Species at Risk Act
Action Plan Series

Multi-species Action Plan for Rouge National Urban Park of Canada

2021

Canada

Recommended citation:

Parks Canada Agency. 2021. Multi-species Action Plan for Rouge National Urban Park of Canada. *Species at Risk Act* Action Plan Series. Parks Canada Agency, Ottawa. iv + 55 pp.

For copies of the action plan, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, recovery strategies, and other related recovery documents, please visit the Species At Risk Public Registry[1].

Cover illustration: © Parks Canada Agency. Rouge National Urban Park of Canada photo credit: Parks Canada/Scott Munn.

Également disponible en français sous le titre:
«Plan d'action visant des espèces multiples dans le parc urbain national de la Rouge au Canada [proposition]»

ISBN: 978-0-660-39802-0
Catalogue no.: CW69-21/73-2021E-PDF

[1] www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Preface

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996)[2] agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as Extirpated, Endangered, and Threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the Species at Risk Public Registry.

Under SARA, one or more action plan(s) provides the detailed recovery planning that supports the strategic direction set out in the recovery strategies for the species. The plan outlines what needs to be done to achieve the population and distribution objectives (previously referred to as recovery goals and objectives) identified in the recovery strategies, including measures to address the threats and monitor the recovery of the species, as well as the proposed measures to protect critical habitat that has been identified for the species. The action plan also includes an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation. The action plan is considered to be one resource in a series of documents that are linked and should be taken into consideration together with the COSEWIC status reports, management plans, recovery strategies, and other action plans produced for these species.

The Minister responsible for the Parks Canada Agency (the Minister of the Environment and Climate Change) is the competent minister under SARA for the species found in Rouge National Urban Park of Canada and has prepared this action plan to implement the recovery strategies as they apply to the Park, as per section 47 of SARA. It has been prepared in cooperation with Environment and Climate Change Canada, Fisheries and Oceans Canada, the province of Ontario, and the Rouge National Urban Park First Nations Advisory Circle as per section 48(1) of SARA.

Implementation of this action plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

[2] www.canada.ca/en/environment-climate-change/services/species-risk-act-accord-funding.html#2

Acknowledgments

Thank you to all of those who contributed to the content of this plan, especially the Rouge National Urban Park First Nations Advisory Circle (FNAC), partner communities, stakeholders, and experts who participated in discussions and planning meetings in the fall and winter of 2018, the site analysis meetings held in December 2019 and March 2020, and the provision of written feedback on the draft and proposed versions of this plan. Special thanks goes out to individuals from: Birds Canada; Environment and Climate Change Canada; Fisheries and Oceans Canada; Friends of Rouge National Urban Park; the Ministry of the Environment, Conservation and Parks; the Ministry of Natural Resources and Forestry; the Ontario Federation of Anglers and Hunters; Ontario Streams; the Rouge Valley Conservation Centre; the Toronto and Region Conservation Authority; the Toronto Zoo; the University of Toronto- Scarborough; York Region Federation of Agriculture; Jarmo Jalava- Independent Consultant; and to all those who contributed their time, expertise and information throughout this process.

The development of this action plan was strengthened by the participation of representatives from the FNAC communities who contributed to Parks Canada's current understanding of areas of mutual interest. The Rouge National Urban Park FNAC consists of: the seven Williams Treaties First Nations – Mississaugas of Scugog Island First Nation, Hiawatha First Nation, Alderville First Nation, Curve Lake First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Beausoleil First Nation – as well as Mississaugas of the Credit First Nation, Six Nations of the Grand River, and the Huron-Wendat Nation.

Executive Summary

The *Multi-species Action Plan for Rouge National Urban Park of Canada* applies to lands and waters occurring within the boundaries of Rouge National Urban Park (RNUP) of Canada, including Bead Hill National Historic Site. The plan meets the requirements set out in the *Species at Risk Act* (SARA s.47) for species requiring an action plan that regularly occur at this site. Measures described in this plan will also provide benefits for other species of conservation concern that regularly occur at RNUP. For the purposes of this plan, “regularly occurring” indicates that the species has been observed at the site at least once in the past ten years.

Where it has been determined that the site can implement management activities to help recover and/or manage a species, site-specific objectives are identified in this plan and represent the site’s contribution to objectives presented in federal recovery strategies and management plans. Species at risk, their residences, and their habitat are protected by existing regulations and management regimes in national parks, national urban parks, and national historic sites as well as by SARA. Additional measures that will contribute to the survival and recovery of the species at the site are described in this plan. These measures were identified based on threats and actions outlined in federal and provincial status assessments and recovery documents, as well as knowledge of the status and needs of each species at each site. Population monitoring measures are also identified for the species for which management activities at the sites can contribute to recovery.

Critical habitat has already been identified in RNUP for Blanding’s Turtle and Bashful Bulrush and more may be identified in the future when possible. No additional critical habitat is identified in this action plan. Measures used for protection of existing critical habitat are described.

Measures proposed in this action plan will have limited socio-economic impact and place no restrictions on land use outside of RNUP. The implementation of Farm Management Plans and incorporation of best management practices into agricultural practices may present minimal socio-economic costs to Park farmers as outlined in Section 5.1. Direct costs of implementing this action plan will be borne by the Parks Canada Agency (PCA). Indirect costs are expected to be minimal, while benefits will include positive impacts on ecological integrity, greater awareness and appreciation of the value of biodiversity to Canadians, and opportunities for engagement of local communities and Indigenous groups.

Table of contents

1. Context

Canada's first national urban park, Rouge National Urban Park (RNUP), was officially established in May 2015 and protects some of the highest quality habitat in the Greater Toronto Area (GTA). Once fully established, it will span 79.1 km^2 in the heart of Canada's largest and most diverse metropolitan area, overlapping the cities of Toronto, Markham, and Pickering, and the Township of Uxbridge (Figure 1). Within the park is evidence of 10,000 years of human history relating to the presence of Indigenous Peoples, agricultural settlement, recreational use, and environmental stewardship. One particularly significant site that is included within RNUP boundaries is the Bead Hill National Historic Site, the only known remaining and intact 17th-century Seneca village site in Canada. RNUP has a long history of agriculture heritage and about half of its land area is managed by Park farmers through agricultural leases. The Park's natural and cultural diversity and urban setting pose opportunities and challenges never before encountered in any other place under the Parks Canada Agency's (PCA) protection.

RNUP contains some of the largest and highest quality examples of forest, meadow, riverine, and inland and coastal wetlands in the urban and near-urban landscape of the GTA. The Park also contains small remnants of rare habitats such as oak savannah, and some of the northern-most reaching remnants of Carolinian woodlands in Ontario. The Park extends across three watersheds (Rouge River, Petticoat Creek and Duffins Creek) in the eastern portion of the GTA, thus contributing tangibly to the overall health of those ecosystems.

The southern portion of the Park lies at the northern edge of the Carolinian Life Zone and supports a high diversity of flora and fauna. It predominantly consists of mature forested ravine complexes in addition to steep valley slopes along the Rouge River, bluffs, expansive floodplains, and the largest coastal wetland in the City of Toronto, the Rouge Marsh. The Rouge Marsh is among the region's most ecologically valuable and productive habitats; it provides a number of essential ecosystem services, and provides important habitat for many mammal, bird, reptile, amphibian, and fish species throughout their different stages of development. The northern portion of the Park lies at the southern limit of the Oak Ridges Moraine. In the north, the landscape is predominantly level and dominated by agricultural lands, with wetland and forested pockets and corridors intertwined. It also forms a key ecosystem connection within the Greenbelt between Lake Ontario and the Oak Ridges Moraine. The Rouge's relatively high biodiversity and ecological richness can be attributed to the Park's location and its many variations in topography, microclimates, soil type and land use.

Human presence has long been part of the Rouge's trajectory, with over 10,000 years of recorded human history in the area, including rich and diverse Indigenous history. Although settlers have been farming the Rouge Valley since 1804, the first farmers in this area were Indigenous communities who started growing corn and other crops around 700 AD. Significant increases in human disturbances correspond with Euro-Canadian settlement in the 18th-century and the proliferation of logging, milling, and agriculture. Modifications to the landscape intensified in the 20th-century and much of the area's original landscapes were further altered or disturbed by housing

developments, aggregate mineral extraction, and the construction of service and transportation corridors. In recent years, unmanaged and increasing visitation, dumping, pollution, poaching, and the creation and use of several unofficial trails throughout sensitive habitats has resulted in significant human impacts in the Park, with many of these issues predating Parks Canada's presence and the creation of Rouge National Urban Park in 2015. Ecological impacts of past and current settlement and recreation activities include the introduction of numerous invasive alien plant species and feral animals, increased effects of hyper-abundant species, altered hydrological and fire regimes, the destruction of habitat from urban development, the extirpation of several species, and the increased use of pesticides, herbicides, and fertilizers for use in forestry, agricultural operations and surrounding urban settlements.

The Park's ecological integrity will be maintained or restored through a wide range of actions that result in greater native biodiversity, better conditions for cold-water aquatic species, and enhanced ecological connectivity. Restoration projects throughout the Park will focus on improving conditions in five main types of ecosystems – forest, meadow, wetland, coastal marsh, and riverine. In agricultural landscapes in the Park, restoration programming will seek to find win-win opportunities where ecosystem function can be improved simultaneously with farming operations through enhancement of infrastructure or implementation of best management practices. Restoring wetlands and riparian vegetation along stream channels, re-naturalizing fallow areas, restoring marginal lands no longer used for agriculture, and working with Park farmers to enhance native species composition in hedgerows, woodlots, and pollinator habitats are all activities that will benefit the ecological integrity of Park ecosystems. Additionally, these activities will help to preserve Class 1 farmland, the rarest and most fertile in the country, in a landscape where farming is an activity with more than two hundred years of history.

Rouge National Urban Park is surrounded by a dynamic urban environment, including many residential, industrial and commercial developments that have the potential to greatly impact the ecological integrity of the Rouge. Infrastructure such as roads, highways, rail lines, hydro corridors, regional water mains, pipelines, and sewers traverse all parts of the Park and serve growing urban populations in the eastern portion of the GTA. While Parks Canada can implement conservation and recovery measures in RNUP, and enforce Agency legislation within its boundaries, many of the species and their habitats that are a focus of this action plan also extend beyond the boundaries of the Park. This is why the important partnerships that have been forged with the Park's conservation partners and community stakeholders are critical in species conservation and recovery efforts.

Parks Canada has worked with many partners and volunteers in RNUP to improve the ecological health of the Park and increase opportunities to support the recovery of species at risk. Parks Canada works closely with representatives from 10 Indigenous communities, as part of the Rouge National Urban Park First Nations Advisory Circle (FNAC), as well as other federal departments, the Province of Ontario, the Toronto and Region Conservation Authority (TRCA), the Toronto Zoo, local municipalities, academic

partners, local conservation groups, farmers and community volunteers to conserve and protect species at risk and their habitats. Multiple measures in this plan involve engaging key conservation partners, road authorities, external landowners, leaseholders, and Park user groups to raise public awareness of the challenges facing species at risk in the GTA and encourage the use of best management practices and participation in citizen science opportunities.

Parks Canada will also work closely with the Rouge National Urban Park FNAC to meaningfully incorporate Indigenous Traditional and Modern Knowledge into management practices to conserve species at risk. The integration of Indigenous Traditional and Modern Knowledge into park management practices is an important and integral part of the PCA's commitment to become better stewards of the park now, and for future generations. By continuing to build and strengthen long term relationships with FNAC communities, Parks Canada will gain a better understanding of the ecological, cultural, and spiritual significance of the lands we are working to protect. This, in turn, allows Parks Canada to care for ecosystems using a holistic approach, through shared values and perspectives. Honoring and incorporating Indigenous ways of knowing into park planning, management, and operations will also empower relationships that contribute to further stewardship, increasing capacity to connect with Indigenous-led conservation projects and sharing Indigenous Traditional and Modern Knowledge on a broader scale with park tenants, visitors, and Canadians across the country.

Maintenance and restoration of ecological integrity is the first priority of national parks (*Canada National Parks Act* s.8(2)) and Canada's first national urban park (*Rouge National Urban Park Act* s.6(1)). Species at risk, their residences, and their habitat are therefore protected by existing park legislation, rules and management regimes. In addition, the *Species at Risk Act* (SARA) prohibitions protecting individuals and residences apply automatically when a species is listed, and all critical habitat in national parks and national historic sites must be legally protected within 180 days of being identified.

Recovery measures for species at risk will be integrated within the framework of Parks Canada's Ecological Integrity Monitoring and Impact Assessment programs. Parks Canada maintains comprehensive and scientifically rigorous ecological integrity monitoring and restoration programs in Canada's national parks that are organized according to the major ecosystems present in the Park. These ecological integrity programs can be found in Park-specific State of the Park Reports[3]. The recovery measures described in this action plan are therefore organized in the same manner. Parks Canada's Ecological Integrity Monitoring programs make contributions to the recovery of species at risk by providing inventory and monitoring data that contribute to habitat management decisions, and through the implementation of habitat restoration projects and other conservation measures. The species-directed measures outlined in this plan will, in turn, contribute to maintaining and improving ecological integrity at the site by improving the conservation status of native species and their habitat and maintaining biodiversity. All projects that are proposed as part of this action plan will

[3] https://www.pc.gc.ca/en/agence-agency/bib-lib/rapports-reports/parcs-parks

undergo the impact assessment process in order to ensure all potential negative impacts are identified and mitigated or avoided and that compensation is implemented, where required. Species at risk and critical habitat are two of the primary 'valued components' considered through the impact assessment process, along with various other components such as water quality and aquatic ecosystems, cultural and agricultural resources, socio-economic impacts and visitor experience.

