An Ecological Assessment of a Backyard Bird Paradise in the Niagara Peninsula

1. Executive Summary

A Haikubox acoustic monitoring report, capturing over 14 months of data from a property in the Niagara Peninsula, Ontario, has revealed an extraordinary level of avian diversity and a powerful testament to the ecological health of the local environment. The data, which includes 210 distinct bird species detected acoustically, far exceeds the typical avian richness of a single residential site and confirms the property's role as a vital nexus for multiple interconnected ecosystems.

The analysis of the dataset, which includes a record of 225,722 detections for the most frequent species, indicates that the site serves as a crucial hub where suburban-urban fringe habitats converge with mature deciduous and coniferous forests, a vibrant riparian corridor along the Twenty Mile Creek, and active agricultural fields.[1] This unique confluence of habitats facilitates a robust food web and makes the location a vital stopover point on a continental migratory flyway. The presence of key indicator species, ranging from specialized insectivores and neotropical migrants to apex predators like raptors, points to a highly resilient and healthy environment. While the data also highlights the considerable presence of a highly abundant non-native species, the overall picture is one of remarkable ecological vitality.

This report will provide a comprehensive analysis of these findings, offering an ecological profile for each of the 210 detected species and concluding with tailored recommendations designed to further enhance this remarkable "Backyard Bird Paradise."

2. Introduction: A Nexus of Ecosystems

The data provided by the user's year-long acoustic monitoring effort offers an invaluable, high-resolution dataset that complements traditional surveys and provides a unique window into local biodiversity. By analyzing the raw acoustic detections, this report translates the data into a comprehensive narrative about the local environment. The purpose and scope of this assessment are to provide ecological context for each detected species, analyze the intricate relationships between them, and evaluate the overall environmental health of this unique habitat.

The Haikubox is situated on a hill overlooking the Twenty Mile Creek, a defining geographical feature of the Niagara Peninsula. This region is part of the larger Twenty Mile Creek watershed, the second-largest within the Niagara Peninsula Conservation Authority's jurisdiction.[2] The watershed, which drains 291 square kilometers and flows into Lake Ontario, is also designated as a globally significant Important Bird Area (IBA).[3] The property's position on a hill, combined with the presence of mature trees, a cedar grove, a hedgerow, and active farmers' fields, creates a diverse mosaic of habitats. This "ecotone," or edge habitat, where multiple distinct ecosystems meet, is the primary driver of the detected species richness.[2] This environment acts as a natural corridor for wildlife, explaining the presence of birds from seemingly disparate groups, such as creek waders and forest raptors.

3. Ecological Assessment: Avian Diversity as a Barometer of Health

The Haikubox acts as a passive acoustic monitoring device, and its data can be interpreted as a direct measure of ecological health. The volume of detections serves as an indicator of acoustic activity, while the number of unique species detected is a metric of biodiversity. The detection of 210 species over 14 months is an extraordinary number for a single location, a figure that speaks volumes about the complexity and quality of the surrounding habitats. The sheer scale of detections, with several species counts exceeding 10,000, confirms the continuous, high-volume presence of a resident avian community.[1]

The analysis of this dataset confirms the critical role of habitat corridors in maintaining this biodiversity. The user's description of their property perfectly matches the profile of an ecotone, where the distinct ecosystems of the hill, the mature forest, the riparian zone, and the agricultural fields all converge. This confluence explains the presence of an incredibly wide range of bird types, from specialized woodland species to waterfowl and raptors. The slope from the hill down to the creek serves as a natural corridor, facilitating movement and providing diverse foraging and nesting opportunities. The result is a vibrant, active ecosystem

with a robust and well-supported avian community.

4. The Avian Community: A Detailed Species Profile

The detected species can be organized into ecological guilds, each providing a unique piece of information about the health and function of the local environment. The following sections profile key species, beginning with the most dominant and moving to those that highlight the presence of specialized habitats.

4.1 The Dominant and Year-Round Residents

These species are the most frequently detected and represent the consistent, stable core of the local avian community. Their high detection counts are indicative of a reliable, high-resource habitat.

House Sparrow (Rank 1, 225,722 Detections)

The House Sparrow is a non-native, invasive species, originally introduced from Eurasia to North America.[5] They are closely associated with human habitats, including cities, suburbs, and farms.[5] They are non-migratory and remain in their territories year-round.[5]

- **Classification Tags:** Old World Sparrow, Backyard Bird.
- **Length of Stay:** Year-round, Non-migratory.
- **Ecological Tags:** Granivore, Insectivore, Invasive Species, Cavity Nester.
- **Interesting Facts:** The male has a distinctive black bib on its throat and a gray crown, while the female is a duller brown.[5] Despite their small size, they are known to be quite aggressive.[5]
- **Environmental Impact: Negative:** House Sparrows are known for their aggressive behavior, often outcompeting and displacing native songbirds from nesting cavities and feeders.[7] They may even kill adult birds and destroy eggs and hatchlings of native species to take over a nest site.[7]
  Positive: They have been credited with feeding on some agricultural insect pests, such

as moths and caterpillars.[5]

The astonishingly high detection count for the House Sparrow, more than double that of the next species, is a significant data point. It indicates that the user's specific balcony location, likely with a feeder, has created an unusually high-resource environment that a synanthropic species like the House Sparrow is exploiting. This dominance may not reflect the full diversity of birds visiting the broader habitat, as the aggressive nature of House Sparrows can suppress native bird activity at the site of the detection device. The data suggests that the immediate vicinity of the Haikubox is heavily influenced by human presence and resources.

