DRAFT Recovery Strategy for the Yellow-breasted Chat (*Icteria virens*) in Ontario

2019

Recommended citation

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Declaration

The recovery strategy for the Yellow-breasted Chat (*Icteria virens*) was developed in accordance with the requirements of the *Endangered Species Act, 2007* (ESA). This recovery strategy has been prepared as advice to the Government of Ontario, other responsible jurisdictions and the many different constituencies that may be involved in recovering the species.

The recovery strategy does not necessarily represent the views of all individuals who provided advice or contributed to its preparation, or the official positions of the organizations with which the individuals are associated.

The recommended goals, objectives and recovery approaches identified in the strategy are based on the best available knowledge and are subject to revision as new information becomes available. Implementation of this strategy is subject to appropriations, priorities and budgetary constraints of the participating jurisdictions and organizations.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy.

Responsible jurisdictions

Ministry of the Environment, Conservation and Parks
Environment and Climate Change Canada – Canadian Wildlife Service, Ontario
Parks Canada Agency

Executive summary

The *Endangered Species Act, 2007* (ESA) requires the Minister of the Environment, Conservation and Parks to ensure recovery strategies are prepared for all species listed as endangered or threatened on the Species at Risk in Ontario (SARO) List. Under the ESA, a recovery strategy may incorporate all or part of an existing plan that relates to the species.

The Yellow-breasted Chat (*Icteria virens*) is listed as endangered on the SARO List. The Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*), which is the subspecies that occurs in Ontario, is listed as endangered under the federal *Species at Risk Act* (SARA). Environment and Climate Change Canada prepared the Recovery Strategy for the Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) in Canada in 2019 to meet its requirements under the SARA. This recovery strategy is hereby adopted under the ESA. With the additions indicated below, the enclosed strategy meets all of the content requirements outlined in the ESA.

The Critical Habitat section of the federal recovery strategy provides an identification of critical habitat (as defined under the SARA). Identification of critical habitat is not a component of a recovery strategy prepared under the ESA. However, it is recommended that the approach used to identify critical habitat in the federal recovery strategy, along with any new scientific information pertaining to the Yellow-breasted Chat and the areas it occupies, be considered when developing a habitat regulation under the ESA.

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1.0 Adoption of federal recovery strategy

The *Endangered Species Act, 2007* (ESA) requires the Minister of the Environment, Conservation and Parks to ensure recovery strategies are prepared for all species listed as endangered or threatened on the Species at Risk in Ontario (SARO) List. Under the ESA, a recovery strategy may incorporate all or part of an existing plan that relates to the species.

The Yellow-breasted Chat (*Icteria virens*) is listed as endangered on the SARO List. The Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*), which is the subspecies that occurs in Ontario, is listed as endangered under the federal *Species at Risk Act* (SARA). Environment and Climate Change Canada prepared the Recovery Strategy for the Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) in Canada in 2019 to meet its requirements under the SARA. This recovery strategy is hereby adopted under the ESA. With the additions indicated below, the enclosed strategy meets all of the content requirements outlined in the ESA.

1.1 Species assessment and classification

The following list is assessment and classification information for the Yellow-breasted Chat in Ontario. Note: The glossary provides definitions for the abbreviations and technical terms in this document.

- SARO List Classification: Endangered
- SARO List History: Endangered (2013), Special Concern (2004)
- COSEWIC Assessment History: Endangered (2011), Special Concern (2000, 1994)
- SARA Schedule 1: Endangered (2017)
- Conservation Status Rankings: G-rank G5T5; N-rank: N2B; S-rank: S1B

COSEWIC (2011) recognizes two subspecies and three separate populations of the Yellow-breasted Chat (*Icteria virens*) in Canada: *Yellow-breasted Chat auricollis subspecies - Southern Mountain population* (listed as Endangered on Schedule 1 of SARA), *Yellow-breasted Chat auricollis subspecies - Prairie population* (Not listed on Schedule 1 of SARA), and *Yellow-breasted Chat virens subspecies - Eastern population* (listed as Endangered on Schedule 1 of SARA). The populations are considered discrete based on biogeographic separation, as well as genetic and taxonomic distinctiveness of the subspecies. The Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) is the only subspecies that occurs in Ontario. Thus, the information presented in this adoption, including the Conservation Status Ranking listed above, is specific to the Yellow-breasted Chat *virens* subspecies.

1.2 Area for consideration in developing a habitat regulation

Under the ESA, a recovery strategy must include a recommendation to the Minister of the Environment, Conservation and Parks on the area that should be considered in developing a habitat regulation. A habitat regulation is a legal instrument that prescribes an area that will be protected as the habitat of the species. The recommendation provided below will be one of many sources considered by the Minister, including information that may become newly available following completion of the recovery strategy, when developing the habitat regulation for this species.

The Critical Habitat section of the federal recovery strategy provides an identification of critical habitat (as defined under the SARA). Identification of critical habitat is not a component of a recovery strategy prepared under the ESA. However, it is recommended that the approach used to identify critical habitat in the federal recovery strategy along with any new scientific information pertaining to the Yellow-breasted Chat and the areas it occupies, be considered when developing a habitat regulation under the ESA.

Glossary

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The committee established under section 14 of the Species at Risk Act that is responsible for assessing and classifying species at risk in Canada.

Committee on the Status of Species at Risk in Ontario (COSSARO): The committee established under section 3 of the *Endangered Species Act, 2007* that is responsible for assessing and classifying species at risk in Ontario.

Conservation status rank: A rank assigned to a species or ecological community that primarily conveys the degree of rarity of the species or community at the global (G), national (N) or subnational (S) level. These ranks, termed G-rank, N-rank and S-rank, are not legal designations. Ranks are determined by NatureServe and, in the case of Ontario's S-rank, by Ontario's Natural Heritage Information Centre. The conservation status of a species or ecosystem is designated by a number from 1 to 5, preceded by the letter G, N or S reflecting the appropriate geographic scale of the assessment. The numbers mean the following:

1 = critically imperilled
2 = imperilled
3 = vulnerable
4 = apparently secure
5 = secure
NR = not yet ranked

Endangered Species Act, 2007 (ESA): The provincial legislation that provides protection to species at risk in Ontario.

Species at Risk Act (SARA): The federal legislation that provides protection to species at risk in Canada. This Act establishes Schedule 1 as the legal list of wildlife species at risk. Schedules 2 and 3 contain lists of species that at the time the Act came into force needed to be reassessed. After species on Schedule 2 and 3 are reassessed and found to be at risk, they undergo the SARA listing process to be included in Schedule 1.

Species at Risk in Ontario (SARO) List: The regulation made under section 7 of the *Endangered Species Act, 2007* that provides the official status classification of species at risk in Ontario. This list was first published in 2004 as a policy and became a regulation in 2008.

List of abbreviations

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
COSSARO: Committee on the Status of Species at Risk in Ontario
CWS: Canadian Wildlife Service

ESA: Ontario's *Endangered Species Act, 2007*
ISBN: International Standard Book Number
MECP: Ministry of the Environment, Conservation and Parks
SARA: Canada's *Species at Risk Act*
SARO List: Species at Risk in Ontario List

References

COSEWIC. 2011. COSEWIC assessment and status report on the Yellow-breasted Chat *auricollis* subspecies *Icteria virens auricollis* and the Yellow-breasted Chat *virens* subspecies *Icteria virens virens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 51 pp.

Appendix 1. Recovery strategy for the Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) in Canada

Species at Risk Act
Recovery Strategy Series

Recovery Strategy for the Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) in Canada

Yellow-breasted Chat

2019

Government of Canada
Gouvernement du Canada

Canada

Recommended citation:

Environment and Climate Change Canada. 2019. Recovery Strategy for the Yellow-breasted Chat *virens* subspecies (*Icteria virens virens*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. xi + 43 pp.

For copies of the recovery strategy, or for additional information on species at risk, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the Species at Risk Species at Risk (SAR) Public Registry[1].

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[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 recovery strategies for listed Extirpated, Endangered, and Threatened species and are required to report on progress within five years after the publication of the final document on the SAR Public Registry.

The Minister of Environment and Climate Change and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Yellow-breasted Chat *virens* subspecies and has prepared this recovery strategy, as per section 37 of SARA. To the extent possible, it has been prepared in cooperation with the Province of Ontario and any others as per section 39(1) of SARA.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy and will not be achieved by Environment and Climate Change Canada and the Parks Canada Agency, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this strategy for the benefit of the Yellow-breasted Chat *virens* subspecies and Canadian society as a whole.

This recovery strategy will be followed by one or more action plans that will provide information on recovery measures to be taken by Environment and Climate Change Canada, the Parks Canada Agency and other jurisdictions and/or organizations involved in the conservation of the species. Implementation of this strategy is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

The recovery strategy sets the strategic direction to arrest or reverse the decline of the species, including identification of critical habitat to the extent possible. It provides all Canadians with information to help take action on species conservation. When critical habitat is identified, either in a recovery strategy or an action plan, SARA requires that critical habitat then be protected.

In the case of critical habitat identified for terrestrial species including migratory birds SARA requires that critical habitat identified in a federally protected area[3] be described in the *Canada Gazette* within 90 days after the recovery strategy or action plan that identified the critical habitat is included in the public registry. A prohibition against

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

[3] These federally protected areas are: a national park of Canada named and described in Schedule 1 to the *Canada National Parks Act*, The Rouge National Park established by the *Rouge National Urban Park Act*, a marine protected area under the *Oceans Act*, a migratory bird sanctuary under the *Migratory Birds Convention Act, 1994* or a national wildlife area under the *Canada Wildlife Act* see ss. 58(2) of SARA.

destruction of critical habitat under ss. 58(1) will apply 90 days after the description of the critical habitat is published in the *Canada Gazette*.

For critical habitat located on other federal lands, the competent minister must either make a statement on existing legal protection or make an order so that the prohibition against destruction of critical habitat applies.

If the critical habitat for a migratory bird is not within a federal protected area and is not on federal land, within the exclusive economic zone or on the continental shelf of Canada, the prohibition against destruction can only apply to those portions of the critical habitat that are habitat to which the *Migratory Birds Convention Act, 1994* applies as per SARA ss. 58(5.1) and ss. 58(5.2).

For any part of critical habitat located on non-federal lands, if the competent minister forms the opinion that any portion of critical habitat is not protected by provisions in or measures under SARA or other Acts of Parliament, or the laws of the province or territory, SARA requires that the Minister recommend that the Governor in Council make an order to prohibit destruction of critical habitat. The discretion to protect critical habitat on non-federal lands that is not otherwise protected rests with the Governor in Council.

Acknowledgments

This recovery strategy was prepared by John Brett, with assistance from Elisabeth Shapiro, and Angela Darwin (Environment and Climate Change Canada, Canadian Wildlife Service (CWS) – Ontario); and Smeet Panchal and Marie-Claude Archambault (formerly Environment and Climate Change Canada, CWS – Ontario), based on an earlier draft by Krista Holmes (Environment and Climate Change Canada, CWS –Ontario) and Kari Van Allen (formerly Environment and Climate Change Canada, CWS – Ontario). In part, this strategy was based on the management plan (Environment Canada 2011) that was developed by Ken Tuininga and Mike Cadman (Environment and Climate Change Canada, CWS – Ontario), Dr. David Kirk (Aquila Conservation & Environment) and Northern Bioscience.

The many individuals who offered unpublished reports, personal communications and advice that were invaluable in completing this plan are gratefully acknowledged. They include Christine Bishop (Environment and Climate Change Canada, Science and Technology - Pacific and Yukon); François Shaffer (Environment and Climate Change Canada, CWS – Quebec); Mike Cadman, Judith Girard, Lesley Dunn and Elizabeth Rezek (Environment and Climate Change Canada, CWS – Ontario); Marie-Claude Archambault, Madeline Austen, Tianna Burke and Janet LaPierre (formerly Environment and Climate Change Canada, CWS – Ontario); Becky Whittam (Environment and Climate Canada, CWS – Atlantic); Wendy Dunford (Environment and Climate Change Canada, CWS – National Capital Region); Valerie Minelga, Tammy Dobbie and Joanne Tuckwell (Parks Canada Agency); Emily Slavik (Ontario Ministry of Natural Resources and Forestry, Ontario Parks); Aileen Rapson, Leanne Jennings, Amelia Argue, Megan McAndrew, Lucy Ellis, Mark Hulsman, Michelle Bacon, Maria Vavro, Glenn Desy, Lauren Sharkey, Natasha Leahy, Ayden Sherritt, Mike Burrell, Don Sutherland, and Lara Griffin (Ontario Ministry of Natural Resources and Forestry); Chris Risley (formerly Ontario Ministry of Natural Resources and Forestry); Patrick Kramer (Pelee Island Bird Observatory); and Mhairi McFarlane (Nature Conservancy of Canada). The IUCN threats assessment was led by Dwayne Lepitzki and Judith Jones, with input from Tammie Dobbie and Heidi Brown (Parks Canada Agency); Mhairi McFarlane, Jill Crosthwaite, and Kate McKenzie (Nature Conservancy of Canada); Karen Cedar (Ojibway Nature Centre); Darren Ungar (Ontario Parks); Jon McCracken (Bird Studies Canada); Patrick Kramer (Pelee Island Bird Observatory); Graham Buck (Ontario Ministry of Natural Resources and Forestry); and Elisabeth Shapiro, Mike Cadman, and John Brett (Environment and Climate Change Canada, CWS – Ontario). Andrew Couturier (Bird Studies Canada) provided the Ontario distribution map.

