

- As might be expected given the record number of nests found in 2022, the year saw an increase in nest density in every zone except Zone A. The shrubs in Zone A have become denser to the point that there is less attractive nest habitat for Yellow Warblers and Red-winged Blackbirds. A further factor may have been the relative lack of casual water in 2022 in Zone A (the zone with the least exposure to Lake Ontario), resulting in fewer insects to feed nestlings.
- The density in Zone B was below that experienced in most of the past 10 years. The gradual decrease in recent years is presumably the result of the removal of phragmites in Embayment D in fall 2020, as well as dogwood along the Neck in 2016 when the shoreline was being enhanced for fish habitat. Further, the shrubs in the area around Point Count 5 have become increasingly dense, thereby discouraging nesters.
- Zone C nest density has been steadily increasing. A contributor in recent years has been the loss of many trees (principally birch) from the flooding in 2017 and 2019, which has created space for dogwood and honeysuckle to flourish and present nesting habitat. Both Zones C and D benefitted from vegetation regrowth after the previous removal of phragmites in Cells 1 and 2 and Embayment C. The increased staffing has also allowed more thorough coverage in all areas of both Zones C and D.
- Zone D density has been the lowest of all zones over the last 10 years due to the lack of suitable habitat. This resulted from storm damage along the Endikement and the Cell 2 construction. Now that the vegetation is recovering in these areas, there was a modest increase in density in 2022.
- Other than 2020, when nest searching had a late start due to the COVID-19 restrictions, the nest density in Zone E has been trending steadily upwards, aided by a wide biodiversity.
- The sharp decrease in Zone F in 2020 was probably linked to the significant flooding in this zone in 2017 and 2019. This flooding caused several trees to die, while simultaneously encouraging many shrubs on Peninsulas B and C to become too dense to offer suitable nesting habitat.

3.2.2.2 Nest Productivity

In 2022, 941 nests were recorded online with Project NestWatch (Table 3.5). In terms of nest productivity, of the 613 nests which had known outcomes, 147 (or 24%) failed, meaning that 466 (or 76%) were successful in fledging young. The remaining 329 nests which were monitored and reported to NestWatch, but had unknown outcomes, represented 35% 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 2022 nest failure rate of 24% reverses

the recent trend in decreasing failure rates. There is no obvious reason for this higher failure rate. (Of the 147 failures, 48 occurred at the egg stage, 8 at the young stage and 91 at either the egg or the young stage.)

Table 3.5. Nest Productivity from 2013 to 2022

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
Nests discovered	733	902	926	1,018	1,175	1,027	1,060	918	1,058	1,236	1,005
Nests monitored & reported to NestWatch	549	690	657	702	801	663	736	564	769	941	707
• Unknown outcome	266	232	226	211	301	244	243	165	251	329	247
• Known outcome	283	458	431	491	500	421	493	399	518	613	461
➤ Successful	186	338	323	388	394	335	382	338	431	466	358
➤ Failed	97	120	108	103	106	86	111	61	87	147	103
➤ Failure rate	34%	26%	25%	21%	21%	20%	23%	15%	17%	24%	22%

Figure 3.F demonstrates how the downward trend in the known nest failure rate was interrupted in 2022. It will be interesting to see whether future years determine that 2022 represented an anomaly or not.

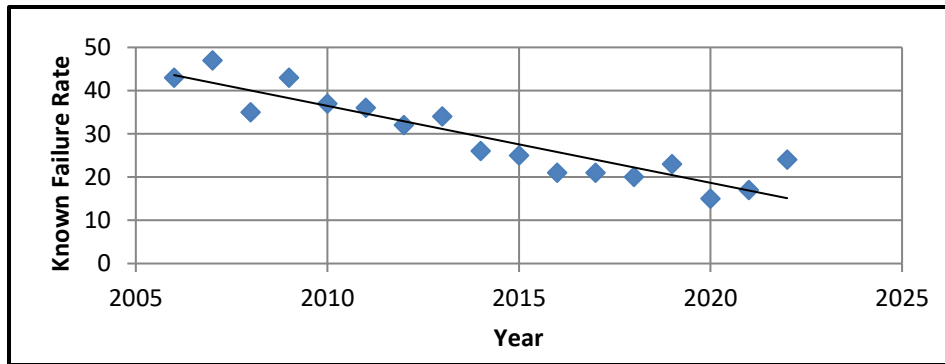


Figure 3.E. Known Nest Failure Rate Trend

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, foxes and, rarely, squirrels.

Of the 147 failed nests noted in Table 3.5 for 2022, a total of 89 nests were predated, representing 17% of nests with a known outcome. In total, 11 species had at least one nest predated in 2022, with the most common being Red-winged Blackbird at 21% of their nests with a known outcome, Yellow Warbler at 20%, and American Robin at 17%.

Predated Red-winged Blackbird Nest (D. Johnston)

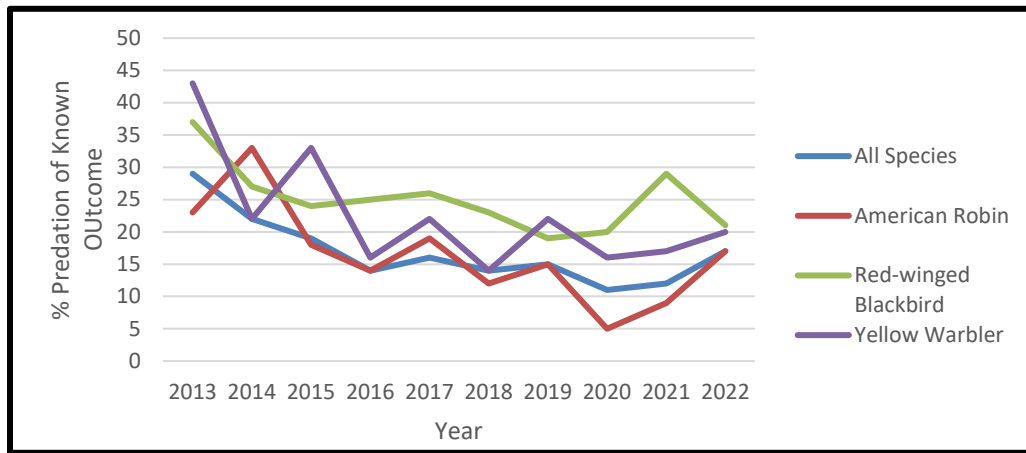


Figure 3.F. Predation Rates of the Most Numerous Breeding Species

Figure 3.F 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 for all of these converged in the 17 – 20% range in 2022, and this represented an increase in predation for American Robins, Yellow Warblers and all species combined. Red-winged Blackbird was the only species experiencing a decrease from 2021, perhaps indicating that 2021 was an anomaly for this species. It is difficult to find any reason for changes in predation from year to year.

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, and in 2022 they represented 69.7% of all nests. While the number of American Robin nests has been fairly consistent in recent years at 10 - 13% of all nests, Red-winged Blackbirds and Yellow Warblers have seen notable changes in their proportion of the total nests.

TRCA initiated a phragmites management program in Cells 1 and 2 in 2018, extended it to Embayments C and D in 2020, and then to Embayments A and B, Triangle Pond, Goldfish Pond and the Toplands in 2021. As phragmites are often used by Red-winged Blackbirds for nesting, the apparent effect of the program on this species can be seen in Table 3.4, which shows a significant drop-off in Red-winged Blackbird nests starting in 2019. Prior to 2019, blackbird nests represented approximately 40% of all nests. While the number of blackbird nests has started to show signs of recovery, for the last three years it has only been able to maintain a 31% proportion of the steadily increasing total nests. The proportion of Yellow Warbler nests, on the other hand, which was below 20% every year prior to 2015, has been gradually increasing and has surpassed 25% of all nests in three of the last four years. The overall trends depicted in Figure 3.H continue to suggest that Yellow Warblers may eventually overtake Red-winged Blackbirds as a percentage of all nests.