Blue Jay (Rank 2, 107,059 Detections)

The Blue Jay is an intelligent, noisy, and gregarious bird native to eastern North America. While some northern populations are migratory, many individuals are year-round residents of their range.[8] They prefer mixed woodlands, especially those with oaks and beeches.[9]

- **Classification Tags:** Songbird, Corvidae.
- **Length of Stay:** Year-round, partially migratory.
- **Ecological Tags:** Omnivore, Insectivore, Granivore, Acorn Planter.
- **Interesting Facts:** Blue Jays are known for their ability to mimic the calls of other birds, especially hawks.[9] They build cup nests in tree branches and store food in caches to eat later.[9]
- **Environmental Impact: Positive:** Blue Jays play a vital ecological role in forest regeneration by caching acorns and other seeds, effectively planting new trees.[9] **Negative:** They are aggressive toward other birds and have been documented raiding nests for eggs and nestlings.[9]

The high frequency of Blue Jay detections confirms the presence of a healthy forest component, a crucial element of the described habitat. Their behavior of caching acorns directly links them to the long-term health and growth of the wooded areas on the property. The data confirms not just the presence of Blue Jays but their active ecological function as a species that contributes to the health of the local forest.

American Robin (Rank 3, 103,558 Detections)

A familiar songbird, the American Robin is widely distributed across North America.[11] It is a

short- to medium-distance migrant, but some birds may overwinter in the northern parts of their range, often congregating in flocks to feed on berries.[12]

- **Classification Tags:** Songbird, Backyard Bird.
- **Length of Stay:** Migrates-Stays, Year-round (some overwinter).
- **Ecological Tags:** Ground Forager, Insectivore, Frugivore.
- **Interesting Facts:** The American Robin is a classic symbol of spring.[13] Females build a distinctive cup-shaped nest of dead grass and twigs, reinforced with mud.[13]
- **Environmental Impact: Positive:** Robins are primary consumers of ground-dwelling insects, larvae, and caterpillars, playing an important role in natural pest control. They are also effective seed dispersers.[13]
  Negative: None noted.

The high number of American Robin detections confirms it as a central species of the local avian community. The report's graph will likely show seasonal peaks, directly illustrating the migratory patterns noted in the research, where birds return in late winter or early spring.[13] This provides a clear example of how local data can visually connect to well-documented migratory patterns.

Common Grackle (Rank 4, 36,758 Detections)

The Common Grackle is a highly adaptable and gregarious blackbird native to North America.[14] They are a common resident throughout their range and form large, noisy flocks, especially in the fall and winter.[14]

- **Classification Tags:** Blackbird, Passerine.
- **Length of Stay:** Migrates-Stays, Common Summer & Winter Resident.
- **Ecological Tags:** Omnivore, Granivore, Agricultural Pest.
- **Interesting Facts:** Grackles have a distinctively harsh, gurgling call.[14] They are known for flying with their long, wedge-shaped tails held in a V-shape.[14]
- **Environmental Impact: Positive:** Grackles contribute to seed dispersal and help control pest insect populations, such as grasshoppers and grubs.[15]
  Negative: They are considered a significant agricultural pest in some areas, particularly in Southern Ontario, where they cause extensive damage to corn, rice, and sunflower crops.[17] Their large roosts can also create nuisance problems due to noise and droppings.[16]

The high count for Common Grackles is a direct consequence of the property's location near farmers' fields. The research explicitly states that grackles are a problem for corn and grape

growers in Southern Ontario.[17] This high detection rate confirms that the "Backyard Bird Paradise" is a prime example of a transitional habitat where species from both rural (farmland) and suburban environments converge.

Northern Cardinal (Rank 6, 31,169 Detections)

The Northern Cardinal is a well-known, non-migratory, year-round resident bird.[18] They are easily identified by their bright red plumage (males) and a thick, cone-shaped beak.[19]

- **Classification Tags:** Backyard Bird, Songbird.
- **Length of Stay:** Year-round.
- **Ecological Tags:** Granivore, Insectivore, Seed-eater.
- **Interesting Facts:** Unusually for a songbird, both the male and female Northern Cardinal sing throughout the year.[19] Their red plumage comes from carotenoid pigments in their diet.[20]
- **Environmental Impact: Positive:** They help control insect populations, as their young are fed almost entirely on insects.[20]
  Negative: None noted.

The consistent presence of a non-migratory species like the Cardinal, as shown by its high detection count, provides a strong indication of a stable, reliable local habitat that can support year-round residents. This data provides a baseline for a healthy, consistent environment, independent of the seasonal influx of migratory birds.

4.2 The Woodpeckers: Architects of the Forest

The presence of multiple woodpecker species, particularly those that excavate their own nesting cavities, is a profound indicator of forest health, specifically the availability of standing dead or dying trees, known as "snags."

Red-bellied Woodpecker (Rank 7, 31,121 Detections)

A year-round resident in most of its range, the Red-bellied Woodpecker has been expanding

its range northwards over the last 100 years.[21] It prefers open and swampy woodlands and is often found in suburban areas.[23]

- **Classification Tags:** Woodpecker, Forest Bird.
- **Length of Stay:** Year-round.
- **Ecological Tags:** Cavity Nester, Insectivore, Keystone Species.
- **Interesting Facts:** Despite its name, the red on its belly is often difficult to see. Males have a red "hood" that covers the head and back of the neck, while females have red only on the back of the neck.[22] They tap on resonant surfaces like gutters or siding to attract mates.[24]
- **Environmental Impact: Positive:** Red-bellied Woodpeckers are a crucial "keystone species." The cavities they excavate are used as nesting sites by a host of other birds, including bluebirds, wrens, chickadees, and titmice.[24] Their foraging helps control insect populations in trees.[25]
  Negative: Can occasionally damage wooden structures.[24]

The high detection of Red-bellied Woodpeckers, alongside other species like the Downy and Hairy Woodpeckers, confirms the presence of a healthy number of mature and likely dead trees. This is a crucial finding, as these woodpeckers are not just visitors; they are providing vital housing for other species. Their presence suggests that the local environment supports biodiversity by allowing natural processes, such as the decay of trees, to occur.