A number of federal and provincial recovery strategies and plans, management plans, and action plans have been prepared for species considered in this action plan. Along with COSEWIC status assessments, those documents provide guidance for the recovery of individual species, including strategic directions, recovery objectives, critical habitat, and threats. This action plan was developed and will be implemented in a manner that is consistent with those recovery documents, and should be viewed as part of this body of linked strategies and plans.

1.1. Scope of the action plan

The geographic scope of this action plan includes all federally owned lands and waters managed by Parks Canada in RNUP (Figure 1), including Bead Hill National Historic Site as it is wholly contained within the boundaries of the park. This multi-species action plan has been written specifically for RNUP because Parks Canada is legally responsible for species at risk on Parks Canada's lands and waters, has the ability to take direct conservation action, and deals with different threats, legislation, and management priorities than areas outside the sites.

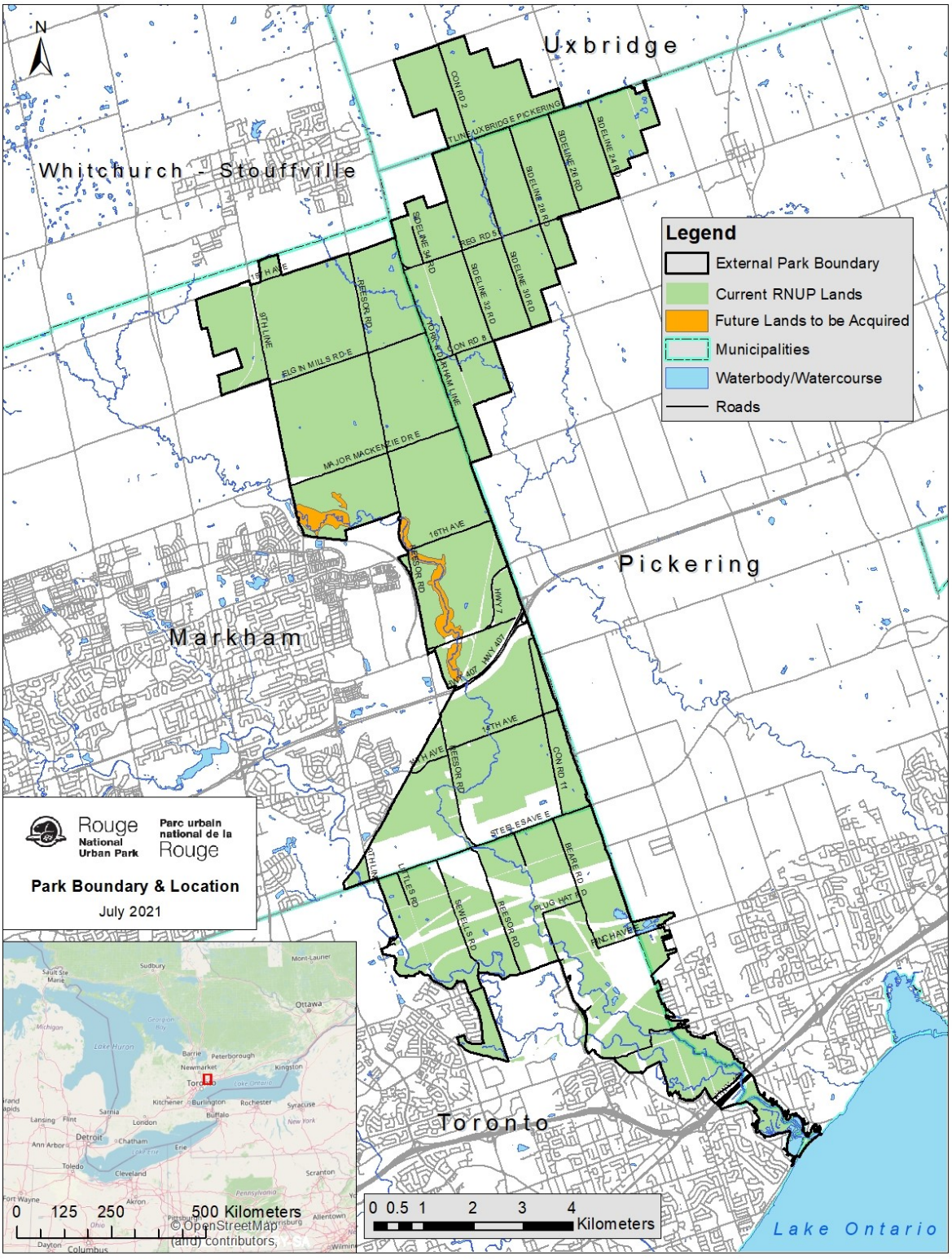

Figure 1. Boundaries of Rouge National Urban Park of Canada.

This action plan addresses 42 SARA-listed species as well as eight other species of conservation concern that regularly occur[4] in RNUP (Table 1). Extirpated, Endangered and Threatened species in the list require an action plan under SARA (s.47). This plan specifically addresses the portion of the species' population that occurs within RNUP. This approach both responds to the legislated requirements of SARA and provides Parks Canada with a comprehensive plan for species conservation and recovery at the site.

Table 1. Species included in the action plan for RNUP.

Species	Scientific Name	COSEWIC Status	SARA Schedule 1 Status
Mammals			
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered
Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered
Birds			
Acadian Flycatcher	*Empidonax virescens*	Endangered	Endangered
Bank Swallow	*Riparia riparia*	Threatened	Threatened
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened
Black Tern[5]	*Chlidonias niger*	Not at Risk	Not Listed
Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened
Canada Warbler	*Cardellina canadensis*	Special Concern	Threatened
Cerulean Warbler	*Setophaga cerulea*	Endangered	Endangered
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened
Common Nighthawk	*Chordeiles minor*	Special Concern	Threatened
Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened
Eastern Wood-pewee	*Contopus virens*	Special Concern	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum pratensis*	Special Concern	Special Concern
Horned Grebe	*Podiceps auritus*	Special Concern	Special Concern
King Rail	*Rallus elegans*	Endangered	Endangered
Least Bittern	*Ixobrychus exilis*	Threatened	Threatened
Loggerhead Shrike Eastern subspecies[5]	*Lanius ludovicianus ssp.*	Endangered	No Status
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Threatened
Piping Plover circumcinctus subspecies	*Charadrius melodus circumcinctus*	Endangered	Endangered
Peregrine Falcon anatum/tundrius	*Falco peregrinus anatum/tundrius*	Not at Risk	Special Concern
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Endangered	Endangered
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern
Short-eared Owl	*Asio flammeus*	Threatened	Special Concern
Wood Thrush	*Hylocichla mustelina*	Threatened	Threatened
Yellow-breasted Chat virens subspecies	*Icteria virens virens*	Endangered	Endangered
Yellow Rail	*Coturnicops noveboracensis*	Special Concern	Special Concern
Reptiles			

Species	Scientific Name	COSEWIC Status	SARA Schedule 1 Status
Blanding's Turtle (Great Lakes/St. Lawrence population)	*Emydoidea blandingii*	Endangered	Threatened
Eastern Milksnake	*Lampropeltis triangulum*	Special Concern	Special Concern
Eastern Ribbonsnake (Great Lakes population)	*Thamnophis sauritus*	Special Concern	Special Concern
Midland Painted Turtle[5]	*Chrysemys picta marginata*	Special Concern	Special Concern
Northern Map Turtle	*Graptemys geographica*	Special Concern	Special Concern
Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern
Amphibians			
Western Chorus Frog (Great Lakes/Upper St. Lawrence-Canadian Shield Population)	*Pseudacris triseriata*	Threatened	Threatened
Fishes			
American Eel[5]	*Anguilla rostrata*	Threatened	No Status
Atlantic Salmon (Lake Ontario population)[5]	*Salmo salar*	Extinct	No Status
Lake Sturgeon (Great Lakes/Upper St. Lawrence population) [5]	*Acipenser fulvescens*	Threatened	No Status
Northern Brook Lamprey (Great Lakes/Upper St. Lawrence populations)	*Ichthyomyzon fossor*	Special Concern	Special Concern
Redside Dace	*Clinostomus elongatus*	Endangered	Endangered
Silver Lamprey (Great Lakes/Upper St. Lawrence populations)	*Ichthyomyzon unicuspis*	Special Concern	Special Concern
Invertebrates			
American Bumblebee[5]	*Bombus pensylvanicus*	Special Concern	No Status
Black Purse Web Spider[5]	*Sphodros niger*	Not Listed	Not Listed
Eastern Pondmussel	*Ligumia nasuta*	Special Concern	Special Concern
Monarch	*Danaus plexippus*	Endangered	Special Concern
Yellow-banded Bumble Bee	*Bombus terricola*	Special Concern	Special Concern
Plants			
Bashful Bulrush[6]	*Trichophorum planifolium*	Endangered	Endangered
Black Ash[5]	*Fraxinus nigra*	Threatened	No Status
Butternut	*Juglans cinerea*	Endangered	Endangered

[4] For the purpose of this Multi-species Action Plan, a regularly occurring species is defined as a species that has been observed at least once within RNUP boundaries in the last 10 years.
[5] Species of conservation concern that are not currently listed under SARA are included in this action plan because the PCA can take actions to increase knowledge about the species in RNUP and improve conservation outcomes.
[6] Species extirpated from the site are only included in this plan if reintroduction is being considered as a recovery measure for the species.

Additional action plans may be developed by partners that address other portions of the species' range extending beyond RNUP boundaries. This action plan should be considered along with any other action plan developed for species listed in Table 1 in order to have a comprehensive view of recovery actions that cover the full range of the species. Refer to the Species at Risk Public Registry to access other action plans. This action plan will be amended as required to meet SARA requirements.

2. Site-based population and distribution objectives

The potential for Parks Canada to undertake management actions at the site that will contribute to the recovery of each species was assessed. Site-specific population and distribution objectives were developed (Appendix A) to identify the contribution that the site can make towards achieving the national objectives presented in federal recovery strategies and management plans. Because they are directly linked to the site-based population and distribution objectives, monitoring activities are reported in Appendix A rather than in the tables of recovery measures (Appendices B & C). If there is little opportunity for the site to contribute to the recovery of a species, site-specific objectives and conservation measures may be limited to protection measures in place under the *Rouge National Urban Park Act,* the *Canada National Parks Act*, the *Impact Assessment Act,* and SARA, and population monitoring, habitat maintenance, and restoration through the existing management regimes at the site. For many species, population and distribution objectives for RNUP are not meaningful at the scale of this action plan for various reasons, including 1) threats cannot be controlled in the park or do not exist in the park (e.g., wide-spread disease, threats exacerbated by the surrounding dynamic urban environment, loss of overwintering habitat elsewhere); 2) species is only transient; or 3) population within the site is a very small part of the Canadian distribution or is unknown or unconfirmed.

3. Conservation and recovery measures

The opportunities for RNUP to contribute to national population and distribution goals for species at risk have been assessed and prioritized. In total, 76 conservation and recovery measures are outlined in Appendices B & C. Each measure includes an associated desired outcome, identifies the threat or recovery measure addressed through the implementation of the measure, and Appendix B includes a timeline for the desired outcome to be completed by. Desired outcomes reflect outcomes that are quantifiable and achievable over the five-year implementation period of this plan. Long-term conservation and recovery objectives such as increasing species usage of a restored or replaced habitat, eradicating invasive species from RNUP, and increasing the natural recruitment of a long-lived species are all longer term objectives, but are likely not achievable by 2026.

Many recovery measures outlined in this plan (Appendices B & C) will be conducted in collaboration with conservation partners in RNUP. Academic interest in the Park has also meant a consistent source of research that informs management and restoration efforts. Additionally, Parks Canada continues to engage Park leaseholders, visitors and

volunteers to improve the ecological health of the Park and support the recovery of species at risk. The broad and diverse Park visitor base provides opportunities to connect with visitors through direct involvement in species recovery and to draw upon citizen science and volunteers in resource conservation. In 2017, for example, the Park held one of Canada's largest ever citizen science events, BioBlitz Canada 150. Educational events and programs of this nature are expected to continue in the years ahead.

This action planning process identified measures to achieve site-based population and distribution objectives, along with measures required to protect the species and learn more about them. The process of determining which measures will be conducted by the Park (Appendix B) and which measures will be encouraged through partnerships or when additional resources come available (Appendix C) involved a prioritization process. The process primarily considered ecological effectiveness of measures, and also included consideration of opportunities to increase the value of the visitor experience at the Park, opportunities to increase awareness through external relations, and fiscal opportunities and constraints. Wherever possible, Parks Canada is taking an ecosystem based approach, prioritizing actions that benefit numerous species at once to effectively and efficiently protect and recover species at risk.

Five themes emerge from the measures Parks Canada will take for species at risk recovery in RNUP: habitat restoration; active management; invasive species management; working together to fill knowledge gaps; and visitor engagement, education and outreach. These themes are briefly described below.

Habitat restoration

Parks Canada will continue to build on important work conducting broad-scale ecological restoration programming throughout RNUP including the creation and enhancement of habitat for species at risk. Within the five-year window of this plan, Parks Canada will restore more than 40 hectares of wetland and riparian habitat, 30 hectares of forest habitat, and 6 hectares of meadow habitat in RNUP. These deliverables are in addition to the more than 70 hectares of wetland and riparian habitat, 27 hectares of forest habitat and two hectares of meadow habitat that have already been restored since RNUP was created in 2015.

Developing and implementing a five-year ecological restoration plan will allow RNUP to prioritize sites for restoration work that will result in the highest gains from an ecological perspective. In collaboration with TRCA, a Restoration Opportunities Prioritization Framework specific to RNUP is being developed, which takes into account a wide variety of valued systems that may be impacted (e.g., species at risk, areas of cultural importance, agricultural operations and promoting a vibrant farming community, and aquatic ecosystems). The framework encompasses lands throughout the Park, including agricultural lands, and helps to identify objectives that complement restoration work, such as enhancing visitor experience and creating opportunities for partnership and public engagement.