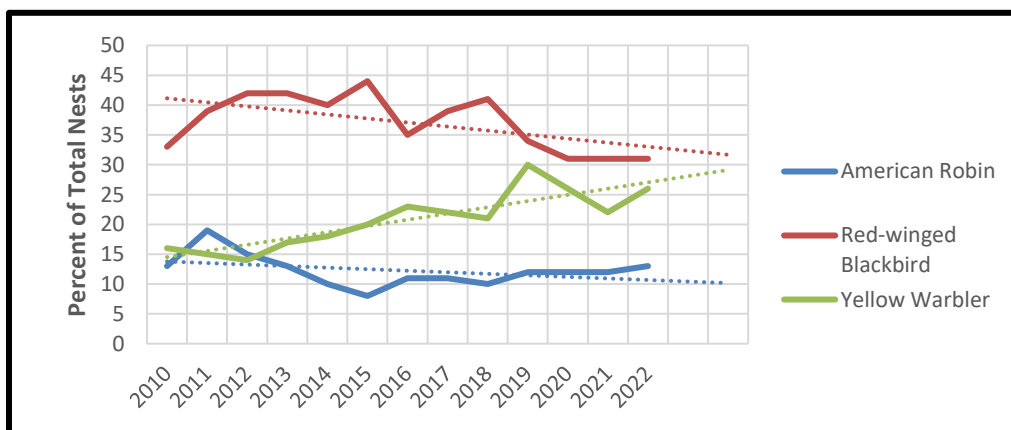


Figure 3.G. Trend in Percent of Total Nests for the Most Numerous Breeding Species

Examples of Adult Birds with Their Young Observed in 2022



Blue-gray Gnatcatchers (J. Alvo)



Canvasbacks (G. Clark)



Northern Mockingbirds (J. Alvo)



Orchard Orioles (J. Nishikawa)



Red-winged Blackbirds (G. Clark)



Trumpeter Swans (J. Alvo)

3.2.2.5 Species Detected During the Breeding Season from all Studies

As can be seen in Table 3.6, the 44 confirmed breeders in 2022 are slightly above the most recent 10-year average, while the 88 total species detected in 2022 are the highest of the last 10 years by far. These numbers are a good reflection of the general health of TTP for a diversity and abundance of species. Of particular note are the 16 “possible breeding species” in 2022, many of which have not yet nested at TTP (see Appendix E).

The first section of Table 3.6 provides a breakdown of the 44 confirmed breeders in 2022. Nests of 32 species of landbirds, including Brown-headed Cowbird, were found in 2022. Black-capped Chickadee, European Starling and Wood Duck were confirmed by the presence of recently fledged young. Hairy Woodpecker and Swamp Sparrow were confirmed at TTPBRS where individuals of both species were recaptured multiple times; these individuals had brood patches, indicating nearby nesting. When the five confirmed colonial waterbird nesters (i.e., 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 44 species nesting at TTP in 2022.

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

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	AVG
Breeding Species:											
Colonial Waterbirds	7	7	5	7	5	6	5	5	7	5	6
Managed Waterfowl	2	2	2	2	2	2	2	2	2	2	2
Sub-total	9	9	7	9	7	8	7	7	9	7	8
Landbird Nests (incl cowbirds)	26	32	29	30	33	33	29	35	36	32	32
Additional Nesting Confirmed	5	2	3	0	1	3	4	3	1	5	3
Sub-total	31	34	32	30	34	36	33	38	37	37	35
Confirmed Breeding Species (total of above)	40	43	39	39	41	44	40	45	46	44	42
Probable Breeding Species	5	5	3	4	3	2	6	2	4	4	4
Possible Breeding Species	4	8	14	11	8	5	4	7	12	16	9
Other Species Observed	11	8	15	12	17	20	20	17	15	24	16
Total Species Detected	60	64	71	66	69	71	70	71	77	88	71

3.2.2.6 Parasitism by Brown-headed Cowbirds



Red-winged Blackbird Nest with one Brown-headed Cowbird Egg (S. Birkett)

Brown-headed Cowbird parasitism is a major issue for small landbird species in open habitats and forest fragments. In 2022, a total of 18 nests of four 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 2022 of 4% was the lowest of this project and well below the 10-year average of 12%. Red-winged Blackbirds, which have seen the highest number of parasitized nests over the past 10 years, matched their lowest rate of parasitism at 4% in 2022. Yellow Warblers, the species with the second highest number of parasitized nests, had their second lowest rate in 2022 at 6%.

Table 3.7. Brown-headed Cowbird Parasitism Data and Rates from 2013 to 2022.

Brown-headed Cowbird Parasitism											
		American Goldfinch	American Robin	Gray Catbird	House Finch	Northern Cardinal	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	Totals
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%
2022	Nests checked*	8	78	20	0	6	134	6	11	149	411
	No. parasitized	0	0	0	0	0	6	1	2	9	18
	% parasitized	0%	0%	0%	0%	0%	4%	17%	15%	6%	4%
AVG	Avg nests checked *	8.2	37.4	17.2	0.3	3.7	141.5	4.6	10.8	104.5	328.0
	Avg parasitized	0.2	0.2	0.4	0.1	0.2	17.9	0.8	0.9	12.4	33.1
	Avg % parasitized	2%	1%	2%	33%	6%	13%	17%	8%	12%	10%

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

Although the overall parasitism rate has fluctuated from year to year during this project, the rate in 2022 of 4% continued the overall downward trend, as demonstrated in Table 3.7 and Figure 3.H. This trend is paralleled in the Point Counts, where cowbird numbers have remained low 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).

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 2022 for 20 additional species which represented a total of 135 nests.

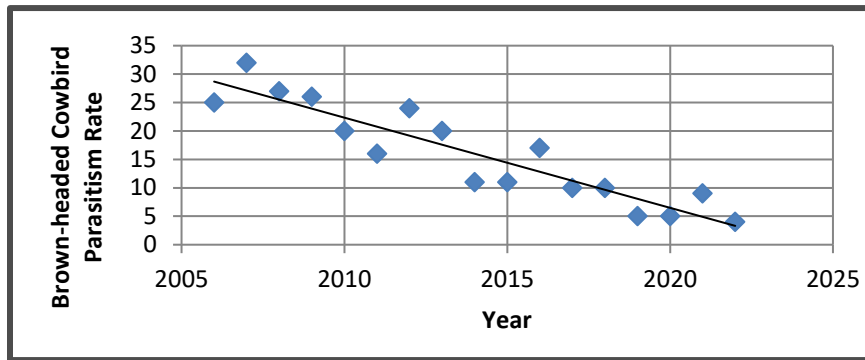


Figure 3.H. Brown-headed Cowbird Parasitism Rate Trend

3.3 The Overall Picture in 2022

The most valuable aspect of this project is its ability to reveal changes in breeding bird abundance and diversity over time at TTP. Breeding avifauna respond to changes in habitat distribution, composition and structure due to natural succession and habitat creation.

