SWCR Operations Plan 2019-2028

DRAFT – 11 September 2018

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1.0 Introduction

1.1 Background

St. Williams Conservation Reserve (SWCR) is located in Norfolk County in the former geographic townships of South Walsingham and Charlotteville. It is comprised of 1033.95 hectares (ha) of Crown land in two geographically separate parts. The site was officially regulated as a conservation reserve on June 4, 2008 under Ontario Regulation 199/08 under the *Provincial Parks and Conservation Reserves Act, 2006.*

The SWCR is one of the largest blocks of forest in the Carolinian Life Zone (Ecoregion 7E) of extreme southern Ontario and is recognized regionally, provincially, and nationally for its exceptional biological diversity and natural heritage values. The combined diversity of oak savanna, oak woodlands, Carolinian forests, and wetland habitats support one of the highest concentrations of species at risk in Ontario and Canada.

The ecological integrity of the conservation reserve ("the CR") is bolstered by its proximity to other protected natural areas including Turkey Point Provincial Park, the Nature Conservancy of Canada's Backus Woods Block, and many smaller tracts of public conservation lands owned by the Province of Ontario, Norfolk County, and the Long Point Region Conservation Authority (See MAP 1, local context).

The lands included in the CR were formerly part of the St. Williams Provincial Forest Station and were known as the St. Williams Crown Lands. The two tracts were known as the Nursery Tract and the Turkey Point Tract. In 2011, the local heritage association proposed that the two tracts be designated as the Dr. Edmund J. Zavitz Forest and the Dr. J. H White Forest, in recognition of the two foresters who were instrumental in establishing the provincial forestry station and the early forest research plantings, respectively. In keeping with these heritage designations, in this document the tracts are referred to as the Zavitz Nursery Tract (ZNT) and the White Turkey Point Tract (WTPT).

The CR is managed by the Ministry of Natural Resources and Forestry (MNRF) under provincial policy governing conservation reserves and the policy direction of the *St. Williams Conservation Reserve Management Plan*[1] (Management Plan). MNRF Aylmer District directs the management of the SWCR through the SWCR District Technical Advisory Committee (DTAC) comprised of district staff.

The St. Williams Conservation Reserve Community Council (SWCR CC) works with the MNRF to provide community input and advice to DTAC, and also assumes a key role in the implementation of the SWCR Operations Plan. Initially established by MNRF in 2007, the SWCRCC incorporated as an independent non-profit organization in 2012. Details as to specific project and activities to be undertaken at SWCR are outlined in

[1] Ontario Ministry of Natural Resources, *St. Williams Conservation Reserve Management Plan* (Aylmer District, Ontario Ministry of Natural Resources, 2005).

multi-year work schedules and annual work plans developed by SWCRCC with input from DTAC.

All management operations in the SWCR, including natural heritage protection and restoration activities, shall comply with the *Provincial Parks and Conservation Reserves Act 2005* (PPCRA), *Endangered Species Act 2007* (ESA), *Environmental Assessment Act* (EA), *Environmental Bill of Rights* (EBR), *Fish and Wildlife Conservation Act* (FWCA), and other pertinent legislation.

1.2 History of Management Planning at SWCR

The SWCR Management Plan was approved in January 2007. The management plan provides policy direction for a 50-year period (2005 – 2055).

The SWCR Management Plan built on several earlier documents and planning processes including the forestry station resource management plan[2], the recommendations of the St. Williams Steering Committee formed in 1999 following the closure of the forestry station[3], a life science inventory of the St. Williams Crown Land completed in 2002[4], and the long-term management recommendations of the St. Williams Crown Lands Technical Advisory Group[5].

In the management plan, Ontario's goal for SWCR was adopted from the TAG report: *that these tracts will be a flourishing example of extraordinary biological diversity representing their pre-European settlement natural legacy of ecological communities while protecting their unique cultural heritage and providing opportunities for compatible land uses.* The SWCR Management Plan lists five key objectives for the management of the site toward that vision: *Natural Heritage Protection and Restoration, Cultural Heritage Protection, Recreation, Educational Awareness,* and *Research*. Detailed information on SWCR management objectives and policies can be found in the SWCR Management Plan.

Following completion of the management plan, a 10-year operations plan was prepared. The first SWCR Operations Plan (OP1)[6] identified management activities to support the objectives and policies set out in the management plan over the 2009-2018 period. Management priorities in the 2009-2018 plan were identified by the SWCR DTAC. SWCRCC reviewed and commented on various drafts of the proposed Operations Plan.

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[2]Ontario Ministry of Natural Resources. 1990. *St. Williams Forest Station Resource Management Plan*.
[3] St. Williams Steering Committee. 2001. *A recommendation to the Ministry of Natural Resources: Alternative Delivery Model for the St. Williams Crown Forest.* Unpublished report for MNR.
[4] Draper, W.B., M.E. Gartshore and J.M. Bowles. 2002. *Life Science Inventory and Evaluation of St. Williams Crown Forest*. Unpublished report by Bird Studies Canada, World Wildlife Fund and Tallgrass Ontario for Ontario Parks and the Ontario Ministry of Natural Resources.
[5] St. Williams Crown Lands Technical Advisory Group. 2003. *Recommendations for the Long-term Management of the St. Williams Crown Lands.* Unpublished report for MNR.
[6] Ontario Ministry of Natural Resources. 2009. *St. Williams Conservation Reserve 10-year Operations Plan, 2009-2018.*

The final version of SWCR OP1 was posted on the Environmental Registry for information purposes (also on the www.swcr.ca website).

1.3 Development of the Operations Plan, 2019-2028

This is the second 10-year operations plan for SWCR. It was developed jointly by DTAC and SWCRCC, with input from various stakeholders. An ecological consultant familiar with the SWCR led the development of this plan, under the direction of a working group comprised of two MNRF and two SWCRCC representatives.

Stakeholder consultations focusing on recreational users were conducted in winter 2017-2018. A communication consultant prepared and delivered an online survey that had 620 respondents. A total of 22 interviews were conducted with various stakeholders including: representatives of the main active and passive recreational user groups, and the managers of adjoining Crown land and conservation lands. A summary of the recreational user survey was published online. Details of the stakeholder interviews are available from MNRF or SWCRCC.

The draft plan was publicly available for comment (posted on website and/or EBR?) for a xx-day period in the fall of 2018. [DETAILS TO BE COMPLETED IN FINAL PLAN]

2.0 Management Framework

2.1 Ecological Integrity as Primary Consideration

Under the PPRCA (2006), maintaining and restoring the ecological integrity of the SWCR is the primary consideration for management operations.

The PPCRA (2006) defines ecological integrity as: *"A condition in which biotic and abiotic components of ecosystems and the composition and abundance of native species and biological components are characteristic for their natural regions and rates of change and ecosystem processes are unimpeded."*

Ecological integrity is based on three ecosystem characteristics:

1. abundance of native species and biological communities (**composition**),
2. biotic or living (e.g., animals, plants) and abiotic or non-living (e.g., soil, water) components of an ecosystem (**structure**), and
3. ecosystem processes and rates of changes (**function**)[7].

Ecosystems have integrity when their lands, waters, native species and natural processes are intact.

2.2 Ecosystem-based Management

An ecosystem-based management approach at various scales will be used to protect and restore the ecological integrity of SWCR.

It is expected that these ecosystem-based efforts that focus on habitat management will benefit numerous species of conservation concern at SWCR, including many species at risk. A species-based approach may be appropriate in some instances, for example where a threat to a species protected under the *Endangered Species Act 2007* occurs at a specific location.

Landscape-scale ecological management approaches may be developed in coordination with the managers of nearby conservation lands (see Map 1).

2.3 Management Planning and Scheduling

Implementation of management activities requires a coordinated, integrated approach in terms of:

- scheduling the sequence of activities in a particular area (e.g. controlling invasives before thinning or prescribed burns),
- coordinating activities in adjacent areas (e.g. slash from thinning operations precludes prescribed burns in adjacent blocks for several years), and

[7] *Ecological Integrity in Ontario's Provincial Parks and Conservation Reserves: a discussion paper. OMNRF 2018.*

- logistical considerations (e.g., using trails and access roads as the boundaries for prescribed burns where feasible, leveraging marketable materials to get qualified operators for vegetation management operations).

The SWCR Management Plan and this Operations Plan provide long-term direction and shorter-term targets respectively but do not include a detailed implementation schedule. Specific restoration and maintenance treatments on specific priority areas will be developed by SWCRCC and SWCR DTAC through annual work plans. A rolling 3- to 5-year management schedule will be used to coordinate the annual work plans. Annual work plans will be authorized by MNRF. Management operations will be subject to environmental assessment screening by MNRF. Some activities (e.g. prescribed burns) may be subject to additional MNRF procedures and approvals (see Management Framework).

The annual cycle of management operations will be scheduled to prevent or minimize impacts to associated species. Vegetation management will generally be carried out between 1 November through 31 March when most plants are dormant and birds are not nesting. Prescribed burns will be conducted in early spring or late fall to minimize impacts on snakes, bird and insects and capitalize on the differential timing of dormancy in native versus non-native plants.

2.4 Adaptive Management

Adaptive management involves monitoring and evaluating the implementation of an action and adjusting the action as necessary to reach a desired outcome. Adaptive management is an essential strategy for achieving the management goals of the CR given the inherent uncertainty in predicting how ecosystems will respond to management actions and human use, particularly given the dynamic nature of the oak savanna ecosystem and novel stressors such as invasive alien species and climate change.

An adaptive management strategy will be used to plan and evaluate restoration and management operations at SWCR. Management strategies, methods and targets may need to be revised from time to time using an iterative process of planning, implementing, monitoring, evaluation, learning and adapting.

Inventory and monitoring were identified in the OP1 as a critical component of this adaptive management cycle. However, a monitoring plan has yet to be developed. The development of a practical monitoring program that can be used to evaluate management activities is included as a target in this plan (see section 8, Research and Monitoring).

2.5 Provincial Management Policies and Procedures

Management of the SWCR is subject to an array of provincial policies and procedures, particularly those established by the PPCRA legislation. Enforcement activities are provided primarily by MNRF Conservation Officers.

All new projects in the CR, new approvals and permits issued, and any relevant amendments must meet the legal requirements of the '*Class Environmental Assessment for Provincial Parks and Conservation Reserves*'[8]. Environmental assessment (EA) screenings have been prepared for invasive species control, prescribed burns and other vegetation management activities at SWCR. These screening documents are reviewed, updated and renewed every five years. Other activities in the CR may be subject to screening under the PPCR Class Environmental Assessment procedures.

Policies and procedures related to forest management on Crown Land also apply at SWCR as the removal of some standing timber is required to meet the ecosystem recovery objectives of the SWCR Management Plan. Forest management activities will be implemented according to a silviculture prescription prepared by a qualified individual (Registered Professional Forester). Trees to be removed will be identified and inventoried by a certified tree marker in compliance with the prescription. Merchantable material resulting from ecological restoration activities will be salvaged and sold. Revenues from timber sales are applied towards future ecosystem restoration and management activities.

The province has developed comprehensive guidelines for forest management and silviculture in southern Ontario (MNRF 2000). However, the objectives of the vegetation management operations at SWCR (e.g. oak savanna restoration) often differ from standard management objectives for southern Ontario forests. Silvicultural systems may need to be modified to ensure that forest management at SWCR advances the site-specific ecosystem recovery objectives.

Policies and procedures related to prescribed burns on Crown Land apply at SWCR. Prescribed burns, including slash pile burns at SWCR are subject to MNRF approval. A MNRF-approved prescribed burn application and burn plan prepared following the MNRF Prescribed Burn Planning Manual are required.

Protection and stewardship of the many species at risk found at SWCR is a primary consideration in all management activities. Some areas at SWCR are regulated habitat for certain species under the Endangered Species Act 2007 habitat regulations. The general habitat regulations for species at risk apply to almost all parts of the CR.

2.6 Management Constraints

Management operations at SWCR are limited by resources, capacity, understanding, and logistics.

Funding for future management activities is uncertain as there is no base funding for operations and no revenue stream from user fees. The main source of funds for recent

[8] Ontario Ministry of Natural Resources, Environmental Assessment Report Series, *A Class Environmental Assessment for Provincial Parks and Conservation Reserves* (Ontario Ministry of Natural Resources, 2005). An amended Class Environmental Assessment was proposed by MNRF in 2015 but as of 2018 is still under review.

management activities have been grants obtained by SWCRCC for activities that advance the protection and recovery of the many species at risk at SWCR, supplemented with revenue generated from some vegetation management operations.

MNRF capacity for managing the SWCR is expected to continue to be quite limited and focussed on planning, technical guidance and enforcement. Since 2008, SWCRCC has gradually developed its capacity to plan and implement management activities by cultivating a pool of highly qualified independent contractors familiar with the SWCR, and by recruiting and training a small but growing number of volunteers.

The 2001 Life Science Inventory and subsequent ecological surveys, studies and research work have increased understanding of the natural features of the SWCR and identified various management needs. However, understanding of how best to protect the significant features and restore the ecological integrity and historical ecological communities at the SWCR is an ongoing constraint as there are few comparable examples to draw on in southern Ontario. The adaptive management approach is seen as a means of overcoming this limitation, but it requires additional resources for planning and monitoring, and the effects may not be apparent for many years.

The feasibility of management operations varies considerably. Some management activities (e.g., prescribed burns, conifer thinning, some invasives control) require considerable resources as they require specialized personnel and equipment and are subject to specific timelines and conditions for planning, site preparation and implementation. Other activities can be done by trained volunteers (brush control, some invasive control, some monitoring) but on a small scale.

Implementation of this operations plan is subject to the availability of resources and capacity. Management capacity is expected to remain stable over this period at levels similar to 2013-2018. Management priorities and strategies will be reviewed and updated regularly to account for the availability of resources, changes in organizational and technical capacity, and new information and current best management practices.

2.7 Ecological Management Units

For management and planning purposes, it is convenient to sub-divide the SWCR into spatially-defined management units or compartments.