Acknowledgment and thanks is given to all other parties that provided advice and input used to help inform the development of this recovery strategy including various Indigenous organizations and individuals, individual citizens, and stakeholders who provided input and/or participated in consultation meetings.

Executive Summary

Formerly considered part of the wood-warbler family (Parulidae), the Yellow-breasted Chat is a large songbird that is now considered to be the sole member of the family Icteriidae (Eckerle and Thompson 2001, Chesser et al. 2017). It is a neotropical migrant and is present in Canada from the spring through late summer. There are two recognized subspecies of the Yellow-breasted Chat: *Icteria virens auricollis* and *Icteria virens virens.* In Canada, the *auricollis* subspecies is found in British Columbia (Southern Mountain population), Alberta and Saskatchewan (Prairie population). The Yellow-breasted Chat *virens* subspecies has only been confirmed as breeding in Ontario, and regular breeding was likely historically limited to a core area that includes Pelee Island and what is now Point Pelee National Park. While there have been sightings of Yellow-breasted Chat in Quebec, New Brunswick and Nova Scotia, breeding has not been confirmed in those provinces. This recovery strategy is specific to the Yellow-breasted Chat *virens* subspecies.

The global population of Yellow-breasted Chat has been estimated at approximately 13 million birds, and the *virens* subspecies makes up approximately 80% of the global population. Although it is difficult to estimate the population size of the Yellow-breasted Chat *virens* subspecies in Canada, a review of Ontario Breeding Bird Atlas data from 2001 to 2005 indicates the population might have been fewer than 42 pairs (80 individuals). Recent occurrence information suggests that the Canadian population of the Yellow-breasted Chat *virens* subspecies has declined markedly since the atlas, with a 2013 estimate of fewer than 10 pairs (M. Cadman pers. comm. 2013), and an estimate of fewer than 2 pairs currently remaining (M. Burrell pers. comm. 2018).

In 1994 and 2000, the Yellow-breasted Chat *virens* subspecies was assessed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) due to the perceived possibility of rescue from populations in states bordering Ontario. In 2011, COSEWIC re-assessed the Yellow-breasted Chat *virens* subspecies as Endangered due to the apparent reduced potential for rescue effect, because population declines were evident across most of the northeastern range of the subspecies. As a result it was listed as Endangered on Schedule 1 of the federal *Species at Risk Act* (SARA) in 2017.

The most significant threat to the Canadian population of the Yellow-breasted Chat *virens* subspecies appears to be ecosystem modifications that reduce the amount of suitable breeding habitat available to the species, but a number of other threats (including development, nest parasitism by Brown-headed Cowbirds (*Molothrus ater*), and nest predation) may be negatively affecting the population as well.

There are some unknowns regarding the feasibility of recovery of the Yellow-breasted Chat *virens* subspecies. In particular, if the regional decline continues or is not reversed, it may not be feasible to achieve recovery in Canada for this species that was historically precarious. Nevertheless, in keeping with the precautionary principle, this recovery strategy has been prepared as per section 41(1) of SARA as would be done

when recovery is determined to be feasible. This recovery strategy addresses the unknowns surrounding the feasibility of recovery. The population and distribution objectives for the Yellow-breasted Chat *virens* subspecies in Canada are to:

Short-term (10 years):

> Halt the current decline, and provide enough suitable habitat to support at least eight pairs within the species' core area.

Long-term (beyond 10 years)

> Achieve a stable population trend within the known distribution range in Canada.

Broad strategies to be taken to address the threats to the survival and recovery of the Yellow-breasted Chat *virens* species are presented in Strategic Direction for Recovery (Section 6.2).

Critical habitat is identified in this recovery strategy based on the best available information at the time of writing. Critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada is identified in the core area for the species in Ontario (i.e. Point Pelee National Park and Pelee Island), and specific locations within those areas are based on recent site occupancy and habitat availability. Identification of additional critical habitat and/or refinement of existing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada may occur as additional information becomes available.

One or more action plans, in addition to the posted Parks Canada multi-species action plans that include Yellow-breasted Chat, will be posted on the Species at Risk Public Registry to direct implementation of this recovery strategy.

Recovery Feasibility Summary

Recently, the Government of Canada published the [Proposed] Species at Risk Policies – Policy on Survival and Recovery (2016)[4] to guide consistent interpretation of major concepts applicable under the federal *Species at Risk Act*. Recovery feasibility for the Yellow-breasted Chat *virens* subspecies was assessed following this new draft guidance[5].

Based on the best available information, the Yellow-breasted Chat *virens* subspecies was probably never particularly widespread or abundant within Canada and is considered to be historically precarious[6] in Canada (see Appendix A: *Historical*

[4] http://registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=2985
[5] https://registrelep-sararegistry.gc.ca/virtual_sara/files/policies/Survival_and_Recovery_EN1.pdf.
[6] A species that, prior to significant effects from human activity, was below the survival threshold or was dependent on demographic connectivity with outside populations for the long-term presence in Canada according to the best available information on the species population in Canada. Such a species may be recovered by achieving a condition that approximates its historical state.

Context). The first Yellow-breasted Chat record in Ontario is from Point Pelee in 1879 (Austen et al. 1994), and the highest population estimate on record for this species in Ontario is 50 pairs (Cadman et al. 1987). For species that have been assessed as historically precarious (Appendix A), the Government of Canada uses the criteria in Table 1 below to determine whether recovery for this species is technically and biologically feasible.

There are unknowns regarding the feasibility of recovery of the Yellow-breasted Chat *virens* subspecies. In keeping with the precautionary principle, this recovery strategy has been prepared as per section 41(1) of SARA, as would be done when recovery is determined to be technically and biologically feasible. This recovery strategy addresses the unknowns surrounding the feasibility of recovery. The determination of feasibility will be re-assessed if new information becomes available.

Assessing Recovery Feasibility

For a species that is determined to be historically precarious, recovery will be deemed feasible if the extent of irreversible change[7] is such that under the best achievable scenario[8] it is technically and biologically feasible to improve the condition of the species to a point that it is approaching the historical condition[9]. Information or estimates about fundamental species characteristics are used to determine recovery feasibility. The historical condition of the species should be used to understand the appropriate context of each characteristic for the species in question (Table 1).
For more information, see the Government of Canada's [Proposed] Species at Risk Policies - *Policy on Survival and Recovery*.

[7] A change that results in the establishment of a new set of ecological or biological conditions that limit the ability of the species to return to its historic condition and which cannot reasonably be changed in a way that improves those conditions for the species within a biologically relevant time frame (e.g., loss of genetic diversity, loss of food/host species, effects of permanent infrastructure).
[8] The biologically and technically feasible scenario with the lowest possible risk of extinction to the species that can be achieved, taking into account irreversible change.
[9] An estimate of the historic level of redundancy, resilience, representation, population and distribution, trend, threats and ecological role in Canada prior to significant effects of human activity, based on the best available information.

Table 1. Determination of Recovery Feasibility for Historically Precarious Species

Fundamental Species Characteristic	Recovery Threshold for Precarious Species	Technically and Biologically Feasible to Achieve Before Opportunity Lost? (Y/N/Unknown)
Population Trend	Approximating historical condition	Unknown
Resilience[a] (Population size)	Approximating historical condition	Unknown
Redundancy[b] (Population # / Distribution)	Approximating historical condition	Unknown
Population Connectivity[c]	Approximating historical condition	Unknown
Mitigation of Anthropogenic Threats	Significant threats avoided or mitigated to the extent that they no longer threaten the species	Unknown
Species Condition[d]	Improved over when first assessed as at risk	Unknown
Representation (Species presence in appropriate ecological communities)	Approximating historical condition at a coarse scale	Yes
Independent of connectivity with populations outside of Canada	Connectivity okay if necessary	Unknown, but connectivity likely necessary
Independent of Species Interventions	Yes	Unknown, but interventions likely necessary

[a] Resilience is the species' ability to recover after a disturbance and is critical to the survival of a species that is considered historically precarious. Although a larger population size does not protect against all threats, it is a strong predictor of resilience against increasing rates of decline due to inbreeding or chance events (Elphick et al. 2001; McGowan et al. 2014).

[b] Redundancy refers to the number of local populations and their distribution. If one local population is damaged or destroyed, others can act as a source to restore this missing local population.

[c] Connectivity among local populations can be important in naturally restoring depleted populations. If connectivity between habitat patches is decreased (e.g. through habitat loss or population declines), remaining local populations may be too small to be viable on their own, or may become inbred due to a lack of gene dispersal.

[d] The condition of the species refers to the combination of its population size, distribution, trend, threats, ecological role and any factors that together determine the risk of extinction or extirpation of the species.

Narrative to Support Recovery Feasibility

Population Trend, Resilience, and Redundancy

Determining the historical condition of population trend, resilience, and redundancy for the Yellow-breasted Chat *virens* subspecies in Canada is challenging. While the first Ontario Breeding Bird Atlas (1981-1985) estimated 50 pairs (Cadman et al. 1987) and the 1994 COSEWIC assessment estimated 18 to 38 pairs (Cadman and Page 1994), these estimates were both made following the species' late 19th century and early 20th century range expansion (Taverner 1906, Austen et al. 1994). While these estimates likely exceed the historical (i.e. pre-European settlement) condition for this species in Canada, sufficient suitable habitat could potentially be made available to support these estimated population sizes.

However, as the small Canadian population of the Yellow-breasted Chat *virens* subspecies occurs at the northern part of its continental range, and the vast majority of its continental distribution and population occurs further south in the United States (Figure 1), it is important to note that population changes at the regional level may have a significant effect on recovery feasibility in Canada. As the regional population is experiencing an ongoing downward population trend (Sauer et al. 2017), its range may contract away from the current periphery. In such a case, despite best efforts described in this strategy to ensure that sufficient suitable habitat is available and key threats are mitigated, the numbers of the Yellow-breasted Chat *virens* subspecies in Canada may continue to decline.

It is not known what population size or how many occupied locations in Canada would be required to maintain a self-sustaining Canadian population in the context of further regional/continental declines, but this number would exceed the historical condition and achieving it is likely not feasible.

Population Connectivity

In determining the appropriate level of population connectivity required to ensure the survival or recovery of the species in Canada, it is important to consider the historical level of connectivity to which the species is adapted. However, the historical level of connectivity for the Yellow-breasted Chat in Ontario is unknown.

Mitigation of Human-caused Threats

This criterion refers specifically to those threats, as a result of human activity, that significantly increase risk to the species. Due to its limited range and specific habitat requirements, the Yellow-breasted Chat *virens* subspecies is particularly susceptible to habitat change. Some of the threats to the Yellow-breasted Chat *virens* subspecies, such as habitat loss and degradation caused by anthropogenic activities (e.g., residential development and agricultural activities) can be mitigated through recovery actions. Outside of Canada, habitat loss is a concern within the migration and wintering areas. The degree to which these threats exist and can be mitigated is currently unknown.

Species Condition

It is unknown whether the condition of the Yellow-breasted Chat *virens* subspecies in Canada can be returned to a state that exceeds what it was when it was first assessed as at risk. In 1994, when it was assessed as Special Concern, the population size was estimated as 18-34 pairs, which may exceed the historical condition for the species in Canada. If the regional population continues to decline, meeting or exceeding the species' estimated 1994 condition will likely not be achievable.

Representation in Appropriate Ecological Communities

Yellow-breasted Chats are restricted to a relatively narrow range of habitat conditions (i.e. early-/mid-successional shrub habitat). Continued breeding populations at both Point Pelee National Park and Pelee Island likely approximates the historical representation for this species in Canada, and is likely feasible to achieve if the regional/continental population decline is reversed and the trend is stabilized.

Independent of Connectivity with Populations Outside of Canada

There are currently individuals capable of reproduction within the Canadian range, but these numbers are small and declining (COSEWIC 2011). Individuals capable of breeding are also present in neighbouring states, but the Yellow-breasted Chat *virens* subspecies is showing long-term population declines in all states adjacent to Ontario, as well as range contraction across much of the northeastern United States (COSEWIC 2011, Sauer et al. 2017). As such, the possibility of using these individuals as a source population is limited and results of the recent status assessment by the COSEWIC (2011) suggest that the potential for a rescue effect has declined. It is not known to what degree the Canadian population of this subspecies relies on immigration from neighbouring populations in the United States, but it is likely that the Canadian population trend is closely linked to regional trends.

Independent of Species Interventions

In the absence of natural disturbance events to maintain sufficient suitable early-/mid-succession habitat, active management will likely be required periodically to maintain habitat availability at some sites.

Summary of Recovery Feasibility

It is likely that the Yellow-breasted Chat *virens* subspecies was never abundant or widespread in Canada, and will likely continue to be considered rare in Canada given that its current Canadian range is at the northern edge of its continental range. If the species remains extremely rare, it will likely always be vulnerable to human-caused stressors and natural, random events.

It is not known what population size or how many occupied locations in Canada would be required to maintain a self-sustaining Canadian population in the long-term, but it is

likely that sufficient suitable habitat could be made available to support a population of eight pairs (see the short-term population and distribution objective). Yellow-breasted Chats prefer early successional habitat with low, dense shrubs (i.e., young shrubland), and opportunities exist to increase the amount of early successional shrubland habitat by changing current management practices at select sites (e.g., strategic use of periodic cutting or prescribed burns), especially within managed sites in the Yellow-breasted Chat *virens* subspecies' core area (i.e. Point Pelee National Park and Pelee Island). Outside of the core area, southern Ontario is heavily developed and intensively cultivated, leaving limited habitat suitable for management or restoration.