The year 2022 marks the completion of the 18th consecutive year for the landbird and non-colonial waterbird project. Over those years, and particularly during the last 10 years, significant changes in habitat have taken place at TTP, some of which have resulted in a decrease in nesting habitat:

- The floods in 2017 and 2019, as well as the appetite of the expanding beaver population, have resulted in the loss of many trees on the four peninsulas.
- Natural densification of the principal shrubs such as dogwood, honeysuckle and willows has made some areas in the Baselands, Neck and Peninsulas B and C unsuitable for nesting.
- The spread of invasive species such as white sweet clover, spotted knapweed, phragmites, dog-strangling vine and black locust trees has also made some areas unsuitable for nesting and reduced the amount of meadow, particularly in the Baselands, the area south of Cell 3 and Toplands.

At the same time, nesting habitat has been enhanced by a variety of TRCA projects:

- The creation of a wetland in Cell 2 (Cell 1 having been converted previously).
- Construction of the Nature Centre, Environmental Shelter and Bird Research Station with overhangs that provide welcome nesting habitat for swallows, which have seen their numbers declining elsewhere in recent years.
- Planting of thousands of shrubs and trees.
- Management of phragmites and dog-strangling vine in many areas, which is allowing the return of native species.

Although these TRCA projects have sometimes temporarily disrupted normal nesting in some areas, the bird population has demonstrated its adaptability and resilience, as is evidenced by the 1,236 nests discovered in 2022, the highest total of the 18 years. Further, new species continue to find a place to nest at TTP, with the total now standing at 78 species. It is true that some species, such as grassland-nesting species (e.g., Eastern Meadowlark, Bobolink and Savannah Sparrow), will not be attracted to nest at TTP due to habitat requirements, but habitat restoration and creation projects such as the wetlands will encourage new species to nest. In the meantime, the dominant landbird nesting species continue to be American Robin, Red-winged Blackbird and Yellow Warbler, all of which only require basic habitat conditions with a few fundamental components to thrive.

As has been done in past annual reports, it is 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). Reasons that address why a species might be recorded by one method, but not the other include: (i) low abundance in breeding season (e.g., Trumpeter Swan), (ii) secretive habits (e.g., Blue-gray Gnatcatcher), (iii) well-hidden nests (e.g., American Woodcock), and (iv) nests or normal habitat not located near Point Counts (e.g., Canvasback).

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
American Woodcock Black-capped Chickadee Common Yellowthroat Eastern Wood-Pewee European Starling Northern Rough-winged Swallow	Blue-gray Gnatcatcher Canvasback Eastern Phoebe Gadwall Trumpeter Swan



Similar Eggs and Nests – Common Grackle (left) and Red-winged Blackbird (right) (D. Johnston)

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 provided valuable assistance in editing the report.

The landbird and non-colonial waterbird section of this report is the result of the efforts of dedicated volunteers: Jack Alvo, Stephanie Birkett, Gwendolyn Clark, John Crawford, Lynne Freeman, Alex Hoffman, Emily-Kate Hunter, Don Johnston, Annette Lambert, JohN Nishikawa, Ian Sturdee and Paul Xamin.

The 2022 Point Count observations were collected by Jack Alvo, Lynne Freeman, Don Johnston and Ian Sturdee.

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Appendices

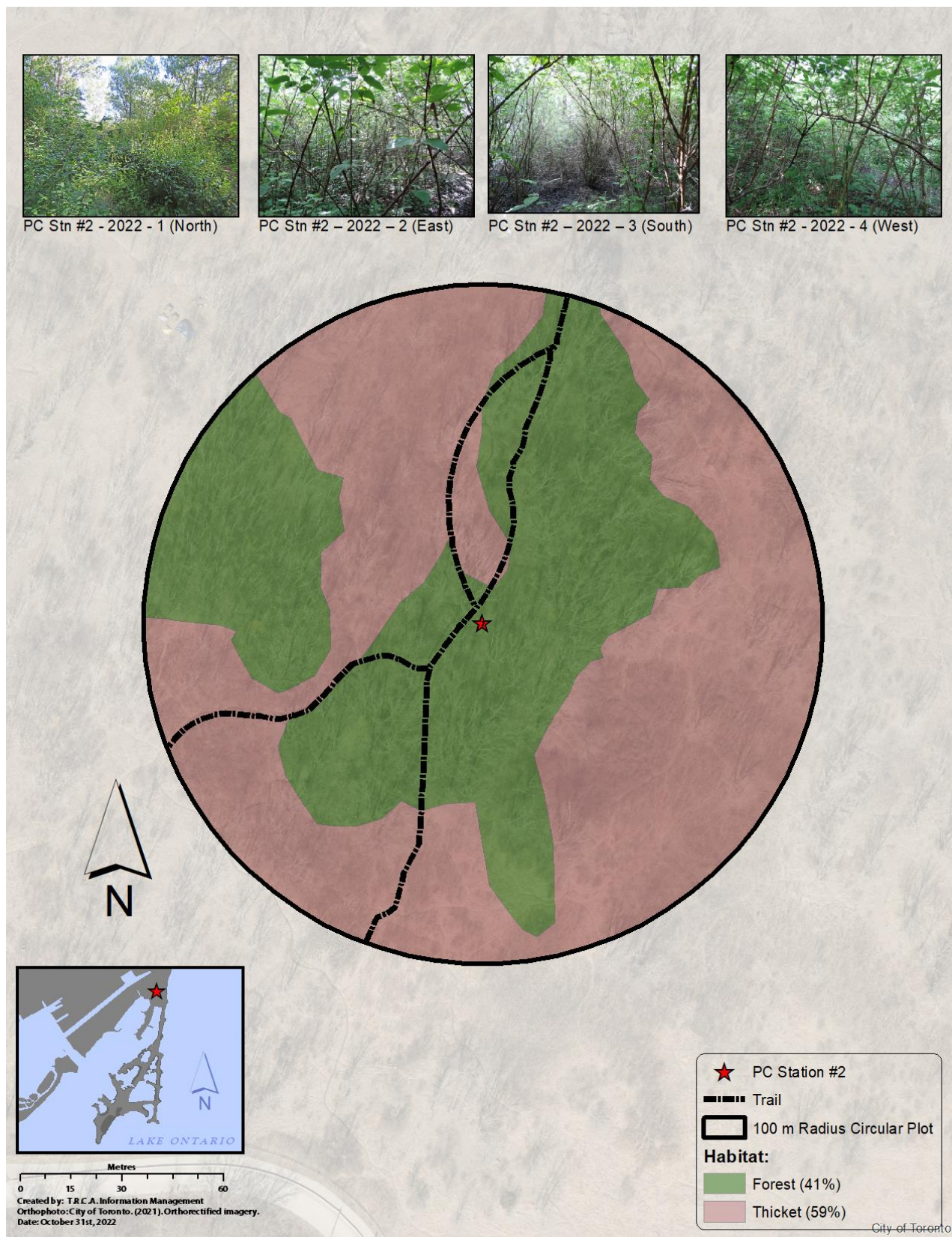
Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