For the OP1, various management units were used including:

- Ecological Land Classification (ELC) polygons from the Life Science Inventory completed in 2001 (Draper et al. 2002, 2003);
- Modified ELC polygons (“burn blocks”), where the original ELC units were adjusted to better fit with existing roads and trails that provided a logistical advantage, were used for delineating the Oak Savana Restoration areas; and
- Forest stand compartment as delineated for the 1990 St Williams Crown Lands resource management plan were used for forest management planning.

Limitations of using ELC polygons as the primary management unit at this site include:

- The total number of ELC polygons (more than 100 at each tract) is not practical for planning purposes.
- The size of the ELC units is highly variable, ranging from less than a hectare to 65 hectares, and often not consistent with the scale of management operations.
- The boundaries of the ELC units are irregular and often not identifiable on the ground (where gradual transition between natural habitat types).
- The ELC units at SWCR are not stable over time, particularly for the many culturally-modified vegetation communities (plantation, in-grown savannas, etc.) which are the focus of the ongoing ecological restoration efforts.
- ELC mapping standards for southern Ontario were under revision at the time this OP was being prepared so updating the ELC maps was not feasible.

To address the limitations identified above, a modified approach was developed for this plan that delineated spatial management units based on current ecological communities, the future target ecosystem, and operational logistics. Each tract is divided into "Ecological Management Units" (EMUs) and nested sub-units (sub-EMUs).

The sub-EMUs recognize existing differences in habitat structure and composition within the EMUs that affect short-term management needs. The sub-EMU units are more likely to change over time (update at 5- to 10-year intervals), whereas the EMUs should be stable over the longer-term.

The following guidelines were used to delineate the management units for this plan:

- *Boundaries:* Where possible, EMU boundaries are aligned with existing roads, trails or topographic features that are both easily recognizable on the ground and relatively stable over time.
- *Size:* The size of the EMUs and sub-EMUs was based primarily on logistical considerations (e.g. maximum size for Low Complexity Prescribed Burn block is 25 hectares). Larger management units are appropriate in areas of natural vegetation where minimal active management is proposed. Smaller units were delineated in areas which will be actively managed. The configurations of the land parcels, access roads, trails and habitat complexity affected the actual size of the EMUs and sub-EMUs. A minimum size of 10 ha and maximum size of 100 ha was used as a guideline for EMUs. The target size range for the sub-EMUs was 2 ha to 20 ha.
- *Number of EMUs:* The initial target was to delineate about 40 EMUs and 100 sub-EMUs.

Preliminary EMUs and sub-EMUs were delineated using 2016 aerial photographs, and then ground-truthed by SWCRCC consultants in 2017 and 2018. The EMU and sub-EMUs are similar but not always consistent with the forest stand polygons identified using the 2017 forest resource inventory data (2017 FRI Report), and with the OP1 management area mapping.

At ZNT, 25 EMUs ranging from 15 to 47 ha in area, and 64 nested sub-EMUs ranging from 1.5 to 47 ha have been delineated (Map 3a). At WTPT, eight EMUs ranging from

19 to 82 ha in area, and 38 sub-EMUs ranging from 1.9 to 36 ha are delineated (Map 3b). Information about each sub-EMU is summarized in Appendix B.

EMUs are labelled based on the tract, township, concession, lot number, and position within the lot (e.g. ZNT W-5-22S). A letter code (A to G) is added to distinguish the nested sub-EMUs (e.g. ZNT W-5-22S-C). The lot and concession system is convenient for labelling the EMUs because there are established fire roads along almost all of the lot boundaries. A more ecological approach could be used to grouping and labeling the sub-EMUs and EMUs in future as restoration work proceeds.

3.0 Current Ecological Context

3.1 Overview

This section of the OP2 summarizes aspects of the current ecological context of the SWCR relevant to operational planning and monitoring the ecological integrity of the CR. Current conditions are described, along with any known changes or trends since 2008. Long-term goals for restoring the ecological integrity and strategies and priorities for implementation of the SWCR management plan are updated and clarified. Various spatial scales are considered, ranging from the regional setting (ecoregion, watershed, landscape scales) to the site, ecosystem, and management unit. The ecological context is summarized in terms of the main components of ecological integrity: function, structure and composition.

3.2 Baseline and monitoring information

The Life Science Inventory carried out in 2001(Draper et al. 2002, 2003) provides comprehensive information on the ecology of SWCR, including a summary of the historical and recent ecological communities, flora, and fauna. The 2001 inventory serves as the primary baseline for establishing the ecological condition of the SWCR when it was regulated in 2008. A 2003 survey by MNR of all authorized and unauthorized trails at the SWCR provides a baseline for measuring changes in human disturbance.

Additional ecological information has been collected by SWCRCC since 2001 including a series of pre-management ecological surveys covering about half of the SWCR (~500 ha covered by one or more surveys between 2008-2018), assessments of most of the authorized recreational trail system, and a variety of surveys of SAR species.

Forest resource inventory information covering the entire property was collected in 2017-2018. Standard data on tree species composition, tree height class, age class. and basal area were collected for sample plots that were strategically placed throughout the forested areas at a density of about 1 plot per 5 hectares. *See Forest Resource Inventory Report 2018 for additional details.*

Information on the current condition and management needs of each sub-EMU at WTPT and ZNT was also collected and compiled in 2017-2018. This assessment was more subjective than the forest resource inventory but looked at a broader set of considerations including structure (canopy cover, current cover type, relative density of each vegetation layer, extent of natural regeneration), vegetation composition, and stressors including woody invasives, herbaceous invasives, problematic native species (e.g., red maple regeneration in absence of fire, extent of deer browse), insect or disease issues, and unauthorized recreational use. This field assessment also identified management actions need to maintain or restore the ecological integrity of each sub-EMU. *Additional details are available in the draft EMU Assessment Report.*

Landscape scale information is available from various sources including the Carolinian Canada report card, and the LPRCA watershed report cards produced in 2013 and

2018. Air photos are another important source of information, particularly temporal changes in land cover and land use at SWCR and vicinity. Air photo base maps from 2015, 2010, 2006, 2002 and 1964 are available on the Norfolk County website (http://www.norfolkcounty.ca/visiting/norfolk-maps/online-interactive-maps/).

3.3 Regional Setting

The SWCR is situated in Ecoregion 7-E, also known as the Carolinian Life Zone. This ecoregion has the highest biodiversity in Canada.

SWCR was identified as a core natural area in the initial "Big Picture" ecoregion analysis prepared by Carolinian Canada in 2000. According to a preliminary landscape analysis in the Carolinian Canada Big Picture report card (Jalava 2015), SWCR is situated in a landscape with relatively high levels of natural cover (28% for Norfolk County, SOLRIS 2010 data), connectivity (73% natural cover along riparian corridors in Norfolk County, SOLRIS 2010 data) and protection (over 6% of land in Norfolk County with some form of protected status as of 2014). Moreover, the trend in natural cover and protection status in Norfolk County is positive according to the preliminary Big Picture report card.

The SWCR falls within the Long Point Basin watershed, more specifically within the Dedrick-Young Creek subwatershed (includes 100% of WTPT and 87% of ZNT) and the Big Creek subwatershed (includes northwest corner of ZNT, see Map 2a). The LPRCA 2018 watershed report graded the Dedrick-Young Creek watershed as having fair surface water quality, good forest conditions, and excellent wetland cover (LPRCA 2018). The Big Creek watershed received a grade of fair in all three categories. There was insufficient data to grade groundwater quality. These grades are unchanged from the 2013 report card except that forest conditions in the Dedrick-Young Creek watershed slipped from Excellent (A) to Good (B).

At a local landscape scale, there has been an increase in natural cover, connectivity and the amount of protected conservation lands as the Nature Conservancy of Canada has acquired and restored several land parcels in the vicinity of the ZNT since 2018, including two parcels abutting the ZNT (see Map 1). The main changes in the vicinity of the WTPT since 2008 have been the development and expansion of the Long Point Eco-Adventures (LPEA) and Burning Kiln Winery commercial tourism operations on the western edge of the CR, the rebuild of the Normandale provincial fish culture facilities, and the acquisition and restoration of the Pond Nature Reserve property by the Long Point Land Trust.

Other landscape scale events and changes since 2008 that have impacted the ecological integrity of the CR include:

- Outbreak of Gypsy Moth (scientific names of all species mentioned in this document are available in Appendix A) in 2007 and 2008 which led to the aerial spraying of the broad-spectrum biological control agent "Bte" on many adjacent woodlots in spring 2008. A narrow-spectrum biological control agent ("Gypchek")

was applied across the SWCR in 2008 by the Canadian Forest Service researchers.
- High mortality of ash trees due to the spread of Emerald Ash Borer (first detected in Norfolk County in 2008 in woodlot adjacent to WTPT).
- Improvement in air quality and reduction in nitrate deposition following the closure of the Nanticoke coal-burning power facility in 2013.

3.4 Site Setting

The CR is composed of eight parcels (separated by municipal roads) in two disjunct tracts with a total area of 1033.95 ha. The boundaries of the CR have not changed since 2008. The two tracts are separated by about 6 km, with the intervening area being a mix of agricultural fields and forests. The land cover within the SWCR is almost entirely culturally-modified vegetation with some active and legacy infrastructure features.

The ecological integrity and management of the SWCR is influenced by land cover and land use on adjoining properties, and along hydrological corridors. These features and influences are summarized below for each tract. Changes since 2008 are highlighted.

3.4.1 Zavitz Nursery Tract (ZNT)

The total area of the ZNT is 662 ha. A 3 km section of unmaintained municipal road (6h Concession Road, aka the “Dirt Sixth”) bisects the ZNT into two parcels. Within the ZNT, three small interior fields within the southeastern quadrant of the ZNT leased to the St Williams Nursery and Ecology Centre (SWNEC) have a total edge of 1.8 km.

The ZNT total external boundary is 12.1 km, of which 45% is edged by municipal roads and 55% by abutting properties. Ignoring the bounding roads, 56% of the external boundary abuts agricultural fields (including SWNEC native plant nursery fields), 41% abuts forested lands, and 3% abuts rural residential lands. Approximately 41% of the ZNT boundary abuts other public lands including leased Crown lands (30%), two LPRCA woodlots (9%) and Norfolk County woodlot (2%).

A 2 km section of Dedrick Creek, a coldwater stream system, flows through the ZNT. The impoundment along Dedrick Creek at the ZNT, referred to here as the Nursery Pond, is created by a water control structure built by MNRF in ~1960s. The water control structure is outside of the SWCR, but the pond (approximately1 ha) and associated wetlands are situated within the CR.

As of 2018, the Nursery Pond is still being used as a water source for irrigation of nursery stock on the privately leased lands. MNRF is responsible for the management and inspection of this legacy structure. The dam is operated as a gang and sluice-way stop log facility. Stop logs are removed in the late fall and reinstated in the spring after the freshet. There are three other structures on Dedrick Creek within the CR: a stone weir at the top of the pond, a concrete culvert on a designated management access road, and a metal culvert on a closed access road. Traces of the historical McCall sawmill that was situated on Dedrick Creek below the current dam are still visible.

Other legacy infrastructure features at the ZNT include the network of former forest access roads and firebreaks, a graveled parking area off of Highway 24 near the dam on Dedrick Creek, two gates on access roads at north end of former Manestar Tract, and the footprint of an old homestead on the East Quarterline north of the Sixth Concession Road.

Changes at or adjacent to ZNT since 2008 include:

- A designated parking area was established at a former log landing on the Sixth Concession, trailhead and 911 signage (1665 6th Concession Road) was installed, and the area was graded.
- Many of the former access roads and unauthorized trails are not being used and are partly grown-in.
- Three new heavy-duty gates were installed on management access roads on the 7th Concession and the north side of 6th Concession.
- There have been several changes in ownership and production strategy for the private nursery operation on the adjacent leased Crown lands. The current operator (St. Williams Nursery and Ecology Centre) took over the operation in 2009 with a focus on growing a wide array of native plants.
- Two adjacent forested properties were acquired by the NCC for long-term biodiversity conservation.
- In 2013, Norfolk County installed three water wells on the north edge of the Sixth Concession road allowance where is passes through the ZNT to assess potential groundwater source of Port Rowan municipal water supply, but these wells are not being used.

The site context at ZNT is not expected to change significantly over the next 10 years or more except for:

- possibility of recognizing the informal parking area off Highway 24 as a designated parking area (and add 911 signage);
- possibility of incorporating two areas of Crown land (2.8 ha 1910 white pine plantation on corner of Highway 24 and Forestry Farm Road, and 19.7 ha parcel on corner of Highway 24 and East Quarterline) into the ZNT portion of the CR.
- the gradual revegetation of closed access roads and unauthorized trails at SWCR;
- an increase in natural cover in the vicinity as the plantings on the restored NCC lands become established.

3.4.2 White Turkey Point Tract

The total area of the WTPT is 372 ha. It is divided into six parcels by 3.3 km of internal municipal roads (Front Road, Charlotteville Road 1, Gibson Road and Turkey Point Road). There are no internal parcels within WTWT but there are two indentations in the external boundary (5.5 ha private agricultural field on Gibson Road and ~15 ha of Crown land that includes the Turkey Point Provincial Park maintenance yard and Normandale Fish Culture Sub-station). A local hydro transmission line right-of-way passes through parts of the WTPT (Map 2b).

The WTPT total external boundary is about 13.8 km, of which 36% is edged by municipal roads. Ignoring the roads, 63% of the boundary abuts forests or other natural areas, 31% abuts agricultural fields, and 6% abuts various other land cover (provincial fish hatchery, the Long Point Eco-Adventures (LPEA) tourism operation, and one rural residential parcel. Approximately 57% of the WTPT external boundary abuts other public lands including Turkey Point Provincial Park (29%), other Crown lands (20%), and a Norfolk County woodlot (7%).

A 750 m section of Gibson Creek, a short spring-fed coldwater stream passes through WTPT south of Front Road. Two other small spring-fed streams arise in the ravines south of Front Road to the west and east of Gibson Creek ravine. All three streams flow into Turkey Point Marsh just downstream of the CR.

There is a water control structure on the headwaters of Gibson Creek, on the north side of Front Road immediately upstream of the WTPT. This structure controls the head pond (0.2 ha) for the MNRF Normandale Fish Culture Substation, which dates back to 1934. A new dam was constructed when the substation facility was rebuilt in 2012. The Normandale Fish Culture Station is the main MNRF production facility for Atlantic salmon for the Lake Ontario Atlantic Salmon Restoration Partnership Initiative and will continue in this role for the foreseeable future. The fish culture substation and dam are not part of the CR.