However, the Yellow-breasted Chat *virens* subspecies is showing long-term population declines in all states adjacent to Ontario, as well as range contraction across much of the northeastern United States (COSEWIC 2011, Sauer et al. 2017) Despite the best efforts described in this strategy to ensure that sufficient suitable habitat is available and key threats are mitigated, the numbers of the Yellow-breasted Chat *virens* subspecies in Canada may continue to decline.

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1. COSEWIC* Species Assessment Information

Date of Assessment: November 2011

Common Name (population): Yellow-breasted Chat *virens* subspecies

Scientific Name: *Icteria virens virens*

COSEWIC Status: Endangered

Reason for Designation: This subspecies is a shrub-thicket specialist that occurs at the northern edge of its range in Canada. Its population in southern Ontario is localized and very small. Since the last status report was produced, declines have occurred in the Ontario population owing to habitat loss. The potential for rescue effect has also been dramatically reduced, because population declines are evident across most of the northeastern range of this subspecies.

Canadian Occurrence: Ontario

COSEWIC Status History: Designated Special Concern in April 1994. Status re-examined and confirmed in November 2000. Status re-examined and designated Endangered in November 2011.

* COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

2. Species Status Information

The global conservation status for the Yellow-breasted Chat (*Icteria virens*) is secure[10] (G5; NatureServe 2017). In the United States, the species has a nationally secure breeding population (N5B) and occurs in 32 states with varying sub-national ranks (Appendix A; NatureServe 2017). In Canada, the national conservation status is apparently secure[11] breeding population (N4B).

There are two recognized subspecies of the Yellow-breasted Chat in Canada: *Icteria virens auricollis,* which is found in British Columbia (Southern Mountain population; Endangered), Alberta and Saskatchewan (Prairie population; Not at Risk) and *Icteria virens virens*, which is found in Ontario, with extralimital[12] observations in Quebec, New Brunswick and Nova Scotia*.* This recovery strategy is specific to the Yellow-breasted Chat *virens* subspecies, which was listed as Endangered on Schedule 1 of the federal *Species at Risk Act* (SARA) in 2017. It is also listed as

[10] A species that is at very low risk of extinction or elimination.
[11] A species that is at fairly low risk of extinction or elimination but with possible cause for some concern as a result of recent local declines, threats, or other factors.
[12] Occurring outside the expected or historical distribution.

Endangered[13] under Ontario's *Endangered Species Act, 2007*, which provides protection for the species and its general habitat.

The Yellow-breasted Chat *virens* subspecies is ranked globally secure, but has not been ranked nationally in the United States (NatureServe 2017). In Canada, both the national conservation rank and the sub-national conservation rank in Ontario indicate imperiled[14] breeding populations (N2B; S1B; NatureServe 2017). It is estimated that less than 1% of the global range of the Yellow-breasted Chat *virens* subspecies is in Canada (Eckerle and Thompson 2001; Rich et al. 2004).

3. Species Information

3.1 Species Description

Formerly considered a wood-warbler (Parulidae), the Yellow-breasted Chat is now considered to be the sole member of its family, Icteriidae (Eckerle and Thompson 2001, Chesser et al. 2017). It is approximately 18 cm in length and weighs about 25 g (COSEWIC 2011), and has a relatively thick, slightly curved bill and a long tail. It has a lemon-yellow breast, chin and throat; olive green back, wings and tail; and a blue-grey head with white "spectacles" (Eckerle and Thompson 2001). During the breeding season, the male sings a highly variable song, which has been described as a series of whistles, squawks, rattles and catcalls (Eckerle and Thompson 2001).

Yellow-breasted Chats are neotropical migrants, and are present in Canada between the spring and late summer (their breeding season). In Ontario, chats arrive at breeding sites in approximately mid-May (Eagles 2007), and the nesting period typically continues until late July (Peck and James 1987, Rousseu and Drolet 2017).

For a more detailed species description see the COSEWIC status report (COSEWIC 2011).

3.2 Species Population and Distribution

Globally, the Yellow-breasted Chat breeds in North America (southern Canada, the United States and northern Mexico) and winters in parts of both North and Central America (Figure 1). The global population estimate is approximately 13 million birds (Partners in Flight Science Committee 2013). The *virens* subspecies makes up approximately 80% of the global population (COSEWIC 2011).

[13] A species that lives in the wild in Ontario but is facing imminent extinction or extirpation.
[14] At high risk of extirpation in the jurisdiction due to a very restricted range, very few populations or occurrences, very steep declines, severe threats or other factors.

Figure 1. Distribution of the Yellow-breasted Chat (from Eckerle and Thompson 2001). The Yellow-breasted Chat *virens* subspecies' breeding range is the continuous lighter shaded portion of eastern North America shown above, while the darker shaded portion to the south is the species wintering range. Dashed lines represent areas where the species has existed sporadically.

The Yellow-breasted Chat *virens* subspecies breeds from the eastern Great Plains and central Texas eastward and north to extreme southwestern Ontario (COSEWIC 2011). It winters in the lowlands of eastern and western Mexico, across Central America and into western Panama (Figure 1). Additional individuals have been known to overwinter in the southern United States (COSEWIC 2011). In Canada, COSEWIC (2011) estimated the extent of occurrence[15] of this subspecies at 42,300 km^2 and the area of occupancy[16] at less than 200 km^2.

In Canada, the Yellow-breasted Chat *virens* subspecies mainly occurs in Ontario, where there is a very small breeding population in the extreme southwestern portion of the province (Figure 2). A significant portion of the Ontario population of Yellow-breasted Chat has been observed at two locations: Point Pelee National Park and Pelee Island;

[15] The area included in a polygon without concave angles that encompasses the geographic distribution of all known populations of a wildlife species (excluding cases of vagrancy). The extent of occurrence of the Yellow-breasted Chat is illustrated in Figure 1.
[16] The area within 'extent of occurrence' that is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that the extent of occurrence may contain unsuitable or unoccupied habitats.

these locations are the only in Canada considered to have annual, core populations (COSSARO 2017); most mapped occurrences on Figure 2 represent single-season events, and many of the records likely represent prospecting males rather than breeding pairs. Although never confirmed, the possibility exists that the Yellow-breasted Chat *virens* subspecies has also bred in Quebec (COSEWIC 2011). Of 57 sightings in Quebec, only two are records of probable[17] breeding (Les Oiseaux du Quebec 2013); the remainder are of individuals sighted in spring or fall migration. During surveys for the Maritimes Breeding Bird Atlas, two records meeting the criteria for probable breeding occurred in New Brunswick during 2006 and 2007, one record of possible[18] breeding occurred in New Brunswick in 2008, and one record of probable breeding occurred in Nova Scotia in 2009 (Maritimes Breeding Bird Atlas 2010). Despite meeting possible or probable breeding criteria, these records are presumed to represent unpaired prospecting males (Maritimes Breeding Bird Atlas 2010).

While some details of the historical condition of the Yellow-breasted Chat *virens* subspecies in Canada are unknown, it was not particularly common in this part of its range prior to European settlement of eastern North America, and that any regular breeding in Canada was limited to the core area in and around Point Pelee and Pelee Island. Taverner (1906) stated that the Yellow-breasted Chat in Michigan "must be viewed as intrusive forms of the Carolinian Fauna to the south of us that have, for the last decade or so, been extending their range northward." In Ohio, it was noted as being common in the southern parts of the state, but almost rare on the Lake Erie shore (Taverner 1906). McGowan (2008) noted that "before European settlement in New York and the destruction of the forests, the Yellow-breasted Chat was likely very uncommon, if present at all, although it may have bred on Long Island" (in the southeast corner of the state). It was not until 1879 that the species was documented in Ontario at Point Pelee (Austen et al. 1994). It was suggested that a significant expansion of the species' range in the northeast took place in approximately 1893 and 1894 (Taverner 1906), but even following that expansion it was considered to be rare in Canada. In 1908, Taverner and Swales noted that "Point Pelee is the only locality in Canada where the Yellow-breasted Chat is any more than a rare accidental straggler."

The creation of early successional habitat through changes to the landscape (e.g. logging, widespread abandonment of farms in the mid-1900s) created an opportunity for range expansion in the northeast part of its range, including Canada (Austen et al. 1994, Cadman et al. 2007, COSEWIC 2011). However, as shrubby habitats were left to succeed into forest, a reduction in the availability of suitable shrub habitat resulted in a decline and range contraction (Austen et al. 1994). Point Pelee and Pelee Island are now considered the only annual, core locations for the Yellow-breasted Chat *virens* subspecies in Canada (COSSARO 2017). Most occurrences outside the core area are believed to be sporadic and occur for a single breeding season (Austen

[17] Probable breeding is considered to have occurred when birds display the following behaviours: pairs within suitable nesting habitat, established territory, courtship displays, visiting probable nesting site, agitated behavior, or nest-building.

[18] Possible breeding occurs when birds are observed displaying certain characteristics such as when a singing male is observed in its breeding season in suitable habitat.

et al. 1994). Away from this core area, there have been very few records during the breeding season since the second Ontario Breeding Bird Atlas period (eBird 2018).

Based on data collected from 1981 to 1985, a population size of 50 pairs was estimated in the first Ontario Breeding Bird Atlas (Cadman et al. 1987). The 1994 COSEWIC assessment reported an estimated population size of 18 to 38 pairs in Ontario (Cadman and Page 1994). The population was estimated to be 42 to 50 pairs during the second Ontario Breeding Bird Atlas period (i.e. 2001 to 2005; Eagles 2007), but the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2011) indicated that this estimate likely failed to factor in the likelihood of one-time only transitory events (brief and non-reoccurring) and the decline in occupied squares between atlas periods. Given an estimate of 50 pairs in the first atlas, and an observed 55% decline in the number of occupied atlas squares between atlases, the Ontario population at the time of the second atlas was likely lower than the minimum estimate of 42 pairs (COSEWIC 2011). In 2013, the Canadian population of the Yellow-breasted Chat *virens* subspecies was estimated to be fewer than 10 pairs or 20 mature individuals (M. Cadman pers. comm. 2013). Following targeted surveys in 2016 and 2017, the Ontario Natural Heritage Information Centre estimated that there may now be fewer than two pairs remaining in Ontario, and probably zero (M. Burrell pers. comm. 2018a).

The Yellow-breasted Chat *virens* subspecies has declined markedly in the species' core area in Canada (Walker 2012). Wormington (1981) indicated that there were "over ten pairs" present in Point Pelee National Park in 1981. Ten and eight pairs were observed in 1982 and 2005, respectively, and in 2008, a systematic search was conducted during which only three pairs were found (Walker 2012). Although those three years were the only ones in which formal surveys were conducted at Point Pelee National Park, even incidental records of Yellow-breasted Chats in the park have been scarce over the last few years. Of these incidental records, two breeding pairs were reported in 2007, one in 2009, and one pair is known to have bred either within, or near the park in 2010 (A. Wormington pers. comm. 2009; V. Minelga pers. comm. 2013). Two singing males were reported on territories within the park in 2011 and one in 2012, but successful breeding was not observed (L. Cabrera pers. comm. 2013; V. Minelga pers. comm. 2013). While an immature bird was observed at the park in August 2016 (eBird 2018), it is not known whether this individual represents successful breeding within the park.

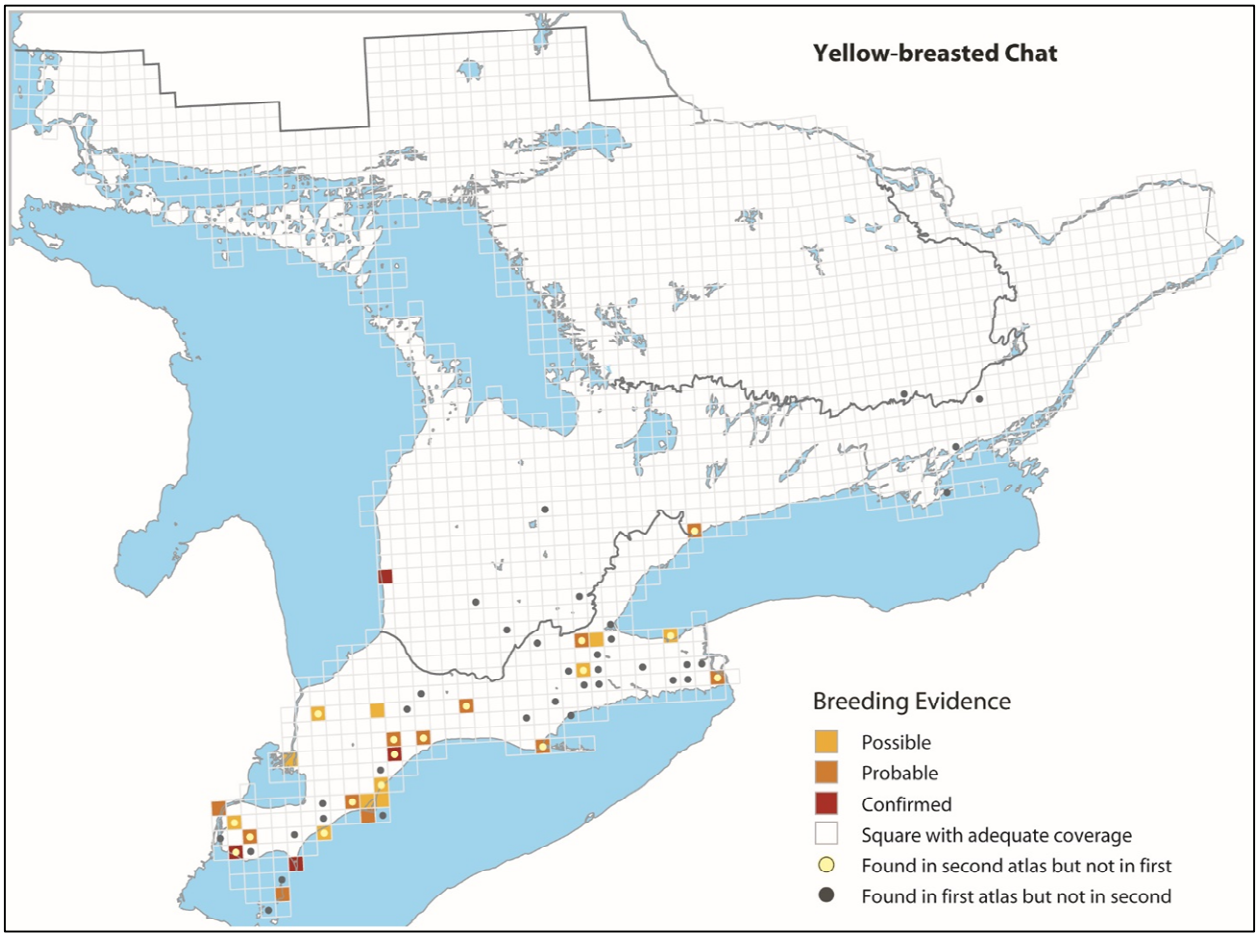

Figure 2. Distribution of the Yellow-breasted Chat *virens* subspecies in Ontario between 2001 and 2005 (map provided by A. Couturier, Bird Studies Canada; adapted from Cadman et al. 2007).