Station 1



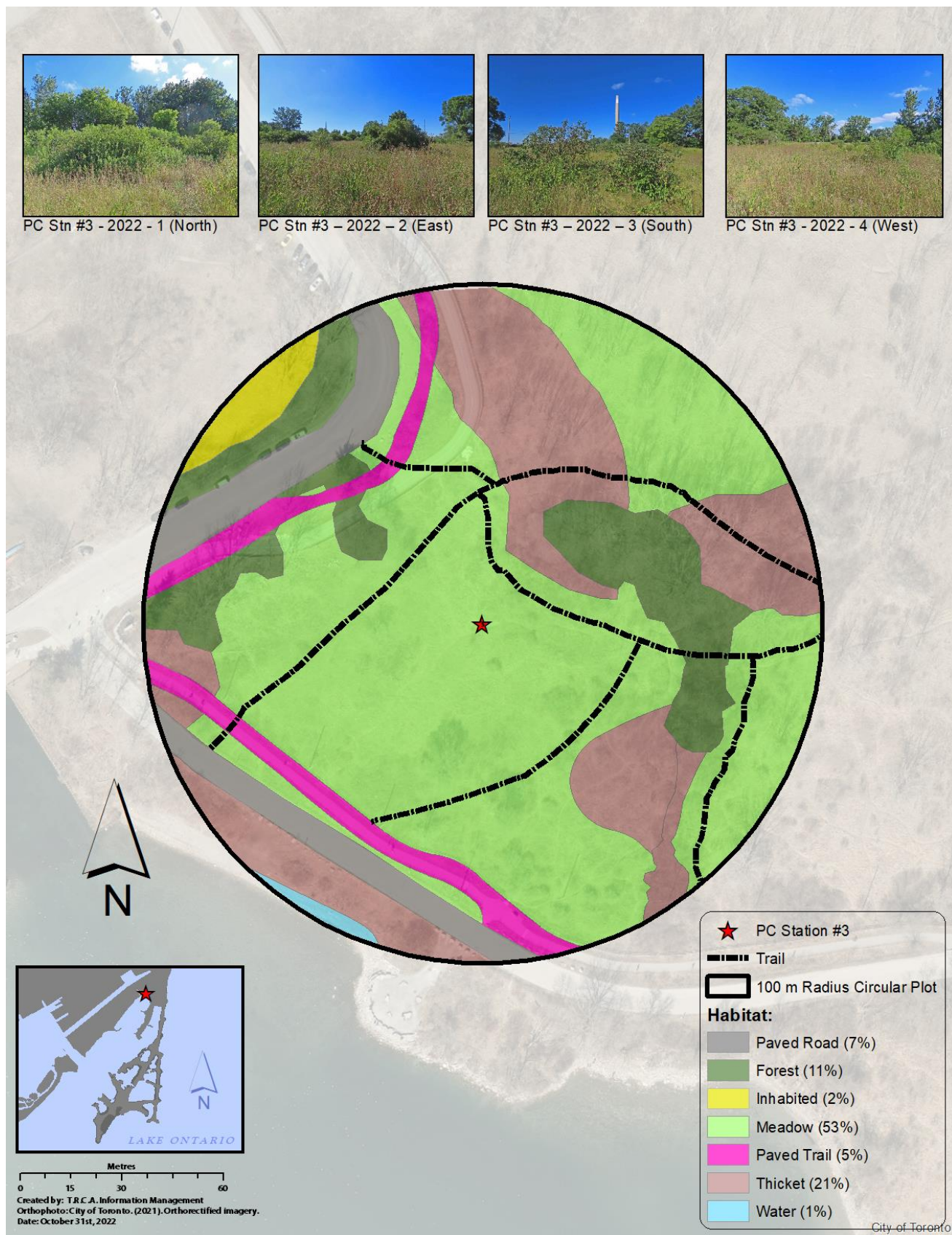
Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

Station 2



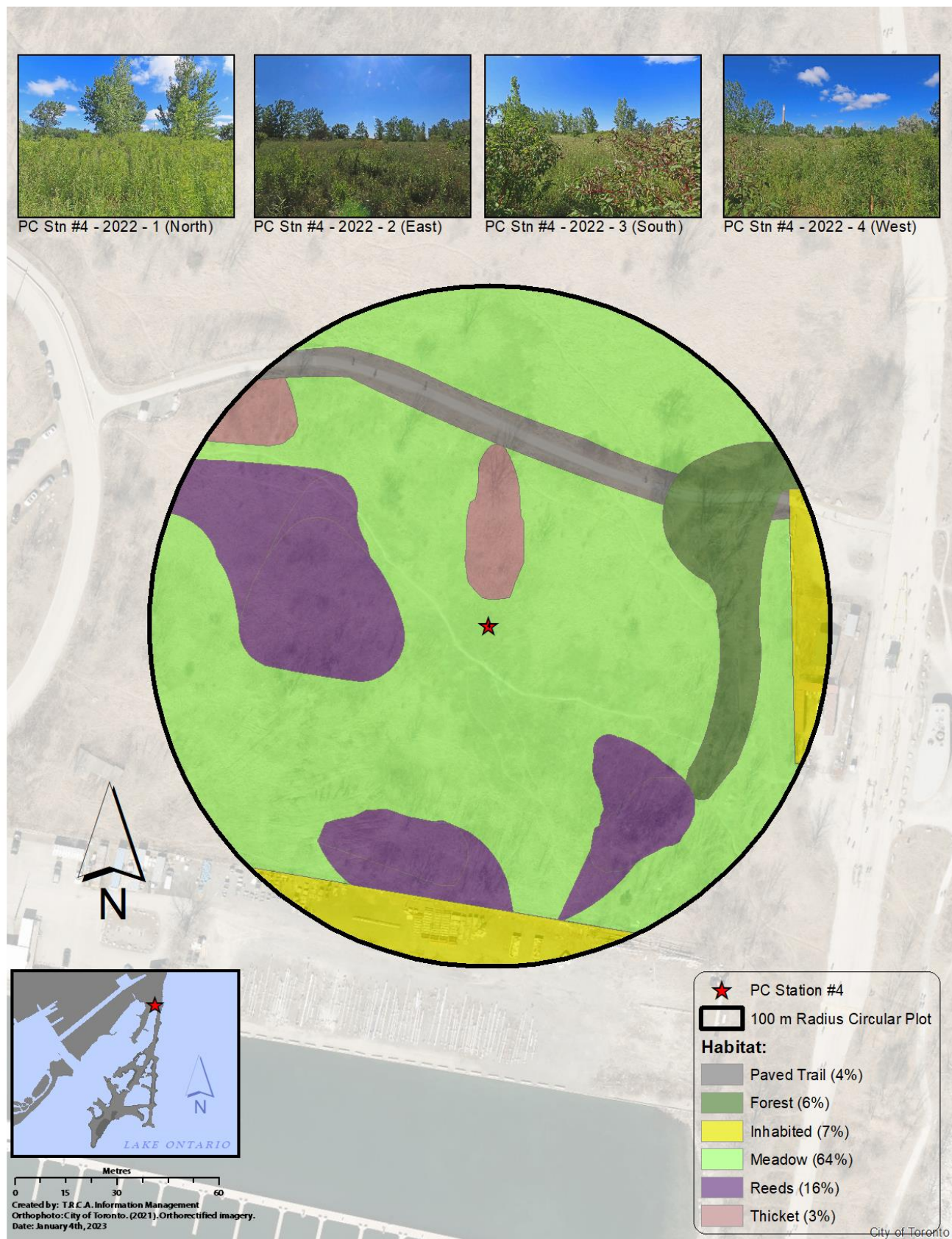
Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