The main station for the Normandale Fish Hatchery, situated on Normandale (Potters) Creek, also abuts the WTPT and was rebuilt in 2012.

Since 2005, Normandale Fish Culture Station (FCS) has been the main MNRF production facility involved in the production of Atlantic salmon for the Lake Ontario Atlantic Salmon Restoration Partnership Initiative and will continue in this role for the foreseeable future. The substation and main station facilities require large quantities of high-quality water drawn from the spring-fed pond and groundwater wells, respectively.

Other existing infrastructure in or adjacent to the WTPT includes:

- Turkey Point Flux Station including two steel tower structures and associated buried hydro cables and monitoring equipment used for McMaster University environmental research work.
- A natural gas well situated on the boundary of WTPT, west of Gibson Sideroad (see Map 2b). This well was drilled in 1984 and is currently active.
- Communications tower on north side of Front Road on western edge of WTPT.
- Hydro lines, communication cables and natural gas collection pipelines are present along several of the road rights-of-way intersecting and abutting the WTPT.

Other legacy infrastructure features at the WTPT include the network of former forest access roads and firebreaks, the footprint of an old homestead on the east side of

Gibson Road, and an old refuse dump at the head of the east ravine south of Front Road.

Changes at or adjacent to WTPT since 2008:

- In 2011, a gated 0.3 ha parking area was established on Charlotteville Road in an area with high concentrations of non-native invasive plants, and trailhead and 911 signage (849 Charlotteville Road One) was installed.
- In ~2012, stream crossings on the Blue trail were improved with the installation of new wooden bridges (by TPMBC) including two bridges on Gibson Creek and one on the small stream to the west of Gibson Creek, replacing previous informal structures.
- In ~2013, a new gate was installed on the Picetum management access road on south side of Front Road.
- In 2017, the height of the carbon sequestration research tower north of Charlotteville Road 1 was raised to bring it above canopy height again.
- In 2018, a power line (partly buried, partly on poles) was installed in the north parcel on west side of Gibson Road to service monitoring equipment associated with the Variable Retention Harvest forestry research work (see section 5).
- Many of the former access roads and unauthorized trails are not being used and are partly grown-in.
- LPEA opened in 2009 and has since developed into a major tourism operation with onsite accommodations and a well-used trail network that is connected to the SWCR “Blue Trails” (mountain bikes and pedestrian use).
- The former Potters Creek Ranger Camp facility on Crown Land adjacent to SWCR was re-activated as a waterfowl-focused research and education facility by Long Point Waterfowl in 2009. The facility is now operated as a Hunting Heritage and Conservation Center by Delta Waterfowl.
- The water control structure that controlled an 8-hectare pond at the main Normandale fish culture station was decommissioned in 2010 after the earthen dam failed in a high rain event in May 2008.
- The Normandale provincial fish culture station facilities were rebuilt and both sub-stations were re-opened in 2013.
- The “Blue Trails” were modified and expanded several times over the decade for various reasons but this trail network is now considered complete.

Anticipated and proposed changes at WTPT over the next 10 years include:

- the gradual revegetation of closed access roads and unauthorized trails at SWCR;
- Ongoing development of the LPEA and Burning Kiln winery tourism operations (construction of a craft brewery at LPEA proposed for 2019)
- Possible transfer of informal parking area at Charlotteville Road 1 and Turkey Point Road (Five Points Corner) from the CR to TPPP.
- Possibility of incorporating one or more areas of abutting Crown land (8.5 ha parcel on northwestern corner of WTPT, all or part of the area between Turkey Point maintenance yard and Turkey Point Road) into the WTPT portion of the CR.

3.5 Ecosystem Recovery

As noted in section 2, an ecosystem-based management approach is being used at SWCR that is focused on protecting and restoring the ecological integrity of the native ecological communities and their associated species and ecological processes. Understanding the historical ecosystems is critical to planning and implementing ecosystem recovery.

The 'St. Williams Life Science Inventory'[9] found evidence that much of the land now within SWCR historically supported species and habitats characteristic of an oak savanna ecosystem. Although few intact savanna vegetation communities remain (most of the vegetation is now closed canopy forest), plant species that are considered savanna indicators are present in many parts of the CR.

The historical natural communities in other parts of SWCR were more typical of the Carolinian Forest ecosystem, including both upland and lowland deciduous forests. Within Canada, the Carolinian Forest ecosystem is restricted to extreme southwestern Ontario, where it is subject to many stresses and threats.

In southern Ontario, oak savanna ecosystems were uncommon historically and restricted to sites with drought-prone, nutrient-poor soils, whereas upland and lowland Carolinian Forests were common and widespread. Both ecosystems are much diminished from their historical status, but the loss of oak savanna is particularly severe (less than 3% of historical extent). Oak savanna is one of the most threatened ecosystems in Ontario and North America.

For operational planning purposes, two ecosystems are identified as broad targets for ecosystem recovery at SWCR: the Eastern Oak Sand Savanna ecosystem and the Carolinian Forest and Wetlands ecosystem. The former is characterized by sun-loving, drought-tolerant, fire-tolerant plant species whereas the latter is characterized by shade-tolerant, fire-sensitive plant species. Periodic disturbance, typically ground fires and droughts, plays a key ecological function in the Eastern Oak Sand Savanna ecosystem. The Carolinian Forest and Wetlands ecosystem is more stable with the typical natural disturbance regime being gap-phase dynamics caused by the occasional loss of canopy trees through windfall or mortality. These distinctions are simplistic and somewhat artificial but useful for operational planning. The characteristics of these ecosystems at SWCR are described below.

3.5.1 Eastern Oak Sand Savanna Ecosystem

In the context of SWCR and this plan, the term Eastern Oak Sand Savanna[10] ecosystem includes a suite of diverse but inter-related disturbance-dependent natural

[9] William B. Draper, Mary E. Gartshore, and Jane M. Bowles, *St. Williams Crown Forest Life Science Inventory* (Ontario Parks, 2002).

[10] Will-Wolf, S. and F. Stearns. 1999. Dry soil oak savanna in the Great Lakes Regions, pp. 135-154 in Anderson, R.C, J.S Fralish, and J.M Baskin (eds.). Savannas, Barrens and Rock Outcrop Plant Communities in North America. Cambridge University Press.

ecological communities occurring on dry sandy soils including open sand barren, tallgrass prairie, shrub thicket, oak savanna, oak woodland, and oak-pine forest. These component ecological communities represent a continuum of natural succession stages with increasing shrub and tree cover.

As defined herein, this ecosystem encompasses two vegetation classes within the southern Ontario ELC framework (Lee et al.1998): Tallgrass Prairie, Savannah and Woodland class, and Sand Barren. The term Eastern Oak Sand Savanna (or shortened to Oak Savanna) is used here as at SWCR oaks, particularly black oak and dwarf chinquapin oak, are the characteristic vegetation rather than the prairie grasses that are more generally characteristic of the tallgrass prairie. In addition to the oak savanna, tallgrass woodland, and sand barren communities identified in the OP1, closed canopy upland oak forests are included here in the Oak Savanna ecosystem as they are also considered disturbance-dependent.

Historically, the various types of Oak Savanna vegetation communities would have occurred as a dynamic mosaic on the landscape, shifting in location in response to periodic natural disturbances, particularly wildfires and drought, followed by natural succession as the vegetation structure and composition changed in the absence of disturbance. The historical fire regime for this ecosystem is uncertain and cannot be reconstructed as it is unlikely than any pre-settlement era legacy trees with fire scars have persisted. Based on studies in similar ecosystems in southern Ontario (Pinery, Rondeau, High Park) and in adjacent parts of United States, the historical fire regime is inferred to have been characterized by frequent, low-severity surface fires, often of anthropogenic origin, with a fire return interval of 0 to 35 years.

The Eastern Oak Sand Savanna ecosystem at SWCR is closely associated with areas of drought-prone sandy soils, particularly on the relict dune ridges as the ZNT and the extensive sand plain area at WTPT (Draper et al. 2002). Draper et al. (2002) identified about 700 ha of ingrown sand barrens, oak savanna and oak woodland habitat at SWCR based on the presence of savanna indicator plants. Additional areas with dry sandy soils are included here even if savanna indicator species have not been reported (e.g., furrow-planted conifer plantations on tablelands at WTPT) as Oak Savanna would be the long-term restoration goal for these depauperate sites.

Restoration of the Eastern Oak Sand Savanna ecosystem is the highest priority for biodiversity conservation at SWCR. The Oak Savanna communities within the SWCR are known to support a high diversity of rare flora and fauna species. These include significant populations of savanna-associated Species at Risk such as Bird's-foot Violet and Virginia Goat's-rue.

This ecosystem is in urgent need of restoration as the habitat structure, species composition and ecological processes have been drastically altered due to land clearing in the 19th century, followed by combination of land clearing and/or planting with conifers, fire suppression, natural succession, and the effects of invasive alien species

over the past century. Protecting and enhancing the remnant habitats that are relatively intact takes precedent over restoration of more disturbed areas.

In the OP1, sand barrens were recognized as a distinct management target even though they often overlapped with the OP1 oak savanna management areas and some were very small. In this plan, sand barrens are included in the oak savanna ecosystem, where they represent the most open (>50% open sand and <25% forest cover) and most disturbance-dependent extreme within the continuum between open sand and oak-pine forest. The sand openings of the SWCR support a considerable number of species, some unique to dunes and barrens, including some species at risk. As in the previous OP1, all existing sand barrens will be retained. The larger sand barren areas are identified as discrete sub-EMUS while the small sand barren pockets will be managed as an important feature within a sub-EMU.

The overall ecological integrity of the Oak Savanna ecosystem at SWCR is considered degraded (poor to fair condition relative to natural historical state) due to changes in structure, species composition, and ecological processes. These changes are the result of various factors, particularly the past practice of planting conifers into “under-stocked” areas at the forestry station and a century of fire suppression. Almost all former oak savanna areas at SWCR are now heavily treed with a closed canopy forest structure and significant conifer component. Most savanna trees and plants are sun-loving species that can tolerate only low to moderate amounts of shade. Without periodic fire or other disturbances that create and maintain canopy openings and reduce brush cover, savanna understory species tend to disappear.

The most intact examples of the savanna ecosystem vegetation communities, which still support a rich assemblage of savanna-associated species, are associated with small oak woodland remnants at the WPT and some of the sand dune areas at ZNT (Draper et al. 2002). Many savanna species also persist in open edge situations, such as along roads and trails, and in openings that have intentionally or unintentionally been created, such as hydro rights-of-way and various disturbed areas. Savanna indicator plants are no longer present in the more degraded habitats (e.g. dense conifer plantations).

About three-quarters of the SWCR is categorized here as Eastern Oak Sand Savanna ecosystem. Although currently degraded, the drought-prone soils and presence of some relatively intact remnant habitats favour the persistence, restoration and maintenance of this globally rare ecosystem.

3.5.2 Carolinian Forest and Wetlands Ecosystem

The term Carolinian Forest and Wetlands ecosystem (shortened to Carolinian Forest) encompasses a range of ecological communities including deciduous and mixed upland forests, swamp forests and riparian forests. As used here the term also encompasses non-forested wetland communities, such as seeps, wet thickets and meadow marshes, that at SWCR occur as small inclusions within the swamp forests or riparian areas.

The distribution of the various community types within the Carolinian Forest and Wetlands ecosystem at SWCR is determined largely by differences in topography, soils, soil moisture and hydrological processes. These features and processes tend to be fairly stable; consequently, the distribution of the community ecotypes also tends to be stable. The natural fire regime for the Carolinian Forest ecosystem is inferred to be characterized by very infrequent, stand-replacing fires with a fire return interval of over 200 years, although drier upland areas may experience mixed severity fires more often, with a fire return interval in range of 35 to 100+ years.

In Canada, the Carolinian Forest ecosystem is highly threatened as it is restricted to southwestern Ontario, where it is subject to many stressors. At SWCR, this ecosystem supports many species at risk, such as American Chestnut, Blanding's Turtle and Acadian Flycatcher, as well as provincially and nationally rare species such as Black Gum.

Most of the wetland communities at SWCR have been formally evaluated. The ZNT Nursery Tract contains a total of 32.5 ha wetlands that are part of three Provincially Significant Wetland Complexes: wetlands in the northeast quadrant are part of the St. Williams Wetland (DYC4) in the northeast quadrant, the wetlands (including Nursery Pond) along Dedrick Creek in southeast quadrant are part of Wetland DYC9, and the Backus Woods Wetland (DYC3) is on the southern edge of southwest quadrant. The southern edge of the WTPT overlaps with Turkey Point Tract 0.4 ha of the very large Provincially Significant Long Point Wetland Complex (LP1), which includes the Turkey Point Marsh. The wetland evaluations at ZNT and WTPT were completed in 1996, and 1984, respectively.

In general, the Carolinian Forest and Wetland ecosystem components at SWCR are in relatively good condition, although the forest composition has been altered due to the loss of formerly common tree species such as American Chestnut, American Elm, and ash species. Because these past losses are likely irreversible, the management focus for the Carolinian Forest ecosystem at SWCR is on maintaining current conditions and protecting special features such as the wetlands and coldwater streams.

3.6 Ecological Management Unit Context

This section of the plan focuses on the management unit scale. As described in section 2.7, the SWCR has been subdivided into 33 Ecological Management Units (EMUs) and 102 nested sub-EMUs for management purposes. Each sub-EMU has been categorized as to ecosystem, current vegetation type and current ecological condition. These classifications are summarized for SWCR and for each tract. Available information on known or inferred changes in the ecological condition of the management units since 2008 is also summarized.

3.6.1 Ecosystem Classification

For operations planning purposes, the ecosystem of each sub-EMU has been categorized as either Oak Savanna or Carolinian Forest. Several factors were considered including soils, topography, the presence of indicator plants, historical

information, current condition, and restoration feasibility. The scale of the management unit mapping obscures finer-scale features and variability in areas with complex soils or topography (e.g. sand barren pockets are not identified at this scale, there may be small wetland pockets in some units identified as Oak Savanna and vice versa).