Conceptual restoration plans for rare and remnant habitats that support species at risk in the Park (e.g. oak savannah, oak woodland) will be developed and implemented over the next three years. Restoration activities will include creation of additional habitat for species at risk and the enhancement of existing wildlife corridors in strategic locations throughout the Park where specific habitat types are limited (e.g. turtle and snake nesting, basking and overwintering habitat, and complex woody habitat for fish). Restoration goals will be achieved, in part, by prioritizing sites with high ecological value for species at risk. Targeted habitat restorations will include actions such as forest, riparian and meadow plantings, wetland restoration and enhancement, stream channel re-naturalization, wildlife barrier removals, priority invasive species removal, and the ongoing creation and implementation of plans for forest prescriptions, prescribed fires, mowing and cutting regimes and best management practices for farm operations.

Collaboration with the park's farming community to maintain and restore ecological integrity through the enhancement of natural habitats, as well as management of soils and water on agricultural properties has resulted in both ecological and agricultural gains. A few examples of how restoration efforts have and will continue to result in farmland enhancement include: improving farming conditions by increasing naturalized drainage, improving hydrology and water filtration through the creation of tile treatment wetlands, improving farm crossings while incorporating natural-bottom culverts and low-level crossings that facilitate aquatic species movement, and restoring the native species composition of hedgerows and associated vegetation buffers that act as wind breaks and prevent loss of soil, while providing habitat for pollinators that are necessary for crop and native plant pollination.

Active management

While habitat restoration is important for many species at risk at RNUP, there continues to be individual needs for certain species. Active management measures will include, but are not limited to:

- Ongoing Blanding's Turtle reintroductions to supplement the original Park population. Parks Canada has worked with the Toronto Zoo to release nearly 400 two-year old Blanding's Turtles back into the wild and will continue to reintroduce head-started turtles in the coming years.
- Nest protection and egg collection, incubation, and release of Snapping Turtles, Midland Painted Turtles, Map Turtles, and Blanding's Turtles within the park. This initiative, led by PCA's resource conservation staff, will help to reduce the nearly 100% nest predation that occurs due to human subsidized predators such as raccoons, skunks, foxes, and coyotes.
- Contributing to further improvements to wildlife passage across roads throughout the Park. In areas of the park that are heavily used as migration corridors for breeding or nesting, adjacent to wetlands, or that have been identified as road mortality hotspots, the installation and improvement of eco-passages and road mortality mitigation fencing will be considered, working in cooperation with intergovernmental agencies to identify key opportunities.
- Parks Canada will develop and implement a Fire Management Plan for RNUP, which will include prescriptions for burns to facilitate the natural succession of

fire-dependent ecosystems, such as meadows, native prairie, and oak woodland habitats within RNUP. In some circumstances, the succession of these meadows has resulted in the establishment of invasive species and reduced suitability of these habitats for species at risk. To encourage regeneration of native meadow species and to maintain RNUP's largest meadow at Bob Hunter Memorial Park and the new 19th Avenue Welcome Area, prescribed burns will be implemented at these sites.

- In partnership with park farmers, Parks Canada will work towards developing specific farm management plans and encourage the incorporation of Best Management Practices (BMPs) into farming practices in the Park. Through this process, tenant farmers and Parks Canada staff will be more aware of the needs of the farming community, of BMPs currently in place by park farmers, and of new and innovative BMPs that will encourage both agricultural and ecological sustainability. Examples of BMPs that will be encouraged include, but are not limited to: 1) managing agricultural grasslands such as pastures, hay fields, small grain fields, and fallow fields to support species at risk and pollinators; 2) making minor adjustments in harvest timing to support wildlife nesting and other seasonal wildlife needs; and 3) restoring hedgerows and associated buffers that benefit wildlife and habitat connectivity and are necessary for crop pollination.

Invasive species management

Invasive species represent a significant threat to many of the species at risk in RNUP and are posing a threat to RNUP's overall ecological integrity. While there has been an ongoing effort to manage some of the most prevalent invasive species, such as dog-strangling vine (*Vincetoxicum rossicum*), European common reed (*Phragmites australis australis)*, and Japanese knotweed (*Reynoutria japonica*), a larger initiative is planned and necessary for the coming years.

Developing and implementing an Invasive Species Management Plan (ISMP) will provide Parks Canada a framework to target invasive species in RNUP that are highest priority for removal and threaten species at risk and their habitats. Specific programs will combat invasive alien plant species such as *Phragmites* and dog-strangling vine. The Rouge Marsh Restoration Program will incorporate the removal of *Phragmites* through herbicide application for *Phragmites* established on dry land, and cutting and drowning methods for *Phragmites* cells originating underwater. Dog-strangling vine will be managed through herbicide applications in specific areas, and alternative management approaches such as biocontrol, manual removal methods, and planting native species to increase resilience to invasion will be explored. Invasive tree species are also pushing some species at risk trees, such as butternut, to the brink of extirpation due to hybridization with exotic plantings. A comprehensive park-wide butternut inventory will be conducted and the hybridization of each tree will be determined using phenotypic traits or genetic analyses where required. A list of butternut hybrids and invasive species known to readily hybridize with butternut will be maintained and used to prioritize future management activities.

Currently, RNUP's resource conservation staff manage a database to document observations of invasive species. Most of the invasive species management efforts, including herbicide applications to *Phragmites* and dog-strangling vine in the park thus far have been reactive, but through the implementation of the ISMP, early detection through the park's ecological integrity monitoring program, and the creation of a formalized Watch List, RNUP will work towards the proactive prevention of incoming invasive species.

An additional challenge for RNUP when combating invasive species includes the surrounding dynamic urban environment (e.g. residential backyards) and municipally and provincially owned infrastructure that traverses the park (e.g. roads, highways, rail lines, and hydro corridors). Parks Canada will collaborate with external land managers to combat invasive species in these areas and prevent park invasions or reinvasions.

In addition to invasive plant species, non-native fauna, diseases, and other pathogens also pose a threat to species at risk in RNUP. Actions to reduce impacts of common carp and impending threats of Asian carp species in the Rouge Marsh, and non-native turtles throughout RNUP wetlands will be addressed through this plan.

Working together to fill knowledge gaps

Research and monitoring is needed to fill gaps in the knowledge base necessary to build programs for some species at risk. Many of these measures will require partnerships and/or additional funding, and will benefit from the opportunity to work with the academic community, Indigenous partners, partner agencies, non-governmental conservation organizations, volunteers, and citizen scientist programs.

Many species at risk occupy anthropogenic structures such as chimneys and attics of houses, barns, and other outbuildings during part or all of their life cycle. Parks Canada manages over 1600 units of infrastructure (built assets) within RNUP, including those for public use, operational and commercial buildings, houses, and outbuildings such as sheds, garages, barns, stables, and silos. In cases where these structures are in a state of disrepair and removal or decommissioning must be considered due to health and safety concerns, habitat compensation will be considered or required, particularly in cases where species at risk have been observed actively inhabiting these structures. Barn Swallows, Chimney Swifts, Eastern Milksnakes, Eastern Ribbonsnakes, and *Myotis* bat species are intensively surveyed for at sites that are beyond a state of repair and are being considered for removal. Any structure that is actively used by any of these species will be replaced with the appropriate habitat compensation, or the integrity of the structure will be reassessed and considerations will be made to keep the structure or the part of the structure being used by the species. Best Management Practices and recommendations for these species at risk currently exist and are being implemented. Parks Canada is hoping to further contribute to these BMPs within RNUP by serving as a sample site to test, monitor, and evaluate many of the current proposed mitigations, designs, and monitoring methods that have been used throughout Ontario, Canada, and across borders.

In addition, targeted surveys are required in order to confirm the presence and/or distribution of several species such as Butternut, Western Chorus Frog, Eastern Pondmussel, and species at risk fishes. Inventory information is needed to better identify the role and importance of RNUP to the protection and recovery of these species.

Visitor engagement, education, and outreach

Visitor experience and outreach opportunities are also key to the success of this multi-species action plan. Located within a one hour's drive of 20% of Canada's population, RNUP has a unique opportunity to engage with hundreds of thousands of visitors annually, including a diversity of Canadians, newcomers, and international visitors. The park will contribute to broader species conservation by building awareness and encouraging stewardship among the visiting public. Special events and programming will be used to provide species at risk information during peak visitor seasons each year. Guided hikes throughout the year focus on connecting visitors with nature, sharing information on RNUP's history, and educating about species at risk, their habitats, and conservation and recovery measures underway in RNUP. On average over 170 guided hikes are led annually, reaching over 2,500 visitors each year.

Parks Canada will also engage and involve the public in meaningful recovery actions in RNUP for species at risk through volunteer and citizen science opportunities. Visitors will be encouraged to participate in species at risk inventory and monitoring by reporting sightings to the "Rouge National Urban Park Project" using the free iNaturalist app or by becoming an official RNUP volunteer and assisting with ecological surveys for nesting turtles, bat maternity roosts, species at risk pollinators, and helping at invasive species removal and restoration planting events.

Education and outreach opportunities in RNUP are not limited solely to our visitors and Park tenants. Including additional target partners in educational opportunities and messaging such as intergovernmental agencies, private businesses, and landowners on adjacent lands will allow RNUP to address threats within its boundaries, but also across the broader landscape extending outside of the Park. Working together on improving road management practices such as use of salt and invasive species management in right-of-ways, altering mowing regimes to benefit species like the Monarch and educating tenants and landowners on threats to turtles by hosting nest protection workshops are all activities that can contribute to the protection of species at risk within RNUP and on a broader landscape scale.

3.1. Measures already completed

Since the first official land transfer to the PCA in 2015, the Agency has been taking action towards the recovery of species at risk in RNUP. Conservation and recovery measures already completed include:

- Over 72 ecological restoration and farmland enhancement projects, in partnership with TRCA, Indigenous partners and park farmers, resulting in the restoration of more than 70 hectares of aquatic habitat, more than 27 hectares of

forest habitat, two hectares of meadow habitat and the planting of more than 126,000 native trees, perennials, shrubs and aquatic plants;
- Over one hectare of *Phragmites* removal and management in the Rouge Marsh and on tenanted farmland;
- Box culvert improvements and the installation of eco fencing along the roadsides at a site adjacent to a large wetland resulting in a significant decrease in road mortality, in partnership with the Toronto Zoo, TRCA, Ontario Ministry of Natural Resources and Forestry, City of Toronto and City of Pickering;
- The improvement, replacement, and installation of over 15 culverts in stream channels at farm crossings, resulting in reduced sedimentation and increased water flow and connectivity, in partnership with park farmers and the TRCA;
- Surveys of historical locations of extirpated plant species, such as Bashful Bulrush, and the completion of a feasibility study for reintroduction to RNUP;
- Surveys of suitable habitat for two SARA-listed lichen species, Flooded Jellyskin and Pale-bellied Frost Lichen, to confirm absence in RNUP;
- The first seasonal closure of sensitive wildlife habitat for ecological reasons;
- The installation of approximately 400 metres of deer exclusion fencing to protect a sensitive forested area of RNUP;
- The installation and monitoring of replacement habitat structures for Barn Swallows, snakes, and bats;
- The development of ten ecological integrity monitoring measures, many of which allow Parks Canada staff in RNUP to collect inventory data on species at risk (e.g. bird and amphibian community monitoring, forest invasive species monitoring and deer browse surveys);
- The development of signage and visitor experience programs (e.g., Creature Feature, Wildlife Wednesdays) that promote the protection and recovery of species at risk;
- The creation and fostering of more than 20 new partnerships to enhance the protection of species at risk and their habitats;
- In partnership with the Toronto Zoo: 1) the identification of hibernacula, nesting sites, and movement throughout the Park for Eastern Milksnake (in collaboration with the University of Waterloo) and Eastern Ribbonsnake; 2) acoustic monitoring, trapping, and radio-tracking of *Myotis* species to inform health of bat populations, their reproductive status, and to identify roosting sites and changes in species composition over the long- and short-term; and 3) the monitoring of turtle populations in RNUP, including nesting sites, road mortality hotspots, hibernation sites, and the release of 270 two-year-old Blanding's Turtles and nearly 185 hatchlings into RNUP wetlands;
- The incubation and release of 176 hatchling Snapping Turtles and Painted Turtles from nests discovered in RNUP by Parks Canada staff in the first year of the program's implementation; and
- The first comprehensive compilation of a database of species at risk observations and reports from throughout the newly established RNUP boundaries, including the integration of data from three bioblitz events, research and collections reports, more than 15 different organizations and numerous

individuals (e.g., NHIC, TRCA, Birds Canada, Ontario Nature, park staff and tenants, citizen scientists).

4. Critical habitat

Critical habitat is “the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species” (SARA s.2(1)). Critical habitat has already been identified in RNUP for Blanding’s Turtle and Bashful Bulrush in their respective recovery strategies. In cases where critical habitat identification is not complete, it will be identified in an upcoming or revised action plan or revised recovery strategy; refer to the schedule of studies in relevant recovery strategies for further details.

4.1. Proposed measures to protect critical habitat

Critical habitat identified in future versions of this action plan and in other recovery documents within RNUP will be legally protected from destruction as per section 58 of SARA. Other mechanisms that help to protect critical habitat in RNUP include Parks Canada’s Impact Assessment program and the Research and Collection’s permitting process. Specific measures to restore, enhance, and protect critical habitat in RNUP are included in Appendix B.

5. Evaluation of socio-economic costs and of benefits

The Species at Risk Act requires the responsible federal minister to undertake *“an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation”*.