Station 3



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

Station 4



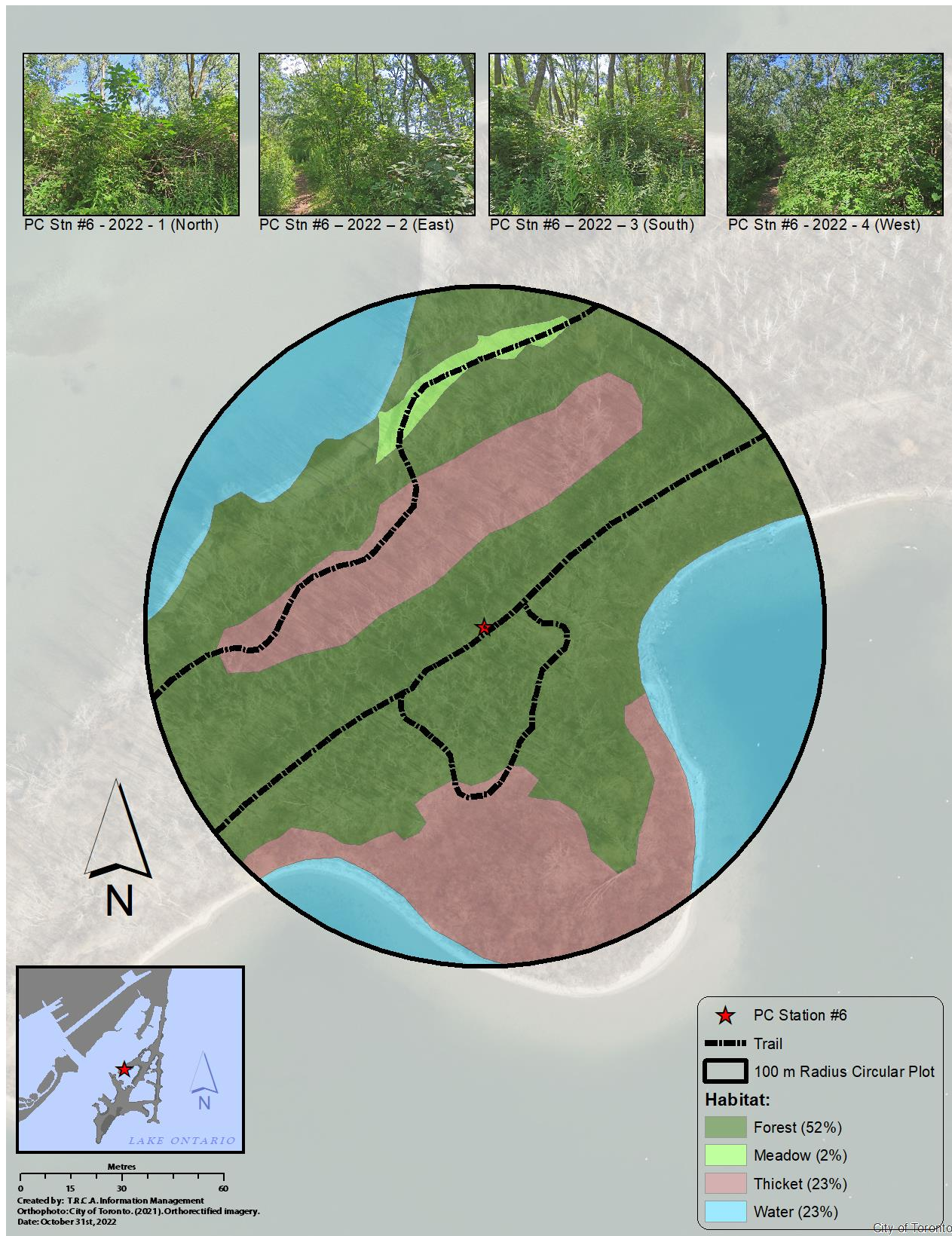
Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

Station 5



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

Station 6



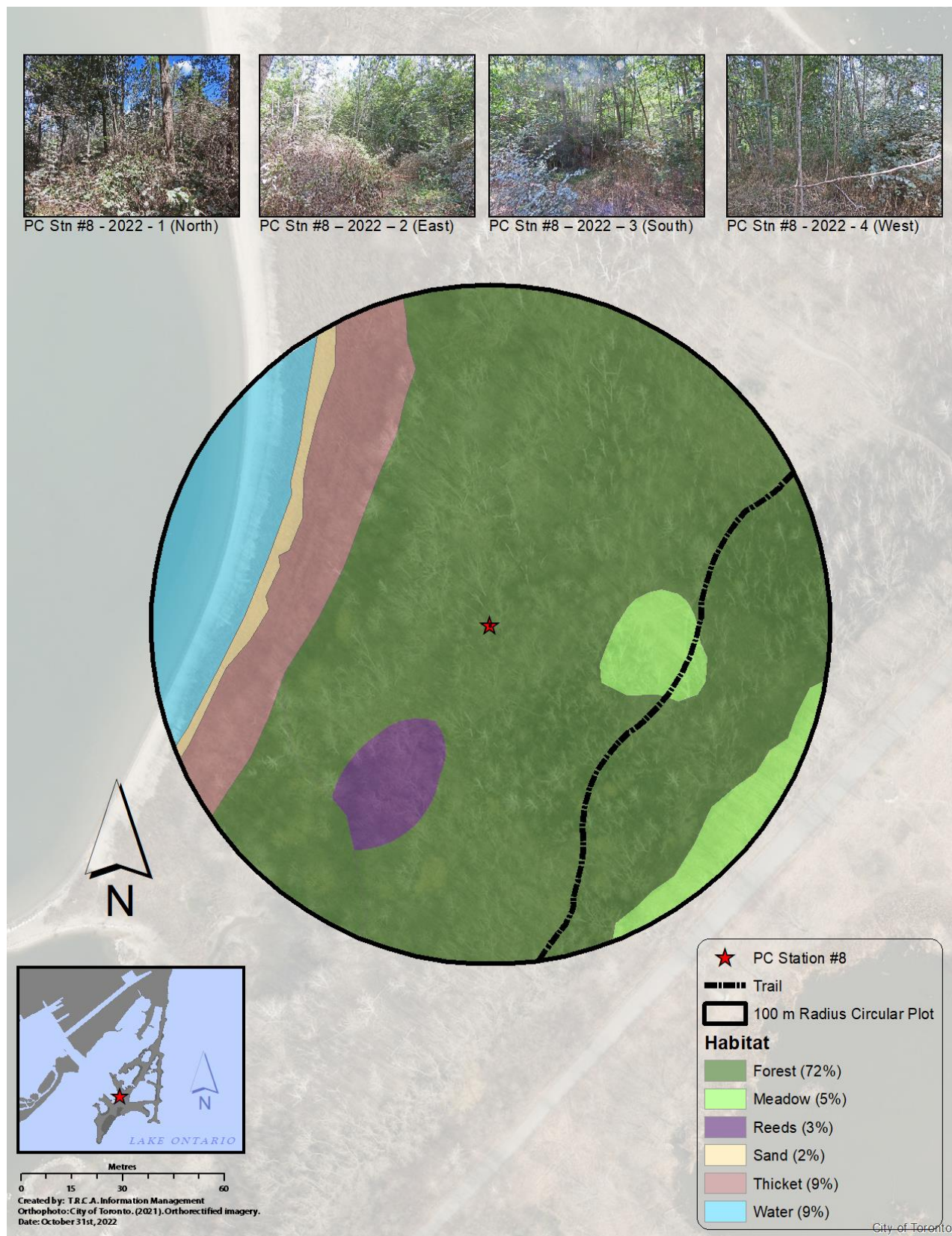
Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