The management unit ecosystem classifications (Maps 4a and 4b) provide general guidance on habitat management objectives at a practical spatial scale. The sub-EMU ecosystem classifications will be refined as new information becomes available. More specific ecosite or ecological community level targets (e.g. open sand barren, oak-pine forest, lowland deciduous forest) could be defined for each sub-unit in future iterations.

Overall, about three-quarters of SWCR is classed as Eastern Oak Sand Savanna ecosystem and one-quarter as Carolinian Forest and Wetlands ecosystem.

Zavitz Nursery Tract: Over two-thirds (69%) of the ZNT is classed as Eastern Oak Sand Savanna (see Map 4a and Table 1). The 31% of the ZNT classified as Carolinian Forest ecosystem is mostly associated with the wetlands in the northeast quadrant and the Dedrick Creek riparian corridor but includes some upland deciduous forest.

White Turkey Point Tract: Most (~87%) of the WTPT is classed Eastern Oak Sand Savanna (Map4b and Table 1). The ~13% of the WTPT classified as Carolinian Forest ecosystem is associated with the ravines and bluffs south of Front Road.

Table 1. Summary of ecosystem classifications for SWCR managements units

Ecosystem Goal	**Zavitz Nursery Tract** hectares, % of total area		**White Turkey Point Tract** hectares, % of total area		**Total for SWCR** hectares, % of total area	
Eastern Oak Sand Savanna	~459	69%	~317[1]	87%	776[1]	76%
Carolinian Forest and Wetlands	~202	31%	~48	13%	~250	24%
Total Area	**~661**	**100%**	**~365**	**100%**	**~1026**	**100%**

[1] Includes ~100 ha of plantations where ecosystem recovery is not the short-term management goal (see section 4.4).

3.6.2 Current Vegetation Type

The vegetation cover at SWCR includes conifer plantations where planted native and non-native species predominate, culturally-modified habitats where the vegetation includes a mix of naturally-occurring and planted species (e.g., cultural forests) and/or has been influenced by past land clearing (e.g., cultural sand barrens), and natural habitats where naturally-occurring species predominate but have been influenced by past logging and the loss of important species such as American chestnut.

The current vegetation of each sub-EMU is classed as Natural, Cultural or Planted. The vegetation type was classed as “Natural” if native species resulting from natural regeneration and succession are predominant (>66% of cover), “Planted” if native or non-native planted species are predominant (e.g. conifer plantations with little natural

regeneration), or "Cultural" if both planted and naturally-occurring vegetation are common (e.g. under-planted natural forests, plantations that have been thinned with good natural regeneration). Areas were the current vegetation is strongly influenced by past land clearing (e.g., cultural sand barrens) or ecosystem modifications (wetland created by water control structure) were included in the Cultural vegetation category.

At present, only 19% of the vegetation cover at SWCR is classed as Natural, whereas over half (56%) is Cultural, and 26% is Planted (Table 2). Most of the Natural vegetation is at ZNT and most of the Planted vegetation is at WTPT.

Areas with Natural vegetation are generally a priority for protection whereas Planted areas are generally a priority for thinning to expedite natural regeneration. The overall vegetation management strategy is to decrease the amount of Planted vegetation and increase the amount of Natural Vegetation. Many factors influence the rate of vegetation conversion.

Table 2. Summary of the current vegetation type of all SWCR management units as of 2018.

Current Vegetation Type	**Zavitz Nursery Tract** hectares, % of total area		**White Turkey Point Tract** hectares, % of total area		**Total for SWCR** hectares, % of total area	
Natural	~134	20%	~59	16%	~192	19%
Cultural	~452	68%	~120	33%	~572	56%
Planted	~76	12%	~186	51%	~262	26%
Total Area	~661	100%	~365	100%	~1026	100%

3.6.3 Assessment of Current Ecological Condition

Based on the field assessments conducted in 2017-2018 assessments, and other recent data (see section 3.2), the current ecological condition is classed as Good, Fair or Poor. Factors used to assess the current condition of each sub-EMU include the current structure, composition, and ecological processes relative to an inferred historical or "natural" state, and the presence of known stressors (e.g. invasive species, recent or ongoing recent disturbance) that may impede restoration efforts.

The sub-EMU condition assessments for ZNT and WTPT are summarized in Table 3 and shown on Maps 5a and 5b, respectively. Overall, the ecological condition of 61% of SWCR is classified as Fair, and 23% as Poor and 16% as Good (Table 3).

The condition assessments were heavily influenced by the current vegetation type as only areas with Natural vegetation types were in Good condition and most of the areas with Planted vegetation types were rated as in Poor or Fair condition, depending on the amount of natural regeneration. Only a few areas were rated as Poor primarily because of non-native invasive species populations.

Within the CR, protecting areas that are in good condition is is the first priority. Connecting and expanding these high-quality remnant areas is also a priority. Subject to resources and capacity limitations, management operations will also focus on the

longer-term process of restoring ecological communities that are currently in a disturbed or degraded condition.

As with the ecosystem target categories, the sub-EMU condition assessments should be considered a first approximation and refined over time. The value of developing a more structured approach to defining vegetation types and/or assessing the ecological condition of each management unit will be considered over the course of the OP2. The time and resources required for data collection and compilation should be a major consideration. Condition monitoring would be an important component of a broader monitoring program (see Research and Monitoring section 8).

The presence and condition of significant communities, including savanna and sand barren habitats in Ontario is tracked by the Natural Heritage Information Centre (NHIC) as part of its significant wildlife habitat monitoring program. This information is used as an indicator for the provincial biodiversity monitoring program. Only two habitat remnants at ZNT, totaling 4.6 ha, are currently included in the NHIC tracking system. The extent and condition of these two remnants has not been updated since the 1990s (W. Bakoswky, NHIC, pers. comm. 2017). The extent and condition of all provincially significant plant communities at SWCR should be assessed using the plant community condition scoring system developed by NHIC for ranking alvars, dunes and prairies (Henson and Bakowsky 2014). This condition scoring system could be modified for general use at SWCR.

Table 3. Current ecological condition of the SWCR management units as of 2018.

Current Condition	**Zavitz Nursery Tract** hectares, % of total area		**White Turkey Point Tract** hectares, % of total area		**Total for SWCR** hectares, % of total area	
Good	~120	18%	~46	12%	~165	16%
Fair	~472	71%	~151	41%	~624	61%
Poor	~69	10%	~168	46%	~237	23%
Total	~661	100%	~365	100%	~1026	100%

3.7 Summary of Management Activities 2009-2018

The extent of management activities over the past 10 years is summarized in this section both as a gauge of the implementation of the OP1 and to provide a realistic guide as to capacity to implement management action over the OP2 period. Habitat conditions improved on about one-third of the total area of the SWCR as a result of these vegetation management and threat mitigation activities.

3.7.1 Surveys and monitoring

- Pre-management ecological surveys focused on locating rare and at risk plant populations and other sensitive features were conducted by SWCRCC contractors on over 300 ha (20 to 100 ha/ year).
- Surveys to assess the impact of trails on significant plants and species at risk habitat were carried out by SWCRCC contractors for most of the existing authorized trail system.
- Since 2014, intensive baseline surveys were carried out by SWCRCC contractors for four endangered plant species.

3.7.2 Recreation management

Recreation management during the OP1 focused on establishing an authorized trail system, closing unauthorized trails, and increasing compliance. Management and mitigation measures included:

- Production and distribution of maps showing the authorized trail network
- Establishing communication channels with the various recreational user groups
- Installing and maintaining signage and barriers on closed trails
- Installing and maintaining directional signage on the authorized trails,
- Support for enforcement activities by monitoring compliance and promoting the TIPS line,
- Managing conflicts and responding to user requests for additional trails

These activities resulted in the effective closure of more than ~20 km of unauthorized trails resulting in a ~50% reduction in overall trail density. Unauthorized recreational activities continue to be an issue on ~20 km of unauthorized trails and continues to impact sensitive sand barren and wetland habitats.

3.7.3 Vegetation management

Vegetation management activities over the past 10 years focused on the priority forest management, oak savanna restoration, and sand barren areas identified in the OP1. Over the course of OP1 period, SWCRCC established its capacity to manage the implementation of these activities and took over from MNRF as the lead proponent.

Vegetation management activities (Table 4) implemented at SWCR since 2008:

- Ecological thinning of a total of 282 hectares of conifer plantations and cultural forests to promote regeneration of natural communities (20 to 52 ha/year since 2011, average 40 ha/y);
- Woody invasive plant control on over 300 hectares (including pre- and post-thinning control and priority oak savanna and sand barren areas) (20 to ~60+ ha/year, average ~50+ ha/y);
- Pre- and/or post-thinning control of red maple on ~30 hectares of priority oak savanna management areas (up to 20 ha/y).
- Control of white pine regeneration on a total of ~25 hectares of priority oak savanna restoration areas and ~15 ha of sand barren management areas (up to ~5 ha/y)
- Implementation of 12 low complexity prescribed burns (additional 5 planned but not completed) over five years, covering a total of 22 hectares in seven burn blocks at WTPT (total includes two PBs on one 2 ha block) and 10.4 ha in three burn blocks at ZNT (total includes two PBs on one 4 ha block) (up to 4 burn blocks, blocks ranged from 1 to 6 ha, up to 8 ha burned in a year).

4.0 Natural Heritage Protection and Restoration

4.1 Context

The primary management objective for SWCR is to "maintain and restore the native ecological communities (including oak savanna, oak woodland, other tallgrass communities; and sand barrens, Carolinian forests, wetlands and streams) of SWCR, and their associated species and ecological processes."[11]

As in the first Operations Plan, an area-based approach will be used to prioritize and schedule ecological management operations.

The focus of these management activities over the next 10-year period is on:

- Protecting and maintaining the ecological integrity of areas with relatively intact natural habitats, high natural heritage values and other sensitive habitats (Special Protection Areas),
- Expanding and/or buffering the Special Protection Areas,
- Strengthening ecological connections between Special Protection Areas, and
- Continuing the long-term process of restoring and improving the ecological condition of areas that are currently in a disturbed or degraded condition.

While ecological restoration is the long-term management strategy for most of the SWCR, over the shorter-term some areas (about 10% of the CR) will continue to be managed for other objectives over the short-term, including certain legacy plantations and forest research areas (see 4.4) and legacy infrastructure such as the Nursery Pond at the ZNT and the hydroline corridors rights-of-ways at the WTPT.

Natural Heritage targets for 2019-2028 are identified in Section 4.2. Ecosystem and species management strategies that will be used to achieve the natural heritage targets are described in Sections 4.3 and 4.4. Section 4.5 described procedures used for vegetation management operations. Priority areas for protection and restoration are identified in section 4.6.

4.2 Natural Heritage Targets, 2019-2028

Natural heritage targets for the next 10 years include measurable targets related to plan implementation, changes in overall ecosystem condition, and the effectiveness of the plan in terms of protecting or restoring focal species, maintaining or restoring ecological processes, and managing ecological stressors. These targets consider various aspects of ecological integrity (structure, composition, function) at appropriate spatial scales. Targets are limited to measures with adequate baseline information that can be readily monitored given anticipated resources. Comparable measures for the OP1 period are provided for comparison.

[11] Ontario Ministry of Natural Resources, *St. Williams Conservation Reserve Management Plan* (Aylmer District, Ontario Ministry of Natural Resources, 2005).

4.2.1 Plan Implementation Targets

Natural heritage protection and restoration operations at SWCR are constrained by available resources, capacity, understanding, and logistics (section 2.6). The following implementation targets assume that resource and logistical constraints will be similar to 2018 levels, and that there will be modest gains in management capacity and understanding over the next 10 years.

If achieved, the area-based targets identified in Table 4, will mean that over the OP2 period:

- 100% of the SWCR will have either a primary (first pass) or secondary (follow up survey),
- 100% of the SWCR will have had at least one sweep completed to control woody invasive plants, and
- All mature conifer plantations will have been thinned at least once since 2008 (including thinning of Forest Research Areas subject to researcher approval).

Brush management and prescribed burn targets for OP2 are ambitious but represent a gradual scaling-up towards the levels needed to achieve the long-term management goal of restoring the Eastern Oak Sand Savanna ecosystem at SWCR.

For context, achieving a mean fire return interval comparable to the inferred historical range (18 mean, 0-35 range) for this ecosystem would require burning about 40 hectares per year on average. Extensive canopy thinning and brush management is required in most areas before the use of prescribed burns for long-term ecosystem “maintenance” is an appropriate strategy.

Table 4. Implementation Targets 2019-2028 (in hectares)

Management Operations	Zavitz Nursery Tract		White Turkey Point Tract		Total for SWCR		
	OP1 Total	OP2 Target	OP1 Total	OP2 Target	OP1 Total	OP2 Target	Annual Target
Primary Ecological Surveys	350+	300	200+	170	550 +ha	500	50 ha/y
Secondary Ecological Surveys	0	350	50	200	50	550	100 ha/y
Total coverage		*100%*		*100%*		*100%*	
Canopy thinning	133	260	149	160	282	420	42 ha/y
Brush control	~50	300	~40	100	~90	400	40 ha/y
Prescribed Burns	6.4	50	20	30	26.4	80	8 ha/y
No Vegetation Management	*~457*	*325*	*~207*	*130*	*664*	*455*	
Total coverage		*50%*		*65%*		*56%*	
Primary Woody Invasive plant control	~180	200	~160	200	~340	400	40 ha/y
Secondary Woody Invasive plant control	~90	200	~80	200	~170	400	40 ha/
Total coverage		*100%*		*100%*		*100%*	

4.2.2 Ecological Condition Targets

Targets for the ecological condition of SWCR over the next 10 years are based on the aspiration to maintain the condition of all areas (165 ha total) presently in Good condition, and improve the ecological condition of some other management units sufficiently for their condition to be upgraded from Fair to Good (~37 ha), or Poor to Fair (~64 ha). The condition of the areas managed as Legacy Plantations or Forest Research during this period (see Section 5.4) are not expected to change.