5.1. Costs

The total cost to implement this action plan will be borne by Parks Canada through existing resources. This includes incremental salary costs, materials, equipment, and contracting of professional services for measures outlined in Appendices B and C. No major socio-economic costs to partners, stakeholders, or Indigenous Peoples are expected as a result of this action plan; however, the implementation of Farm Management Plans and incorporation of BMPs into agricultural practices may present some socio-economic costs to park farmers. In order to mitigate potential costs to farmers, decisions related to the implementation of these plans and practices will incorporate feedback from the agricultural community. In some situations, Parks Canada may reimburse or compensate farmers for implementing certain practices. Additional resources or partnerships will be sought to support the measures outlined in Appendix C.

Many of the proposed measures will be integrated into the operational management of the site and there will be few new costs. These costs to the government will be covered by prioritization of existing resources, funding and salary dollars at the site and should not result in additional costs to society.

The action plan applies only to lands and waters in RNUP, and does not bring any restrictions to land use outside the site. As such, this action plan will place no socio-economic costs on the public. However, minor restrictions may be placed on visitor activities, residential properties, and agricultural operations on RNUP lands and waters to protect and recover species at risk.

5.2. Benefits

Measures presented in this action plan for RNUP will contribute to meeting recovery strategy objectives for Threatened and Endangered species, and will also contribute to meeting management objectives for species of Special Concern. These measures are expected to have an overall positive impact on ecological integrity and enhance opportunities for appreciation of the site and the species by visitors and the general public. This action plan includes measures that could result in benefits to Canadians, such as positive impacts on biodiversity and the value individuals place on preserving biodiversity.

The proposed measures seek a balanced approach to reducing or eliminating threats to species at risk populations and habitats, and include protection of individuals and their habitat (e.g. restrictions to human activities within areas occupied by the species, combined with ongoing research and monitoring), potential species re-establishment, and increasing public awareness and stewardship (e.g. signage, visitor programs, and highlights in communications materials).

Potential economic benefits of the recovery of the species at risk found in this site cannot be easily quantified, as many of the values derived from wildlife are non-market commodities that are difficult to appraise in financial terms. Wildlife, in all its forms, has value in and of itself, and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons. The conservation of wildlife at risk is an important component of the Government of Canada's commitment to conserving biological diversity, and is important to Canada's current and future economic and natural wealth.

Implementing this action plan is expected to have positive benefits for park visitors, local residents, farmers, and Indigenous Peoples. Some activities in the plan may create opportunities for local residents to become involved in the recovery of species at risk and for cooperation and community partnerships in species at risk recovery. Benefits should be relatively evenly distributed across individuals in local communities, and opportunities for involvement will be available to all local residents. These include opportunities to learn about and take part in the recovery of culturally important species at risk, opportunities for visitors and partner communities to be involved in conservation issues, opportunities for integration of Indigenous Traditional and Modern Knowledge into conservation issues in RNUP, and greater awareness of Indigenous values and culture among local residents and visitors to the parks. In doing so, the plan supports the following goal under SARA: "*the traditional knowledge of the [Indigenous] Peoples*

of Canada should be considered in the assessment of which species may be at risk and in developing and implementing recovery measures".

6. Measuring progress

Reporting on the implementation of the action plan (under s. 55 of SARA) will be done by assessing progress towards implementing the measures listed in Appendix B. Reporting on the ecological and socio-economic impacts of the action plan will be done by assessing progress towards meeting the site-based population and distribution objectives. Progress will be assessed annually and a report summarizing the results of this plan will be issued at the end of the plan's initial five-year window.

7. References

Arancibia, D. under the supervision of Hélène Cyr. 2012. The Distribution and Status of Freshwater Mussel Populations in the Rouge River Watershed. University of Toronto, Toronto, Ontario. 19 pp.

Barnhart, B., C. Toulouse, M. Young (Ed.), and D. Gasbarrini (Ed.). 2020. Eastern Milksnake Monitoring Rouge Park: 2018 and 2019 Report. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 27 pp.

Barrett, S. under the direction of the Rouge Watershed Task Force. 2007. Rouge River Watershed Plan towards a Healthy and Sustainable Future. Report of the Rouge Watershed Task Force. 2007. Toronto and Region Conservation Authority, Toronto, Ontario. ix + 192 pp.

Brown, H. 2010. Habitat Assessment and Recovery Planning for Species at Risk in Rouge Park [Final Report]. Rouge Park, Aurora, Ontario. 58 pp.

Bureau du Nionwentsïo- Nation huronne-wendat. Remis à Environnement et Changement climatique Canada. 2016. Écologie Historique et Connaissances Écologiques Traditionnelles Huronnes-Wendat Relatives à Douze Espèces Animales et Végétale dans le Wendake Sud [Historical Ecology and Traditional Huron - Wendat Ecological Knowledge Pertaining to Twelve Animal and Plant Species in *South Wendake*]. Nation huronne-wendat, Quebec. 136 pp.

Burke, P.S. 2012. Management Plan for the Black Tern (*Chlidonias niger*) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources (OMNR), Peterborough, Ontario. vi + 47 pp.

Chaput, G., D.K. Cairns, S. Bastien-Daigle, C. LeBlanc, L. Robichaud, J. Turple, and C. Girard. 2014. Recovery Potential Assessment for the American Eel (*Anguilla rostra*ta) for eastern Canada: mitigation options. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/133. v + 30 pp.

COSEWIC. 2010. COSEWIC assessment and status report on the Atlantic Salmon *Salmo salar* (Nunavik population, Labrador population, Northeast Newfoundland population, South Newfoundland population, Southwest Newfoundland population, Northwest Newfoundland population, Quebec Eastern North Shore population, Quebec Western North Shore population, Anticosti Island population, Inner St. Lawrence population, Lake Ontario population, Gaspé-Southern Gulf of St. Lawrence population, Eastern Cape Breton population, Nova Scotia Southern Upland population, Inner Bay of Fundy population, Outer Bay of Fundy population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xlvii + 136 pp.

COSEWIC. 2011. COSEWIC assessment and status report on the Silver Lamprey, Great Lakes – Upper St. Lawrence populations and Saskatchewan – Nelson Rivers populations *Ichthyomyzon unicuspis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xiii + 55 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the Eastern Wood-pewee in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.

COSEWIC. 2012. COSEWIC assessment and status report on the Wood Thrush *Hylocichla mustelina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.

COSEWIC. 2013. COSEWIC assessment and status report on the Grasshopper Sparrow pratensis subspecies *Ammodramus savannarum pratensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 36 pp.

COSEWIC. 2015. COSEWIC assessment and status report on the Yellow-banded Bumble Bee *Bombus terricola* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 60 pp.

COSEWIC. 2017. COSEWIC assessment and status report on the Redside Dace *Clinostomus elongatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the American Bumble Bee *Bombus pensylvanicus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 52 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Black Ash *Fraxinus nigra* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 95 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Chimney Swift *Chaetura pelagica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Midland Painted Turtle *Chrysemys picta marginata* and the Eastern Painted Turtle *Chrysemys picta picta* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 107 pp.

Environment Canada. 2010. Recovery Strategy for the Butternut (*Juglans cinerea*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa vii + 24 pp.

Environment Canada. 2011. Management Plan for the Cerulean Warbler (*Dendroica cerulea*) in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 19 pp.

Environment Canada. 2011. Management Plan for the Yellow-breasted Chat virens subspecies (*Icteria virens virens*) in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 18 pp.

Environment Canada. 2012. Recovery Strategy for the Acadian Flycatcher (*Empidonax virescens*) and the Hooded Warbler (*Wilsonia citrina*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa, Ontario. viii + 32 pp.

Environment Canada. 2012. Recovery Strategy for the King Rail (*Rallus elegans*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vi + 21 pp.

Environment Canada. 2013. Management Plan for the Yellow Rail (*Coturnicops noveboracensis*) in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 24pp.

Environment Canada. 2014. Recovery Strategy for the Least Bittern (*Ixobrychus exilis*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vi + 41 pp.

Environment Canada. 2015. Management Plan for the Eastern Milksnake (*Lampropeltis triangulum*) in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iii + 27 pp.

Environment Canada. 2015. Management Plan for the Eastern Ribbonsnake (*Thamnophis sauritus*), Great Lakes population, in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iv + 23 pp.

Environment Canada. 2015. Management Plan for the Rusty Blackbird (*Euphagus carolinus*) in Canada. *Species at Risk Act* Management Plan Series. Environment Canada, Ottawa. iv + 26 pp.

Environment Canada. 2015. Recovery Strategy for the Loggerhead Shrike, *migrans* subspecies (*Lanius ludovicianus migrans*), in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vii + 35 pp.

Environment Canada. 2015. Recovery Strategy for the Western Chorus Frog (*Pseudacris triseriata*), Great Lakes / St. Lawrence – Canadian Shield population, in Canada, *Species at Risk Act* Recovery Strategy Series, Environment Canada, Ottawa, vi + 50 pp.

Environment Canada. 2016. Recovery Strategy for the Canada Warbler (*Cardellina canadensis*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vii + 56 pp.

Environment Canada. 2016. Recovery Strategy for the Common Nighthawk (*Chordeiles minor*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vii + 49 pp.

Environment Canada. 2016. Recovery Strategy for the Olive-sided Flycatcher (*Contopus cooperi*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vii + 52 pp.

Environment and Climate Change Canada. 2016. Management Plan for the Monarch *(Danaus plexippus*) in Canada. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 45 pp.

Environment and Climate Change Canada. 2016. Management Plan for the Snapping Turtle (*Chelydra serpentina*) in Canada [Proposed]. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 39 pp.

Environment and Climate Change Canada. 2017. Management Plan for the Peregrine Falcon anatum/tundrius (*Falco peregrinus anatum/tundrius*) in Canada. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 28 pp.

Environment and Climate Change Canada. 2018. Management Plan for the Short-eared Owl (*Asio flammeus*) in Canada. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada, Ottawa. v + 37 pp.

Environment and Climate Change Canada. 2018. Recovery Strategy for the Blanding's Turtle (*Emydoidea blandingii*), Great Lakes/St. Lawrence population, in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 59 pp.

Environment and Climate Change Canada. 2018. Recovery Strategy for the Eastern Whip-poor-will (*Antrostomus vociferus*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 107 pp.

Environment and Climate Change Canada. 2018. Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. ix + 172 pp.

Environment and Climate Change Canada. 2019. Management Plan for the Northern Map Turtle (*Graptemys geographica*) in Canada. *Species at Risk Act* Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 46 pp.

Environment and Climate Change Canada. 2019. Recovery Strategy for the Red-headed Woodpecker (*Melanerpes erythrocephalus*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. x + 120 pp.

Falconer, M., K. Richardson, A. Heagy, D. Tozer, B. Stewart, J. McCracken, and R. Reid. 2016. Recovery Strategy for the Bank Swallow (*Riparia riparia*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. ix + 70 pp.

Fisheries and Oceans Canada. 2018. Management Plan for the Northern Brook Lamprey (*Ichthyomyzon fossor*), Great Lakes – Upper St. Lawrence populations, in Canada. *Species at Risk Act* Management Plan Series. Fisheries and Oceans Canada, Ottawa. vi + 33 pp.

Fisheries and Oceans Canada. 2018. Recovery strategy and action plan for the Eastern Pondmussel (*Ligumia nasuta*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa. vi + 63 pp.

Golder Associates Ltd. 2011. Recovery Strategy for Lake Sturgeon (*Acipenser fulvescens*) – Northwestern Ontario, Great Lakes–Upper St. Lawrence River and Southern Hudson Bay–James Bay populations in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vii + 77 pp.

Heagy, A., D. Badzinski, D. Bradley, M. Falconer, J. McCracken, R.A. Reid, and K. Richardson. 2014. Recovery Strategy for the Barn Swallow (*Hirundo rustica*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. vii + 64 pp.

Hodgkiss, S., J.V. Jalava, and the Rouge River Valley CAP Development Team. 2015. Rouge River Valley Signature Site Conservation Action Plan. 2015. Carolinian Canada Coalition, London, Ontario. x + 48 pp. + appendices.

Jalava, J.V. 2017. Feasibility of Reintroduction of Bashful Bulrush (*Trichophorum planifolium*) to Rouge National Urban Park. Prepared for Parks Canada. v + 39 pp.

Kirk, D.A. 2014. Management Plan for the Horned Grebe (*Podiceps auritus*) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. viii + 32 pp.

Kirkpatrick, C., K. McKeown, D. Gasbarrini (Ed.), and M. Young (Ed.). 2020. Blanding's Turtle Head-Start Monitoring: Turtle Tracking 2018-19 Report. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 18 pp.

Lee, R., S. Ritchie, J. Phillips, and B. Johnson. 2012. Rouge Park Blanding's Turtle

Headstart Initiative. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 55 pp.

Leermakers, C., M. Young (Ed.), and D. Gasbarrini (Ed.). 2020. Road Ecology in Rouge National Urban Park: 2019 Report. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 10 pp.

MacGregor, R., J. Casselman, L. Grieg, J. Dettmers, W.A. Allen, L. McDermott, and T. Haxton. 2013. Recovery Strategy for the American Eel (*Anguilla rostrata*) in Ontario. Ontario Recovery Strategy Series. Prepared for Ontario Ministry of Natural Resources, Peterborough, Ontario. x + 119 pp.

Maddalena, M. 2018. Multi-Scale Patterns of Eastern Milksnake (*Lampropeltis triangulum)* Habitat Selection and Behavioural Responses to Habitat Fragmentation (Master's Thesis). University of Waterloo, Waterloo, Ontario. x + 70 pp.