Station 7



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

Station 8

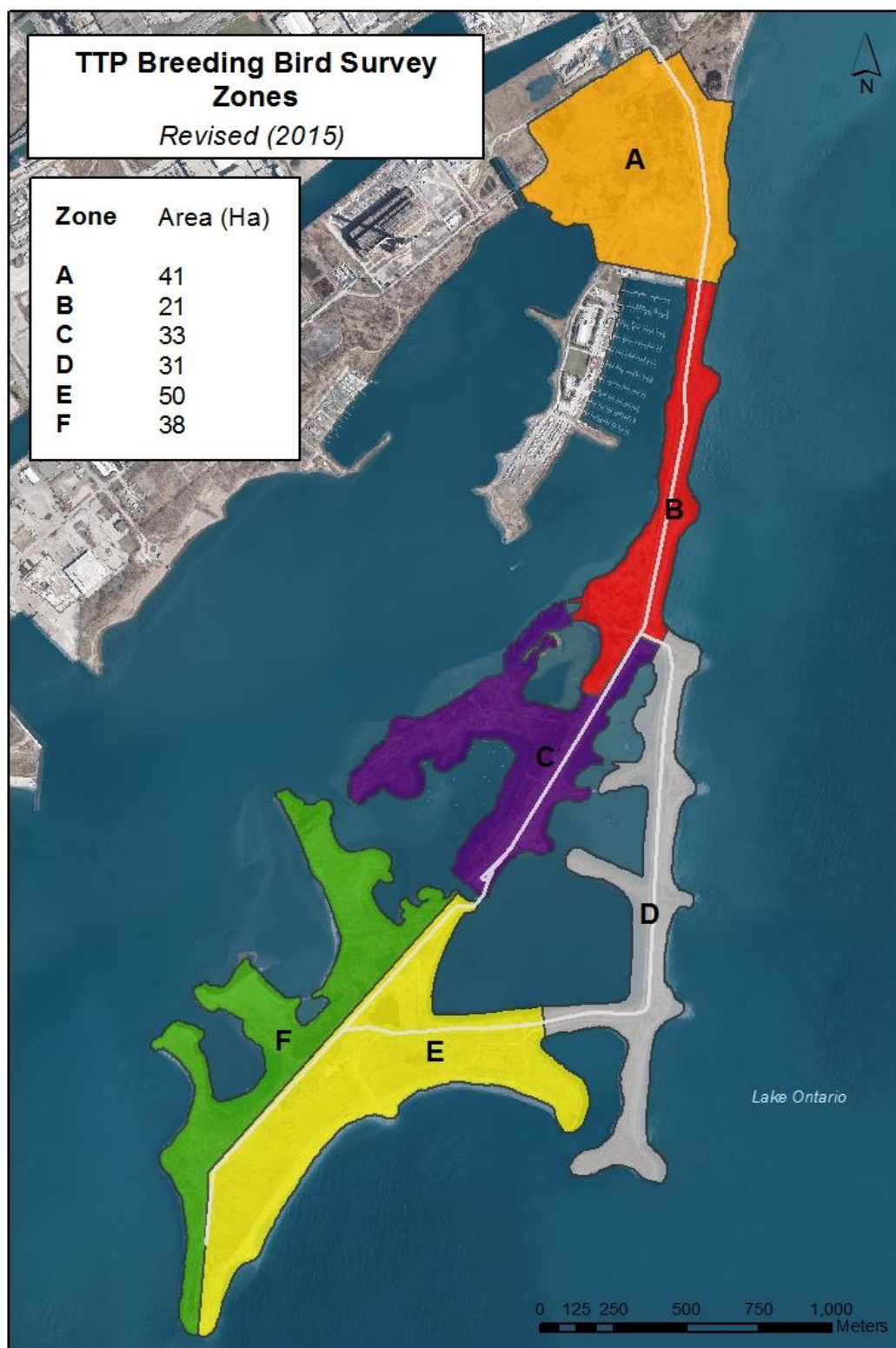


Appendix A: Description of Point Count Stations (Habitat Pictures and Maps)

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 2022 or previously, as well as any other species recorded in 2022 whose breeding range includes TTP. The species recorded in 2022 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 (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a bird found at the end of May was presumably a late migrant.



American Black Duck (2022 - possible) Known to have bred historically at TTP. In 2022, multiple birds were observed in several areas during the breeding season.

(J. Alvo)



American Crow (2022 - observed) Known to have bred historically at TTP. Single birds observed in late April 2022 were presumably migrants or visiting from elsewhere in the Toronto area.

(D. Johnston)



American Goldfinch (2022 - confirmed) This species is a regular late breeder at TTP, nesting primarily in shrubs, but also occasionally in trees. In 2022, 14 nests were discovered, which is slightly below the most recent 10-year average.

(D. Johnston)



American Kestrel (2022 – observed) Known to have bred historically at TTP. Single birds observed sporadically during the breeding season in 2022 were presumably migrants or visiting from elsewhere in the Toronto area.

(J. Alvo)



American Redstart (2022 - possible) In 2021, this species nested in the Baselands, the first recorded nest at TTP. In 2022, a few sightings were noted during the breeding season, including one record of multiple birds in the Baselands in May.

(I. Sturdee)



American Robin (2022 - confirmed) Common nesting species in forested areas throughout TTP. In 2022, 159 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 (2022 - probable) This species is a regular breeder at TTP in low numbers. In 2022, individual birds were recorded regularly throughout TTP in May and June. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests much less likely.)

Baltimore Oriole (2022 - confirmed) Common nesting species in forest areas of TTP in moderate numbers. In total, 13 nests were recorded in 2022, somewhat below the average of the past 10 years of this project.

(D. Johnston)



Bank Swallow (2022 - confirmed) In 2022, 22 nests were found on a steep bank on the south edge of the Flats in an area not previously checked and difficult to access.

(D. Johnston)



Barn Swallow (2022 - confirmed) Barn Swallows are regular nesters at TTP under the eaves and roofs of buildings. In 2022, 44 nests were found, 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 (2022 - possible) Single birds, along with an occasional pair, were seen regularly at TTP in 2022 during the breeding season.

(J. Alvo)



Black-billed Cuckoo (2022 – observed) In 2022, a bird was observed calling in June south of Cell 3 where the species nested in previous years.

Blackburnian Warbler (2022 - observed) This species has never been confirmed as a breeder at TTP. A few birds observed in mid-May 2022 were presumably late migrants.

(J. Alvo)



Black-capped Chickadee (2022 - confirmed) A regular but uncommon cavity nester at TTP, with nests often difficult to locate. In 2022, breeding was confirmed by the presence of recently fledged young.

(J. Alvo)



Black-crowned Night-Heron (2022 – possible) In 2022, birds were observed in suitable nesting habitat, but no nest attempts were confirmed. At their peak in 2000, an estimated 30% of the Canada-wide population of Black-crowned Night-Herons were breeding at TTP.

(D. Johnston)

Blackpoll Warbler (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a few birds observed on May 25 were presumably migrants.

Black-throated Green Warbler (2022 - observed) This species has never been confirmed as a breeder at TTP. A few birds seen in mid-May 2022 were presumably migrants.



Blue-gray Gnatcatcher (2022 - confirmed) In 2022, six nests were found, slightly above 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 (2022 - possible) This species has never been confirmed as a breeder at TTP. Several birds were observed in 2022 during the breeding season throughout TTP in suitable breeding habitat.



Blue-winged Teal (2022 – absent) Known to have bred historically at TTP.

(J. Alvo)



Bobolink (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a small flock observed in mid-May along the east side of TTP were presumably migrants.

(J. Alvo)



Brown-headed Cowbird (2022 - confirmed) In 2022, a total of 18 nests of Red-winged Blackbird (6), Song Sparrow (1), Willow Flycatcher (2) and Yellow Warbler (9), were found to have been parasitized by cowbirds. This was the lowest rate of parasitism of the project.

(J. Alvo)



Brown Thrasher (2022 – possible) Brown Thrasher is a regular but uncommon nester at TTP whose nests can be difficult to find. In 2022, both single birds and pairs were seen in suitable nesting habitat in various areas of TTP during their breeding season.

(J. Alvo)

California Gull (2022 – absent) Known to have bred historically at TTP.



Canada Goose (2022 - confirmed) There were 17 nests confirmed in 2022, and these were managed according to the TRCA Canada Goose Management Strategy.