Targets for the amount of area in each condition category at each tract by ecosystem are presented in Table 5, along with a summary of current conditions. The targets require achieving significant improvements in the condition of about 10% of the total area of the SWCR and will result in an incremental improvement in the overall condition of the SWCR (still Fair condition overall).

A more rigorous approach to assessing ecological condition may need to be developed for this target to be measurable (and avoid shifting baseline syndrome.)

Table 5. 2018 Current Ecological Condition and 2028 Ecological Condition Targets for SWCR by Ecosystem

Ecosystem	Current Condition	Zavitz Nursery Tract Hectares		White Turkey Point Tract hectares			Total for SWCR hectares, % of total area		
		2018	2028	2018	2018	2028	2018	2028	

				Recovery	research	all			
Eastern Oak Sand Savanna	**Good**	0	20	~13	0	30	~13	50	6%
	Fair	~412	420	94	42	160	548	580	74%
	Poor	~47	20	~115	52	130	214	150	19%
	Total	**~459**	**~460**	**~222**	**~94**	**320**	**775**	**780**	**100%**
Carolinian Forests & Wetlands	**Good**	~120	~120	~33		~35	~153	~155	62%
	Fair	~60	~70	~15		~15	~75	~85	34%
	Poor	~22	~10	~0		~0	22	10	4%
	Total	**~202**	**~200**	**~48**	**0**	**50**	**250**	**250**	**100%**
SWCR	**Good**	~120	140	~46	0	65	~165	205	20%
	Fair	~472	490	~151	42	175	~624	665	65%
	Poor	~69	30	~168	52	130	~237	160	15%
	Total	**661**	**660**	**~271**	**~94**	**370**	**~1026**	**1030**	**100%**

4.2.3 Species Protection and Recovery Targets

Populations of target species that are being monitored will be used to track the effectiveness of management efforts.

Target species include species that are priorities for management and conservation, such as Species at Risk, species that closely associated with priority habitats such as savanna and sand barren indicator species, and species that are dependent on important ecological processes such as fire-dependent species and cold-water stream species. Proposed species targets and measures are presented in Table 6.

Table 6. Proposed Focal Species and Targets

Target	Ecosystem	Tract	Measure	Ecological integrity indicator
Spotted Wintergreen	Oak Savanna	Both	Population size (number of patches) stable or increasing	Fire-sensitive Oak Savanna indicator species
Eastern Hognose Snake	Oak Savanna	Both	Detected annually at each tract	Sand barren habitat. Sensitive to habitat fragmentation, poaching and disturbance.
Eastern Whip-poor-will	Oak Savanna	Both	Detected annually at each tract	Open habitat (structure). Insectivore.
SAR Savanna Plants (Bird's-foot Violet, Virginia Goat's-rue)	Oak Savanna	WTPT	Population extent and abundance stable or increasing	Fire-dependent oak savanna indicator species
Wild Lupine	Oak Savanna	ZNT	Population extent (number of patches, total area of patches) sufficient to support lupine-dependent SAR insects (Karner Blue)	Savanna indicator species that requires open habitat and is critical food plant for SAR insects.
Carolinian Forest Birds at Risk (Acadian Flycatcher, Louisiana Waterthrush, Cerulean Warbler)	Carolinian Forest	Both	Population size (number of singing males) stable or increasing	Forest Interior. Forest Structure. Hydrological Regime

4.2.4 Ecological Processes Targets

Maintaining and restoring ecological processes is critical to ecological integrity. However ecological processes are often difficult to measure and monitor because they often occur at variable spatial and temporal scales. Hydrological and ecological connectivity are important ecological processes that can be assessed using measurable

proxies as indicated in Table 7. Connectivity and barriers can measured at various scales (site, landscape). Landscape scale targets are included here as the landscape matrix impacts the ecological integrity of the site, even though management at this scale is beyond the scope of the Operations Plan.

Table 7. Targets for Maintaining and Restoring Ecological Processes at SWCR

Target	Tract	Measure	Ecological process/feature
Coldwater stream systems (Dedrick Creek, Gibson Creek)	Both	Connectivity maintained (no additional crossings or in-stream structures,	Hydrological Regime
Riparian buffer	Both	Connectivity maintained (no loss of natural habitat within CR and upstream)	Ecological connectivity
Patch size and connectivity	Both	Increase in mean size and connectivity of oak savanna habitat in good condition	Ecological connectivity
Forest interior conditions	Both	The area of forest habitat greater than 100 m from edge	Edge effects
Landscape context	Both	% of CR edge with natural vegetation cover is stable or increasing.	Edge effects

4.2.5 Ecological Stressors Targets

Disturbance to wildlife due to roads and recreational activities is an ecological stressor known to impact ecological integrity. Two targets are proposed based on a benchmark of no increase over current disturbance levels (Table 8).

Table 8. Proposed Wildlife Disturbance Targets for SWCR OP2

Target	Tract	Measure	Threat/Impact
Trail Density	Both	No increase in overall authorized trail density (m/ha)	Disturbance to wildlife and habitat
Areas with Low Disturbance to Wildlife	Both	~25% of area within each tract has no active use trails or roads within 100 m	Disturbance to wildlife and habitat

4.3 Ecosystem Management Strategies

Different management approaches are needed for the two distinct ecosystems at SWCR. Active management is needed to maintain and restore the disturbance-dependent Oak Savanna ecosystem. A passive management approach will be used for the Carolinian Forest ecosystem that allows natural processes to continue undisturbed, except in circumstances where the values for which the CR was established are threatened.

4.3.1 Oak Savanna Management Strategies

The Oak Savanna ecosystem areas at SWCR require ongoing active management to mitigate ecological stressors and restore and maintain ecological integrity.

Known ecological stressors affecting the Oak Savanna ecosystem at SWCR include:

- changes in vegetation structure, composition and processes due to fire suppression (canopy closure, increase in fire-sensitive species, decrease in oak regeneration, mesophication);
- presence of planted conifers including native species (white pine) and species not native to SWCR (other pines, spruce, larch, etc.);
- non-native invasive plants including herbaceous species (spotted knapweed, hoary alyssum) and woody species (e.g. autumn olive, multiflora rose, black locust);
- established and emerging non-native insects and diseases (e.g. gypsy moth, oak wilt);
- trampling, erosion and disturbance to wildlife associated with recreational activities.

Recovery of the Oak Savanna ecosystem will require ongoing management of vegetation structure (canopy thinning, brush control operations) and species composition (removal and/or control of planted trees, control of non-native invasive plants, control of problem native species such as red maple), as well as restoring or emulating key natural ecological processes (low complexity prescribed burns to emulate wildfire, soil scarification to emulate wind effects on open sand).

Prescribed burning will be used strategically to maintain and improve the habitat in Oak Savanna remnant areas that are currently in fair to good condition. Expanding and connecting these remnants is a priority over the next 10 years.

Sand barren areas may require site-specific habitat management such as vegetation removal or soil scarification. Conversely, revegetation may be needed in sand barren areas where excessive disturbance from recreational users has occurred.

Assisted seed dispersal or planting of savanna species may be appropriate, as part of a vegetation community or species recovery effort, to speed up re-colonization of restored habitat areas. Seed and plant material collection will occur only from appropriate sources and may be subject to permitting under the ESA (2007).

Vegetation management, including a combination of canopy thinning, brush control and invasive species management, is needed to restore the extensive Oak Savanna restoration areas affected by past conifer planting activities (Cultural and Planted vegetation types). Vegetation management operations are described in more detail in section 4.5.

Species-focused management strategies needed to protect and restore the Oak Savanna ecosystem at SWCR over the next 10 years include:

- monitoring and control of priority invasive plants areas (see Section 4.4.2);
- detection and monitoring of emerging insect and disease issues (see Section 4.4.3),
- species-based monitoring, threat mitigation and habitat stewardship for species at risk (see Section 4.4.1).

Oak savanna and sand barren restoration is a relatively new and rapidly evolving field of practice. The use of new restoration and maintenance techniques developed by other partners or jurisdictions may be considered for implementation in the SWCR as deemed appropriate by the SWCR DTAC.

4.3.2 Carolinian Forest Management Operations

In general, the Carolinian Forest ecosystem areas at SWCR require much less in the way of active management than the Oak Savanna ecosystem areas. This in part because many of these areas are already in relatively good condition. The ecological communities also more resilient as key ecological functions are relatively intact including the hydrological regime and landscape connectivity (although the connectivity of the Carolinian Forest area at ZNT is more as robust as at WTPT). Fire is not a critical ecological process for the Carolinian Forest ecosystem at SWCR. Loss of American Chestnut, American Elm and ash species has affected the composition of forest communities. but the structural impact of these losses has been relatively short lived as other native species rapidly fill in the canopy gaps. At current population levels, white-tailed deer and non-native earthworm populations do not appear to be having a significant impact on this ecosystem at SWCR.

Some of the known ecological stressors affecting the Carolinian Forest ecosystem at SWCR include:

- non-native invasive plants including herbaceous species (e.g., garlic mustard, common reed) and woody species (e.g. black alder, black locust),
- emerging non-native insects and diseases (e.g. beech bark disease, hemlock woolly adelgid),
- trampling, rutting and soil compaction and disturbance to wildlife associated with recreational activities, particularly in wetland and riparian areas,
- habitat fragmentation and edge effects affecting forest breeding birds
- water quality in Dedrick Creek (upstream agriculture and rural residential land use, temperature impact of the Nursery Pond) and Gibson Creek (fish culture station upstream).

The various species at risk associated with the Carolinian Forest ecosystem at SWCR face additional specific threats (e.g. road mortality of Eastern Fox Snake and Gray Ratsnake moving along the Dedrick Creek corridor)

Management operations to protect and restore the Carolinian Forest ecosystem at SWCR over the next 10 years will focus on the known ecological stressors include:

- monitoring and control of priority invasive plants (see Section 4.4.2),
- detection and monitoring of emerging insect and disease issues (see Section 4.4.3),
- species-based monitoring, threat mitigation and habitat stewardship for species at risk (see Section 4.4.1).
- monitoring long-term changes in forest structure and composition (update forest inventory every 10 to 20 years.

Vegetation management (canopy thinning, brush control operations) are not proposed for any of areas identified as Carolinian Forest ecosystem areas (Maps 4a/b) during OP2. However, forest management may be needed in the future to deal with disease issues or to promote the ecological restoration of particular management units (e.g. WTPT C-SOFR-A). Vegetation management in the Carolinian Forest area will be informed by Section 6 – Silvicultural Guidelines by Forest Cover Types, of 'A Silvicultural Guide to Managing Southern Ontario Forests'[12].

4.4 Species Management Strategies

In general, biodiversity at SWCR will be managed and conserved through ecosystem recovery and vegetation management activities that restore and conserve natural ecological communities and wildlife habitat rather than through species management strategies. Non-native species that are invasive, harmful or otherwise will pose a significant risk to ecosystem recovery may require active management. Wildlife needs will be considered during all management activities, including vegetation management and recreation management.

4.4.1 Species at Risk Stewardship Strategy

SWCR provides important habitat for more than 20 wildlife species at risk, including plants, insects, reptiles, amphibians, birds, and mammals. The number of species at risk at SWCR will likely increase over the next decade as status assessments are completed for the many other provincially and nationally rare plants and insects and other species of conservation concern that have been reported at SWCR.

Species at risk stewardship at SWCR is a major focus for SWCRCC and MNRF. The recovery of species at risk populations at SWCR will be advanced primarily through habitat protection and enhancement efforts, and threat mitigation strategies (e.g. recreation management, education, and support for enforcement action). Other

[12] Ontario Ministry of Natural Resources, Forest Management Section, *A Silvicultural Guide to Managing Southern Ontario Forests* (Ontario Ministry of Natural Resources, 2000).

activities identified in individual species recovery documents may also be implemented. MNRF approval is needed for species at risk research, monitoring and stewardship work.

Information on species at risk populations will be gathered and compiled annually to inform management priorities and actions. As described in section 4.2, certain species at risk populations have been identified as monitoring targets for this plan.

4.4.2 Invasive Alien Plant Management Strategies

Invasive non-native species can cause considerable harm to native species, disrupt natural ecological communities, alter ecosystem functions and interfere with ecological restoration efforts.

Invasive exotic plants can quickly occupy a forest site, restricting or excluding native flora and suppressing small trees and shrubs. Management efforts to date have focused on controlling woody invasive alien plants in conjunction with other vegetation management activities, controlling localized infestations of herbaceous invasives in priority habitats, and detecting and eradicating newly established occurrences of non-native herbaceous plants. The impacts of invasive species on SWCR will be monitored and assessed on an ongoing basis.

Invasive species management efforts at SWCR will target priority species based on ecological impact and ease of control. Detection and eradication of new and localized infestations of highly invasive species (e.g. Dog-strangling Vine) is a high priority.

Exotic woody invasive plant species that are being actively managed in SWCR include non-native trees that were planted at SWCR in the past and have become naturalized (Black Locust, European Black Alder, Hedge Maple, Norway Maple and Scots Pine) and non-native shrubs and vines (Autumn Olive, Multiflora Rose, exotic Bush Honeysuckles, and Oriental Bittersweet).

Non-native herbaceous plants that are being actively controlled wherever they occur at SWCR include Spotted Knapweed, Hoary False-Alyssum and Common Reed. Garlic Mustard and Greater Celadine are being targeted where they are localized but not where they are widespread. Localized infestations of exotic invasive ground cover plants (Periwinkle, Pachysandra, Yellow Archangel, Crown Vetch, English Ivy, Daylily) originating from garden waste dumping are priorities for eradication.

Invasive species will be managed using an adaptive management model, with science provided by Best Management Practices (BMPs). Management operations in SWCR may include those to eliminate invasive species, such as herbicide or pesticide application, mechanical removal, etc.

The impacts of invasive species on SWCR will be monitored and assessed on an ongoing basis.

4.4.3 Strategies for managing invasive alien insects and diseases

Invasive non-native species can cause considerable harm to native species, disrupt natural ecological communities, alter ecosystem functions and interfere with ecological restoration efforts.

Invasive species management efforts at SWCR will target priority species based on ecological impact and ease of control. Detection and eradication of new and localized infestations is a high priority. Many invasive species are inherently mobile and therefore difficult to manage at a site level. Broad-scale collaborative efforts are therefore often needed for effective control of invasive species.