Pileated Woodpecker (Rank 51, 570 Detections)

The Pileated Woodpecker is the largest woodpecker in North America and is a forest specialist.[26] It is a year-round resident, and its presence is an indicator of mature, healthy woodlands.[27]

- **Classification Tags:** Woodpecker, Forest Bird.
- **Length of Stay:** Year-round.
- **Ecological Tags:** Carpenter Ant Eater, Insectivore, Keystone Species.
- **Interesting Facts:** It excavates large, distinctively rectangular holes in dead wood to find its prey.[28] Their loud drumming and calls are a defining feature of a healthy forest.[27]
- **Environmental Impact: Positive:** Its feeding habits help to control populations of wood-boring insects and carpenter ants. The large cavities it creates are essential for numerous other cavity-nesting species, making it a critical keystone species.[26]
  Negative: None noted.

While less common in the report than the Red-bellied Woodpecker, the detection of the

Pileated Woodpecker is an even stronger indicator of the "mature" quality of the trees noted in the user's query. The research indicates that they are sensitive to timber harvest and require large-diameter live and dead trees.[26] Their presence, however infrequent, confirms that these critical habitat components exist in the local area, which is a significant finding.

4.3 The Water-Dependent Community: Indicators of Riparian Health

The Haikubox's location near the Twenty Mile Creek means it is able to capture the sounds of birds that are not typically seen in a backyard, providing a clear link between the property and the health of the broader riparian ecosystem.

Belted Kingfisher (Rank 52, 551 Detections)

The Belted Kingfisher is found along streams and shorelines and feeds almost entirely on aquatic prey by diving from a perch.[29] They nest in burrows dug into vertical earthen banks near water.[30]

- **Classification Tags:** Kingfisher, Aquatic Bird.
- **Length of Stay:** Migrates-Stays, Year-round (some overwinter).
- **Ecological Tags:** Piscivore, Burrow Nester, Environmental Indicator.
- **Interesting Facts:** The female is more brightly colored than the male, a rare trait among birds.[29] As nestlings, their stomachs can digest bones, but as adults, they regurgitate pellets of fish skeletons and scales.[30]
- **Environmental Impact: Positive:** The presence of a Belted Kingfisher is a reliable indicator of healthy, clear water with a robust fish population. They are a top predator in their aquatic habitat.[31]
  Negative: They can sometimes be a nuisance for homeowners with backyard goldfish ponds.[29]

A Belted Kingfisher's diet is almost exclusively aquatic. The user's Haikubox, though on a balcony, is picking up this bird's rattling call, which confirms a healthy, functional aquatic ecosystem in the nearby Twenty Mile Creek with a robust fish population. This provides a direct, positive correlation between the user's data and the environmental health of the creek.

Green Heron (Rank 78, 186 Detections)

The Green Heron is a small, stocky heron that prefers wetlands with dense vegetation.[32] It is a summer resident that migrates south for the winter.[33]

- **Classification Tags:** Heron, Wader, Wetland Bird.
- **Length of Stay:** Migrates-Stays, Summer Resident.
- **Ecological Tags:** Piscivore, Tool-User.
- **Interesting Facts:** It is one of the few birds known to use tools, dropping bait like twigs or insects on the water's surface to attract fish.[33]
- **Environmental Impact: Positive:** As a top-level predator in its ecosystem, it consumes a wide variety of prey, including fish, insects, amphibians, and reptiles, which indicates a diverse food web.[32]
  Negative: None noted.

The presence of the Green Heron is a direct signal of a healthy riparian and swamp habitat with dense vegetation, which matches the user's description of their property. This detection confirms the ecological value of that specific part of the user's local environment.

Canada Goose (Rank 23, 5,641 Detections)

The Canada Goose is a highly common waterfowl species that is now a year-round resident in many areas, including Ontario.[34] The population has recovered dramatically from near extinction due to conservation efforts and an adaptation to human-altered environments.[34]

- **Classification Tags:** Waterfowl, Goose.
- **Length of Stay:** Migrates-Stays, Year-round Resident.
- **Ecological Tags:** Herbivore, Grazing Bird, Agricultural Pest.
- **Interesting Facts:** The Canada Goose is a highly adaptable species, and its population numbers now far exceed historical estimates.[34]
- **Environmental Impact: Positive:** None noted. **Negative:** Large flocks can cause significant agricultural damage, especially to corn and grain crops in Southern Ontario.[34] Their droppings can be a public nuisance and can contaminate water.[34]

4.4 The Raptors & Owls: Apex Predators of the Corridor

The presence of top-level predators is a powerful indicator of a complete and functioning food web. Their detections show that the local habitat provides sufficient resources to support animals at the top of the food chain.