Maddelena, M.P., J.R. Rowe, M.E. Dyson, G. Blouin-Demers, and B.C. Fedy. 2020. Movement and Habitat Selection of Eastern Milksnakes (*Lampropeltis triangulum)* at Intact and Fragmented Sites. Copeia 108(4), 847-854.

Matczak, E., M. Donnelly, and T.J. Thorne under the direction of K.C.R. Kerr. 2020. Bat Population Assessment within Rouge National Urban Park: 2015-2019 Report. Native Bat Conservation Program, Toronto Zoo, Scarborough, Ontario. v + 56 pp.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink *(Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.

Ontario Ministry of Natural Resources and Forestry. 2017. A Wetland Conservation Strategy for Ontario 2017–2030. Queen's Printer for Ontario. Toronto, ON

Parks Canada Agency. 2013. Detailed Assessment for the Blanding's Turtle (*Emydoidea blandingii)* in Rouge National Urban Park of Canada. Species at Risk Detailed Assessments. Parks Canada Agency. Ottawa. 12 pp.

Parks Canada Agency. 2013. Detailed Assessment for Eastern Pondmussel (*Ligumia nasuta*) in the Rouge National Urban Park. Species at Risk Detailed Assessments. Parks Canada Agency. Ottawa. 9 pp.

Parks Canada Agency. 2013. Detailed Assessment for the Few-Flowered Club-Rush (*Trichophorum planifolium)* in Rouge National Urban Park. Species at Risk Detailed Assessments. Parks Canada Agency. Ottawa. 9 pp.

Parks Canada Agency. 2013. Detailed Assessment for the Milksnake (*Lampropeltis triangulum)* in Rouge National Urban Park. Species at Risk Detailed Assessments.

Parks Canada Agency. Ottawa. 11 pp.

Parks Canada Agency. 2019. Rouge National Urban Park Management Plan. Parks Canada Agency. Ottawa. ix + 73 pp.

Redside Dace Recovery Team. 2010. Recovery Strategy for Redside Dace (*Clinostomus elongatus*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 29 pp.

Ritchie, S., M. Kula, J. Phillips, and B. Johnson. 2011. Identifying Wetland Restoration Opportunities for Recovery of Species at Risk Turtles in Rouge Park. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. vii + 154 pp.

Ritchie, S. 2017. Overwintering Ecology of Head-started Blanding's Turtles (*Emydoidea blandingii*) in an Artificial Wetland Complex (Master's Thesis). University of Toronto, Toronto, Ontario. vii + 84 pp.

Smith, T.W. and C.J. Rothfels. 2007. Recovery Strategy for Few-flowered Club-rush/Bashful Bulrush (*Trichophorum planifolium* (Sprengel) Palla) in Canada. Prepared for the Ontario Ministry of Natural Resources by the Royal Botanical Gardens. Hamilton. vi + 22 pp.

Sodhi, D.S., S.W. Livingstone, M. Carboni, M.W. Cadotte. 2019. Plant invasion alters trait composition and diversity across habitats. Ecol Evol 9:6199-6210. https://doi.org/10.1002/ece3.5130

Toronto and Region Conservation Authority. 2012. Stewardship of Species at Risk in Grasslands and Farmlands of Rouge Park [Final Report]. Toronto and Region Conservation Authority, Toronto, Ontario. 14 pp.

Toronto and Region Conservation Authority (TRCA). 2015. Rouge National Urban Park – Terrestrial Biological Inventory and Assessment. Toronto and Region Conservation Authority, Toronto, Ontario. 167 pp.

Tu, C., J. Pisapio, D. Lawrie, T. Rance with technical advisory input from S. Woolfenden and L. Yeager. 2010. Rouge River Watershed Fisheries Management Plan [DRAFT]. Toronto and Region Conservation Authority, Toronto, Ontario and Ontario Ministry of Natural Resources, Peterborough, Ontario. xvi + 212 pp.

Vandervelde, C., C. Jennings (Ed.), M. Young (Ed.), and D. Gasbarrini (Ed.). 2020. Rouge National Urban Park Turtle Nesting Report 2019. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 22 pp.

Varga, S., J. Jalava, and J.L. Riley. (1991). Ecological Survey of the Rouge Valley Park. Open File Ecological Report 9104. Ontario Ministry of Natural Resources and Forestry, Aurora, Ontario. vii + 282 pp. + 5 folded maps.

Wijewardena, T., D. Gasbarrini (Ed.), and M. Young (Ed.). 2020. Blanding's Turtle Head-Start Project Mark-Recapture Study 2019. Adopt-A-Pond Wetland Conservation Program, Toronto Zoo, Scarborough, Ontario. 16 pp.

Appendix A: Species information, objectives and monitoring plans for species at risk in RNUP.

Species	National objectives[7]	Site-based population & distribution objectives	Population trend in RNUP[8]	Population monitoring[9]	General information and broad park approach
Blanding's Turtle – Great Lakes - St. Lawrence Population	Long term: increase abundance and maintain, and if possible increase, the area of occupancy. Medium term: maintain the presence of known local populations.	To increase the abundance of juvenile Blanding's Turtles in the southern half of RNUP and increase the area of occupancy beyond the current distribution. Maintain adult nesting activity at a minimum of one location every two years. To increase hatching success of naturally occurring nests over a five-year period via nest protection and egg collection and incubation programs.	Increasing.	Survey annually in partnership with Toronto Zoo, TRCA, and university partners and record incidental observations to contribute data to population estimates and movement patterns. Methods will include: mark-recapture, radio-telemetry, trapping, nesting, and road-mortality surveys.	RNUP is a small portion of the range of Blanding's Turtles in Ontario. The park approach focuses on protecting nests, restoring suitable basking, breeding, nesting and over-wintering habitat, and implementing measures to protect individuals of this species through all life stages. Blanding's turtle nests are not encountered often in RNUP as the released individuals have not yet reached maturity; however, any Blanding's Turtle nests that are discovered will be collected and transferred to the head-start program at the Toronto Zoo. The PCA in RNUP will work towards active monitoring of increased nesting activity as the released individuals reach maturity. Over time, additional monitoring sites will be added and monitored annually. The overall goal of the head-starting program is to ensure a self-sustaining population level for Blanding's turtles over the long term (i.e. 200 breeding individuals based on habitat capacity and demographics required to compensate natural mortality rates). Population viability analyses are re-run every three years to assess the number of head-start individuals required to reach the target population size based on survival rates of head-starts monitored with radio-telemetry.

Species	National objectives[7]	Site-based population & distribution objectives	Population trend in RNUP[8]	Population monitoring[9]	General information and broad park approach
Butternut	Long term: to ensure conditions that will allow for the restoration of viable, ecologically functioning, and broadly distributed populations within its current range.	To maintain the current population of healthy purestock Butternut trees in RNUP.	Unknown.	Survey new and known locations for saplings and mature trees every 5 years to determine abundance and monitor tree health through Butternut Health Assessments.	RNUP is a small portion of the range of Butternut in Ontario. The largest threat is Butternut Canker. RNUP will work with experts to contribute to meeting objectives outlined in the National Recovery Strategy such as archiving scions from individuals that are putatively resistant to Butternut Canker. A secondary threat to Butternuts is hybridization with non-native walnut species. RNUP will eliminate Butternut hybrids and non-native walnut species that threaten park populations.
Eastern Milksnake	To maintain populations throughout the range in Canada where it is known to occur and, where possible, fill knowledge gaps on demographics, habitat use and threats to the subspecies found in Canada.	Maintain the area of occupancy at all three study sites in RNUP and at any new sites identified in the park through future surveys.	Unknown.	Survey annually in partnership with Toronto Zoo, TRCA and university partners and record incidental observations. Methods will include: mark-recapture, the use of artificial cover objects, road-mortality, and hibernacula emergence surveys.	RNUP is a small portion of the range of Eastern Milksnake in Ontario. The park approach focuses on protecting individuals, and restoring or creating suitable basking, breeding, and overwintering habitat to help maintain a stable population. Surveys will expand into the northern park lands in order to determine the distribution of the species in the park.

Species	National objectives[7]	Site-based population & distribution objectives	Population trend in RNUP[8]	Population monitoring[9]	General information and broad park approach
Eastern Pondmussel	Long term: to prevent extirpation and promote recovery.	Maintain the area of occupancy and abundance in the Rouge River.	Unknown.	The current population will be surveyed every five years to determine presence, abundance, and area of occupancy.	The last Eastern Pondmussel inventory in RNUP took place in 2012 and identified the area of occupancy as ~0.3 km^2. The park approach will be to work with partners to conduct an Eastern Pondmussel survey in 2022. The park will work towards maintaining the area of occupancy and abundance of individuals determined in 2022.
Midland Painted Turtle	N/A	Maintain the area of occupancy of nesting individuals at the four known sites in RNUP. To increase hatching success of naturally occurring nests over a five-year period via nest protection and egg collection and incubation programs.	Unknown.	Survey annually in partnership with Toronto Zoo, TRCA and university partners and record incidental observations. Methods will include: mark-recapture, trapping, nesting, and road-mortality surveys.	The park approach focuses on protecting and collecting nests for ex-situ incubation and release, restoring suitable breeding and nesting habitat and implementing measures to protect individuals of this species through all life stages.
Northern Map Turtle	Stabilize population levels and thereafter maintain the distribution and abundance through threat reduction and mitigation as well as habitat management.	Maintain occupancy in the park.	Unknown.	Survey annually in partnership with Toronto Zoo, TRCA, and university partners and record incidental observations. Methods will include: mark-recapture, trapping, nesting, and road-mortality surveys.	The park approach focuses on protecting nests, restoring suitable breeding and nesting habitat and implementing measures to protect individuals of this species through all life stages. There are no records of nesting Map Turtles in RNUP but nest collection, ex-situ incubation, and release will occur if nests are discovered.

Species	National objectives[7]	Site-based population & distribution objectives	Population trend in RNUP[8]	Population monitoring[9]	General information and broad park approach
Redside Dace	Provincial objectives: to protect existing populations and their habitats and, where feasible, restore degraded habitats to allow for increased distribution adjacent to occupied reaches.	Maintain species' presence in the park.	Unknown.	The number of individuals observed/captured through targeted surveys and incidental observations will be counted. Targeted surveys will be conducted at least once every three years.	The mid- and upper portions of the Rouge River watershed support the highest concentration of Redside Dace populations in Canada. The park approach will be to continue ongoing restoration of wetland and riparian areas in the park. Aquatic restoration and riparian plantings will contribute towards improving the thermal regime of tributaries historically occupied by Redside Dace, reducing sedimentation and providing additional habitat that will help maintain a stable population.
Snapping Turtle	Maintain and, if possible, increase the index of area of occupancy in Canada and to maintain and, if possible, increase abundance by reducing threats, particularly affecting adult Snapping Turtles.	Maintain the area of occupancy of nesting individuals at the four known sites in RNUP. To increase hatching success of naturally occurring nests over a five-year period via nest protection and egg collection and incubation programs.	Unknown	Survey annually in partnership with Toronto Zoo, TRCA, and university partners and record incidental observations. Methods will include: mark-recapture, trapping, nesting, and road-mortality surveys.	The park approach focuses on protecting and collecting nests for ex-situ incubation and release, restoring suitable breeding and nesting habitat and implementing measures to protect individuals of this species through all life stages.

Species	National objectives[7]	Site-based population & distribution objectives	Population trend in RNUP[8]	Population monitoring[9]	General information and broad park approach
Acadian Flycatcher, American Bumble Bee, American Eel, Atlantic Salmon, Bank Swallow, Barn Swallow, Bashful Bulrush, Black Ash, Black Tern, Black Purse Web Spider, Bobolink, Canada Warbler, Cerulean Warbler, Chimney Swift, Common Nighthawk, Eastern Loggerhead Shrike, Eastern Meadowlark, Eastern Ribbonsnake, Eastern Whip-poor-will, Eastern Wood-Pewee, Grasshopper Sparrow, Horned Grebe, King Rail, Lake Sturgeon, Least Bittern, Little Brown Myotis, Monarch, Northern Brook Lamprey, Northern Myotis, Olive-sided Flycatcher, Peregrine Falcon, Piping Plover, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Silver Lamprey, Tri-colored Bat, Western Chorus Frog, Wood Thrush, Yellow-banded Bumble Bee, Yellow-breasted Chat, Yellow Rail	No population and distribution objective has been established because no threats are known in the park or no RNUP management actions can contribute to conservation within the park or limited data is available at this time for the species in the park or RNUP is of limited importance to the species' national recovery.		Unknown.	Record incidental observations.	The park will continue to protect individuals, protect suitable habitat on park lands, and support partners where feasible for recovery and protection of these species. Additionally, RNUP will work with partners to conduct opportunistic surveys for under-surveyed species in the park and adjust management approaches appropriately when new populations are found.

[7] National objectives as per most recent versions of relevant recovery documents found in References section.
[8] Population trend is from 2015-2020.
[9] Where population and distribution objectives have been established for RNUP, monitoring is designed to directly measure success in achieving those goals.