Invasive alien wildlife monitoring and management efforts have focused on certain forest pests (Gypsy Moth). Information on the presence and abundance of other invasive invertebrate species that can have significant impacts on ecosystems (e.g., snails, slugs, earthworms, etc.) is not available for SWCR.

Non-native insects often do more damage than native insects because they have no natural predators or diseases here to limit the expansion and subsequent naturalization of their populations. Targeted control of non-native insects and diseases may be considered if likely to impact the SWCR management objectives, and if part of a broader control effort.

Past invaders that have altered the composition of the ecological communities at SWCR include chestnut blight, Dutch elm disease, butternut canker, and emerald ash borer. Invasive species and diseases that are present at SWCR and of ongoing management concern include dogwood anthracnose, European Gypsy moth, and white pine blister rust, and beech bark disease. Emerging concerns that may affect SWCR during the next decade include hemlock wooly adelgid and oak wilt.

Many invasive species are difficult to manage at a site level. Broad-scale collaborative efforts may be needed for effective control of invasive species.

4.4.4 Strategies for managing problematic native species

Some native species can become problems for ecosystem management in certain situations, particularly where natural processes have been disrupted, allowing populations to increase well above normal levels.

White-tailed Deer and Wild Turkey at SWCR are managed through recreational hunting. Current population levels do not appear to be causing significant ecological harm at this site. Impacts on species at risk (e.g., deer browse on plants, turkey predation of insects and snakes) will continue to be monitored.

Populations of native insects and diseases affecting vegetation within the SWCR may be allowed to develop undisturbed, pending impacts and management objectives.

Problematic native plant species (e.g., red maple or other species causing excessive shading and competition) may be controlled as part of the overall vegetation management strategy.

4.4.5 Fish and Game resource management strategy

SWCR has important fish and wildlife resources, including coldwater streams and actively harvested populations of deer, wild turkey and other game species.

Any wildlife and fisheries management strategies will follow guidelines as set out by MNRF for each species. Management strategies may need to be adapted to changes in habitat conditions or presence of new wildlife species.

4.4.6 Strategies for minimizing impact of vegetation management on wildlife

Vegetation management activities in SWCR will have regard for the protection and enhancement of wildlife species diversity and habitats.

The timing of management activities will be scheduled to minimize adverse impacts on wildlife. Tree marking for forest management will be done in accordance with Section 4.4 - Conservation of Wildlife Habitat of 'A Silvicultural Guide to Managing Southern Ontario Forests'[13].

4.4.7 Strategies for minimizing impact of recreation on wildlife

Recreational activities can have many direct (e.g., trampling) and indirect (e.g., disturbance of nesting birds, habitat degradation) impacts on wildlife.

Several strategies will be used to minimize the impact of trails on wildlife including:

- Trails will be situated in areas with lower wildlife values where possible
- Overall trail density will not be increased.
- Parts of the CR will be managed to provide wildlife with areas where they are a low risk of being disturbed by road or recreational traffic. Areas of the CR that are greater than 100 m from an active trail or road would be considered low disturbance areas. The working target is to have low wildlife disturbance levels in at least ~25% of the CR.
- Trails or sections of SWCR may be closed to accommodate sensitive areas and times for fish or wildlife. Closed trails will be signed accordingly.

Fish and wildlife recreational opportunities at SWCR are described in Recreational Opportunities section.

4.5 Vegetation Management Operations

Additional details about the procedures used to plan and implement the vegetation management operations used to restore the Oak Savanna ecosystem at SWCR are

[13] Ontario Ministry of Natural Resources, Forest Management Section, *A Silvicultural Guide to Managing Southern Ontario Forests* (Ontario Ministry of Natural Resources, 2000).

outlined in this section. Most of the vegetation management operations will occur in conifer plantations or cultural forests but some may include selective fuel wood or other cutting in hardwood stands as directed by the SWCR DTAC, with a specific goal to reduce tree density and/or canopy cover in ingrown communities and promote oak regeneration.

4.5.1 Canopy Thinning Operations

A major focus for vegetation management activities over the next 10 years will be to continue canopy thinning operations in plantations and cultural forests within the Oak Savanna restoration areas.

Management objectives for these forest management operations include:

- Removing planted trees and non-native trees to restore species composition in the canopy;
- Reduce basal area to reduce canopy closure and restore vegetation structure;
- Promote the regeneration and growth of the natural vegetation, particularly of oaks and other savanna associated species; and
- Protect and enhance habitat for species at risk (SAR).

Forest management operations must comply with MNRF Crown land procedures for forest management.

Standard operating procedures for forest management operations at SWCR include:

- Ecological survey to locate SAR and other sensitive features conducted 1 to 5 years prior to proposed harvest
- Mitigation measures (if needed) for SAR and other values approved by MNRF
- Forest management prescription prepared by qualified forester and approved by MNRF
- Certified tree marker selects and marks trees for removal
- Woody invasive species control prior to operation (as per management prescription)
- Red maple control before, during and/or after operation (as per management prescription)
- Marked timber offered for sale using a competitive bid process
- Operating window: 1 November and 30 March
- Additional restrictions placed on equipment, travel routes, etc. as needed.
- Qualified operator used to implement operation
- During the operation, site inspections are carried out daily (by MNRF or SWCRCC staff)
- Audits completed after marking and after harvest completed as needed
- Ongoing monitoring of response to management.

4.5.2 Brush Management Operations

Another major focus for vegetation management activities over the next 10 years will be brush control operations within the Oak Savanna ecosystem areas. Brush control options include mechanical control (cut, girdle) and chemical control methods (basal bark, drill-and-fill, stump treatments, foliar). Common brush management methods are described in Section 8 of 'A Silvicultural Guide to Managing Southern Ontario Forests'[14].

Mechanical control can create large volumes of slash. Slash management options include piling, chipping, removing, and burning (MNRF slash pile burn permit required).

Brush control operations will target ingrown oak woodland remnants and sand barren areas as the highest priority. Ingrown cultural oak woodlands and forests and some younger plantations with a significant oak or sand barren component will also be targeted. Brush control may also be carried out as needed to control regeneration following vegetation management, but due to resource constraints this will be done selectively, such as to maintain open habitat to protect significant values such as certain species at risk.

Management objectives for brush management operations include:

- Reducing the density of woody vegetation in the shrub, sapling and small pole size range in the target areas to increase light penetration, reduce competition and prepare the area for future prescribed burns.
- Control non-native woody vegetation, planted trees, and problem native species (white pine and red maple) to improve species composition
- Promote the regeneration and growth of the natural vegetation, particularly of oaks and other savanna associated species.
- Protect and enhance habitat for extant and extirpated species at risk (SAR).

Standard operating procedures for mechanical brush control operations include:

- Preferred operating window: 1 August to 15 May (outside main breeding bird season)
- Use trained, supervised volunteers where possible
- Manage slash and girdled trees to limit potential fire risk and hazard trees near trails.

Standard operating procedures for chemical brush control operations at SWCR include:

- Preferred operating window: 1 August to 15 May (outside main breeding bird season)
- Qualified pesticide operator used to apply chemicals.
- Plan operations to limit potential fire risk and hazard trees near trails.

[14] Ontario Ministry of Natural Resources, Forest Management Section, *A Silvicultural Guide to Managing Southern Ontario Forests* (Ontario Ministry of Natural Resources, 2000).

Prescribed burns and slash piles burns are subject to subject to provincial fire regulations and must conducted in accordance with an approved MNRF prescribed burn plans or slash pile burn plan, respectively.

4.5.3 Prescribed Burn Operations

Prescribed burns will be used selectively to control regeneration, remove leaf litter and maintain habitat in priority Oak Savanna areas that are in good to fair condition with adequate fine fuels and limited brush and woody invasive plants (see Maps 5a/b).

Standard operating procedures for prescribed burns at SWCR include:

- Preferred burn windows are early spring (1 March through 15 May) or late fall (1 October to 15 December) to minimize wildlife impacts and preferentially impact non-native vegetation
- Qualified insured burn boss and crew required.

4.6 Priority Areas for Protection and Ecosystem Restoration 2019-2028

4.6.1 Special Protection Areas

Certain areas of the CR are higher priorities for protection because they contain rare, threatened and/or other habitats and features that are of high ecological value and/or are particularly sensitive to disturbance or vulnerable to degradation.

These “Special Protection Areas” at SWCR include:

- The 34.3 ha of high priority oak savanna remnants identified in OP1;
- The 28 ha of sand barren habitats identified in OP1;
- The 32.9 ha of Provincially Significant Wetlands,
- Areas identified as of critical importance to the recovery of endangered and threatened species at risk.
- Forested ravines, bluffs, riparian corridors and associated coldwater stream systems.
- Other areas with highly significant vegetation communities, flora or fauna, and other significant wildlife habitat areas
- Areas that are in relatively good ecological condition (structure, composition and processes are largely intact)

A total of xxx ha, including xxx ha at ZNT and xxx ha at WTPT have been identified as Special Protection Area. These “Special Protection Areas” are shown on Maps 5a/b.

4.6.2 Vegetation Management and Ecological Restoration Areas

Vegetation management and other ecological restoration activities over the next 10 years will focus on managing, buffering, expanding and/or linking the most intact habitat remnants and other Special Protection Areas. Improving the condition of other areas at SWCR is a lower priority at this time but may be included in the OP2 operations

schedule based on logistical considerations and cost efficiencies. Management operations may also be carried out in the designated forest research areas in cooperation with the lead researchers where these operations advance both natural heritage and research objectives. Management may also occur in legacy plantations as required for plantation management needs.

Approximately 580 ha have been identified as priority areas for vegetation management over the next 10 years (Maps 5a/b). This total includes about 337 ha in 46 of 64 management units (sub-EMUs) at ZNT and 243 ha in 30 of 38 management units (sub-EMUs) at WTPT. The WTPT total includes potential vegetation management activities in approximately 55 ha of Forest Research Areas as WTPT.

A breakdown of the area proposed for each type of management operation (canopy thinning, brush control, prescribed burning) is provided in the implementation targets table (Table 3). Operations will overlap in some areas (see Maps 5a/b).

The actual areas covered will vary depending on ecological and logistical considerations. The scale and timing of operations is also dependent on resources and capacity considerations.

4.6.3 Ecological Surveys and Monitoring

Pre- and post-management surveys and monitoring are an integral part of this operations plan. The scope, scale and location of vegetation management operations is subject to change as new information becomes available, including through pre-management ecological surveys and post-management monitoring activities and new understanding.

5.0 Cultural Heritage Protection

5.1 Context

Recognizing the cultural significance of the SWCR as part of the first provincial forest station in Ontario is an important management objective, as is protecting any archaeological artifacts and sites that may be found within the conservation reserve.

5.2 Cultural Heritage Targets, 2019-2028

Over the next 10 years the MNRF and SWCRCC will continue to work with partners to further document, recognize and celebrate the cultural significance of the St. Williams Forestry Station.

Targets for the cultural heritage protection objective include:

- Continue to assist and support the efforts of the Port Rowan/ South Walsingham Heritage Association (PRSWHA) in operating the St Williams Forestry Station Interpretive Centre and documenting the history of the CR lands.
- Reference the two tracts as the Zavitz Nursery Tract (ZNT) and White Turkey Point Tract (WTPT) in all publications and communications.
- By 2023, develop a long-term management strategy for the legacy representative plantations.
- By 2028, add the original White Pine plantation to the CR and/or recognize its historical significance through a heritage designation.
- Continue to communicate and cooperate with the researchers involved in the legacy forest research plots.
- Work with partners to develop interpretive materials for the cultural heritage features at SWCR.

5.3 Land Use History

Most of the lands that comprise SWCR were acquired by the province between 1908 and 1947 to establish the St. Williams Provincial Forest Station. At the time these lands were acquired by the province they were considered “wastelands” that had been abandoned by their previous owners as they were not viable farms due to the erosion-prone, droughty, infertile sandy soils present. The 81 ha (200 acre) Manestar Tract within the Zavitz Nursery Tract was acquired by the province in 1992 specifically to protect the rare species and ecological communities present.

Traces of past habitation and land use are present in the conservation reserve, including some vestiges of occupancy and use of these lands by First Nations people for thousands of years prior to European settlement and the footprints of old sawmills and homesteads dating from the 18th century.

The current vegetation of the SWCR is strongly influenced by tree planting and forest management activities carried out when the provincial forestry station was operating.

5.4 Cultural Heritage Features and Opportunities

5.4.1 St. Williams Provincial Forest Station

The St. Williams Forest Station was established by the Province in 1908 as the first forestry station in Canada. The St. Williams Forest Station served many purposes over its 90-year operating history including: to provide tree seedlings for distribution throughout Ontario, to demonstrate the feasibility of reclaiming lands by afforestation, and to experiment with various tree species in relation to this work. The forest station was a major employer in this area and a showcase of conservation practices for visitors from near and far. The history of the St. Williams Forestry Station is documented in a book by Harry Barrett[15].

The Port Rowan/South Walsingham Heritage Association (PRSWHA) operates the "Canada's First Forestry Station Interpretive Centre" (Interpretive Centre) (http://www.canadasfirstforestry.org/). Opened in 2005, the Interpretive Centre does an excellent job of documenting the history of the St. Williams Forest Station. The Interpretive Centre is in a former forestry station building located at 885 Norfolk Highway 24, on the privately leased Crown lands adjacent to the SWCR (Map 2a). This building is made available to the PRSWHA through the generosity of the lease holders, the St. Williams Nursery and Ecology Centre.

The MNRF and SWCRCC will continue to cooperate with the efforts of the PRSWHA to document and communicate the history of the St. Williams Forestry Station, including the lands now included in the CR.

5.4.2 Recognition of Significant Individuals

The SWCR provides opportunities to recognize individuals who made significant contributions to the development and operation of the St. Williams Forest Station in the 20th century.

In 2011, the PRSWHA proposed that the Nursery Tract be recognized as "The Dr. Edmund J. Zavitz Forest" and that the Turkey Point Tract as the "J.H. White Forest", a designation that was initially assigned in 1949[16]. Zavitz was instrumental in the establishment of the Forest Station in 1908. White initiated the tree planting research trials at near Turkey Point. Commemorative plaques recognizing these individuals were installed on cairns on Crown lands adjacent to the CR (Map x). The names of the two tracts used in this Operations Plan have been updated to recognize these designations, while providing continuity with the names used in Management Plan.