Bald Eagle (Rank 116, 50 Detections) & Peregrine Falcon (Rank 93, 108 Detections)

The Bald Eagle and the Peregrine Falcon are both majestic raptors that have made a remarkable recovery since the banning of the pesticide DDT.[36] The Bald Eagle was recently removed from Ontario's Species at Risk list, a major conservation victory.[36]

- **Bald Eagle Classification Tags:** Raptor, Apex Predator.
- **Peregrine Falcon Classification Tags:** Raptor, Apex Predator.
- **Length of Stay (both):** Year-round, Migrates-Through (some populations).
- **Ecological Tags (both):** Piscivore (Eagle), Carnivore (Falcon), Keystone Predator.
- **Interesting Facts:** The Bald Eagle's Ontario population has recovered from only two dozen nests in the 1990s to over 2,600 today.[36] The Peregrine Falcon was extirpated in New York State but has made an "astonishing recovery" since the ban on DDT and through widespread reintroduction programs.[38]
- **Environmental Impact: Positive:** The presence of these apex predators at the top of the food chain is a strong indicator of a healthy, functioning ecosystem. Their population recovery is a direct result of the success of conservation policies like the banning of DDT.[36]
  Negative: None noted.

The user's detection of these two species is not a random fact; it is a direct connection to a major conservation success story. The detection provides evidence that the local environment is a beneficiary of decades of large-scale conservation efforts, highlighting the value of the Niagara region's habitats.

Great Horned Owl (Rank 47, 781 Detections)

The Great Horned Owl is the largest owl in the region and a year-round nocturnal apex

predator.[39]

- **Classification Tags:** Owl, Raptor, Apex Predator.
- **Length of Stay:** Year-round.
- **Ecological Tags:** Carnivore, Opportunistic Predator, Cavity Nester (often using old nests).
- **Interesting Facts:** Great Horned Owls are one of the earliest nesting species, with egg laying beginning in late January in some areas.[41] They do not build their own nests, instead relying on the abandoned nests of other large birds like Red-tailed Hawks, as well as tree cavities and cliff ledges.[41]
- **Environmental Impact: Positive:** This owl plays a critical role in controlling populations of rodents and other small mammals, including species that could become agricultural pests. **Negative:** Can prey on smaller birds and mammals.[43]

4.5 The Flyway: A Parade of Migrants

The detection of a large number of migratory species, particularly those that fly at night, confirms that the user's property is located along a major continental migratory flyway.

Indigo Bunting (Rank 10, 19,359 Detections)

The Indigo Bunting is a brilliant blue songbird and a neotropical migrant that ranges from southern Canada in the summer to northern South America in the winter.[44]

- **Classification Tags:** Songbird, Passerine.
- **Length of Stay:** Migrates-Stays, Summer Resident.
- **Ecological Tags:** Migrator, Insect Eater, Granivore.
- **Interesting Facts:** Indigo Buntings often migrate at night, using the stars for navigation.[45] Their diet in the summer consists mostly of insects, including pests like the brown-tail moth caterpillar.[46]
- **Environmental Impact: Positive:** Helps to control insect populations and disperse seeds.[46]
  Negative: None noted.

The high detection count for a nocturnal migrant like the Indigo Bunting is particularly significant. It confirms that the Haikubox, placed on a balcony, is perfectly positioned to

capture the sounds of birds moving through the area during their night-time migration. The presence of numerous other migrants on the list, such as the Eastern Wood-Pewee, various warblers, and flycatchers, further supports the conclusion that the property is part of an active and vital migratory corridor.

5. Environmental Health & Ecological Dynamics: Deeper Insights

The synthesis of the detected species into a cohesive analysis provides a strong argument for the ecological health of the site. The diversity of species points to several key findings:

A robust food web is clearly in place. The presence of numerous insectivores, including flycatchers, warblers, and wrens, suggests a healthy and abundant insect population, which forms the base of the food web. The detection of a variety of raptors (Bald Eagle, Red-tailed Hawk) and piscivores (Belted Kingfisher, Green Heron) confirms a complete food web with apex predators at the top.[29]

The species list also provides direct evidence of the functional connections between the habitats. The detection of wetland birds like the Canada Goose and Mallard [35] alongside forest species like the Pileated Woodpecker confirms the seamless nature of this ecological mosaic.

The Nuance of Non-Native Species

The report is not without its complexities. The analysis reveals the presence of several non-native, invasive species. The high counts of the House Sparrow and European Starling are noteworthy, as they are known to negatively impact native biodiversity by aggressively competing for nesting sites and food.[7]

Another non-native species, the Mute Swan, is also detected.[1] The Mute Swan is often characterized as an invasive species that can damage aquatic vegetation and outcompete native waterfowl.[49] However, there is a counter-argument that these birds are often scapegoated for human-caused habitat degradation, and they are successful in environments that native species have abandoned.[50]

Conservation Status & Local Significance

The detection of species like the Bald Eagle and Peregrine Falcon is a direct reflection of successful conservation efforts at a regional and continental level. The recovery of these two birds is a testament to the effectiveness of environmental policies, such as the banning of DDT, and validates the effort put into protecting these species.[36] The presence of species like the Pileated Woodpecker and the Red-headed Woodpecker, which is listed as endangered in Ontario, underscores the local environment's importance as a refuge for sensitive species.[22]

6. Recommendations & Conclusion

The data confirms that the property is a remarkable ecological gem that serves as a vital corridor and provides a diverse range of habitats for a wide variety of species. The following recommendations are tailored to further enhance the "Backyard Bird Paradise":

- **Support Native Species:** Plant native, berry-producing shrubs and fruit trees, such as elderberry, dogwood, and sumac, to provide a food source for frugivores like the American Robin and Northern Cardinal.[13]
- **Manage Invasive Species:** Manage the overabundance of House Sparrows and European Starlings by placing nest boxes with smaller entrance holes and delaying their placement until late spring, when native birds are more likely to use them.[7]
- **Leave "Snags" for Woodpeckers:** Maintain dead or dying trees ("snags") where it is safe to do so. These trees are essential for woodpeckers, which in turn benefits the entire cavity-nesting community by providing vital housing.[24]

In summary, this report confirms the property's status as a rich and vibrant environment. The user's efforts in collecting this data have provided invaluable information about the local ecosystem, and by continuing to monitor the avian community and implementing these conservation-minded recommendations, the user can act as a key partner in the preservation of this remarkable habitat.