Appendix B: Conservation and recovery measures that will be conducted by the Parks Canada Agency in RNUP.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
FOREST COMMUNITY					
Butternut	1	Increase In-house Capacity: Ensure at least two Resource Conservation staff members are trained in distinguishing hybrids using phenotypic characteristics and are certified as Butternut Health Assessors (if certification in Butternut Heath Assessment is available).	Two Resource Conservation staff members are familiar with Ontario's published guidance on how to assess the health of Butternut trees and distinguish hybrids from pure individuals based on phenotypic characteristics.	Threat: hybridization and butternut canker	2021-2022
Acadian Flycatcher, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Olive-sided Flycatcher, Red-headed Woodpecker, Wood Thrush	2	Forest Bird Population Monitoring: To identify populations/occurrences of species at risk and other forest birds and to monitor their long-term populations in RNUP by: a) Implementing a forest bird monitoring protocol in RNUP led by resource conservation staff b) Supporting the implementation of Birds Canada's Forest Bird Monitoring Program (FBMP) point counts in RNUP	The forest bird monitoring protocol will be developed and initiated by resource conservation staff in 2021. Birds Canada's FBMP point counts have been implemented in RNUP by 2022.	Recovery measure: clarify population status and determine trends; develop monitoring protocols	2021-2026
Little Brown Myotis, Northern Myotis, Tri-coloured Bat	3	Population Monitoring: In partnership with Toronto Zoo, continue acoustic monitoring at long- and short-term sites, trapping, and radio tracking in forest patches throughout RNUP.	To determine occupancy, distribution, assess reproduction and identify important foraging and roosting sites.	Clarify population status and determine trends.	Ongoing

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Little Brown Myotis, Northern Myotis, Tri-coloured Bat	4	Education and Outreach: Outreach to the public, contractors and tenants about bat maternity roosts, threats to the species and potential human health hazards, particularly in areas where building decommissioning may occur.	For any work at, or near, a known bat colony, PCA staff have proactively engaged the proponent on bat stewardship and education. Printed materials highlighting best management practices, encouraging stewardship, and increasing awareness are created and ready for distribution by 2024.	Threat: habitat loss and human disturbance	2021-2026
Little Brown Myotis, Northern Myotis, Tri-coloured Bat	5	Habitat Augmentation and Effectiveness Monitoring: Replacement bat structures will be installed at all building decommissioning sites where significant bat roosts have been identified. Bat structures will be monitored for activity annually, for a minimum of three years following installation.	Replacement bat structures are installed at all building decommissioning sites where significant bat roosts have been identified. All replacement structures have been monitored for activity annually for a minimum of three years following installation.	Threat: habitat loss	Ongoing
Acadian Flycatcher, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Wood Thrush	6	Reforestation: Reforestation of 30 hectares with a focus on increasing interior forest habitat and connectivity of forest patches throughout the park.	An additional 30 hectares of land is reforested in RNUP.	Threat: habitat loss	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Acadian Flycatcher, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Northern Myotis, Olive-sided Flycatcher, Tri-coloured Bat, Wood Thrush	7	Forest Prescriptions: Create prescriptions for the management of previous planting initiatives (10-15 years old) to reduce monocultures, increase forest canopy openings, and improve diversity.	Complete a minimum of five forest prescriptions.	Recovery measure: improve existing habitat by improving forest diversity	2022-2026
Little Brown Myotis, Northern Myotis, Olive-sided Flycatcher, Red-headed Woodpecker, Tri-coloured Bat	8	Produce, Share, and Promote BMPs for Retaining Dead or Dying Trees or Limbs: Work with partners to create a BMP document promoting the retention of dead or dying trees or limbs through the implementation of best management practices such as trimming dangerous branches and leaving large stumps, retaining dead individuals leaning away from assets or public areas, and retaining all dead or dying trees or limbs that do not pose a risk to assets or people. Information from this document will be shared across the PCA, with the public, tenants, and contractors working in RNUP.	A BMP document for retaining dead or dying trees or limbs is created by 2023. BMPs for retaining dead or dying trees or limbs are shared and promoted virtually across the PCA, with the public, tenants, and contractors working in RNUP.	Threat: habitat loss	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Acadian Flycatcher, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Wood Thrush	9	Examine Impacts of Deer Browse on Native Forest Vegetation: Conduct deer browse surveys in-house as part of the Park's ecological integrity monitoring program. Collaborate with partners who have existing data to identify gaps and analyze ecosystem impacts.	To determine the extent of deer browse on native forest vegetation and identify priority areas for management actions.	Threat: loss of habitat or individuals from deer browse	2021-2026
WETLAND COMMUNITY					
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Snapping Turtle	10	Volunteer Turtle Nest Monitoring Program: Initiate a volunteer turtle nest monitoring program including predetermined survey routes of known and potential turtle nesting areas.	Volunteers survey the four predetermined routes at least twice per week throughout the nesting season.	Threat: predation and road mortality	2021-2026
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Snapping Turtle	11	Turtle Nest Protection: Opportunistically protect nests from egg predation through the placement of nest protection cages in naturalized areas where the nests are less vulnerable to destruction and poaching.	100% of nests found in lower risk areas are protected using nest protection cages.	Threat: predation	Ongoing
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Snapping Turtle	12	Turtle Nest Protection Cage Lending Program: Implement a turtle nest protection cage lending program and host a nest protection cage building workshop for park tenants and the general public. Provide education on proper installation and monitoring techniques, and general turtle nesting outreach to participants.	The nest protection cage lending program is advertised via the annual tenant newsletter and social media channels. One nest protection cage building workshop is hosted annually.	Threat: predation	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Snapping Turtle	13	Turtle Egg Collection, Incubation and Release: Collect turtle eggs from nests at high risk of destruction for incubation ex-situ and release. High-risk areas include roadsides, parking lots, agricultural fields and heavily used trails.	All eggs from active nests identified in high-risk areas have been collected and incubated. All hatchlings are released in a suitable location in close proximity to the original nest site.	Threat: predation, nest destruction, and road mortality	Ongoing
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Snapping Turtle	14	Non-native Turtle Management: Implement new permit conditions requiring researchers who encounter or trap non-native turtles (red-eared sliders, yellow-bellied sliders, etc.) to remove them and bring them to PCA staff. Encourage visitors and tenants to report sightings of non-native turtle species to park staff. Partner with veterinarians and rescue agencies to rehome or humanely euthanize any non-native turtles encountered.	All non-native turtle species encountered by staff, contractors, tenants, visitors, etc., are reported to Resource Conservation staff and removed from the wild in RNUP.	Threat: non-native species, increased competition for resources, and possible disease	Ongoing
Blanding's Turtle	15	Blanding's Turtle Head-start Program: Continue to work with Toronto Zoo and support the Blanding's turtle head-starting and reintroduction program.	New suitable release sites have been identified by 2022. A minimum of 200 head-started turtles are released by 2026.	Threat: extirpation from the park (only seven adult individuals remained in the wild in RNUP in 2013)	Ongoing
Western Chorus Frog	16	Acoustic Surveys: In partnership with the Toronto Zoo, install acoustic monitors at current and historic Western Chorus Frog locations; a minimum of 5 different wetland complexes and ephemeral pools annually.	To confirm presence of the species in wetland complexes ephemeral pools across RNUP.	Recovery measure: determine distribution of species	2021-2022
Western Chorus Frog	17	Implement a Standardized Western Chorus Frog Monitoring Protocol: Partner with groups leading range-wide monitoring efforts in Ontario to implement standardized monitoring of sites in RNUP. Contribute data for this species to range-wide efforts.	To implement a standard Western Chorus Frog monitoring protocol at sites in RNUP by 2022.	Recovery measure: determine distribution of species	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Western Chorus Frog	18	Education and Outreach: Send out educational emails to the RNUP staff and volunteer email lists every February. Encourage staff and volunteers to learn to recognize Western Chorus Frog vocalizations and to report acoustic observations to resource conservation staff.	Educational emails encouraging reports of Western Chorus Frog vocalizations are emailed to staff and volunteers each February. Any reports received by resource conservation staff are further investigated and confirmed.	Recovery measure: determine distribution of species	2021-2026
Least Bittern	19	Population Monitoring: Partner with Birds Canada to conduct the Marsh Monitoring Program (MMP) annually at sites that meet the MMP protocol criteria and are suitable for the target species at risk. Incidental observations of all species at risk will be recorded (e.g., Black Tern, King Rail, Western Chorus Frog, and Yellow Rail).	The MMP has been implemented annually at all sites that meet the MMP protocol criteria and are suitable for the target species in RNUP.	Clarify population status and determine trends.	2021-2026
MEADOW COMMUNITY					
American Bumblebee, Monarch, Yellow-banded Bumblebee	20	Implement a Pollinator Seed Planting Program: Develop a volunteer and/or tenant planting program for native milkweed and wildflower species used by pollinators in RNUP and for neighboring landowners to enhance and increase breeding habitat where feasible.	A minimum of 15 volunteers participating annually in planting initiatives, starting in 2022. A minimum of 20 additional sites in RNUP are planted with native milkweed and wildflower species by 2026.	Threat: loss of habitat in the form of milkweed and other pollinator plants	2022-2026
American Bumblebee, Monarch, Yellow-banded Bumblebee	21	Create Prescriptions: Create prescriptions for the management of community planted pollinator habitats to prevent succession.	Complete and initiate a minimum of three prescriptions for community planted pollinator habitats.	Recovery measure: improve existing habitat	2022-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
American Bumblebee, Monarch, Yellow-banded Bumblebee	22	Population Monitoring and Education Programs: Partner with groups such as the Toronto Entomologists' Society, UTSC, and Wildlife Preservation Canada to continue annual volunteer monitoring and education programs (e.g., tagging of Monarchs, Monarch counts, Mission Monarch, Bumblebee Watch).	To determine presence and distribution of these species within RNUP. Monarch and pollinator conservation messages are incorporated into park programming and education programs by 2026.	Continue to promote and support citizen engagement in conservation and monitoring. Contribute information to global initiatives to determine survival and population trends.	Ongoing
American Bumblebee, Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Milksnake, Grasshopper Sparrow, Monarch, Red-headed Woodpecker, Yellow-banded Bumblebee	23	Meadow Restoration: a) Increase and/or restore a minimum of six hectares of meadow habitat; b) Meadoway: Collaborate with TRCA and municipalities to implement the creation of a Meadoway corridor connecting downtown Toronto to RNUP; and c) Evaluate opportunities for creating, restoring or enhancing oak savannah habitat in RNUP, where feasible.	A minimum of six hectares of meadow habitat have been created or restored. Conceptual designs and restoration plans for rare and remnant habitats in the Park (e.g. oak savannah, oak woodland) will be developed and implemented by 2023.	Threat: habitat loss	2021-2026
American Bumblebee, Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Milksnake, Grasshopper Sparrow, Monarch, Red-headed Woodpecker, Yellow-banded Bumblebee	24	Meadow Management: Create site-specific meadow management plans, which may include mowing regimes and/or prescribed burn plans to encourage regeneration of native meadow species for the three largest meadows in RNUP.	Site-specific Meadow Management Plans have been created for the three largest meadows in RNUP.	Threat: habitat loss through succession and invasive species	2021-2024