[15] Barrett, H.B., 2008. They Had A Dream: a history of the St. Williams Forestry Station. Port Rowan/South Walsingham Heritage Association. 191 pp.
[16] Anonymous 2011. Commemorating two forest pioneers in Ontario. Forestry Chronicle 87(1):12.

5.4.3 Legacy Plantations

SWCR is a living record of the practices of environmental conservation and soil stabilization dating back to 1908. Through much of the 20th century, thousands of conifer seedlings were planted at SWCR to stabilize the sandy, windblown soil and create productive plantations. Many of these conifer plantations still exist. At the Zavitz Nursery Tract, conifers were often planted directly into open oak savanna habitats or other "understocked" woodlands, resulting in culturally-modified forests with features that are intermediate between a plantation and a naturally occurring ecological community.

Over time, most of the extensive plantations and cultural forests at SWCR will be actively managed to restore natural ecological communities (see Natural Heritage section). Some of the conifer plantations at SWCR, referred to herein as "Legacy Plantations", are being retained to provide opportunities for research, education and demonstration.

The Legacy Plantations identified in this plan (Maps 4a/b) cover about 10% of the total area of the SWCR and include four Legacy Demonstration Plantations (LDP) as described below, and Legacy Research Plantations (LRP) that are part of active forest research projects as described in section 5.4.4

Additional or alternative examples of legacy plantations may be identified and evaluated over the next 10 years. Factors to be considered in assessing which conifer plantations to retain as legacy plantations include:

- Suitability for interpretation (accessibility, proximity to parking and trails);
- Suitability of research purposes (size, uniformity, etc.)
- Heritage value (historical significance)
- Current condition of the plantation (age, stocking, tree health, presence of invasive plants, presence of species at risk, etc.);
- Impact on ecological restoration activities (proximity to high priority restoration areas).

Consideration will also be given to identifying legacy trees or groups of trees for retention. These trees could be planted or of natural origin. Criteria for these "legacy trees" or "heritage trees" would be similar to those for the legacy plantations.

Legacy Demonstration Plantations
In the 2009-2018 Operations Plan (OP1), four small pine plantations with a total area of 8.4 ha were identified as "Representative Plantations" that were selected to reflect the rich history of planting conifers over the 90-year history of the St. Williams Forest Station. These four stands will continue to be recognized as "Legacy Demonstration Plantations" (Table 9).

Table 9. Legacy Demonstration Plantations (LDP) at SWCR.

Map #	Tract	EMU	Stand ID	Area (ha)	Species	Year Planted
LDP#1	Crown Land	n/a	508-4	2.5	White Pine	1910
LDP#2	ZNT	W-5-24a	454-3	1.3	White Pine	1930
LDP#3	WTPT	C-1-12-E	822	2.5	Red Pine	1940
LDP#4	WTPT	C-SOFR D	894	1.3	White Pine	1946

Plantation 1 is a white pine plantation at ZNT that was planted in 1910. It is the oldest plantation at the forest station. This plantation is situated on Crown Land that is not part of the CR but is nonetheless included herein due to its historical significance. In 2018, the PRSWHA and SWCRCC requested that MNRF Aylmer District investigate the feasibility of adding this area to the CR.

Plantation 2 is a white pine plantation at ZNT that was thinned in 2017-18. Plantation 3 is a red pine plantation at WTPT that was thinned in 2012-13. Plantation 4 is a white pine plantation at WTPT that is a priority for a standard conifer plantation thinning within the next 10 years (see vegetation management mapping).

The OP1 document did not provide guidelines on how the Representative Plantations were to be protected or managed over the short- or long-term. Standard silviculture prescriptions were used in the two plantations that were thinned during the OP1 period.

Over the next 10 years, appropriate management strategies or guidelines for each of the Legacy Demonstration Plantations will be developed and implemented. Strategies could include:

- Managing to retain suitable examples of the planted trees on the landscape as long as possible;
- Developing suitable interpretive materials (signage, trail guide, etc.) for visitors; and
- Not compromising the overall ecological restoration goal of the SWCR (e.g., control invasive species in the legacy plantations so don't spread into adjacent areas).

Candidates for Legacy Plantations (PLP)
Some additional plantations that could be evaluated as potential legacy plantations are indicated as "PLP" on Maps 4a/b. Suitability for interpretation was the main factor used to identify these as candidates.

5.4.4 Legacy Forest Research Areas

The SWCR White Turkey Point Tract includes many experimental conifer plantations that are a legacy of the long history of forestry research at the St. Williams Forest Station by past and current MNRF staff. Forest research projects often span many decades and projects started in the 1960s are still in progress. Some of the research plantings are unique collections representing various conifer species, trees from different geographic areas, or special traits or genetics.

Seven areas at the White Turkey Point Tract covering about 94 hectares in total have been identified as Legacy Forest Research Areas because the encompass Legacy Research Plantations (Map 4b). The total extent of the actual Legacy Research Plantations is less than 94 hectares as parts of some of the Forest Research Areas (Areas 5, 6 and 7) are not plantations or not currently used for research.

Information on the active forest research projects (as of 2018), including contact information for the current lead investigator is summarized in Appendix C. Many of these projects are collaborative efforts involving multiple researchers.

Management needs of these plantations over the next 10 years will be determined by the lead researchers, in consultation with MNRF Aylmer. The SWCRCC may assist with implementation of the management actions.

Some of these Legacy Research Plantations may be retained indefinitely as they represent important genetic archives. Other research areas may become available for ecological restoration once the current research project ends. All legacy research projects will be reviewed at five-year intervals (2023 and 2028) to ascertain if they are still active.

The forest legacy research areas also provide an opportunity to highlight the work of past MNRF forest research scientists. In 2016, two interpretive signs were installed at the Picetum research area (map reference R6). These signs recognize the work of Dr. Al Gordon, the retired MNRF forest research scientist who assembled this collection of spruce genetic material from around the world[17]. The SWCRCC Picetum Committee will continue to work with MNRF to protect the Picetum, and to recognize the work of Dr. Al Gordon through interpretive signage and trails.

5.4.5 Other Cultural Heritage Features

Other sites of cultural significance may be identified at SWCR. In general, any archaeological artifacts will be left *in situ*. Culturally significant sites and artifacts will be protected through appropriate land management, education and enforcement.

[17] Sonnenberg, M. 2016. Forester's legacy celebrated. Simcoe Reformer, August 4, 2016.

6.0 Recreational Opportunities

6.1 Context

A secondary management objective of SWCR is to provide day-use recreational opportunities and permit traditional public lands uses, provided that these activities are consistent with the *Parks and Conservation Reserves Act* (PPCRA) and the SWCR Management Plan, and are compatible with the primary management objective of SWCR (i.e. natural heritage protection and restoration).

As part of the public consultations for the development of the OP2, the SWCRCC and MNRF conducted an online survey of SWCR recreational users in fall 2017 (Hickey 2018a, 2018b). A summary of the survey results was produced and posted on the SWCRCC website (http://swcr.ca/documents/2018/05/1792.pdf/).

These consultations confirmed that the level of interest in recreational opportunities is very high and that the CR is used regularly by many and diverse recreational users. Current trail density and the impact of unauthorized recreational activities were identified as significant concerns by MNRF, SWCRCC and many stakeholders. At the same time, recreational user groups frequently request that additional trails be authorized for motorized use or for mountain biking.

Recreational demand exceeds the carrying capacity of the SWCR. Finding a balance amongst different uses and activities while protecting and restoring the ecological integrity of the SWCR is an ongoing challenge.

6.2 Recreation Targets, 2019-2028

Over the next 10-year period, the intention is to continue to provide a diversity of compatible recreational opportunities at SWCR while reducing the impact of recreational activities on natural heritage values.

Targets for the recreational opportunities objective include:

- Provide a functional network of authorized shared-use trails to enable responsible users to continue to safely ride horses, bicycles or recreational motorized vehicles under 300 kg without causing harm to the natural heritage values of the SWCR.
- No increase in the overall density of the authorized trail network (total of ~38.6 km of authorized trails, ~33 m/ha at ZNT and ~45 m/ha at WTPT).
- Provide at least one marked pedestrian route trail at each tract.
- Maintain adequate on-site signage to enable effective enforcement (no charges dropped due to inadequate signage) and an enjoyable user experience (fewer than five user complaints to MNRF and/or SWCRCC per year).
- Adequate information on recreational opportunities and restrictions, including the SWCR user code of conduct and authorized trail maps, is available to potential users in suitable formats (signage, print material, website, etc.).

- Adequate monitoring of trail compliance and the impact of recreational activities on natural heritage values to enable timely action to prevent significant damage (will require developing and implementing a trail monitoring protocol).
- Maintain high level of recreational user satisfaction with their experience (79% of respondents to online survey of recreational users in 2017 indicated their experience was good or great).
- No serious preventable accidents on authorized trail network.
- Achieve satisfactory compliance with regulations and restrictions by all recreational users to minimize harm (unauthorized trails are not used and become revegetated, monitoring indicates non-compliance within acceptable target).
- MNRF review and timely response (within 90-days) to trail change requests received as of 31 December 2023, and December 2027.

6.3 Permitted Recreational Activities and Events

6.3.1 Regulatory Framework

Activities in the conservation reserve are regulated under the *Provincial Parks and Conservation Reserves Act 2006 (PPCRA),* the *Conservation Reserves Regulation 319/07*, and other legislation. The MNRF Aylmer District Manager has authority to open and close trails and roads and to authorize, prohibit or restrict recreational activities in SWCR. Section 5.1 of the SWCR Management Plan (2005) outlines permitted and prohibited activities in the CR.

A partial list of permitted, restricted and prohibited activities in the CR is presented below and in Table 10. A compilation of frequently asked questions (FAQ) about recreational activities at SWCR is available on the www.swcr.ca website.

6.3.2 Permitted Activities

Passive recreational activities such as walking, hiking, cross-country skiing and nature viewing are permitted throughout the SWCR. Hunting and fishing are also permitted subject to some restrictions (see Section 6.7.1 for additional details).

6.3.3 Restricted Activities and Events

Mountain biking, horseback riding, and use of motorized vehicles under 300 kg are restricted activities that are allowed on authorized trails only (see section 6.5 below).

Group events (20 or more people involved in an organized activity) may be permitted but require advance MNRF approval (see section 6.6 below).

6.3.4 Prohibited Activities

Prohibited recreational activities identified in Section 5.1.2 of the SWCR Management Plan include:

- use of motorized vehicles over 300 kg, with the exception of authorized maintenance vehicles,
- overnight camping,

- open fires,
- construction of new private access roads, and
- collection of flora or fauna or parts thereof except where specifically authorized by MNRF.

6.3.5 Other Activities

The acceptability of recreational activities not specifically mentioned in the *PPCRA*, CR Regulation 319/07, SWCR Management Plan, or this document is determined by MNRF on a case by case basis.

6.3.6 Code of Conduct for SWCR Users

All recreational activities and trail use shall be in accordance with the 'Code of Conduct for SWCR Users' (Appendix D). This Code of Conduct outlines general rules of use and etiquette that apply to all users, as well as specific rules for each type of SWCR user. All users and user groups are expected to promote awareness and encourage compliance with the Code of Conduct to reduce the impact of recreational activities on the environment and minimize potential conflicts between various uses.

6.4 Access and Facilities

6.4.1 Site Access

Several municipal roads provide access to SWCR (Maps 1a and 1b). Two of these municipal roads, the 6th Concession Road at ZNT and Gibson Road at WTPT are unmaintained roads that are not plowed in winter. Access to the SWCR is not permitted through the privately-leased Crown Lands to the south of the ZNT except by pedestrians using the Forest Capital Trail (see Section 6.5.2).

Some recreational trails at SWCR connect with trails on adjacent public, leased, and private lands. Signage informing users that they are entering the SWCR has been installed at recognized trail entry points on the two pedestrian routes (see Section 6.5.2).

Additional boundary marker signs may be installed at other regularly used access points and/or to identify the edges of the CR.

There are no required user fees for accessing the conservation reserve or using the trails.

6.4.2 Visitor Parking

One designated visitor parking area with a civic numbering sign has been established at each tract: 1665 6th Concession Road at ZNT, and 849 Charlotteville Road 1 at WTPT (Maps 2a and 2b). At ZNT, a former graveled parking area off Norfolk Highway 24 West by the dam on Dedrick Creek continues to get some use. At WTPT, an informal parking area on the northeast corner of Charlotteville Road 1 and Turkey Point Road is used regularly by recreational visitors accessing the trails at SWCR and adjacent properties. None of these parking areas is regularly maintained.

As of 2018, parking is also allowed along the municipal road verges adjacent to the SWCR lands. Signage or barriers may be installed as needed to prevent roadside parking from encroaching onto the CR lands.

6.4.3 Management Access Roads

No new road development will take place within the SWCR (MNRF 2005). The network of management access roads that existed prior to the regulation of this CR has been rationalized. A total of xx km of management access roads within SWCR are being retained for use by authorized vehicles for management, enforcement and emergency access purposes only. Former access roads that are no longer needed will be closed and allowed to revegetate. Management access roads may be used by pedestrians, but not by other recreational users unless otherwise posted.

6.4.4 Gates and Barriers

Locked gates have been installed on several management access roads and parking areas to control access and prevent unauthorized use (Maps 6a and 7b). Fencing, posts, and other barriers have been installed to prevent or limit access at some locations. Additional gates and barriers will be installed as needed.

6.4.5 Facilities

There are no existing facilities in the conservation reserve and no plans to develop any facilities.

6.4.6 Emergency Access Information

To facilitate Emergency Service response, MNRF will produce and maintain a map for each tract showing the locations of open and closed access roads, active and closed trails, gates and other barriers (and who has keys). 911 signs will be posted at all authorized parking areas. Updated maps and contact information for MNRF staff will be distributed to Norfolk EMS annually (in April).