(J. Alvo)



Canvasback (2022 - confirmed) In 2022, a nest was found in Goldfish Pond (although unfortunately predated), and evidence of further nesting was confirmed by the presence of young in Triangle Pond and Cell 2.

(J. Alvo)



Carolina Wren (2022 – possible). In 2021, this species was confirmed as a breeder at TTP for the first time. In 2022, singing birds were found frequently during their breeding season in suitable breeding habitat near where the first breeding occurred.

(J. Alvo)



Caspian Tern (2022 - observed) This species is an intermittent ground-nester at TTP. In 2022, nesting was not attempted.

(J. Alvo)



Cedar Waxwing (2022 - confirmed) A common late nester at TTP, usually at mid-level heights in trees. A total of 31 nests was found in 2022, slightly below the most recent 10-year average for this project.

(D. Johnston)



Chestnut-sided Warbler (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, the few sightings recorded in mid-May were presumably migrants.

(D. Johnston)



Cliff Swallow (2022 - confirmed) This species nested at TTP for the first time in 2018. A total of 28 nests was recorded in 2022 under the eaves of the Nature Centre.

(J. Alvo)



Common Grackle (2022 - confirmed) Common Grackle is a regular nester in low numbers at TTP, with nests often well-hidden at mid-level in trees. In 2022, 18 nests were found, the highest total of this project for the second year in a row. The birds have been taking advantage of maturing, thick conifers.

(D. Johnston)



Common Raven (2022 – observed) This species has never been confirmed as a breeder at TTP, although a pair has nested immediately nearby TTP in recent years. In 2022, single birds were seen foraging in TTP during April and May.

(J. Alvo)



Common Tern (2022 – confirmed) In 2022, Common Terns successfully nested on two artificial nesting rafts in Embayment D and one in Cell 3. In total, there were 127 nests.

(J. Alvo)



Common Yellowthroat (2022 - possible) Known to have bred historically at TTP. Singing males have been present throughout the breeding season in most recent years, and in 2022, males were observed performing territorial songs in suitable nesting habitat in several locations during their breeding season.

(J. Alvo)



Cooper's Hawk (2022 - confirmed) In 2022, this species was confirmed as a breeder at TTP for the first time. A pair nested successfully on Peninsula C.

(D. Johnston)



Double-crested Cormorant (2022 - confirmed) 8,860 nests were confirmed in the tree and ground nest colonies at TTP in 2022, an overall population decrease of 17.5% from 2021. The percent of the overall colony represented by ground nesting increased to 88% from 78% in 2021. Cormorants are managed for spatial distribution, where ground nesting is encouraged and tree nesting is discouraged, following the TTP Double-crested Cormorant Management Strategy.

(D. Johnston)



Downy Woodpecker (2022 - confirmed) A regular breeder in tree cavities at TTP, but in low numbers. In 2022, two nests were found, the same as the most recent 10-year average for this project.

(J. Alvo)



Eastern Kingbird (2022 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2022, a total of 32 nests was found, the second highest total for this project.

(D. Johnston)

Eastern Meadowlark (2022 - absent) In 2010, a nest found in the Baselands meadow habitat was unsuccessful. The decrease in meadow at TTP and the 2012 change in protocol to not seek ground-nesting birds will combine to make finding nests in future unlikely.



Eastern Phoebe (2022 – confirmed) In 2020, a pair nested on a ledge at the TTPBRS banding station, the first nest recorded at TTP. In 2022, nesting took place there for the third year in a row, and the pair had a second brood as well.

(J. Alvo)

Eastern Towhee (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, the birds spotted early in the breeding season were presumably migrants.



Eastern Wood-Pewee (2022 – probable) In recent years, males were frequently observed performing possible territorial songs in suitable nesting habitat in several locations at TTP during their breeding season. This was observed again in 2022, although no nest was confirmed.

(J. Alvo)



European Starling (2022 - 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 2022, no nests were found, but nesting was confirmed by the presence of recently fledged young.

(D. Johnston)



Field Sparrow (2022 - possible) This species has never been confirmed as a breeder at TTP. In 2022, a few birds were observed singing territorially early in the breeding season in suitable nesting habitat.

(J. Alvo)



Gadwall (2022 - confirmed) Gadwall has been a regular ground-nesting species at TTP in low numbers. In 2022, one nest was located. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(D. Johnston)



Gray Catbird (2022 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. In 2022, 34 nests were found, which was slightly above the most recent 10-year average.

(J. Alvo)



Great Black-backed Gull (2022 - absent) Known to have bred historically at TTP.

(D. Johnston)



Great Blue Heron (2022 - absent) Known to have bred historically at TTP.

(D. Johnston)



Great-crested Flycatcher (2022 - possible) This cavity-nesting species has never been confirmed as a breeder at TTP. In 2022, singing males were recorded in May in suitable breeding habitat.

(J. Alvo)



Great Egret (2022 - confirmed) In 2022, there was one confirmed nest attempt on Peninsula C which was abandoned by peak breeding season.

(D. Johnston)



Green Heron (2022 - observed) Known to have nested historically at TTP. In 2022, two sightings were recorded during the breeding season.

(J. Alvo)



Green-winged Teal (2022 – absent) In 2017, this species was confirmed as a breeding species at TTP for the first time. Not seen in 2022.

(D. Johnston)



Hairy Woodpecker (2022 – confirmed) In 2022, this species was confirmed as a breeder for the first time at TTP as a result of a bird with a brood patch (indicating nesting) being recaptured a number of times in the same suitable nesting area at TTPBRS.

(D. Johnston)



Hermit Thrush (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a few sightings of presumed migrants were recorded in May.

(I. Sturdee)



Herring Gull (2022 – confirmed) A breeder at TTP in small numbers in some years. In 2022, a couple of nests were observed on Peninsula B.

(D. Johnston)



Hooded Merganser (2022 – observed) This species has never been confirmed as a breeder at TTP. In 2022, birds were observed in Cell 2 in late April and early May, presumably migrants.

(D. Johnston)



Horned Lark (2022 - absent) Known to have bred historically at TTP.

(J. Alvo)



House Finch (2022 - possible) Nesting by this species at TTP has been sporadic. In 2022, a few sightings were recorded in May in the Baseland (where recent nests have been found).

(J. Alvo)



House Sparrow (2022 - possible) Known to have bred historically at TTP. This species is known to nest in cavities immediately north of TTP. In 2022, birds were recorded in suitable nesting habitat in the Baselands in June.

(J. Alvo)



House Wren (2022 - confirmed) Believed to be a regular cavity nester at TTP, but in very low numbers. In 2022, two nests were found, one more than the most recent 10-year average.

(J. Alvo)



Killdeer (2022 - confirmed) Killdeer is a regular ground-nesting species at TTP in low numbers in open areas with low or no vegetation. In 2022, two nests were found, one below the most recent 10-year average. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(J. Alvo)



Least Bittern (2022 – absent) This species, listed as Threatened both provincially and federally, was confirmed as a breeding species at TTP for the first time in 2017. The nesting took place in Embayment D and Triangle Pond, where phragmites management has since been implemented. Monitoring for bitterns will take place over the next several years as native plant communities regenerate.

Least Flycatcher (2022 - confirmed) A regular but uncommon breeder in very low numbers at TTP. In 2022, three nests were found, compared to the most recent 10-year average of one.

(J. Alvo)



Mallard (2022 - confirmed) Mallard is a regular ground-nester at TTP in low numbers. Three nests were found in 2022, below the most recent 10-year average of five. (The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.)

(D. Johnston)



Mourning Dove (2022 – possible) Mourning Dove nests have been scarce at TTP in recent years. In 2022, single birds and pairs were seen in May and June in suitable breeding habitat, primarily in the Baselands.