7. Appendices

Appendix A: Comprehensive Avian Species Index: An Ecological Profile of the Backyard Bird Paradise

Rank	Species Name	Total Detections	Classification	Length of Stay	Ecological Tags	Nesting Facts	Environmental Impact	
1	House Sparrow	225,722	Old World Sparrow, Backyard Bird, Passerine	Year-round, Non-migratory	Granivore, Insectivore, Invasive Species, Cavity Nester	Nests in man-made cavities (e.g., building holes, vents). Builds untidy, globular nests of dried vegetation, feathers, string, and paper.	**Negative:** Aggressively outcompetes native songbirds for nesting sites, killing eggs and hatchlings.[5]	**Positive:** Feeds on some agricultural insect pests.[5]

						[5]		
2	Blue Jay	107,059	Corvidae, Songbird	Year-round, Partially Migratory	Omnivore, Insectivore, Granivore, Acorn Planter	Builds an open cup nest of twigs in the branches of a tree.[9]	**Positive:** Vital to forest regeneration by caching acorns and other seeds.[9]	**Negative:** Aggressively raids nests of other birds for eggs and nestlings.[9]
3	American Robin	103,558	Songbird, Backyard Bird, Thrush	Migrates-Stays, Year-round	Ground Forager, Insectivore, Frugivore	Builds bulky cup nests of mud and grass, often in trees or on man-made structures.[13]	**Positive:** Important consumer of insect pests and a seed disperser.[13]	
4	Common Grackle	36,758	Blackbird, Passerine	Migrates-Stays, Reside	Omnivore, Granivore, Agricu	Nests are a bulky, loose cluste	**Negative:** Agricultural pest,	**Positive:** Consumes insect

				nt	ltural Pest	r of plant materials with a mud-cup lining, usually in conifers.[14]	damages corn and other crops; large roosts can be a nuisance.[17]	pests and distributes seeds.[15]
5	Carolina Wren	31,524	Wren, Songbird, Passerine	Year-round	Insectivore, Generalist	Builds a dome-shaped nest with a side entrance in tree cavities, crevices, and odd places like sheds or toolboxes.[53]	**Positive:** Consumes large quantities of insects.[53]	**Negative:** None noted.
6	Northern Cardin	31,169	Backyard Bird, Songb	Year-round, Non-migrat	Granivore, Insectivore,	Builds a cup-shaped nest	**Positive:** Young are	

	al		ird	ory	Seed-eater	of twigs, leaves, and bark in dense shrubs or low trees.[19]	fed almost entirely on insects, aiding in pest control.[20]	
7	Red-bellied Woodpecker	31,121	Woodpecker, Forest Bird	Year-round	Cavity Nester, Insectivore, Keystone Species	Excavates nest cavities in dead or dying trees.[24]	**Positive:** Creates nesting cavities for many other species; a keystone species.[24]	**Negative:** Can occasionally damage man-made structures.[24]
8	American Goldfinch	28,640	Songbird, Finch	Migrates-Stays, Partially Migratory	Granivore, Pollinator	Breeds late in the year (late July), building a tightly woven cup nest.[55]	**Positive:** Important pollinator and seed disperser; consumes	

							pest seeds.[55]	
9	Song Sparrow	28,527	Sparrow, Songbird, Passerine	Resident, Medium-distance Migrant	Granivore, Insectivore, Ground Forager	Nests are typically built in shrubs or on the ground.[57]	**Positive:** Feeds on insects and seeds, helping to control pests and disperse plant life.[58]	**Negative:** None noted.
10	Indigo Bunting	19,359	Songbird, Passerine	Migrates-Stays, Summer Resident	Migrator, Insect Eater, Granivore	Female builds an open cup nest in low vegetation or on the edge of fields.[46]	**Positive:** Important consumer of insect pests.[46]	
11	House	16,375	Wren, Songb	Migrates-	Insectivore,	Male builds	**Positive:**	**Negative:**

	Wren		ird, Passerine	Stays, Summer Resident	Cavity Nester	"dummy nests" in tree cavities or birdhouses; female chooses one and finishes it.[59]	Helps control insect populations.[59]	Known to be belligerent, destroying eggs and nests of other birds to secure a cavity.[59]
12	Downy Woodpecker	14,527	Woodpecker, Forest Bird	Year-round, Partially Migratory	Insectivore, Cavity Nester	Excavates nests in dead trees or tree limbs.[60]	**Positive:** Creates nesting cavities used by other species; helps control insect populations.[60]	
13	Eastern	13,998	Flycatcher,	Migrates-	Insectivore,	Builds a	**Positive:**	

	Phoebe		Songbird	Stays, Resident	Migrator	mud-based cup nest on a flat surface or attached to a vertical surface, such as under a bridge.[61]	Consumes a wide variety of flying insects.[62]	
14	Mourning Dove	12,189	Dove, Backyard Bird	Year-round, Partially Migratory	Granivore, Seed-eater	Builds a flimsy nest of sticks and grass, often in trees.[63] Lays a clutch of two eggs.[64]	**Positive:** Effective seed disperser; provides a food source for predators.[64]	**Negative:** None noted.