On Pelee Island there also appears to have been a severe decline, from more than 10 pairs during the first Ontario Breeding Bird Atlas (1981-1985), to five or six pairs in 2008, to only one possible pair in 2010 (COSEWIC 2011; Parks Canada Agency 2012a). In 2012, staff from the Pelee Island Bird Observatory located two, and possibly three, territories on Pelee Island (Gibson et al. 2012), and multiple singing individuals were documented in 2014, 2015, 2016, and 2018, but breeding has not been confirmed in recent years (Schott and Onishi 2014, Gibson and Onishi 2015, Schott et al. 2016, M. McFarlane pers. comm. 2017a, M. Burrell pers. comm. 2018a, P. Kramer pers. comm. 2018).

In addition to the population decline in Canada, there has been a contraction of the northern part of the Yellow-breasted Chat *virens* subspecies' continental range following an apparent expansion around the turn of the 20th century (COSEWIC 2011, Taverner 1906). The North American Breeding Bird Survey (BBS) indicates long-term population declines throughout the northeastern United States (Sauer et al. 2017), however, the BBS is largely inadequate for monitoring Yellow-breasted Chat populations at the northern edge of their range because of the species' rarity

(COSEWIC 2011). Breeding bird atlas projects from New York, Pennsylvania and Michigan report reduced occupancy between first and second atlas surveys (McGowan 2008; Cornell Lab of Ornithology 2009; Chartier et al. 2011). McGowan (2008) noted that "as a southern species, the chat has had perhaps a tenuous hold on a breeding range in New York for the last 200 years, and it may well disappear completely in the near future." The Ohio Breeding Bird Atlas II (Rodewald et al. 2016) noted a clear southward contraction of the range of the Yellow-breasted Chat. As in Canada, the decline and range contraction in neighbouring states may result in a distribution that more closely resembles the historical condition for the region.

3.3 Needs of the Yellow-breasted Chat *virens* subspecies

The Yellow-breasted Chat is an open-canopy obligate[19] species, and resides in early successional shrub habitats, with low, dense deciduous or coniferous vegetation (Eckerle and Thompson 2001; COSEWIC 2011). It is adapted to colonize ephemeral[20] successional habitats by moving to new areas as habitat becomes available (Thompson and Nolan 1973; Eagles 2007). A wide variety of early successional habitats are used, including early shrubby re-growth on abandoned agricultural fields, power-line corridors, clear-cuts, fencerows, forest edges and openings and areas near water bodies (streams, ponds, swamps; see Eckerle and Thompson 2001). In Ontario, it has also been observed in railway corridors, young coniferous reforestations, shrubby openings caused by tree blowdowns and, occasionally, wet willow-ash-elm thickets bordering wetlands (Austen et al. 1994, Eagles 2007). Individuals have been found nesting in dogwood (*Cornus* sp.), grapevine (*Vitis* sp.), raspberry (*Rubus* sp.), hawthorn (*Crataegus* sp.), juniper (*Juniperus* sp.) and Fragrant Sumac (*Rhus aromatica*; Eagles 2007; Walker 2012).

Of the three types of shrubland (transitional, young, and older shrublands) described by Peterjohn (2006), the Yellow-breasted Chat occupies "young shrublands," also known as early successional shrublands. Early successional shrublands have a more diverse breeding bird community than transitional shrublands and are dominated by species preferring dense brushy vegetation. In young shrublands, woody vegetation cover becomes dominant, but there are still patches of herbaceous vegetation existing. Densities of Yellow-breasted Chat peak when dense shrub thickets are abundant, and decrease as forests begin to mature[21]. As early successional shrubland habitats age, woody plants (primarily shrubs and woody vines < 4.5 m tall) continue to encroach on the herbaceous vegetation and the habitat becomes less suitable for the species (Crawford et al. 1981).

[19] An obligate species is limited in its habitat to a few, and very specific environmental conditions.
[20] Transitory, existing only briefly.
[21] McKibbin and Bishop (2010) conducted a study of breeding territory, nest patch and nest shrub characteristics for the Yellow-breasted Chat *auricollis* subspecies in British Columbia and found that territories were selected based on specific vegetation characteristics. The mean cover types in the *auricollis* breeding territories were 48% shrubs, 31% trees, 20% grasses and forbs, 1% bare ground and 1% other cover. No similar study has been conducted for the *virens* subspecies.

In a naturally functioning ecosystem (one with few large and/or intensive human disturbances), the availability of suitable nesting and foraging habitat for the Yellow-breasted Chat is a product of the natural frequency and intensity of disturbances such as fire, insect infestations, seasonal storms, and wind events (Askins 2002; Askins et al. 2007). In a highly human-modified ecosystem, the availability of suitable nesting and foraging habitat can be the product of activities such as forestry operations, utility and road right-of-way maintenance and low-density livestock grazing. Much of the suitable habitat in Ontario exists within a highly human-modified ecosystem, and is more likely associated with secondary succession[22] (e.g. an abandoned farm field) than natural or cut-over forests and have a larger proportion of woody vines and shrubs than typically found in regenerating forests.

The Yellow-breasted Chat *virens* subspecies has evolved to capitalise on the dynamic habitat created by periodic disturbances. The lack of such disturbances has likely negatively affected the Yellow-breasted Chat population in Ontario, as early successional shrublands have been allowed to succeed to mature forest (Walker 2012). As a consequence, the Yellow-breasted Chat may be limited by the availability of suitable breeding habitat in southern Ontario. Although the effect of leaving shrub habitat to succeed to forest is not beneficial for the species, it is not known how much of the shrubby habitat used by Yellow-breasted Chats is original to the core area and elsewhere in Ontario, or whether it was created through human activity.

Some research suggests that the Yellow-breasted Chat may be area sensitive[23], preferring large areas of suitable habitat (e.g. greater than 10 ha; Burhans and Thompson 1999; Conner et al. 1983; Rodewald and Vitz 2005), but other research on the Yellow-breasted Chat *virens* subspecies in North Carolina found 4.4 ha to be the "optimal area value" (where individual patch occupancy probability is 90%; Shake et al. 2012). A study in North Carolina found the minimum patch size to support Yellow-breasted Chat to be 2.3 ha (Shake et al. 2012). Research on edge avoidance and area sensitivity in Ohio suggests that larger habitat patches with minimal edge will be most beneficial for shrubland birds such as the Yellow-breasted Chat (Lehnen and Rodewald 2009a).

Within habitat patches, territories averaging 1.2 ha have been documented (Thompson and Nolan 1973). Breeding territories are often clumped together, suggesting a semi-colonial[24] tendency (Eckerle and Thompson 2001). Continuous tracts of suitable habitat or clusters of habitat within close proximity (i.e. 500 m cited in Lehnen and

[22] Refers to a series of community changes that take place on a previously colonized, but disturbed or damaged habitat. The process is started by an event (e.g. a forest fire, flooding) which reduces the established ecosystem (e.g. a forest) to a reduced population of initial inhabitants. Secondary succession occurs more quickly than primary succession.

[23] Area sensitivity refers to the fact that some wildlife species need large, unbroken (unfragmented) areas in a certain successional stage to provide some or all of their habitat requirements. As the patch of habitat becomes smaller, the abundance of the species, or in this case the subspecies, declines.

[24] Semi-colonial bird species are defined as those which frequently nest solitarily as well as with others.

Rodewald 2009b) are likely important features to allow multiple pairs to colonize an area.

Studies in Indiana and Ohio found site fidelity in the Yellow-breasted Chat *virens* subspecies to be relatively low (Thompson and Nolan 1973, Lehnen and Rodewald 2009b). While peripheral sites in Canada are typically not occupied for more than a few years (Eagles 2007), it is not known if the individuals that breed or are born in Canada return to the same sites or the same general area to breed in subsequent years, or if they typically return to Canada to breed at all. The source of the birds that breed in Canada or to what degree the Canadian breeding population relies on immigration from populations in the United States are also unknown.

Non-breeding, wintering, and stop-over habitat requirements are similar to breeding habitat (low, dense woody vegetation; COSEWIC 2011). Wintering habitat includes shrubland with dense, low woody vegetation; savanna or pasture with scattered clumps of trees; scrub and pine-savanna with dense patches of shrubs; riparian forest, mangrove, and disturbed tropical evergreen forest (Eckerle and Thompson 2001).

4. Threats

4.1 Threat Assessment

The Yellow-breasted Chat *virens* subspecies threat assessment is based on the IUCN CMP (World Conservation Union-Conservation Measures Partnership) unified threats classification system. Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (population, species, community, or ecosystem) in the area of interest (global, national, or subnational). Limiting factors are not considered during this assessment process. For purposes of threat assessment, only present and future threats are considered. Historical threats, indirect or cumulative effects of the threats, or any other relevant information that would help understand the nature of the threats are presented in the Description of Threats section.

Table 2. Threat Assessment Table

Threat #	Threat description	Impact[a]	Scope[b]	Severity[c]	Timing[d]
1	**Residential & commercial development**	**Low**	**Small**	**Slight**	**High**
1.1	Housing & urban areas	Low	Small	Slight	High
1.2	Commercial & industrial areas	Negligible	Negligible	Slight	High
2	**Agriculture & aquaculture**	**Low**	**Small**	**Slight**	**High**
2.1	Annual & perennial non-timber crops	Low	Small	Slight	High
7	**Natural system modifications**	**High-Medium**	**Pervasive**	**Serious**	**High**
7.3	Other ecosystem modifications	High-Medium	Pervasive	Serious	High
8	**Invasive & other problematic species &**	**Unknown**	**Pervasive**	**Unknown**	**High**
8.1	Invasive non-native/alien species	Unknown	Pervasive	Unknown	High
8.2	Problematic native species	Unknown	Pervasive	Unknown	High
11	**Climate change & severe weather**	**Unknown**	**Pervasive**	**Unknown**	**High**
11.1	Habitat shifting & alteration	Unknown	Pervasive	Unknown	High

[a] **Impact** – The degree to which a species is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The impact of each threat is based on Severity and Scope rating and considers only present and future threats. Threat impact reflects a reduction of a species population or decline/degradation of the area of an ecosystem. The median rate of population reduction or area decline for each combination of scope and severity corresponds to the following classes of threat impact: Very High (75% declines), High (40%), Medium (15%), and Low (3%). Unknown: used when impact cannot be determined (e.g., if values for either scope or severity are unknown); Not Calculated: impact not calculated as threat is outside the assessment timeframe (e.g., timing is insignificant/negligible or low as threat is only considered to be in the past); Negligible: when scope or severity is negligible; Not a Threat: when severity is scored as neutral or potential benefit.

[b] **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

[c] **Severity** – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or three-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%; Negligible < 1%; Neutral or Potential Benefit ≥ 0%).

[d] **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting.

4.2 Description of Threats

A number of threats are contributing to the decline of Yellow-breasted Chat *virens* subspecies, and while each alone may have a high, medium, low, or negligible/unknown impact (see Table 2), the cumulative effect of combinations of these threats is expected to have a high to medium overall impact on the population (Master et al. 2012). The most significant of these appears be ecosystem modifications that reduce the amount of suitable breeding habitat available to the species, but a number of unknowns related to the severity of other potential threats remain. The direct impacts of most threats on Yellow-breasted Chat *virens* subspecies in Canada may be tempered by the fact that most breeding pairs in the core area tend to occur on protected or conservation lands. Nevertheless, landscape-scale and regional effects may affect local breeding populations.