(J. Alvo)



Mute Swan (2022 - confirmed) The Mute Swan is an introduced species, and all nests are managed by TRCA to eliminate reproduction. In 2022, four nests were managed.

(D. Johnston)

Nashville Warbler (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, there were three sightings in early May, presumably migrants.

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 (2022 - confirmed) A regular nester at TTP, although in varying numbers. In 2022, 17 nests were found, the highest total of this project. 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 (2022 - probable) Northern Flicker is an uncommon but regular cavity-nesting species at TTP. In 2022, a pair was observed copulating in suitable nesting habitat on Peninsula D.

(D. Johnston)

Northern Harrier (2022 - observed) This species has never been confirmed as a breeder at TTP. Two sightings were recorded in 2022 near East Cove.



Northern Mockingbird (2022 - confirmed) In 2022, a pair of birds was recorded nesting twice in the Baselands, the first nesting having been predated.

(D. Johnston)



Northern Rough-winged Swallow (2022 - probable) Nests have been detected in some recent years in the steep banks on the south shore of TTP. In 2022, a pair was seen visiting a probable nest site.

(J. Alvo)



Orchard Oriole (2022 - confirmed) This species has been a regular nester at TTP in recent years, although in low numbers. Five nests were found in 2022, matching the highest total of this project.

(J. Alvo)

Ovenbird (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a few sightings of individual birds in May were presumably migrants.

Purple Martin (2022 – possible) This species has never been confirmed as a breeder at TTP. In 2022, a few instances of birds foraging in June were possibly birds visiting from nearby nesting sites, such as the allotment gardens adjacent to TTP.



Red-bellied Woodpecker (2022 - possible) This species has never been confirmed as a breeder at TTP. In 2022 (as in 2021), a bird was seen or heard a few times in May in the Sunken Woods.

(P. Robillard)



Red-eyed Vireo (2022 - possible) This species has never been confirmed as a breeder at TTP. In 2022, singing males in May in suitable nesting habitat were possibly territorial.

(J. Alvo)



Redhead (2022 - absent) Known to have bred historically at TTP.

(D. Johnston)



Red-necked Grebe (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, a pair was observed in late June and early July, although nesting was not confirmed.

Red-winged Blackbird (2022 - confirmed) The most abundant nesting species at TTP (excluding colonial waterbirds), found throughout TTP in shrubs and reeds. In 2022, 385 nests were found, well above the most recent 10-year average for this project. The elimination of phragmites in the last few years has resulted in fewer nests in some areas, but the eventual return of native species will help restore the species' usual breeding habitat.

(I. Sturdee)



Ring-billed Gull (2022 - confirmed) In 2022, there were approximately 5,000 nests on Peninsulas A and B, but a suspected predation event caused the gulls to abandon their nests in mid-June, resulting in no successful nesting.

(D. Johnston)

Ring-necked Pheasant (2022 - absent) Known to have bred historically at TTP.

Rock Pigeon (2022 - observed) Known to have bred historically at TTP. In 2022, birds were seen in various locations.

Rose-breasted Grosbeak (2022 - observed) This species has never been confirmed as a breeder at TTP. The birds sighted in May 2022 were presumably migrants.



Savannah Sparrow (2022 - absent) Prior to the start of this project, Savannah Sparrow was a common ground nester in the Baselands, along the Neck, in some areas south of Cell 3 and on the 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 (2022 – observed) This species has never been confirmed as a breeder at TTP. In 2022, three sightings in late April and May were presumably migrants.



Song Sparrow (2022 - confirmed) Song Sparrow is one of the most abundant nesting species at TTP, although few of its well-concealed nests are ever found. In 2022, 12 nests were found in a variety of habitats, the highest total of this project. (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 (2022 - 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 (2022 - confirmed) A regular ground nester at TTP in low numbers in grassy areas. One nest was found in 2022, compared to the most recent 10-year average of three. (The 2012 change in protocol with regard to ground-nesting birds making locating nests less likely.)

(J. Alvo)



Swamp Sparrow (2022 – confirmed) In 2022, this species was confirmed as a breeder for the first time at TTP as a result of both a female with a brood patch (indicating nesting) and a male with a cloacal protuberance being recaptured a number of times in the same suitable nesting area at TTPBRS.

(J. Alvo)



Tree Swallow (2022 - confirmed) Tree Swallow is a common breeder at TTP. In 2022, 35 nests were found in nest boxes and natural cavities around TTP, matching the previous high recorded in 2021.

(J. Alvo)



Trumpeter Swan (2022 - confirmed) Trumpeter Swans have nested in the wetlands at Tommy Thompson Park since 2013. There were two nests in 2022, one in Embayment D and a second in Cell 1.

(D. Johnston)

Virginia Rail (2022 - 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 (2022 - 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 adult singing on the nest. In 2022, 24 nests were found, slightly above the most recent 10-year average.

(J. Alvo)



Willow Flycatcher (2022 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2022, 16 nests were found, slightly below the most recent 10-year average.

(J. Alvo)

White-throated Sparrow (2022 - observed) This species has never been confirmed as a breeder at TTP. In 2022, there were several sightings through the first part of May, presumably late migrants.

Wilson's Phalarope (2022 - absent) Known to have bred historically at TTP.



Wood Duck (2022 - confirmed) This cavity-nesting species was confirmed in 2012 as a breeder at TTP for the first time. Nesting in 2022 was confirmed by the presence of recently fledged young in both Triangle Pond and Embayment D.

(J. Alvo)



Yellow Warbler (2022 - 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 318 nests was found in 2022, the second highest total of this project.

(J. Alvo)

Appendix D: Map of 2022 Landbird Nest Locations *



* Excludes colonial waterbirds, Canada Goose and Mute Swan nests

Appendix E: Breeding Status Codes for Each Species Detected In 2022

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

Observed	Species observed in its breeding season (no evidence of breeding)
Possible Status	Singing male present or breeding calls heard in breeding season in suitable nesting habitat
	Species observed in breeding season in suitable nesting habitat
Probable Status	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
Confirmed Status	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

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 24m², 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 1 wetland is approximately 120m² and is more challenging to count because of its size and tall vegetation. Observers carefully walk the island in a grid pattern and note nests and nest contents. From 2016 to 2020, a single population count was 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. Since 2021, count methodology has reverted to in-person visits, either counting all nests on-site, or counting nests based on ground-level photos.

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 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 (s.of Cell 3)	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, 2019 and 2022, 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

Zone	Primary Habitat Type
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.

Appendix G: Notes to Annual Breeding Bird Reports 2005 to 2022

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 Canada. Researchers are able to access Project NestWatch data via Birds Canada's **NatureCounts** tool.

Past Breeding Bird Reports are available at 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.”

“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 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 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 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 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; (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.”

2022

Page 6. Figure 3.A. Annotated Map of Tommy Thompson Park with Point Count Stations was updated to reflect the change in name from Endikement Tip to Pipit Point and to add the Flats.

Pages 12 & 13. Section 3.2.2 and Table 3.4 – nest searching efficiency. Prior to 2022, volunteer nest searching efficiency was determined by dividing each year’s total nest count by the total hours that volunteers spent searching for and monitoring nests. While this metric provided a rough guide as to the average amount of time each volunteer spent in the field to find and monitor each nest, no use was made of this metric in the nest data analysis. Further, whenever new volunteers were added to the project, comparisons with prior years were moot until the new volunteers were able to become fully productive. With six new volunteers joining the project in 2022, it became apparent that it would be impossible to compare future efficiency rates to prior years, and it was decided to discontinue calculating nest searching efficiency.