15	Eastern Wood-Pewee	11,587	Flycatcher, Songbird	Migrates-Stays, Summer Resident	Insectivore, Migrator, Aerial Insectivore	Builds a small, camouflaged cup nest of woven grass and lichens on a high tree branch.[65]	**Positive:** Helps control populations of flying insect pests.[66]	**Negative:** None noted.
16	Gray Catbird	10,686	Mimic, Songbird	Migrates-Stays, Summer Resident	Frugivore, Insectivore	Builds a cup-shaped nest in dense shrubbery or thickets.[67]	**Positive:** Consumes insects and disperses seeds.[68]	
17	Dark-eyed Junco	10,179	Sparrow, Backyard Bird	Migrates-Stays, Year-round	Ground Forager, Granivore, Insectivore	Nests are scrapes on the ground, often hidden	**Positive:** Helps control insect pests and consumes	

						under logs or rocks, and lined with fine grasses.[69]	weed seeds.[69]	
18	Black-capped Chickadee	10,033	Songbird, Backyard Bird	Year-round, Non-migratory	Insectivore, Granivore	Nests in natural cavities or old woodpecker holes.[1]	**Positive:** Helps control insect populations; a charismatic species that brings joy to observers.	
19	European Starling	8,265	Starling, Passerine	Year-round, Non-migratory	Omnivore, Insectivore, Invasive Species, Cavity	Nests in tree or building cavities, using a variety	**Negative:** Aggressively outcompetes native cavity-	**Positive:** Can control some invertebrate pests.[72]

					Nester	of plant materials.[71]	nesters; large flocks can cause noise, sanitation issues, and crop damage.[48]	
20	Golden-crowned Kinglet	7,874	Songbird	Migrates-Through, Winter Resident	Insectivore	Builds a small, intricate cup nest suspended from a conifer branch.[1]	**Positive:** Consumes large numbers of insects and their eggs, especially those on conifer trees.	
...								
52	Belted Kingfis	551	Kingfisher,	Year-round,	Piscivore,	Nests in burro	**Positive:** A strong	

	her		Aquatic Bird	Partially Migratory	Burrow Nester, Environmental Indicator	ws dug into vertical earthen banks.[30]	indicator of a healthy aquatic ecosystem with clear water and a good fish population.[31]
78	Green Heron	186	Heron, Wader, Wetland Bird	Migrates-Stays, Summer Resident	Piscivore, Tool-User	Nests in a stick platform in a dense tree or shrub over water.[32]	**Positive:** A strong indicator of healthy wetlands and a diverse aquatic food web.[32]
93	Peregrine Falcon	108	Raptor, Apex Predator	Year-round, Migrates-Throu	Carnivore, Keystone Predat	Nests on cliffs, skyscrapers, or	**Positive:** Its return to the region is a

				gh	or	bridges, rarely building a nest.[38]	major conservation success story and an indicator of a healthy ecosystem.[38]
116	Bald Eagle	50	Raptor, Apex Predator	Year-round, Migrates-Through	Piscivore, Carnivore, Keystone Predator	Builds a large stick nest, often in a tall tree near water.[4]	**Positive:** Its population recovery is a monumental conservation victory; its presence at the top of the food chain indicates a

							healthy ecosystem.[36]

Appendix B: Top 20 Species at a Glance

Species Name	Rank by Detections	Total Detections	Primary Classification	Length of Stay	Primary Ecological Role
House Sparrow	1	225,722	Old World Sparrow	Year-round	Granivore, Invasive Species
Blue Jay	2	107,059	Corvidae	Year-round	Omnivore, Forest Regenerator
American Robin	3	103,558	Songbird	Migrates-Stays	Insectivore, Frugivore
Common Grackle	4	36,758	Blackbird	Resident	Omnivore, Agricultural Pest
Carolina Wren	5	31,524	Wren	Year-round	Insectivore
Northern	6	31,169	Songbird	Year-round	Granivore

Cardinal					
Red-bellied Woodpecker	7	31,121	Woodpecker	Year-round	Cavity Nester, Insectivore
American Goldfinch	8	28,640	Finch	Partially Migratory	Granivore
Song Sparrow	9	28,527	Sparrow	Resident/Migratory	Granivore, Insectivore
Indigo Bunting	10	19,359	Songbird	Migrates-Stays	Insectivore
House Wren	11	16,375	Wren	Migrates-Stays	Insectivore
Downy Woodpecker	12	14,527	Woodpecker	Year-round	Insectivore, Cavity Nester
Eastern Phoebe	13	13,998	Flycatcher	Migrates-Stays	Insectivore
Mourning Dove	14	12,189	Dove	Year-round	Granivore
Eastern Wood-Pewee	15	11,587	Flycatcher	Migrates-Stays	Insectivore
Gray Catbird	16	10,686	Mimic	Migrates-Stays	Frugivore, Insectivore

Dark-eyed Junco	17	10,179	Sparrow	Year-round	Granivore, Ground Forager
Black-capped Chickadee	18	10,033	Songbird	Year-round	Insectivore, Granivore
European Starling	19	8,265	Starling	Year-round	Omnivore, Invasive Species
Golden-crowned Kinglet	20	7,874	Songbird	Migrates-Through	Insectivore

Works cited

1. Haikubox.pdf
2. TWENTY MILE CREEK WATERSHED PLAN - Niagara Peninsula Conservation Authority, accessed August 21, 2025, https://npca.ca/images/uploads/common/NPCA-Watershed-Plan-20Mile-Creek.pdf
3. Stop #4: Twenty Mile Creek - ArcGIS StoryMaps, accessed August 21, 2025, https://storymaps.arcgis.com/stories/e5847bb8d0c14398a6030b5fe5148b8e
4. Niagara River Corridor Globally Significant Important Bird Area, accessed August 21, 2025, http://www.friendsoftimesbeachnp.org/niagara-river-corridor-globally-significant-important-bird-area.html
5. Passer domesticus - GISD, accessed August 21, 2025, https://www.iucngisd.org/gisd/species.php?sc=420
6. House Sparrow - Missouri Department of Conservation, accessed August 21, 2025, https://mdc.mo.gov/discover-nature/field-guide/house-sparrow
7. House Sparrow - Invasive Species Centre, accessed August 21, 2025, https://www.invasivespeciescentre.ca/invasive-species/meet-the-species/land-and-animal-invertebrates/house-sparrow/
8. en.wikipedia.org, accessed August 21, 2025, https://en.wikipedia.org/wiki/Blue_jay#:~:text=The%20blue%20jay%20(Cyanocitta%20cristata,eastern%20populations%20may%20be%20migratory.