IUCN Threat 1. Residential and Commercial Development

1.1 Housing & urban areas and 1.2 Commercial & industrial areas

The development of housing and urban areas may result in shrubby habitat being replaced by buildings, lawns, and streets. Residential development that reduces the size of habitat patches may also threaten the Yellow-breasted Chat. Studies from Ohio and Missouri indicate that Yellow-breasted Chat shows some degree of area sensitivity (COSEWIC 2011). Lehnen and Rodewald (2009a) found there was a significant relationship between abundance and habitat patch size, and their study is consistent with other research supporting area sensitivity in this subspecies (Burhans and Thompson 1999; Rodewald and Vitz 2005).

While most of the species' recent breeding occurrences are found on protected and conservation lands in the core area, it may also nest on nearby private lands that could be subject to development applications. A study on an Indiana population found relatively low breeding site fidelity in the Yellow-breasted Chat *virens* subspecies (Thompson and Nolan 1973), so the effect of the threat may be reduced if there is other suitable habitat nearby into which the birds may move. The development of commercial and industrial areas may be less likely in the core area where Yellow-breasted Chat *virens* subspecies occurs in Canada, as most occurrences have been on protected or conservation lands. However, while development activities could limit the availability of suitable habitat off these lands, working with landowners and other stakeholders could reduce the impact of this threat.

IUCN Threat 2. Agriculture & aquaculture

2.1 Annual & perennial non-timber crops

The clearing of early successional habitats for agricultural purposes will make the habitat unsuitable for the Yellow-breasted Chat if dense shrubs are not retained in

nearby areas, and can limit the future supply of suitable habitat. In Canada, the Yellow-breasted Chat *virens* subspecies is most commonly found in extreme southwestern Ontario, an area that is mostly intensively cultivated. Over the past 80 years, large areas of hayfield and pasture in Ontario have been converted from forage crops to row crops (e.g. wheat, corn and soybean; OBORT 2005). Agricultural intensification has resulted in the loss of shrubby pastures and other shrubby agricultural habitats favoured by early successional shrubland species such as the Yellow-breasted Chat (Ontario Partners in Flight 2008). In parts of southern Ontario, pasture lands are being converted to crops, and hedgerows and thickets are being removed to expand existing fields. Much of this activity has already occurred in the Ontario range of the Yellow-breasted Chat, but is ongoing in some locations. This threat only occurs outside of parks and protected areas where the Yellow-breasted Chat *virens* subspecies is found, and thus is mainly outside of the core area currently occupied by the subspecies. On Pelee Island, the Nature Conservancy of Canada and other partners are restoring old agricultural lands (McFarlane pers. comm. 2017a), which is increasing the amount of available habitat. The Township of Pelee has been working with private landowners and partner agencies to proactively protect priority conservation lands on Pelee Island; a total of 18% of the island is currently set aside for conservation purposes (MNRF 2017), which could further reduce the impact of this threat on Yellow-breasted Chat.

IUCN Threat 7. Natural system modifications

7.3 Other ecosystem modifications

The primary threat to the Yellow-breasted Chat *virens* subspecies is the decline in the availability of its preferred habitat type of successional shrubland (COSEWIC 2011, COSSARO 2017). Historically, the maintenance of this habitat was reliant upon some form of natural disturbance, such as fire. While suitable habitat continues to be available in the species' core area, elsewhere in southern Ontario and throughout the regional range, much of the species' habitat has been lost due to the region's abandoned farmland succeeding to more mature forest (Askins 2000). In the Lower Great Lakes Plain physiographic area[25], more than 50% of early successional shrubland habitat has been lost since 1966 (Dettmers and Rosenberg 2003). This has affected extent, continuity and habitat suitability of early successional vegetation throughout the Yellow-breasted Chat's range. Remaining landscape cover tends to be composed of either open farmland or forest cover with closed canopy. Without the disturbance or management provided to these habitats by natural processes such as fire, areas where the Yellow-breasted Chat has been known to nest are becoming unsuitable due to vegetation succession.

[25] An area that covers the low-lying areas to the south of Lake Ontario in New York and to the north of Lake Erie in southernmost Ontario (Dettmers and Rosenberg 2003). Physiographic areas are regions that have relatively similar physical characteristics such as mountains, plains and lowlands. They are more specifically defined by attributes such as treeline position and geologic structure.

IUCN Threat 8, Problematic species & genes

8.1 Invasive non-native/alien species/diseases

Some non-native species may directly affect the Yellow-breasted Chat *virens* subspecies in Canada, but the effects may be positive or negative, so the overall impact is unknown. Predation by domestic cats is known to occur (T. Dobbie pers. comm. 2017), and the introduced Eastern Fox Squirrel (*Sciurus niger*), a potential predator of Yellow-breasted Chat (COSEWIC 2011), is abundant on Pelee Island (M. McFarlane pers. comm. 2017b).

Invasive shrub species such as European Buckthorn (*Rhamnus cathartica*) are present in some locations with recent Yellow-breasted Chat observations (McFarlane pers. comm. 2017), which could potentially affect food availability or quality in the shrubland habitat used by chats. Stoleson and Finch (2001) found Yellow-breasted Chats in New Mexico to preferentially use exotic Russian Olive (*Elaeagnus angustifolia*) for nesting, but found no differences in nest success when compared to nests in native species. Research on other migrating birds found a positive correlation between body mass and native-plant shrublands (vs. exotic-dominated shrublands) at migratory stopover points (Oguchi et al. 2017), indicating the higher quality habitat in native-dominated shrubland is important at certain times in the biological cycle of migratory birds. However, a study on breeding Gray Catbirds found that nestling quality was positively correlated with honeysuckle (*Lonicera* spp.) invasion (Gleditsch and Carlo 2014). The effect of non-native/invasive plant species on Yellow-breasted Chat in Ontario is unknown.

Exotic invasive forest pests such as the Emerald Ash Borer, a beetle species native to eastern Asia, could benefit the Yellow-breasted Chat *virens* subspecies in Canada and elsewhere in its range. The Emerald Ash Borer has killed millions of ash trees (*Fraxinus* sp.) in southwestern Ontario, Quebec, Michigan and surrounding states since its discovery in North America in 2002 (Natural Resources Canada 2016). The loss of ash trees could create the open, shrubby conditions used by the Yellow-breasted Chat *virens* subspecies. In May 2012, a male Yellow-breasted Chat was observed defending a territory on Pelee Island in an area that had complete canopy death due to Emerald Ash Borer, which had resulted in the development of a dense shrub layer (M. Burrell pers. comm. 2018b).

8.2 Problematic native species

The Brown-headed Cowbird, an obligate brood parasite, expanded its range into the northern breeding range of the Yellow-breasted Chat *virens* subspecies following forest clearing and agricultural development in the late 1800s (Falk 2007). Although it is probable that cowbirds inhabited southern Michigan prior to the 1800s, they were not noted in Ontario until the 1870s (Falk 2007). Of 16 nests reported in Ontario by Peck and James (1987), 25% were parasitized by Brown-headed Cowbirds. Eckerle and Thompson (2001) reported five to 91% cowbird parasitism rates in various parts of the

Yellow-breasted Chat's range, and also noted that host eggs disappear in parasitized nests, suggesting that cowbirds sometime remove host eggs. However, some studies have suggested that Yellow-breasted Chat nestlings can successfully compete with young cowbirds and survive to fledge (Eckerle and Thompson 2001). Thus, the full effect of nest parasitism as a threat on reproductive success of the Yellow-breasted Chat in Ontario is uncertain.

In addition to the effects of nest parasitism, elevated populations of predators can significantly impact nest success. Although there is little information on adult or juvenile depredation, the Yellow-breasted Chat *virens* subspecies is known to have a variety of nest predators. These predators include: Eastern Chipmunks (*Tamias striatus*), Blue Jays (*Cyanocitta cristata*), American Crows (*Corvus brachyrhynchos*), and various snake species. Little information exists on nest predation rates in Ontario, but nest predation accounted for approximately 94% of all nest failures in an Indiana study (Thompson and Nolan 1973).

The predator community in eastern North America in habitat occupied by the Yellow-breasted Chat *virens* subspecies prior to human settlement was likely quite different than the community that occurs in human-altered landscapes. Prior to settlement, many of the early successional shrubland habitats were limited to natural forest openings. Breeding habitat used in these natural openings likely supported a much less diverse array of predators than can be seen today. In addition to the species listed above, other predators that appear to have increased along with human activities include mammals such as Coyotes (*Canis latrans*), Raccoons (*Procyon lotor*), and Virginia Opossums (*Didelphis virginiana*). The Yellow-breasted Chat *virens* subspecies' nesting behavior does not appear to have adapted to this increase in predator diversity (Ricketts and Ritchison 2000; COSEWIC 2011).

IUCN Threat #11. Climate change & severe weather

11.1 Habitat shifting & alteration

The effects of climate change are likely contributing to northern range expansion for many North American species, allowing them to breed further north than was previously possible. However, a northward expansion is likely to be limited by lack of suitable breeding habitat for the Yellow-breasted Chat. The potential negative impacts of climate change are not yet fully understood, and the effects that climate change may have on the species, or how they would interact with a regional range contraction, are ultimately unknown.

5. Population and Distribution Objectives

The population and distribution objectives for the Yellow-breasted Chat *virens* subspecies in Canada are to:

Short-term (10 years):

- Halt the current decline, and provide enough suitable habitat to support at least eight pairs within the species' core area.

Long-term (beyond 10 years):

- Achieve a stable population trend within the known distribution range in Canada.

The short-term objective serves to prevent the potential extirpation of the Yellow-breasted Chat *virens* subspecies in Canada by halting the decline and providing enough suitable habitat to support the number of pairs recently observed in the species' core area, where individuals continue to persist on an annual basis. However, it is likely that the Canadian population will mirror regional trends; if the regional population continues to decline and does not reverse its population trend, halting the decline in Canada in the short-term may not be achievable.

Achieving the short-term objective in Canada will require immediate anticipatory habitat management within the species' core area to ensure that sufficient suitable habitat[26] is available over the course of the 10-year period and beyond. The habitat target (i.e. enough habitat to support eight pairs) is based on 2008 population estimates in the core area, when three pairs were documented at Point Pelee National Park and five to six pairs were documented on Pelee Island (COSEWIC 2011, Walker 2012). These short-term habitat targets should be treated as minimums; maintaining enough habitat and patches to support more than eight pairs in the core area should be targeted where feasible, recognizing that individual patch occupancy may be inconsistent from year to year owing to potential annual variation in habitat suitability and immigration rates.

Sufficient suitable habitat may already be available now and in the near future to support eight pairs in the species' core area, and some habitat management is already underway. In the *Multi-species Action Plan for Point Pelee National Park of Canada and Niagara National Historic Sites of Canada*, Parks Canada Agency (2016) has already proposed managing a minimum of four hectares of habitat for Yellow-breasted Chat at Point Pelee National Park. On Pelee Island, the Township of Pelee is currently working with private landowners and partner agencies to create new and expand existing nature reserves on the island and integrate other conservation initiatives.

[26] While Shake et al. (2012) found that the minimum patch size to support Yellow-breasted Chat in North Carolina was 2.3 ha, the actual amount of habitat required at each location will depend on patch configuration. As occupancy probability increases with patch size (Shake et. al 2012) and this species appears to be semi-colonial (Eckerle and Thompson 2001), it is likely that maintaining larger patches capable of supporting multiple pairs would be more effective than maintaining multiple individual 2.3 ha patches. While individual pairs could potentially be supported by discrete patches of 2.3 ha each, maintaining suitable habitat in patches of 4.4 ha or more is recommended as a target unless it is demonstrated that Yellow-breasted Chat will reliably occupy smaller areas in Ontario (Lehnen and Rodewald 2009a; Shake et al. 2012). Thompson and Nolan (1973) found an average territory size of 1.2 ha; habitat patches should be configured to maximize the potential number of territories within each patch.

A long-term objective is identified to maintain a stable population trend in Canada. Recognizing that the ongoing persistence of the Yellow-breasted Chat *virens* subspecies in Canada likely relies on the condition of the regional population, maintaining a stable population trend in Canada in the long term may not be feasible if the regional population continues to decline.

It is not known at this time whether a specific population size and distribution are necessary to maintain a stable population trend in Canada. It is possible that a stable population in Canada could mirror the historical condition, with a relatively small population size and limited distribution. In the long-term, if regional population trends are reversed and stabilized, it may even be possible, in the long term, to increase the Canadian population size to that of recent estimates (e.g. 18 to 38 pairs [Cadman and Page 1994]). A revised quantitative long-term objective may be included in an updated recovery strategy or one or more action plans that include the species. Any future quantitative long-term objectives should be developed with any regional (e.g. Bird Conservation Region 13) and continental targets, as well as any range-wide population declines and distribution shifts, in mind to ensure the persistence of the Yellow-breasted Chat *virens* in Canada.

To achieve a stable population trend, suitable habitat management and mitigation of threats, where biologically and technically feasible, will be required. Any conservation efforts outside the core areas should focus on areas near recent breeding occurrences, especially near Point Pelee and Pelee Island, to increase the probability of occupancy and contribution to the national population. The size of the Canadian population and suitable habitat availability should be periodically evaluated to determine if enough suitable habitat is available to support a stable or increasing population trend.