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
American Bumblebee, Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Milksnake, Grasshopper Sparrow, Monarch, Red-headed Woodpecker, Yellow-banded Bumblebee	25	Implement and Raise Awareness of BMPs for Mowing: Work with municipalities, Hydro One, tenant farmers, contractors, and other partners to adhere to timing windows that benefit reproductive windows for wildlife and protect milkweed stands where possible.	Information is available and shared with municipalities, Hydro One, tenant farmers, contractors, and other partners to encourage stewardship and increase awareness of BMPs for mowing. An informational brochure is created and ready for distribution by 2023.	Threat: habitat loss	2021-2026
Eastern Milksnake, Eastern Ribbonsnake	26	Habitat Augmentation and Effectiveness Monitoring: Where buildings are scheduled for decommissioning, convert foundations into snake hibernacula to increase habitat and mitigate for habitat lost. A subset of the hibernacula built as a result of foundation decommissioning will be monitored for Eastern Milksnake activity annually for a minimum of three years following installation.	All buildings that have been identified as hibernacula and decommissioned for health and safety or other reasons have replacement hibernacula created on-site. All replacement hibernacula installed have been monitored for activity annually for a minimum of three years following installation.	Threat: habitat loss	Ongoing
OTHER/MULTIPLE COMMUNITIES					
Piping Plover	27	Support the International Piping Plover Census: Contribute to the census every five years by conducting surveys as per protocol requirements at the Rouge Beach.	To monitor breeding activity in RNUP and contribute data to assess the distribution of the species.	Recovery measure: clarify population status and distribution	2022
American Eel, Atlantic Salmon, Blanding's Turtle, Lake Sturgeon, Northern Brook Lamprey, Northern Map Turtle, Painted Turtle, Piping Plover, Silver Lamprey, Snapping Turtle	28	Develop a Rouge Beach Restoration Concept and Design: The restoration concept and design will focus on the Rouge Beach area south of the Rouge Marsh and will explore potential restoration and management options such as limiting visitor use in areas of high quality habitat, re-naturalizing social/unofficial trails, and enhancing existing habitat through routine shoreline cleanups, improved beach grooming practices, and invasive species management.	The Rouge Beach Restoration Concept and Design are created by 2026.	Threat: habitat loss	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Barn Swallow	29	Habitat Augmentation and Effectiveness Monitoring: Replacement barn swallow habitat will be installed at all building or structural decommissioning projects where active barn swallow nests have been identified. Barn Swallow habitats installed as a mitigation for building decommissioning will be monitored for nesting activity annually, for a minimum of three years following installation.	Any buildings or structures where barn swallow actively nested that have been decommissioned for health and safety reasons have replacement nesting structures installed on-site or as close as feasibly possible. All replacement structures have been monitored for activity annually for a minimum of three years following installation. An evaluation of current proposed mitigations, designs, and monitoring methods will be completed. Final recommendations for future habitat replacement projects based on results and observed preferences will be noted.	Threat: habitat loss	Ongoing
Chimney Swift	30	Education and Outreach: Stewardship collaboration to protect known roosting and nesting locations in the park; extend outreach and stewardship opportunities to residents outside of park boundaries or any newly identified locations within the park; respond as needed to service calls about nesting birds in chimneys.	An informational brochure is created and ready for distribution to tenants, visitors and nearby landowners by 2023 to encourage stewardship and increase awareness of Chimney Swifts in the GTA. Information on Chimney Swift stewardship is incorporated into the annual tenant newsletter by 2022. All service calls related to nesting birds in chimneys are responded to by Resource Conservation staff.	Threat: habitat loss, human disturbance, and destruction	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
American Eel, Atlantic Salmon, Blanding's Turtle, Eastern Milksnake, Eastern Ribbonsnake, Lake Sturgeon, Northern Brook Lamprey, Northern Map Turtle, Painted Turtle, Redside Dace, Silver Lamprey, Snapping Turtle, Western Chorus Frog	31	Install and/or Improve Eco-passages: In partnership with municipalities, transportation agencies, Toronto Zoo, TRCA, and other partners, work to identify opportunities to enhance crossing conditions and improve aquatic and/or terrestrial habitat connectivity by removing in-stream barriers to fish and wildlife migration and/or installing aquatic or terrestrial eco-passages, improving existing culverts, and installing road mortality mitigation fencing. Where possible, coordinate implementation with road operations and/or planned maintenance or construction work.	At a minimum of five locations adjacent to concentrated wildlife movement areas, existing crossing conditions are improved (via culvert replacements, eco-passage installations, trail design, removal of instream barriers, or installation of road mortality mitigation fencing).	Threat: road mortality and habitat fragmentation	2021-2026
All terrestrial and semi-aquatic wildlife species in this plan	32	Integrated Road Mortality Prevention Program: Conduct annual monitoring to identify hotspots and work together with transportation agencies, where necessary, to draft a roadkill mitigation plan for any new areas identified. Mitigations being considered include: the construction of underpasses, traffic calming structures, flashing signage, speed limit reductions, temporary closures during peak breeding or migration, public communications, and in-park education products.	Priority locations or road mortality hotspots in the northern lands of RNUP will be identified through annual monitoring by 2025. A roadkill mitigation plan will be drafted for any hotspot areas identified in the northern lands by 2026. A social media campaign will focus on road mortality in RNUP, hotspot areas, driving strategies to avoid collisions, and current mitigations in place in RNUP.	Threat: road mortality	2021-2026
All terrestrial species in this plan	33	Create and Implement a Fire Management Plan for RNUP: Develop a Fire Management Plan which will include specific site prescriptions for burns to improve and protect natural ecosystems within RNUP.	A Fire Management Plan created and approved by 2022. A minimum of two prescribed burns are completed at priority sites by 2026.	Threat: habitat loss through succession, invasive species, and alteration of natural disturbance regimes	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
All species in this plan	34	Update Vegetation Community Mapping: Update mapping based on Ecological Land Classification (ELC) for Bashful Bulrush and Blanding's Turtle critical habitat in the Rouge Marsh and surrounding habitats.	Vegetation community mapping based on ELC for Bashful Bulrush and Blanding's Turtle critical habitat in the Rouge Marsh and surrounding habitat has been updated.	Research activity listed in schedule of studies for Bashful Bulrush critical habitat.	2021-2023
All species in this plan	35	Implement Farm Plans: Support the development of farm-specific Farm Management Plans in partnership with park farmers to encourage and facilitate the incorporation of BMPs into park farming practices. Farm Management Plans may address topics such as harvest timing windows, pesticide BMPs and water and soil management.	Information is available to tenant farmers to encourage stewardship and increase awareness of SAR BMPs that can be incorporated into farming practices. A minimum of five Farm Management Plans are completed and approved by 2026.	Threat: habitat loss, fragmentation and degradation, incidental mortality, and pesticide exposure	2022-2026
All species in this plan	36	Produce an Invasive Species Management Plan: In collaboration with partners (e.g., Toronto Zoo, TRCA, the province of Ontario, municipalities, and transportation agencies), produce and implement an invasive species management plan that will encompass all habitat types in RNUP. The plan will include management actions for target priority species that alter species at risk habitat such as *Phragmites*, Japanese Knotweed, Dog-strangling Vine, Garlic Mustard, Common Buckthorn, and European Honeysuckles. This plan will include a formalized "Watch List" for proactive prevention of incoming invasive alien species, in particular fishes, plants, insects, and potential incoming diseases such as oak wilt and hemlock woolly adelgid.	The ISMP is created and approved by 2024. The ISMP is implemented annually, starting in 2025.	Threat: invasive species	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Acadian Flycatcher, American Bumblebee, Bobolink, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Meadowlark, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Monarch, Northern Myotis, Red-headed Woodpecker, Tri-coloured Bat, Wood Thrush, Yellow-banded Bumblebee	37	<u>Management of Dog-strangling Vine</u>: a) Herbicide application, in partnership with municipalities, regions, and road authorities to stems of dog-strangling vine located in areas with sensitive species at risk or where there is suitable habitat. b) Increasing native species cover to increase site resilience to invasion	A minimum of 1 hectare of dog-strangling vine is managed annually.	Threat: invasive species and habitat loss	Ongoing

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
American Eel, Atlantic Salmon, Black Tern, Blanding's Turtle, Eastern Milksnake, Eastern Pondmussel, Eastern Ribbonsnake, Horned Grebe, King Rail, Lake Sturgeon, Least Bittern, Monarch, Northern Brook Lamprey, Northern Map Turtle, Painted Turtle, Redside Dace, Silver Lamprey, Snapping Turtle, Yellow Rail	38	*Phragmites* Management: Strategic removal, in partnership with municipalities, regions, and transportation agencies across RNUP, targeting wetlands, restored sites, and road right-of-ways.	A minimum of 1 hectare of *Phragmites* is managed annually.	Threat: loss of habitat due to infiltration of *Phragmites*	Ongoing
All species in this plan	39	Produce a Five-year Ecological Restoration Plan for RNUP: Using the Restoration Opportunities Prioritization Framework, identify restoration opportunities that will result in the highest ecological gains for species at risk and other valued ecosystem components. Collaborate with Park farmers, Indigenous partners, local conservation groups, and TRCA to implement the restoration plan.	The five-year ecological restoration plan is created and approved in 2022. Restoration targets set for each year within the five-year plan are met annually, starting in 2022.	Threat: habitat loss, degradation, and invasive species	2022-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
American Eel, Atlantic Salmon, Bank Swallow, Barn Swallow, Black Tern, Blanding's Turtle, Chimney Swift, Common Nighthawk, Eastern Pondmussel, Eastern Ribbonsnake, Eastern Wood-pewee, Horned Grebe, King Rail, Lake Sturgeon, Least Bittern, Little Brown Myotis, Northern Brook Lamprey, Northern Map Turtle, Northern Myotis, Painted Turtle, Redside Dace, Silver Lamprey, Snapping Turtle, Tri-coloured Bat, Whip-poor-will, Yellow Rail	40	Restore Aquatic Habitat in RNUP: Restore a minimum of 40 hectares of aquatic habitat in partnership with TRCA and other agencies through stream and wetland restoration initiatives and a focus on restoring hemi-marsh conditions in the Rouge Marsh. Components of this restoration work will include riparian plantings, invasive species removal or exclusion, and habitat enhancements such as bird boxes, fish habitat, and turtle nesting beaches.	40 hectares of aquatic habitat including streams, wetlands, and open water areas are created or restored. *Phragmites* has been removed from the Rouge Marsh by 2021. Any new or returning *Phragmites* cells discovered in the Rouge Marsh are removed on an annual basis starting in 2022. Carp exclusion barrier or measures are conceptualized and considered for implementation at the Rouge Marsh.	Threat: habitat loss, degradation, and invasive species	2021-2026

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
Blanding's Turtle, Eastern Milksnake, Eastern Ribbonsnake, Little Brown Myotis, Northern Map Turtle, Northern Myotis, Painted Turtle, Snapping Turtle, Tri-coloured Bat	41	Early Disease Detection: Monitor for White Nose Syndrome and report any unusual bat behaviour or deaths immediately to the Canadian Wildlife Health Cooperative or the Natural Resources Information and Support Centre. Monitor for Ranavirus and Herpes Viruses and send live turtles suspected of having Ranavirus or Herpes Virus to the Ontario Turtle Conservation Centre for testing, or send tissue samples or dead specimens to the Canadian Wildlife Health Cooperative for examination. Contain snakes with signs of Snake Fungal Disease and bring to Toronto Zoo for testing. Results of disease testing will be reported to the Canadian Wildlife Health Cooperative.	Annually, all species at risk showing signs of disease or unnatural behaviour have been reported and, if possible, sent in for testing to the proper organizations.	Threat: wildlife disease and mortality	Ongoing
All species in this plan	42	Integration of Indigenous Traditional and Modern Knowledge: Continue to engage with the Park's 10 First Nation partner communities to collaboratively develop and implement methods to meaningfully incorporate Indigenous Traditional and Modern Knowledge into management practices for species at risk in RNUP.	Parks Canada and the RNUP FNAC continue to engage on species at risk projects and management practices at annual meetings held twice per year, at a minimum. Partnerships will be fostered wherever possible to collaborate on species at risk projects of specific interest to individual communities.	Inclusion of Traditional and Modern Ecological Knowledge to better inform assessment, monitoring, and recovery of the ecosystems that support species at risk.	Ongoing
All species in this plan	43	Enforcement of the *Species at Risk Act*: Include select species at risk in upcoming park warden compliance plans and increase patrols to prevent poaching and disturbance of species at risk and their habitat.	Species at risk have been incorporated into park warden compliance plans annually. Patrols are conducted annually during critical time periods to prevent disturbance to species at risk and their habitats.	Threat: human disturbance, habitat destruction, and all activities prohibited by SARA	Ongoing

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
All species in this plan	44	Install Signage and Interpretive Panels: Promote awareness of actions that can help protect species at risk and their habitat by installing informational signage throughout the Park.	A minimum of 15 interpretive, educational and informational signs, displays and non-personal media related to species at risk will be installed throughout the Park.	Threat: habitat loss and human disturbance. This activity will help to improve public awareness and increase knowledge of local species found in RNUP.	2021-2026
All species in this plan	45	Promote RNUP iNaturalist Project: Promote the RNUP Project on iNaturalist to capture incidental observations of species at risk from staff, tenants, and the public; advertise and promote the project through Visitor Experience and External Relations messaging, signage, etc.	The number of iNaturalist users contributing to the "Rouge National Urban Park Project" has increased since 2021. Information and support are available to the public to advertise and encourage citizen science opportunities.	Continue to promote and support citizen engagement in conservation and monitoring.	Ongoing
All species in this plan	46	Promote Citizen Science Opportunities: Support and advertise citizen science opportunities such as Bumble Bee Watch, Mission Monarch, Monarch Watch, Swift Watch, FrogWatch, etc., through visitor experience programming.	A minimum of three citizen science opportunities will be promoted to tenants and the public by 2026 through social media channels, ERVE events, and/or guided walks.	Continue to promote and support citizen engagement in conservation and monitoring.	Ongoing
All species in this plan	47	Manage Species at Risk Sightings: Record incidental observations of species at risk, including road mortality incidents, and report to the Natural Heritage Information Centre (NHIC) annually.	All species at risk records are submitted to NHIC annually.	Contribute presence, abundance, distribution, and breeding information to provincial databases for use by experts and the public.	Ongoing

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[10]	Timeline
All species in this plan	48	External Relations and Visitor Experience (ERVE) Communications: Feature species at risk in ERVE printed and virtual communications (i.e., Book of Rouge, updated Rouge app, Facebook Live events, Spotlight articles, fact sheets, Rouge Xplorers Booklet) and promote awareness through daily interaction with visitors at Visitor Experience popup booths. Continue to engage media in highlighting species at risk projects (e.g., Blanding's Turtle features, Canadian Geographic articles).	Species at risk are featured in a minimum of three printed and/or virtual communications annually. By 2026, a minimum of two media engagements highlighting species at risk projects in RNUP are completed.	This activity will help to improve public awareness and increase knowledge of local species at risk found in RNUP.	Ongoing
All species in this plan	49	ERVE Events: Promote awareness and protection of species at risk through events and programming such as Creature Feature, Taste of the Trail and Rouge After Dark.	A minimum of two ERVE events annually have a component that promotes awareness and stewardship of species at risk.	This activity will help to improve public awareness and increase knowledge of local species at risk found in RNUP.	Ongoing
All species in this plan	50	Rehabilitate Injured Wildlife: Work in partnership with Toronto Wildlife Centre and wildlife custodians across Ontario to rehabilitate species at risk and other injured or orphaned wildlife.	All injured or orphaned wildlife found in RNUP is brought in to local wildlife custodians for rehabilitation, where feasible.	Threat: premature mortality from vehicles, humans, pets, buildings collisions, etc.	Ongoing

[10] Threat or recovery measures as per most recent versions of relevant recovery documents found in References section.