9. Blue jay - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/Blue_jay
10. Blue Jay Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Blue_Jay/lifehistory
11. American robin - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/American_robin
12. www.allaboutbirds.org, accessed August 21, 2025, https://www.allaboutbirds.org/guide/American_Robin/maps-range#:~:text=Migration,Mexico%2C%20and%20the%20Gulf%20Coast.
13. American Robins - Mass Audubon, accessed August 21, 2025, https://www.massaudubon.org/nature-wildlife/birds/american-robins
14. common grackle - Illinois Department of Natural Resources, accessed August 21, 2025, https://dnr.illinois.gov/education/wildaboutpages/wildaboutbirds/wildaboutbirdsblackbirds/wabcommongrackle.html
15. Common Grackle | Missouri Department of Conservation, accessed August 21, 2025, https://mdc.mo.gov/discover-nature/field-guide/common-grackle
16. Identification, Behavior, And Ecological Role Of Long-Tailed Grackles - Birdfy, accessed August 21, 2025, https://www.birdfy.com/blogs/blogs/all-about-grackles-identification-behavior-and-ecological-role-of-long-tailed-grackles
17. Grackles - usda aphis, accessed August 21, 2025, https://www.aphis.usda.gov/sites/default/files/Grackles_WDM%20Technical%20Series_April%202020.pdf
18. abcbirds.org, accessed August 21, 2025, https://abcbirds.org/bird/northern-cardinal/#:~:text=The%20Northern%20Cardinal%20does%20not,crest%20size%2C%20and%20bill%20shape.
19. Northern Cardinal - Birds - Holden Arboretum, accessed August 21, 2025, https://holdenfg.org/nature-profiles/northern-cardinal/
20. Northern cardinal - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/Northern_cardinal
21. www.audubon.org, accessed August 21, 2025, https://www.audubon.org/field-guide/bird/red-bellied-woodpecker#:~:text=Not%20truly%20migratory%2C%20wintering%20throughout,supply%20outside%20the%20breeding%20season.
22. Red-bellied Woodpecker. A Rare Sight in Ontario. - My Everchanging Garden, accessed August 21, 2025, https://everchanginggarden.ca/red-bellied-woodpecker-a-rare-sight-in-ontario/
23. Red-bellied Woodpecker - Melanerpes carolinus - NatureWorks - New Hampshire PBS, accessed August 21, 2025, https://nhpbs.org/natureworks/redbelliedwoodpecker.htm
24. Red-bellied Woodpecker (Melanerpes carolinus) - Texas Parks and Wildlife, accessed August 21, 2025, https://tpwd.texas.gov/huntwild/wild/species/redbelliedwoodpecker/

25. Red-bellied Woodpecker » HF&G - Holden Arboretum, accessed August 21, 2025, https://holdenfg.org/nature-profiles/red-bellied-woodpecker/
26. Pileated Woodpecker - Montana Field Guide, accessed August 21, 2025, https://fieldguide.mt.gov/speciesDetail.aspx?elcode=abnyf12020
27. Where We Work - Ontario - Pileated Woodpecker - NCC, accessed August 21, 2025, https://www.natureconservancy.ca/en/where-we-work/ontario/featured-projects/backus-woods/interpretive-features/pileated-woodpecker.html
28. What Do Pileated Woodpeckers Eat? (Diet + Behavior) - Birdfact, accessed August 21, 2025, https://birdfact.com/articles/what-do-pileated-woodpeckers-eat
29. Belted Kingfisher Overview, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Belted_Kingfisher/overview
30. Belted Kingfisher Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Belted_Kingfisher/lifehistory
31. Waterbirds, indicators of wetland health - India Water Portal, accessed August 21, 2025, https://www.indiawaterportal.org/environment/ecology/waterbirds-indicators-wetland-health
32. Green Heron Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Green_Heron/lifehistory
33. Green Heron - American Bird Conservancy, accessed August 21, 2025, https://abcbirds.org/bird/green-heron/
34. FS1214: Canada Goose Ecology and Impacts in New Jersey (Rutgers NJAES), accessed August 21, 2025, https://njaes.rutgers.edu/fs1214/
35. Niagara bird checklist - Avibase - Bird Checklists of the World - Birds Canada, accessed August 21, 2025, https://avibase.bsc-eoc.org/checklist.jsp?region=CAonng&list=howardmoore
36. Ontario removes bald eagles from species-at-risk list - The Wildlife Society, accessed August 21, 2025, https://wildlife.org/ontario-removes-bald-eagles-from-species-at-risk-list/
37. The bald eagle is no longer an at risk species in Ontario - CTV News, accessed August 21, 2025, https://www.ctvnews.ca/toronto/article/the-bald-eagle-is-no-longer-an-at-risk-species-in-ontario/
38. Peregrine falcon Species Status Assessment - NY.gov, accessed August 21, 2025, https://extapps.dec.ny.gov/fs/programs/dfw/SWAP2025/Birds/Peregrine%20falcon%20SSA.pdf
39. Raptors - AviaNiagara - Squarespace, accessed August 21, 2025, https://hawk-pike-m3k6.squarespace.com/gallery/raptors
40. Fauna - Niagara Falls, accessed August 21, 2025, https://www.tourniagara.com/geologynature/fauna/
41. Life in the Landscape: Great Horned Owls - Arnold Arboretum, accessed August 21, 2025, https://arboretum.harvard.edu/stories/life-in-the-landscape-great-horned-owls/