6. Broad Strategies and General Approaches to Meet Objectives

6.1 Actions Already Completed or Currently Underway

There are many species and habitats at risk in the Carolinian Region[27] of southwestern Ontario, and several recovery planning documents for these species and areas have either been completed or are currently in development, as well as a number of stewardship, management and monitoring activities. The following plans, and other activities, are particularly pertinent to habitat management for the Yellow-breasted Chat *virens* subspecies.

[27] A life zone in eastern North America primarily dominated by deciduous or broad-leaf trees.

Habitat/Site management

- The Official Plan for the Township of Pelee includes considerations for protecting and enhancing the natural environment of the island. Currently, 18% of Pelee Island has been identified for conservation purposes. The Township of Pelee is currently working with private landowners and partner agencies to create new and expand existing nature reserves on the island and integrate other conservation initiatives. An environmental advisory committee for Pelee Island comprised of municipal, provincial and non-government representatives cooperates on issues of environmental importance.
- The *Multi-species Action Plan for Point Pelee National Park of Canada and Niagara National Historic Sites of Canada* (Parks Canada Agency 2016) includes measures aimed at conservation of the Yellow-breasted Chat *virens* subspecies at Point Pelee National Park.
- The *Integrated Vegetation Management Plan for Point Pelee National Park* includes an objective to improve habitat for species at risk, including the Yellow-breasted Chat (Parks Canada Agency 2012b). Parks Canada has initiated the Yellow-breasted Chat (*Icteria virens virens*) Habitat Restoration Project to increase the availability of suitable habitat within the Point Pelee National Park (Parks Canada Agency 2017).
- Ontario Natural Heritage Information Centre staff conducted point counts with call playback in suitable habitat throughout Pelee Island in 2016 and at other sites in southwestern Ontario in 2017.
- The *Lake Erie Sand Spit Savannah Restoration Strategy* includes provisions to ensure that thicket habitats required by Yellow-breasted Chat are retained when savannah habitats are altered by prescribed fires (Parks Canada Agency 2012c).
- The *Fire Management Plan for Point Pelee National Park* assists species at risk that depend on disturbance-dependent ecosystems as well as those species that find post-burn conditions more appropriate for nesting, e.g. the Yellow-breasted Chat (Parks Canada Agency 2012d).
- Management of the Ojibway Prairie Nature Reserve by the City of Windsor Parks and Recreation Department and the Ontario Ministry of Natural Resources and Forestry includes activities that promote early successional habitats (Environment Canada 2011).
- Recovery actions described in the *Draft Walpole Island Ecosystem Recovery Strategy* (Bowles 2005) included raising awareness in the community about species at risk, including the Yellow-breasted Chat. Promotional materials have been used to raise awareness of species at risk in the Walpole Island First Nation community. The Walpole Island Heritage Centre has leased lands (5 year tenures) for conservation purposes to reduce the rate of conversion of tallgrass prairie and savannah habitat to agriculture. Over 120 hectares of tallgrass prairie, oak savanna and forest have been protected since 2001 through leasing agreements and acquisitions. The Walpole Island Land Trust was established in 2008 to conserve land on Walpole Island First Nation. Multiple species at risk stewardship projects have or will be completed, including the preparation of habitat management and threats mitigation plans, species and habitat surveys, and invasive plant removal/control.

- The *Western Lake Erie Islands Natural Area Conservation Action Plan* (CAP) was completed in 2007 by the Nature Conservancy of Canada (NCC). The Yellow-breasted Chat is expected to benefit directly from activities this plan promotes, such as increasing natural cover, and enhancing/restoring early successional habitats such as shrublands (Nature Conservancy of Canada 2007).
- The *Essex Forests and Wetlands Conservation Action Plan* which includes all of Point Pelee region including the national park, was completed in 2009 by Carolinian Canada Coalition (Ferguson et al. 2009). CAPs for the Hamilton and Short Hills - Fonthill areas were completed in 2010. These benefit Yellow-breasted Chat through implementation of management approaches which are compatible with its needs (Jalava et al. 2010).
- On Pelee Island, the NCC Brown's Road site, also known as the Florian Diamante Nature Reserve, and Richard and Beryl Ivey properties have been restored through the removal of invasive species and planting of native grasses and shrubs, which is expected to benefit the Yellow-breasted Chat *virens* subspecies. At least 19 ha of former agricultural land has been restored (M. McFarlane pers. comm. 2013).

Population Monitoring/Habitat Monitoring

- Parks Canada and Bird Studies Canada established a series of Forest Bird Monitoring Program stations at Point Pelee National Park and surveyed them from 1995-2008, with the exception of 2004. These same forest bird monitoring stations, along with additional stations in savannah habitats, were monitored during the breeding season using both personal observer and acoustic techniques from 2009-2013 (Baldo 2009; Celis-Murillo and Deppe 2011).
- Since 2006, Pelee Island Bird Observatory and NCC have conducted annual surveys of Yellow-breasted Chats and their habitat in southwestern Ontario, with a focus on Pelee Island. Pelee Island Bird Observatory is surveying select sites on Pelee Island in 2018 to document Yellow-breasted Chat occurrences and habitat use (P. Kramer pers. comm. 2017).
- In 2009, with funding assistance from Canada's Aboriginal Fund for Species at Risk program, breeding bird and vegetation surveys were conducted by Six Nations of the Grand River in order to identify potential habitat for several species at risk, including Yellow-breasted Chat.
- The Canadian Wildlife Service led surveys in June 2010 for the Yellow-breasted Chats at 13 sites within southwestern Ontario that had been reported as occupied between 2001 and 2009.
- The University of Waterloo, in collaboration with Parks Canada, conducted avian surveys at Point Pelee National Park in 2010, specifically targeting Yellow-breasted Chat as a species of interest. Parks Canada and the Pelee Island Bird Observatory erected passerine mist-nets to target Yellow-breasted Chat at the Anders Field Complex of Point Pelee National Park in 2010.
- Habitat suitability modeling was completed for Yellow-breasted Chat in Point Pelee National Park in 2010 (Parks Canada 2012a).

6.2 Strategic Direction for Recovery

Table 3. Recovery Planning Table

Threat or Limitation	Broad Strategy to Recovery	Priority[a]	General Description of Research and Management Approaches
Residential & commercial development, agriculture & aquaculture, Annual & perennial non-timber crops, Other ecosystem modifications	Habitat/site management	High	• Develop, as needed, and promote implementation of ecosystem-scale management practices for management of shrubland communities that balance the needs of Yellow-breasted Chat and other rare and at-risk species.
		High	• Manage habitat within the subspecies' core area to ensure that enough (i.e. to support a minimum of 8 pairs) suitable habitat is available at Point Pelee National Park and Pelee Island in any given breeding season. This may require staggered habitat management at a site or landscape scale to ensure a continuous supply of habitat from year to year.
		High	• Consider the use of call playback to attract prospecting Yellow-breasted Chats to suitable habitat at managed sites.
		High	• Identify priority areas near recent breeding occurrences and encourage landowners to manage/maintain habitat for this subspecies. High priority locations may include Bird Conservation Region 13 sites in and near Point Pelee National Park, Pelee Island, Rondeau Provincial Park, and Ojibway Prairie Provincial Nature Reserve.
		High	• Investigate opportunities to secure and/or steward occupied, suitable and restorable habitat through mechanisms such as land acquisition by conservation organizations and stewardship agreements.
Knowledge gaps	Population Monitoring/Habitat Monitoring	High	• Conduct comprehensive surveys (e.g., targeted call-broadcast surveys and vegetation assessments) at locations where the Yellow-breasted Chat is observed during the breeding season to determine where it is currently breeding; monitor these sites to determine productivity, threats, and population trends.

		High	• Monitor habitat and identify threats at occupied sites both within and outside the core area.
		High	• Maintain a database containing the locations and characteristics of breeding sites so that research activities and habitat management can be focused accordingly.
		Medium	• Encourage volunteer birdwatchers and conservation organizations to report Yellow-breasted Chat observations during the breeding season to government agencies (e.g. Ontario's Natural Heritage Information Centre).
		Medium	• Work with regional partners to compile and share data on the historical and current condition in neighbouring states to better understand the range contraction and historical variation in distribution and abundance. Use this information to refine population and distribution objectives and critical habitat, as needed.
Residential & commercial development, agriculture & aquaculture, Annual & perennial non-timber crops, Other ecosystem modifications	Outreach and Communication for Stewardship	High	• Cooperate with governments, municipalities, conservation organizations and landowners in order to promote multi-species habitat management approaches that are compatible with the needs of the Yellow-breasted Chat, other species at risk and rare habitats.
		Medium	• Collaborate with the United States and Central and South American counterparts to describe wintering habitat characteristics; Investigate mechanisms to conserve important wintering and migration habitat.
Residential & commercial development, agriculture & aquaculture, Annual & perennial non-timber crops, Other ecosystem modifications, Invasive non-native/alien species, Problematic native species,	Research	High	• Determine characteristics of suitable breeding season habitat (vegetation and spatial requirements) in Ontario and adjacent locations in collaboration with regional partners.
		High	• Conduct analyses to quantify the extinction risk, refine the population and distribution objectives, and determine the amount of suitable habitat required to achieve the population and distribution objectives.
		Medium	• Evaluate the effects of various habitat management techniques on the abundance, productivity and site fidelity of Yellow-breasted Chat and other shrub/early successional landbirds.

Knowledge gaps		High	• Assess the amount and location of suitable habitat available to Yellow-breasted Chats in Canada, especially near the core area.
		Low	• Assess the effects of invasive species on the productivity of the Yellow-breasted Chat *virens* subspecies within the Canadian range. If determined to be a limiting factor to species' productivity, identify mitigating strategies.
		Low	• Assess the effects of Brown-headed Cowbird parasitism on the productivity of the Yellow-breasted Chat *virens* subspecies within the Canadian range. If determined to be a limiting factor to species' productivity, identify mitigating strategies.
		Low	• Assess the effects of nest predation on the population of the *virens* within the Canadian range. If determined to limit the subspecies' productivity, develop strategies to mitigate this threat.

[a] "Priority" reflects the degree to which the broad strategy contributes directly to the recovery of the species or is an essential precursor to an approach that contributes to the recovery of the species.

7. Critical Habitat

7.1 Identification of the Species' Critical Habitat

Section 41(1)(c) of SARA requires that recovery strategies include an identification of the species' critical habitat, to the extent possible, as well as activities that are likely to result in its destruction. Under section 2(1) of SARA, 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".

Critical habitat is currently identified for the Yellow-breasted Chat *virens* subspecies' core area in Canada (i.e. Point Pelee National Park and Pelee Island), where availability of suitable habitat will be necessary to achieve both the short- and long-term objectives. It is not known at this time if occupancy at locations outside the core area will be necessary to achieve a stable population trend in Canada. If occupancy at locations outside of the core area or at additional locations within the core area is determined to be necessary, then critical habitat may be identified at those locations in an amendment to this recovery strategy. In the meantime, management of habitat to meet the needs of the Yellow-breasted Chat is encouraged at or near locations demonstrating recent occupancy.

Critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada is identified as the extent of biophysical attributes (see Section 7.1.2) wherever they occur within the areas containing critical habitat described in Section 7.1.1 (Table 4; Figure 3 and 4). The critical habitat identified is considered a partial identification of critical habitat as it may be insufficient to meet the Canadian population and distribution objectives for the Yellow-breasted Chat *virens* subspecies. A schedule of studies (section 7.2) has been developed to provide the information necessary to complete the identification of critical habitat that will be sufficient to meet these objectives.

For more information on critical habitat identification, contact Environment and Climate Change Canada – Canadian Wildlife Service at ec.planificationduretablissement-recoveryplanning.ec@canada.ca.

7.1.1 Areas Containing Critical Habitat

In Canada, the presence and persistence of the Yellow-breasted Chat *virens* subspecies depends on an area greater than that occupied by individuals of the species. It requires ecological or landscape features that promote and maintain the

biophysical attributes[28] used by the bird and allow for natural processes related to population dynamics and reproduction to occur.

The areas containing critical habitat are determined as follows:

(1) Locations within the species' core area with demonstrated multi-year occupancy, i.e. observations during breeding season (10 May – 20 July[29]) in each of two separate years since 2007[30] and that are found within 500 m of each other;

(2) Contiguous habitat[31] patches that are:
   a. within 500 m of an observation identified in (1), AND
   b. intersect an observation identified in (1).

Areas containing critical habitat are limited to a 500 m distance from the observations identified in (1). Within these areas, critical habitat is located only where the biophysical attributes (Section 7.1.2) are found. Portions of these areas that do not possess the biophysical attributes of suitable habitat (e.g., mowed lawns, agricultural cropland) are not identified as critical habitat.

The Yellow-breasted Chat *virens* subspecies is secretive and is often difficult to confirm (typically undetected in traditional surveys) due to its skulking habits and its tendency to nest in dense thickets and tangles which are often impenetrable by human surveyors (Eckerle and Thompson 2001; Cadman and Page 1994). For this reason, all observations within the breeding season, and not just confirmed breeding observations, are used to assess location occupancy as described in (1).