Appendix C: Other conservation and recovery measures that will be encouraged through partnerships or when additional resources become available.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
FOREST COMMUNITY				
Bashful Bulrush	51	Options Analysis: Liaise with Western University, the Royal Ontario Museum, and Agri-Food Canada to review existing data and feasibility study to determine if re-introduction is possible with minimal intervention.	A management decision is made with the available information on whether Bashful Bulrush can and will be re-introduced with minimal intervention.	Considered extirpated from the park since 2005. Reintroductions from populations near the park may be possible with minimal intervention.
Butternut	52	Remove Hybrids: Remove hybrid Butternut trees and non-native walnut species (Japanese Walnut) identified as part of the Butternut inventory.	All identified hybrid Butternut trees are removed.	Threat: hybridization
Butternut	53	Population Support: Collaborate with the Butternut Working Group to archive putatively resistant individuals and collect scions from healthy Butternuts that show resistance to Butternut canker for future germination and plantings.	Up to a maximum of five putatively resistant individuals identified by the Forest Gene Conservation Association are archived.	Threat: butternut canker Recovery measure: grafting and archiving at least 10 putatively resistant trees in each ecodistrict in support of a future breeding and/or vegetative propagation program to produce resistant trees for restoration, and in support of future critical habitat identification.
Acadian Flycatcher, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Wood Thrush	54	Deer Population Surveys: Liaise/partner with the Province of Ontario Fish & Wildlife Branch and the Rouge Valley Conservation Centre to determine the deer population size in and around the park. Conduct deer population counts during the fall/winter months via spotlight surveys, aerial counts, and scat surveys, to gather population information specific to RNUP boundaries.	To determine population size and distribution of the species.	Threat: loss of habitat or individuals from deer browse

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Acadian Flycatcher, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Wood Thrush	55	Feasibility Study for the Management of Hyperabundant White-tailed Deer in RNUP: Support a study that identifies the feasibility of hyperabundant White-tailed Deer management options in RNUP to ultimately reduce the impact of deer browse on species at risk and understory vegetation.	To determine the carrying capacity for deer in RNUP. A feasibility study is completed and a report is produced to evaluate the feasibility of options for managing White-tailed Deer in RNUP with a goal of reducing population density to target levels, if necessary.	Threat: loss of habitat or individuals from deer browse
WETLAND COMMUNITY				
Western Chorus Frog	56	Genetic Testing: Support the Canadian Wildlife Service and Queen's University study aiming to clarify the range boundary and population dynamics of Western Chorus Frog populations in Southern Ontario. Determine which Designated Unit RNUP Chorus Frogs belong to.	To determine presence and distribution of the species.	Recovery measure: clarify population status and distribution
Western Chorus Frog	57	Improving Habitat Quality: If Western Chorus Frog populations are discovered in RNUP, species-specific actions to address threats and support recovery will be implemented where feasible, such as restoration of ephemeral and pond wetland habitats, and creation of movement corridors to support connectivity of habitats.	Habitat restoration efforts targeting known Western Chorus Frog populations in RNUP are implemented.	Threat: loss of habitat
Black Ash	58	Education and Interpretation Programs: Partner and engage with Indigenous communities to incorporate traditional knowledge about Black Ash into park programming and provide general education and outreach on Black Ash (e.g., threats of imported wood and invasive species) at RNUP events, where appropriate.	Black Ash conservation messages are incorporated into park programming, and education programs.	Continue to promote and support citizen stewardship and engagement in conservation and monitoring. Educate about the threat of invasive species and significance of the species to Indigenous communities.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Black Ash	59	Conduct Inventory: Conduct an inventory to determine population size and distribution of Black Ash in RNUP and work with partners to proactively manage Ash impacted by the Emerald Ash Borer by injecting systemic insecticides into living trees.	To determine population size, health, and distribution in RNUP. To maintain Black Ash on the landscape and ensure survival and genetic preservation for future generations.	Recovery measure: clarify population status and distribution
RIPARIAN/AQUATIC COMMUNITY				
Eastern Ribbonsnake	60	Visual Encounter Surveys: Targeted surveys for Eastern Ribbonsnake will be implemented in suitable habitat, as per the methodology outlined in the Province of Ontario's Survey Protocol for Ontario's Species at Risk Snakes.	To determine abundance and distribution of the species.	Recovery measure: clarify population status and distribution
Blanding's Turtle, Northern Map Turtle, Painted Turtle, Redside Dace, Snapping Turtle	61	Ninth Line Channel Stream Redesign and Rehabilitation: Work with partners to recover approximately 1 km of stream by re-naturalizing the channel and including riparian plantings.	Increased stream and riparian habitat resulting in a decrease in water temperature and reduced sedimentation in the Ninth Line Channel by 2026.	Threat: habitat loss and degradation
American Eel, Atlantic Salmon, Blanding's Turtle, Northern Brook Lamprey, Northern Map Turtle, Painted Turtle, Redside Dace, Silver Lamprey, Snapping Turtle	62	Morningside Creek Dissipator Area and Fishway Restoration Project: Improve connectivity of the Morningside Creek Tributary by implementing actions to restore natural hydrological regimes, fish passage, and migration.	The existing in-stream barrier to fish passage and migration is removed or repaired and natural hydrological regimes have been restored.	Threat: habitat fragmentation and reduced access to habitat imposed by man-made barriers to up-stream migration

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Atlantic Salmon	63	Support Introduction Initiatives: Support Atlantic Salmon introductions in the West Duffins watershed led by the Ontario Ministry of Natural Resources and Forestry and the Ontario Federation of Anglers and Hunters. Support existing population monitoring initiatives led by partner agencies and initiate new investigations exploring the potential positive and negative impacts to the Park's ecological integrity.	Atlantic Salmon continue to be released at approved stocking locations in RNUP. To investigate potential impacts of the introductions to the Park's ecological integrity.	No specific recovery measures are in place for this species since the original genetic stock of Atlantic Salmon in Ontario is extinct. Atlantic Salmon introduction efforts focus on re-populating historically occupied rivers and tributaries.
American Eel, Atlantic Salmon, Lake Sturgeon, Northern Brook Lamprey, Redside Dace, Silver Lamprey	64	Ontario Stream Assessment Protocol Surveys: Partner with TRCA, Ontario Streams, UTSC, and others to continue electrofishing surveys at select locations throughout RNUP.	To determine stream health and fish communities present in RNUP streams.	To monitor habitat quality, benthos and fish communities over time.
American Eel, Lake Sturgeon, Northern Brook Lamprey, Silvery Lamprey, Western Chorus Frog	65	Targeted Surveys or Collection of Samples for eDNA Analysis: Assess the presence, distribution, and relative abundance of the species.	Baseline data on presence, distribution, and relative abundance of the species.	Determine changes in the number of detections.
MEADOW COMMUNITY				
Monarch	66	Egg Rescue and Release: In the rare circumstances where the removal of milkweed for operational purposes and potential destruction of monarch eggs is unavoidable, collect monarch eggs for relocation or captive rearing. Consider partnering with local organizations to undertake captive rearing activities.	Monarch eggs that would otherwise be destroyed have been collected, successfully hatched and released back into the wild.	Threat: destruction through routine maintenance activities
Eastern Milksnake	67	Tenant Coverboard Pilot: Work with interested tenants to implement coverboard surveys in suitable habitat on their leaseholds. If interest or success is evident after the pilot, continue to establish a tenant monitoring program. Any incidental observations of other species at risk, such as Eastern Ribbonsnake, will be recorded.	A tenant coverboard monitoring pilot is completed and success of the program is assessed.	Continue to promote and support citizen engagement in conservation and monitoring.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Bobolink, Eastern Meadowlark, Grasshopper Sparrow	68	Population Monitoring: Develop a landscape-scale strategy for monitoring annual meadow bird activity (e.g., through the Meadow Bird Monitoring Project and explore the use of drones with thermal imagery to detect grassland nesting species at risk) in RNUP.	To determine presence, distribution, and relative abundance of the species.	Clarify population status and determine trends.
OTHER/MULTIPLE COMMUNITIES				
Acadian Flycatcher, American Bumblebee, Bobolink, Butternut, Canada Warbler, Cerulean Warbler, Common Nighthawk, Eastern Meadowlark, Eastern Whip-poor-will, Eastern Wood-pewee, Little Brown Myotis, Monarch, Northern Myotis, Red-headed Woodpecker, Tri-coloured Bat, Wood Thrush, Yellow-banded Bumblebee	69	Management of Dog-strangling Vine: Work with researchers to release *Hypena* as a biocontrol agent to manage invasive dog-strangling vine.	*Hypena* are released in the park by 2026 and subsequent annual monitoring is completed.	Threat: invasive species and habitat loss
Acadian Flycatcher, Bank Swallow, Barn Swallow, Black Tern, Bobolink, Canada Warbler Cerulean Warbler, Chimney Swift, Common Nighthawk, Eastern Loggerhead Shrike, Eastern Meadowlark, Eastern Whip-poor-will Eastern Wood-pewee, Grasshopper Sparrow, Horned Grebe, King Rail, Least Bittern, Peregrine Falcon, Piping Plover, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Wood Thrush, Yellow-breasted Chat, Yellow Rail	70	Support the Ontario Breeding Bird Atlas: Identify staff and/or volunteers to implement the survey protocol in RNUP.	To determine presence and distribution of species at risk birds in the park and to contribute data related to range-wide distribution and trends.	Clarify population status and determine trends.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Acadian Flycatcher, Bank Swallow, Barn Swallow, Black Tern, Bobolink, Canada Warbler Cerulean Warbler, Chimney Swift, Common Nighthawk, Eastern Loggerhead Shrike, Eastern Meadowlark, Eastern Whip-poor-will Eastern Wood-pewee, Grasshopper Sparrow, Horned Grebe, King Rail, Least Bittern, Peregrine Falcon, Piping Plover, Red-headed Woodpecker, Rusty Blackbird, Short-eared Owl, Wood Thrush, Yellow-breasted Chat, Yellow Rail	71	Support a bird banding program in RNUP: Provide logistical support to qualified partner agencies and experienced volunteers who wish to implement a bird banding program in RNUP.	To monitor species at risk bird population trends and explore local movements of individuals throughout the active period.	Clarify population status and determine trends.
American Bumblebee, American Eel, Atlantic Salmon, Blanding's Turtle, Bobolink, Eastern Meadowlark, Eastern Milksnake, Eastern Pondmussel, Eastern Ribbonsnake, Grasshopper Sparrow, Lake Sturgeon, Monarch, Northern Map Turtle, Painted Turtle, Redside Dace, Snapping Turtle, Western Chorus Frog, Yellow-banded Bumblebee	72	Improve Road and Right-of-Way Management Practices: Meet with road authorities and work together to improve road and right-of-way management practices (e.g., road salting, grading, paving, vegetation management).	Information is available to municipalities, road authorities and transportation agencies to encourage stewardship and increase awareness of the impact of road and right-of-way management practices on species at risk and their habitats. Road and right-of-way management practices have improved in at least one municipal jurisdictions.	Threat: habitat loss, degradation, invasive species and incidental death. Risk of water quality alteration due to an increased siltation and potential sediment and chloride loading.
To be determined	73	Create a SAR Mobile Exhibit: Create a mobile species at risk exhibit (i.e., interactive sign/exhibit that features species at risk birds and sounds, taxidermy, models, and other features) that will be stationed at the visitor centre, but capable of moving to different locations throughout the park (and the province).	The SAR Mobile Exhibit is completed and ready for use by 2026. Information is available to visitors to encourage stewardship and increase awareness.	This activity will help to improve public awareness and increase knowledge of local species at risk found in RNUP.

Species	Measure #	Measure	Desired outcome	Threat or recovery measure addressed[11]
Chimney Swift	74	Habitat Augmentation: Design, construct, and install one artificial chimney structure. If successful use is documented, proceed with installation as needed to mitigate for habitat loss.	A minimum of one artificial chimney structure has been installed and monitored for use by chimney swifts or other species at risk.	Threat: habitat loss and human disturbance
Blanding's Turtle, Eastern Milksnake, Eastern Ribbonsnake, Northern Map Turtle, Painted Turtle, Snapping Turtle, Western Chorus Frog, bird species at risk	75	Promote Responsible Pet Ownership: Incorporate information on the impacts of feral animals, off-leash dogs and aquarium releases into educational programming and social media posts. Conduct outreach to local tenants and surrounding residences to encourage pet owners to keep their animals indoors and under supervision.	Information is available to visitors to encourage stewardship and increase awareness.	Threat: predation and non-native species
Blanding's Turtle, Eastern Milksnake, Eastern Ribbonsnake, Northern Map Turtle, Painted Turtle, Snapping Turtle, Western Chorus Frog, bird species at risk	76	Feasibility Study on Predation Management: Support a study determining the feasibility of developing and implementing approaches to manage human-subsidized predators (i.e. raccoons, feral cats) at RNUP to protect at risk reptiles and birds and, if feasible, develop and implement a program to manage subsidized predators in RNUP.	A feasibility study is completed and report produced to evaluate the feasibility of predation management in RNUP and, if feasible, a program to manage subsidized predators is developed and implemented in RNUP.	Threat: predation
All species in this plan	77	Distribution Mapping and Modelling: Work with GIS specialist to update distribution maps for all species at risk in RNUP and work with partners to model habitat suitability and connectivity for a minimum of three select species at risk.	Distribution maps are created for all species at risk. Habitat suitability and has been modelled for a minimum of three species at risk. An updated habitat connectivity assessment has been completed.	Determine distribution of species and conduct habitat suitability and connectivity assessments.

[11] Threat or recovery measures as per most recent versions of relevant recovery documents found in References section.

Appendix D: Effects on the environment and other species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the Federal Sustainable Development Strategy's[12] goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that recovery actions may also inadvertently lead to environmental effects beyond the intended benefits. The planning process, which is based on national guidelines, directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the plan itself, and are summarized below.

Overall, it is anticipated that implementation of this action plan will have a beneficial impact on non-target species, ecological processes, and the environment in RNUP. This plan puts into practice recovery goals presented in recovery strategies already developed for some of the species at risk in this plan, which were subject to SEAs during the development of those documents. Further, this action plan was developed to benefit all species at risk that regularly occur in RNUP; all of these species were considered in the planning process, any potential secondary effects were considered and mitigated, and where appropriate, measures were designed to benefit multiple species. The planning process was also guided by priorities identified in the park's ecological integrity monitoring program and the Park's management plan (Parks Canada Agency, 2019). Consequently, activities outlined in this plan address key management priorities aimed at improving the broader ecological health of the site. Finally, this plan outlines stewardship actions, educational programs, and awareness initiatives that will involve visitors, local residents, Indigenous organizations, and the general public. This will lead to greater appreciation, understanding, and action towards the conservation and recovery of species at risk in general.

[12] https://www.fsds-sfdd.ca/index.html#/en/goals/