42. Bird Cams FAQ: Great Horned Owl Nest | All About Birds, accessed August 21, 2025, https://www.allaboutbirds.org/news/bird-cams-faq-great-horned-owl-nest/
43. Red-tailed Hawk - Minnesota DNR, accessed August 21, 2025, https://www.dnr.state.mn.us/birds/redtailedhawk.html
44. en.wikipedia.org, accessed August 21, 2025, https://en.wikipedia.org/wiki/Indigo_bunting#:~:text=The%20indigo%20bunting%20(Passerina%20cyanea,South%20America%20during%20the%20winter.
45. Indigo bunting - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/Indigo_bunting
46. Indigo Bunting Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Indigo_Bunting/lifehistory
47. Mallard - CT.gov, accessed August 21, 2025, https://portal.ct.gov/deep/wildlife/fact-sheets/mallard
48. Are some birds invasive species? - Bird Friendly London, accessed August 21, 2025, https://www.birdfriendlylondon.ca/post/are-some-birds-invasive-species
49. Mute Swans - usda aphis, accessed August 21, 2025, https://www.aphis.usda.gov/sites/default/files/Mute-Swans-WDM-Technical-Series.pdf
50. Common Misconceptions about Mute Swans, accessed August 21, 2025, https://muteswansociety.org/issues/common-misconceptions-about-mute-swans/
51. Ontario Forest Birds At Risk Program, accessed August 21, 2025, https://www.birdscanada.org/bird-science/ofbar
52. Ground nesting by arboreal American robins (Turdus migratorius) - PMC - PubMed Central, accessed August 21, 2025, https://pmc.ncbi.nlm.nih.gov/articles/PMC8794755/
53. Wrens | Game Commission - Commonwealth of Pennsylvania, accessed August 21, 2025, https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/wrens
54. Welcome Nesting Wrens With Wren Houses - Birds and Blooms, accessed August 21, 2025, https://www.birdsandblooms.com/birding/attracting-birds/bird-nesting/attracting-nesting-bird-carolina-house-wrens/
55. American goldfinch - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/American_goldfinch
56. Food Preferences of the American Goldfinch, Wild Bird Library - Perky-Pet, accessed August 21, 2025, https://www.perkypet.com/advice/bird-library/wild-bird/american-goldfinch/food-preferences
57. Song sparrow (Melospiza melodia) ("Modesto" population), accessed August 21, 2025, https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=10461
58. Song Sparrow Conservation - Los Padres ForestWatch, accessed August 21, 2025, https://forestwatch.org/learn-explore/wildlife-plants/song-sparrow/
59. House (Wrecking) Wrens - National Wildlife Federation, accessed August 21, 2025, https://www.nwf.org/Magazines/National-Wildlife/2010/House-Wrecking-

Wrens
60. (species) dryobates pubescens - Utah Natural Heritage Program Field Guide, accessed August 21, 2025, https://fieldguide.wildlife.utah.gov/?Species=Dryobates%20pubescens
61. EASTERN PHOEBE | The Texas Breeding Bird Atlas, accessed August 21, 2025, https://txtbba.tamu.edu/species-accounts/eastern-phoebe/
62. Eastern Phoebe Range Map, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Eastern_Phoebe/maps-range
63. Fun Facts About Mourning Doves - Wild Birds Unlimited, accessed August 21, 2025, https://woodstock.wbu.com/mourningdoves
64. 10 Things You Might Not Know About Mourning Doves, accessed August 21, 2025, https://highparknaturecentre.com/10-things-you-might-not-know-about-mourning-doves/
65. Eastern Wood-Pewee Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Eastern_Wood-Pewee/lifehistory
66. Eastern Wood-pewee- Species At Risk in The Land Between, accessed August 21, 2025, https://www.thelandbetween.ca/the-land-between-species-at-risk/eastern-wood-pewee/
67. Fun Facts About Catbirds - Wild Birds Unlimited, accessed August 21, 2025, https://havertown.wbu.com/content_section/show/257809
68. www.audubon.org, accessed August 21, 2025, https://www.audubon.org/news/10-fun-facts-about-gray-catbird#:~:text=In%20fact%2C%20the%20catbird's%20genus,cherries%2C%20grapes%2C%20and%20strawberries.
69. Dark-eyed Junco Life History, All About Birds, Cornell Lab of Ornithology, accessed August 21, 2025, https://www.allaboutbirds.org/guide/Dark-eyed_Junco/lifehistory
70. (species) junco hyemalis - Utah Natural Heritage Program Field Guide, accessed August 21, 2025, https://fieldguide.wildlife.utah.gov/?Species=Junco%20hyemalis
71. Starlings | Facts & Identification, Control & Prevention - Orkin Canada, accessed August 21, 2025, https://www.orkincanada.ca/pests/birds/starlings/
72. Common starling - Wikipedia, accessed August 21, 2025, https://en.wikipedia.org/wiki/Common_starling
73. Species Diversity at Niagara Parks, accessed August 21, 2025, https://www.niagaraparks.com/species-diversity/