The Yellow-breasted Chat *virens* subspecies appears to have limited site fidelity to breeding sites (e.g., individuals do not necessarily show fidelity to specific habitat patches) however, there have been documented returns to a general area. Some studies (e.g., Thompson and Nolan 1973) have found that due to reduced site fidelity, this species is remarkably mobile suggesting that they are good at finding appropriate

[28] Suitable biophysical attributes are those habitat features (Section 7.1.2) that provide individuals of the species the necessary conditions (e.g. soil and moisture, light penetration, species composition and species interactions) to carry out essential life processes.
[29] Based on the nesting period (identified as the period from when 10% of first eggs have been laid until the date when 90% of nests have been left by fledglings) predicted for Yellow-breasted Chat in Bird Conservation Region 13 using the Nesting Calendar Query Tool (http://www.birdscanada.org/volunteer/pnw/rnest/; Rousseu and Drolet 2017). The predicted nesting period is 27 May to 20 July. To account for pre-nesting activities (pair formation, nest building, etc.), 17 days were added at the beginning of this period (Thompson and Nolan 1973), yielding a breeding season estimate of 10 May to 20 July.
[30] A ten-year period (i.e. 2007 to 2016) was used to determine occupancy. Records older than this may not reflect recent occupancy, as Yellow-breasted Chats use early-successional habitat that, in most situations, is ephemeral in nature. In neighbouring Ohio, patches used by Yellow-breasted Chat are "often suitable for fewer than 10 years" (Rodewald et al. 2016).
[31] Patches of habitat assessed at a community class (Lee et al. 1998) scale (including thicket, woodland, meadow, savannah and swamp thicket) and determined based on best available imagery (2015). These community classes were chosen to exclude habitats less likely to contain the biophysical attributes used by the Yellow-breasted Chat *virens* subspecies (Section 7.1.2).

habitat and are constantly moving around to find suitable habitats. During the breeding season, the average movement among patches has been reported as 500 m (Lehnen and Rodewald 2009b).

7.1.2 Biophysical Attributes of Critical Habitat

Critical habitat is found where the following biophysical attributes occur in patches of at least 1.2 ha[32] in size within the areas containing critical habitat (Section 7.1.1., Figures 3 and 4). Patches are made up of one or more of the biophysical attributes described below, which together form a minimum of 1.2 ha of contiguous habitat:

- Early successional habitats containing dense thicket and shrubs where woody plants are less than 4.5m tall and has more than 25% shrub cover in dry or wet grounds. In Ontario, typical shrub cover includes, but is not limited to, raspberry (*Rubus* sp.), grapevine (*Vitis* sp.), dogwood (*Cornus* sp.), hawthorn (*Crataegus* sp.), juniper (*Juniperus* sp.), and Fragrant Sumac (*Rhus aromatica*); AND/OR
- Treed areas (deciduous, coniferous or mixed) where the canopy cover has less than 30% tree coverage; AND/OR
- Patches of tallgrass prairie, savannah and woodland dominated by prairie graminoids; goldenrod species (*Solidago sp.)*, and little bluestem (*Schizachyrium scoparium*) where there is less than 30% tree coverage and approximately 20% herbaceous ground vegetation.

Within the areas containing critical habitat, the biophysical attributes used by the Yellow-breasted Chat *virens* subspecies are dynamic and the location of critical location may change annually due to natural and human disturbance mechanisms that create and maintain it.

[32] While a minimum patch size of 2.3 hectares has been reported for Yellow-breasted Chat in North Carolina (Shake et al. 2012) a precautionary approach is employed here and 1.2 ha is identified as a minimum patch size based on the average territory size reported by Thompson and Nolan (1973).

Table 4. Grid squares that contain the area containing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada. Critical habitat for the Yellow-breasted Chat *virens* subspecies occurs within these 1 x 1 km standardized UTM grid squares[a] only where the criteria described in Section 7.1 are met.

Location	Province/ Territory	UTM Grid Square Coordinates[a]		Land tenure[b]
		Easting	Northing	
1. Point Pelee National Park	Ontario	373000	4644000	Federal Protected Area (Point Pelee National Park)
	Ontario	373000	4645000	
	Ontario	373000	4646000	
	Ontario	374000	4642000	
	Ontario	374000	4643000	
	Ontario	374000	4644000	
	Ontario	374000	4645000	
	Ontario	375000	4642000	
	Ontario	375000	4643000	
2. Pelee Island (North)	Ontario	363000	4628000	Non-federal Land
	Ontario	363000	4629000	
	Ontario	364000	4628000	
	Ontario	364000	4629000	
3. Pelee Island (South)	Ontario	363000	4623000	Non-federal Land
	Ontario	363000	4624000	
	Ontario	363000	4625000	
	Ontario	364000	4623000	
	Ontario	364000	4624000	
	Ontario	364000	4625000	

[a] The listed coordinates are a cartographic representation of where the critical habitat can be found, presented as the southwest corner of the 1 x 1 km standardized UTM grid square containing all or a portion of the critical habitat unit. The coordinates may not fall within critical habitat and are provided as a general location only.

[b] Land tenure is provided as an approximation of the types of land ownership that exist in the area within which critical habitat is found and should be used for guidance purposes only. Accurate land tenure will require cross referencing critical habitat boundaries with surveyed land parcel information.

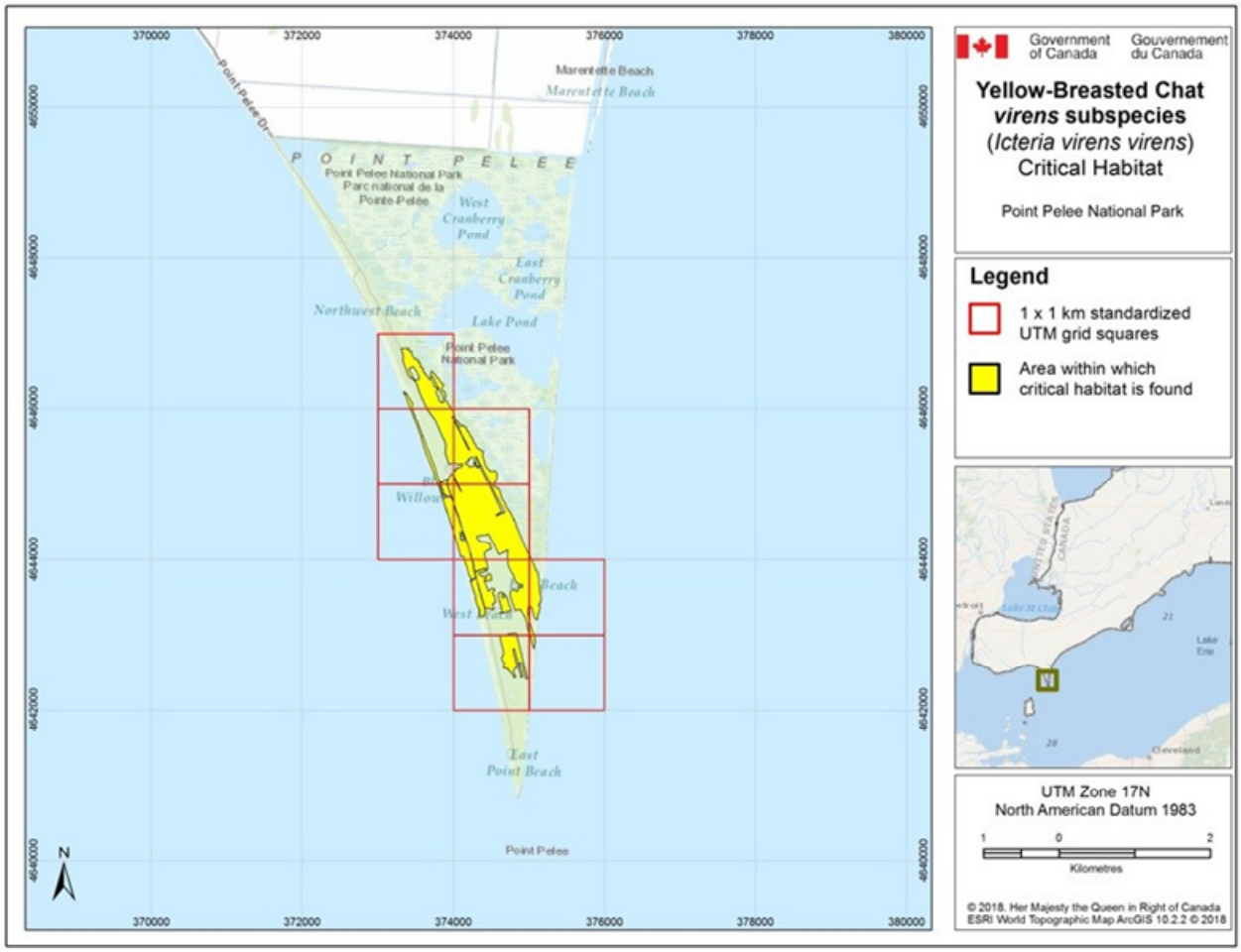

Figure 3. The area containing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada – Point Pelee. The area containing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada, as described in section 7.1, is represented by the yellow shaded unit. **Within this area, critical habitat only occurs where the biophysical attributes described in section 7.1.2 are found.** The 1 km × 1 km UTM grid overlay (red outline) shown on this figure is a standardized national grid system used to indicate the general geographic area within which critical habitat is found.

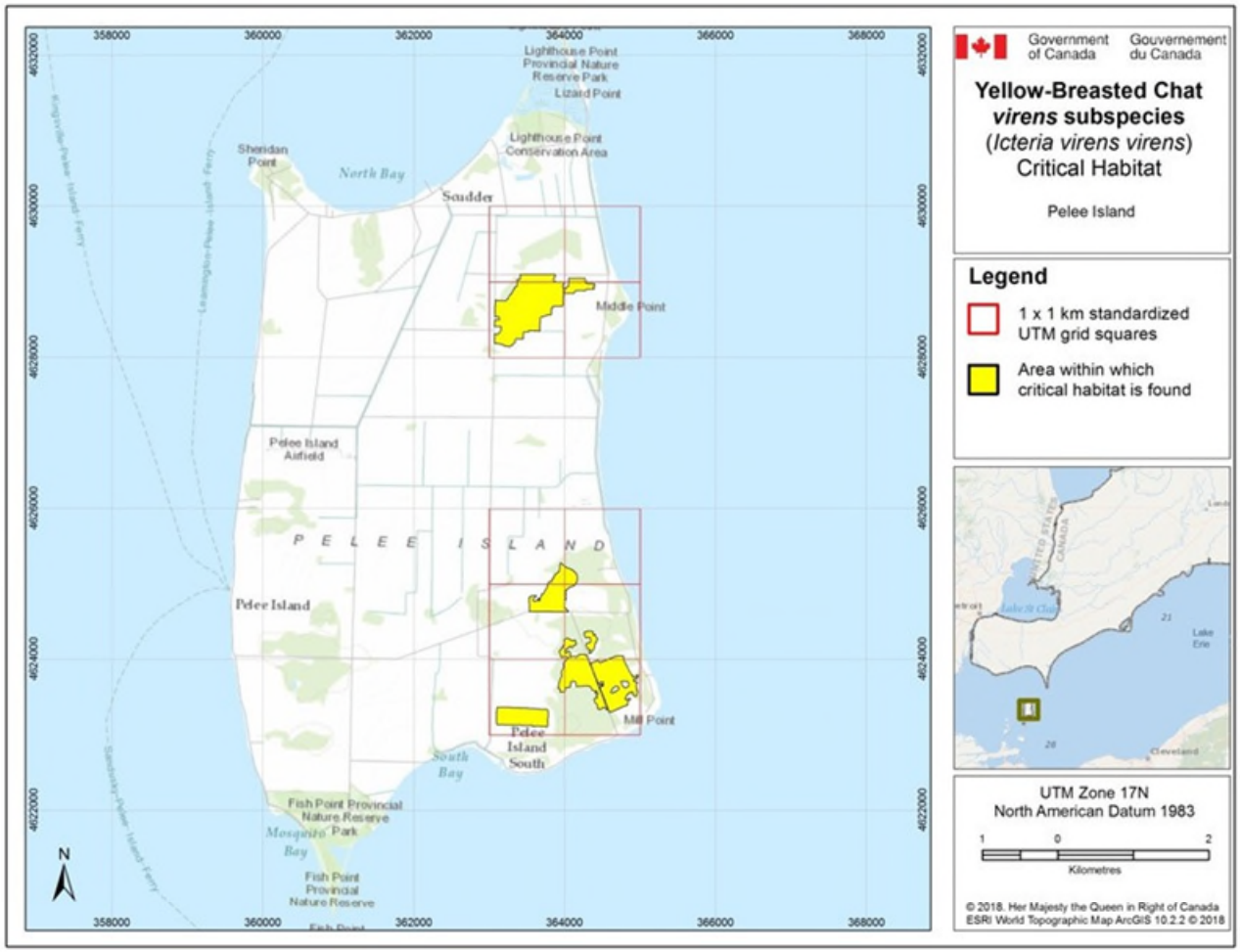

Figure 4. The area containing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada – Pelee Island. The area containing critical habitat for the Yellow-breasted Chat *virens* subspecies in Canada, as described in section 7.1, is represented by the yellow shaded unit. **Within this area, critical habitat only occurs where the biophysical attributes described in section 7.1.2 are found.** The 1 km × 1 km UTM grid overlay (red outline) shown on this figure is a standardized national grid system used to indicate the general geographic area within which critical habitat is found.

7.2 Schedule of Studies to Identify Critical Habitat

Table 5. Schedule of Studies to Identify Critical Habitat

Description of Activity	Rationale	Timeline
Quantify additional critical habitat needed to ensure sufficient annual availability of suitable habitat to support population and distribution objectives. Use the results from any analyses (see Table 3), if available, to inform this step.	Any deficiencies in suitable habitat availability within the areas containing critical habitat, as they relate to achieving the population and distribution objectives, will be identified. The amount of additional critical habitat needed, either within or outside the core area, to support the population and distribution objectives will be determined.	2019-2029
Use results from the comprehensive surveys (see Table 3) to identify additional sites with consistent breeding-season use or restoration/management potential.	Locations will be determined so that additional critical habitat can be identified as needed to support the population and distribution objectives.	2019-2029

7.3 Activities Likely to Result in the Destruction of Critical Habitat

Understanding what constitutes destruction of critical habitat is necessary for the protection and management of critical habitat. Destruction is determined on a case-by-case basis. Destruction would result if part of the critical habitat was degraded, either permanently or temporarily, such that it would not serve its function when needed by the subspecies. Destruction may result from a single activity or multiple activities at one point in time or from the cumulative effects of one or more activities over time. It should be noted that not all activities that occur in or near critical habitat are likely to cause its destruction. Activities described in Table 6 are examples of those likely to cause destruction of critical habitat for the species; however, destructive activities are not necessarily limited to those listed.

It should also be noted that much of Canadian population of the Yellow-breasted Chat *virens* subspecies is found in a highly human-modified ecosystem. Therefore, the species would benefit from some types of human-made or human-influenced disturbance (e.g., some management activities occurring in habitats that impede/slow down succession). In some cases, disturbed ground may become suitable habitat if left idle for five years or more, but this would need to be assessed on a case-by-case basis.

As this species requires dense thicket and shrubs for nesting, critical habitat is likely to be destroyed by any activity that results in the removal of these components.

Activities that are likely to result in the destruction of critical habitat for the Yellow-breasted Chat *virens* subspecies include, but are not limited to:

Table 6. Activities Likely to Result in the Destruction of Critical Habitat

Description of Activity	Description of effect	Details of effect
Permanent Habitat Loss or Conversion		
Conversion of land for residential, commercial, or agricultural development that results in permanent removal of critical habitat	Results in the direct loss of critical habitat, or the conversion of habitat to other land uses. Results in the destruction of critical habitat by reducing or eliminating habitat features required to fulfill the life cycle of the Yellow-breasted Chat *virens* subspecies (i.e., dense, low thicket and shrub vegetation interspersed with patches of herbaceous vegetation). Additionally, some of these activities can result in modifications to the landscape that favour Brown-headed Cowbirds and predators that favour human-altered landscapes such as Raccoons and Virginia Opossums, and could potentially increase levels of brood parasitism and nest predation rates.	Development and conversion of land for residential development or agricultural development is a widespread threat that is of medium concern. It must occur within the bounds of critical habitat to cause destruction. Effects are both direct and cumulative; any single activity can remove critical habitat, with multiple events leading to an increased effect. Development and/or conversion of habitat can occur at any time of the year with resulting long-term impacts. Since the Yellow-breasted Chat is a migratory bird, development or conversion of critical habitat during the breeding season would be particularly harmful. The information available at this time is insufficient to develop a threshold for this activity.
Habitat Degradation		
Maintenance and habitat management activities that result in the removal or damage of suitable vegetation, especially dense thicket and shrub vegetation, within critical habitat.	Vegetation removal or damage, including brush cutting, excavation, or burning, could result in the loss of critical habitat by reducing or eliminating habitat features required to fulfill the life cycle of the Yellow-breasted Chat (especially dense, low thicket and shrub vegetation interspersed with patches of herbaceous vegetation). However, these activities could be used to help maintain the amount of available suitable habitat (e.g. removal of trees to open the canopy or promote early-successional conditions).	Maintenance and habitat management activities that remove or damage suitable vegetation could result in the destruction of critical habitat if not managed in a way that considers the needs of the Yellow-breasted Chat (i.e., in terms of timing and extent). Effects are both direct and cumulative. Vegetation removal could occur at any time of the year, but, since the Yellow-breasted Chat is a migratory bird, activities occurring just prior to, or during the breeding season would be particularly harmful. The information available at this time is insufficient to develop a threshold for this activity. However, maintenance and habitat management activities could be used to create biophysical characteristics that are beneficial for the Yellow-breasted Chat *virens* subspecies. For example, clearing of treed areas that results in succession to shrubland could eventually provide suitable shrub thicket habitat for the Yellow-breasted Chat *virens* subspecies. Vegetation removal activities to maintain the supply of suitable habitat should only take place on habitat that

		is approaching the point of being non-suitable, and should be approached at a landscape scale while considering the timeline of availability of adjacent/nearby habitat to ensure that sufficient suitable habitat will be available in a given year. The anticipated net effect of maintenance and habitat management activities should be evaluated on a case-by-case basis. Habitat management activities should be developed using a holistic ecosystem-based approach to ensure that the needs of other species at risk are addressed.

8. Measuring Progress

The performance indicators presented below provide a way to define and measure progress toward achieving the population and distribution objectives.

- Enough habitat to support a minimum of eight pairs has been maintained in the Yellow-breasted Chat *virens* subspecies' core area.
- In the long term, a stable population trend has been maintained in Canada.

9. Statement on Action Plans

One or more action plans for the Yellow-breasted Chat *virens* subspecies will be posted by 2024 on the Species at Risk Public Registry. Parks Canada multi-species action plans identify recovery measures specific to national parks and other national heritage places where species occur (for a list of current multi-species action plans including the Yellow-breasted Chat *virens* subspecies, refer to the documents section of the SAR Public Registry).

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Appendix A. Historical Context for Yellow-breasted Chat *virens* subspecies

The first step in determining the recovery feasibility of Yellow-breasted Chat *virens* subspecies is to establish the historical context (whether the species' existence in Canada was historically precarious[33] or not precarious). To make this determination, Environment and Climate Change Canada uses the four criteria outlined below.
A species is considered to have been historically precarious if any of the following are known or likely to have been true in Canada, prior to significant effects from human activity:

1. The species was undergoing a long-term natural decline;
    - Unknown. It is likely that the distribution and abundance of the Yellow-breasted Chat in Ontario increased with European settlement, but the population trends for this species in Ontario prior to the first recorded sighting in 1879 are unknown.
2. The species consisted of fewer than 1,000 mature individuals;
    - Yes. The highest population estimate on record for this species in Ontario is 50 pairs (Cadman et al. 1987). The first record of Yellow-breasted Chat in Ontario is from Point Pelee in 1879, and outside the core area of Point Pelee and Pelee Island it was historically considered accidental (Taverner and Swales 1908).
3. The species existed at five or fewer locations[34] or less than 20 km^2 index of area of occupancy[35] (IAO);
    - Unknown, but possible. The first record for Yellow-breasted Chat in Ontario is from Point Pelee in 1879, and Taverner and Swales (1908) noted that "Point Pelee is the only locality in Canada where the Yellow-breasted Chat is any more than a rare accidental straggler." Austen et al. (1994) noted that most records since that time have been from "extreme southwestern Ontario, where it has generally occurred in small numbers."

[33] A species that, prior to significant effects from human activity, was below the survival threshold or was dependent on demographic connectivity with outside populations for its long-term presence in Canada according to the best available information on the species population in Canada. Such a species may be recovered by achieving a condition that approximates its historical state.
[34] 'Location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. (www.iucnredlist.org/technical-documents/red-list-training/red-list-guidance-docs).
[35] An estimate of the number of grid squares occupied by extant populations (http://www.cosewic.gc.ca/default.asp?lang=En&n=36C4805C-1).

4. The species was dependent on connectivity with populations outside Canada for its long term presence in Canada.
    - Unknown, but likely. Yellow-breasted Chat *virens* subspecies is at the northern edge of its range in Canada, and its presence and persistence was likely dependent on immigration from neighbouring US states.

Based on these four criteria, Yellow-breasted Chat *virens* subspecies is considered to have been historically precarious in Canada.

Appendix B: Subnational Conservation Ranks of the Yellow-breasted Chat *virens* subspecies *(Icteria virens virens)* in Canada and the United States

Table 7. Subnational conservation ranks (S-ranks) for the Yellow-breasted Chat (*Icteria virens*) in the range in which the Yellow-breasted Chat *virens* subspecies occurs (NatureServe 2017).

	Global (G) Rank	National (N) Rank	Sub-national (S) Rank
Yellow-breasted Chat (*Icteria virens*)	G5 (Secure – common; widespread and abundant)	Canada: N4B (Apparently Secure)	Ontario (S2B)
		United States: N5B (Secure)	Alabama (S5B, S2N) Arkansas (S4B, S4N) Connecticut (S1B) Delaware (S3B) District of Columbia (S3S4N) Florida (SNRB) Georgia (S5) Illinois (S5) Indiana (S4B) Iowa (S3B, S3N) Kansas (S3B) Kentucky (S5B) Louisiana (S5B) Maryland (S5B) Massachusetts (S1B, S1N) Michigan (S3) Minnesota (SNA) Mississippi (S5B) Missouri (SNRB) Nebraska (SNR) New Jersey (S3B, S4N) New York (S3) North Carolina (S5B) Ohio (S5) Oklahoma (S4B) Pennsylvania (S5B) Rhode Island (S1B, S1N) South Carolina (S4B) Tennessee (S4) Texas (S5B) Virginia (S5) West Virginia (S4B) Wisconsin (S2B)

S1: Critically Imperiled; S2: Imperiled; S3: Vulnerable; S4: Apparently Secure; S5: Secure; SNR: Unranked – Status not yet assessed; B: Breeding Population; N: Non-breeding population

Appendix C: 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*[36]. 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 any of the Federal Sustainable Development Strategy's[37] (FSDS) goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also inadvertently lead to environmental effects beyond the intended benefits. The planning process 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 strategy itself, but are also summarized below in this statement.

Vegetation management to create suitable habitat for the Yellow-breasted Chat could benefit other species that are also dependent on early successional shrubland habitats.

Table 8. List of species that are expected to benefit from conservation and management of Yellow-breasted Chat *virens* subspecies habitat in the areas where the species is known to occur.

Common Name	Scientific Name	COSEWIC Status
American Goldfinch	*Spinus tristis*	Not at Risk
Brown Thrasher	*Toxostoma rufum*	Not at Risk
Carolina Wren	*Thryothorus ludovicianus*	Not at Risk
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Not at Risk
Blue Ash	*Fraxinus quadrangulata*	Special Concern
Blue-winged Warbler	*Vermivora pinus*	Not at Risk
Blue Racer	*Coluber constrictor foxii*	Endangered
Chestnut-sided Warbler	*Setophaga pensylvanica*	Not at Risk
Common Hoptree	*Ptelea trifoliata*	Threatened
Common Yellowthroat	*Geothlypis trichas*	Not at Risk
Eastern Foxsnake (Carolinian population)	*Pantherophis gloydi*	Endangered
Eastern Prickly Pear Cactus	*Opuntia humifusa*	Endangered
Eastern Ribbonsnake	*Thamnophis sauritus*	Special Concern
Eastern Towhee	*Pipilo erythrophthalmus*	Not at Risk
Field Sparrow	*Spizella pusilla*	Not at Risk
Gray Catbird	*Dumetella carolinensis*	Not at Risk
Gray Ratsnake (Carolinian population)	*Pantherophis spiloides*	Endangered
Indigo Bunting	*Passerina cyanea*	Not at Risk

[36] www.canada.ca/en/environmental-assessment-agency/programs/strategic-environmental-assessment/cabinet-directive-environmental-assessment-policy-plan-program-proposals.html
[37] www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1

Milksnake	*Lampropeltis triangulum*	Special Concern
Northern Cardinal	*Cardinalis cardinalis*	Not at Risk
Prairie Warbler	*Setophaga discolor*	Not at Risk
Red-winged Blackbird	*Agelaius phoeniceus*	Not at Risk
White-eyed Vireo	*Vireo griseus*	Not at Risk
Wild Hyacinth	*Camassia scilloides*	Threatened
Wild Turkey	*Meleagris gallopavo*	Not at Risk
Willow Flycatcher	*Empidonax trailli*	Not at Risk
Yellow-billed Cuckoo	*Coccyzus americanus*	Not at Risk
Yellow Warbler	*Setophaga petechia*	Not at Risk

While implementation of this recovery strategy is expected to benefit the environment and native species that favour early successional shrubland habitats such as the Yellow-breasted Chat, potentially adverse effects were also considered. These adverse effects relate to species whose specific requirements may differ from those of the Yellow-breasted Chat. For example, habitat management approaches that favour the Yellow-breasted Chat in Ontario may not favour species that require continuous mature forest such as the Cerulean Warbler (*Setophaga cerulea*) nor species requiring open grassland habitats such as the Bobolink (*Dolichonyx oryzivorus*). Even species that use early successional shrubland habitat may have specific requirements that conflict with the specific needs of the Yellow-breasted Chat *virens* subspecies. In the species' core area in Ontario, there are numerous rare and at-risk species at risk with potentially conflicting requirements, including dozens of native alvar species found on Pelee Island.

Consequently, it is important that habitat management activities for the Yellow-breasted Chat *virens* subspecies be considered from an ecosystem perspective (with input from responsible jurisdictions, stakeholders, Indigenous peoples, and landowners) through the development of multi-species plans, ecosystem-based recovery programs, or area management plans that take into account the needs of multiple species, including other species at risk. Many of the stewardship and habitat improvement activities to benefit the Yellow-breasted Chat *virens* subspecies will be implemented through ecosystem-based conservation programs that have already taken into account the needs of other species at risk.