6.5 Recreational Trails

The present network of authorized recreational trails at SWCR is identified in Maps 6a and 6b and described in section 6.5.1. Marked pedestrian routes have also been identified at each tract (see section 6.5.2, maps available on www.swcr.ca website), although pedestrians can also travel throughout the CR, on or off the trail network.

The authorized recreational trails are colour-coded, with the same colour being used to delineate the routes on the trail maps and on trail directional arrows installed at trail head and junction points. The uses permitted on each of these colour-coded trails are outlined below, in Table 10, and/or on the trail signs and maps.

Regular trail maintenance to minimum standards is not carried out by MNRF or SWCRCC. From time to time, SWCRCC may coordinate trail brushing and clearing activities using contractors and/or volunteer work parties. Trail maintenance may also be carried out by user groups with MNRF approval (see Section 6.5.4)

All trails at the SWCR are unmaintained recreational trails that visitors use at own risk.

Posted signs and trail maps will be updated in 2019 and as needed. Information on the posted signs takes precedence over this document.

6.5.1 Authorized Shared-Use Trails

Specific trails have been identified where restricted recreational activities, such as riding horses, bicycles, ATVs or dirt-bikes are permitted. All authorized trails are open to the public and shared by different types of users. No trails are restricted to a specific use or user group.

These shared-use trails are colour-coded to indicate which uses are permitted.

- ***Yellow (Multi-Use) Trails*** – ~16 km of trails designated by yellow arrows are authorized for multiple uses including riding motorized vehicles, bicycles, and horses, as well as walking and other passive uses. The Yellow Trails are the **only** trail type at SWCR on which motorized recreational vehicles (GVW under 300 kg only) are permitted at either tract. A section of the Yellow (Multi-use) Trail traversing part of the western boundary of the ZNT is part of a snowmobile trail network managed by the Southern Snoriders.
- ***Blue (Mountain Bike) Trails*** – ~9 km of shared use trails at WTPT have been authorized for use by bicycles (non-motorized only) as well as passive users. The WTPT Blue Trails are part of an extensive network of trails maintained by the Turkey Point Mountain Bike Club (TPMBC). Standard blue directional arrows have not been installed on the Blue Trails as the TPMBC has installed adequate directional signage for mountain bike users.
- ***Red (Equestrian) Trails*** – ~12 km of shared use trails designated by red arrows at ZNT may be used by horse riders and passive users. Motorized vehicles and bicycles are not permitted on the Red Trails. The Red Trails are marked by red lines on the map and red directional arrows.

6.5.2 Pedestrian Activities

Pedestrian recreational activities (walking, running, cross-country skiing, and snow-shoeing) are permitted on all authorized trails and throughout the SWCR lands.

Two marked pedestrian routes have been identified to make it easier for pedestrian users not familiar with the conservation reserve trails to find their way. The 2.2 km *Forest Capital Trail* pedestrian route at the ZNT was created in cooperation with the Port Rowan South Walsingham Heritage Association (PRSWHA) as a legacy to Norfolk County's designation as the Forest Capital of Canada in 2008 and 2009. The *Turkey Point Bluffs* pedestrian route at the WTPT connects with walking trails on the adjacent Long Point Eco-Adventures (LPEA) and Burning Kiln Winery properties. The *Turkey Point* Bluffs route consists of three loops (1.3, 2.0 and 2.0 km respectively) that are entirely on the SWCR, and a fourth 3.5 km loop trail that is partly in the CR.

These pedestrian routes are marked with **neon orange arrows.** Some interpretive signs have also been installed along both pedestrian routes. These routes overlap with other shared use trails. Maps of the pedestrian routes and additional information is available on the www.swcr.ca website.

6.5.3 Trail Maps and Signage

Information on the designated trails, permitted uses and the user code of conduct is available to visitors through various media including signboards located in the designated parking area at each tract and at other key locations in the conservation reserve (see Map Xa, Xa) and on the SWCR website (www.swcr.ca).

A printed trail brochure produced by the SWCRCC is also available at local businesses and information centres. The TPMBC and LPEA also have printed brochures which include some of the trails within the SWCR.

The junctions of the authorized trails are signed using colour-coded directional arrows on steel posts. Signs with symbols indicating permitted uses are posted at the trailheads.

"*Pedestrian Access Only*" signage has been installed at the entry points to many former trails and access roads at SWCR to indicate these routes are closed except for passive use. The Pedestrian Access Only signs will be removed when no longer needed for compliance purposes (e.g. once vegetation obscures closed trail).

"*Authorized Vehicles Only*" signs are posted on management access roads that are not part of the shared use trail system.

Additional signage indicating prohibited activities is situated throughout the SWCR (see Educational Awareness section).

6.5.4 Trails Agreements

MNRF Aylmer District may enter into agreements with user group organizations to assist in the management and maintenance of the SWCR trail system.

The Blue (mountain bike) trail network at WTPT is maintained by the TPMBC under a Memorandum of Understanding (10-year MOU dated 1 September 2011). Use of the Blue Trails is not restricted to TPMBC members.

MNRF is not currently pursing any additional agreements with specific trail user group organizations.

6.5.5 Trail and Area Closures

The Crown reserves the right to discontinue any and all trail use. Trail use that contravenes the regulations in this Operations Plan is likely to result in trail closure, restricted use, and/or personal penalties (i.e. fine and/or charges). Trail restrictions, up

to and including loss of trail privileges, may be placed on specific trail user groups if they are found to be incompatible with the natural heritage and cultural values of SWCR.

Trails or areas may be closed temporarily for habitat restoration activities or other management needs. Information on these closures is posted onsite and on the SWCR website. MNRF or SWCRCC may place trail barriers accompanied by a sign to signify a trail's closure. Visitors are required to obey trail barriers and area closures, as it is likely that hazards to human or wildlife health exist on a closed trail.

6.5.6 Changes to the Trail Network

In general, substantial changes to the trail network will be made only as part of a general review of all activities when each 10-year Operations Plan is being updated. MNRF will also review any trail changes proposals submitted by user groups or individuals as of the mid-point of this 10-year Operations Plan. Minor adjustments to the trail network may be considered and implemented at other times.

A Trail Change Application form and additional information is available on the SWCR website (http://swcr.ca/library/Trail%20change%20application%20form.pdf). The next deadlines for trail change applications are:

- 31 December 2023 (for implementation in 2025); and
- 31 December 2027 (for implementation in 2029-2038 Operations Plan).

Any changes to the recreational trail network at SWCR should align with the following guidelines:

- The number and density of trails should be kept to a minimum to preserve natural heritage features and ecological integrity of the CR;
- Trails should avoid disturbance to sensitive habitats and features;
- Trails should be designed to minimize erosion and soil compaction;
- Trails should make use of existing management access routes when feasible; and
- Trails should be designed to connect with other trail networks where possible, and/or form loops appropriate to the designated uses.

The trail network shown on Maps 6a and 6b includes several adjustments but no substantial additions to the authorized recreational trail network.

Over the next 10 years, no new trail development will take place in SWCR and the overall trail density will not be increased. Trails may be modified to connect with other public trails on adjacent properties to better facilitate a trail network at the landscape level. Recreational use on some of the existing management access roads may be considered (e.g., if a currently authorized trail is closed).

Any changes to the trail network will be subject to an Environmental Assessment (EA) screening and may require collection of new data on natural heritage features.

6.6 Special Events and Group Activities

Prior approval from MNRF is required for any organized group event where more than 20 participants are anticipated. Events may be free or advertised events with entry fees.

Completed Event Applications should be submitted to the MNRF Aylmer District Area Supervisor at least 6 months in advance of the event. An Event Application form is available on the SWCR website (http://swcr.ca/documents/2016/06/event-application.pdf).

Events may be approved only if impacts on natural heritage values and other users are minimal. Approvals may include limitations on which areas or routes may be used, the number of participants and other restrictions.

6.7 Hunting, Fishing, Foraging and Trapping

6.7.1 Hunting and Fishing

Hunting and fishing are permitted in SWCR, subject to provincial and federal policy and legislation, the 'Code of Conduct for SWCR Users' and posted signage. Hunting is not permitted in the signed No Hunting buffer zone at ZNT adjacent to the privately leased Crown lands (Map 6a). Fishing is not permitted along the south shore of the pond or from the MNRF dam on the pond at ZNT. Hunting and fishing are not permitted on the privately leased Crown lands.

From time to time, areas of SWCR may be closed to hunting and/or fishing in response to safety, habitat, or species concerns. Notification of closures will be posted on site.

6.7.2 Foraging and Wild Food Gathering

Harvest of edible fruit, plants and mushrooms for personal consumption only is permitted, except for protected species. All other collecting activities are not permitted. Collecting for scientific purposes requires a research permit (see Research Section).

6.7.3 Trapping

Trapping by individuals licensed by MNRF is permitted in SWCR. Recreational trapping is not permitted in the signed No Hunting buffer area north of the leased Crown lands, or on the privately leased Crown lands.

Table 10. Summary of Permitted, Restricted and Prohibited Recreational Activities

Recreational Activity	**Zavitz Nursery Tract**			**White Turkey Point Tract**		
	Off-trail	Red Trail (~12.7 km)	Yellow Trail (~9.1 km)	Off-trail	Blue Trail (~ 9.3 km)	Yellow Trail (~ 7.5 km)
Walking/Running	●	●	●	●	●	●
Dog Walking	●	●	●	●	●	●
Birdwatching/ Nature Appreciation	●	●	●	●	●	●
Snowshoeing	●	●	●	●	●	●
Cross Country Skiing	●	●	●	●	●	●
Hunting*	●**	●	●	●	●	●
Fishing*	●***			●		
Berry picking and mushroom gathering	●	●	●	●	●	●
Bicycling (no e-bikes)			●		●	●
Equestrian Riding		●	●			●
Motorized use – Dirt bikes under 300 kg GVW+			●			●
Motorized use – ATVs/Quads under 300 kg GVW+			●			●
Motorized use – Snowmobiles under 300 kg GVW+			●			●
Side-by-side UTVs	Not Permitted (over 300 kg GVW)					
Off-road vehicles	Not Permitted (over 300 kg GVW)					
Recreational Drones	Not Permitted					
Skeet Shooting/ Target Shooting	Not Permitted					
Camping	Not Permitted					

*Hunting and fishing subject to provincial and federal legislation and regulations.
** No hunting in posted area surrounding leased lands at ZTN (see Map).
*** No fishing from dam of from south shore of Nursery Pond at ZNT. Fishing is permitted only in Dedrick Creek and from the north shore of the Nursery Pond.
+ All motorized vehicles must be licenced and insured with stock mufflers, spark arresters and have a GVW under 300 kg.

7.0 Educational Awareness

7.1 Context

Increasing public awareness and appreciation of the significance, history, ecology, features, complexity, sensitivity and beauty of SWCR is important to the overall protection of the conservation reserve.

Many of the educational initiatives led by MNRF during the first Operations Plan period targeted recreational users to increase awareness of the trail closures and other changes resulting from the establishment of this new conservation reserve. The SWCRCC's educational efforts focussed on informing the local community about the CR, its importance as habitat for many Species at Risk (SAR), and the role of the Community Council. The Port Rowan/South Walsingham Heritage Association (PRSWHA) also developed and delivered educational programming about the history of the Forestry Station lands for school groups and visitors at the Interpretive Centre facility (see also Cultural Heritage section).

The public recreational stakeholder survey conducted in 2017 indicated that the educational awareness objective for SWCR was of low importance to recreational users relative to the natural heritage restoration and recreational opportunities objectives (Hickey 2018a). However, recreational stakeholder groups identified education about the SWCR and improved communications as key strategies for the ongoing challenge of improving compliance with the User Code of Conduct. Other themes related to the educational awareness objective identified in these consultations included increasing appreciation for the SWCR and natural areas in general, increasing awareness of the SWCRCC in the local community, improved communications with neighbouring landowners, and increased information sharing with other conservation land managers.

7.2 Educational Awareness Targets

Targets for the educational awareness objective throughout the next 10 years include:

- Property boundaries, permitted uses, restrictions and trails are adequately signed for user information and enforcement purposes.
- Recreational users understand and respect the permitted, restricted and prohibited activities and the code of conduct (metrics: higher compliance, fewer infractions, fewer complaints).
- Current interpretive materials highlighting the natural and cultural heritage features at SWCR are readily available in a variety of formats.
- The efforts of the PRSWHA to operate the St Williams Forestry Station Interpretive Centre and communicate the history of the SWCR are maintained and supported.
- The number of people (in the target audiences) reached through print material, website, social media and other means is maintained or increased annually.
- Future surveys show increased awareness and appreciation of the significance of the SWCR compared to 2017 levels.

7.3 Educational Awareness Activities

Over the next 10 years the SWCRCC will continue to work with DTAC, PRSWHA, and other local organizations and partners to develop and deliver educational and interpretive materials and programs aimed primarily at protecting and managing the natural heritage values of the CR. Existing educational and interpretive resources and programs will be maintained or improved.

Recreational users and the local community will continue to be the primary target audiences. On-site signage and online resources will be the primary communication tools, supplemented with events, presentations, social media and print materials.

Increasing awareness and promoting compliance with the permitted, restricted and prohibited recreational uses is an ongoing educational need. Building the capacity of the Community Council, its volunteers, and staff to both act as stewards of the CR and to inform the community and users about the significance and sensitivity of the SWCR is another important need. Communicating the rationale for the restoration of oak savanna and sand barren ecological communities may be an emerging need over the next decade as forest cover decreases and the use of fire as a management tool increases.

The focus of the educational activities and the choice of communications tools will need to adapt and evolve to address changing needs and new opportunities. Existing educational and interpretive resources will be reviewed for relevance and accuracy and, if appropriate, adapted for use in the next 10-year context.

7.3.1 Signage

All signage posted at SWCR requires approval from MNRF. Signs will be monitored regularly for vandalism and replaced as needed.

Existing informational, advisory and interpretive signage at SWCR will be maintained or updated as needed, including:

- Property Identification signage:

The existing property identification signs will be replaced with a combination of property identification signs at highly visible locations, property boundary signs on roads and transboundary trails, and trailhead information signs at the parking lot areas and other key access points.

- Restricted/prohibited activities signage:

All existing signage regarding restricted/prohibited activities will be inventoried in 2018 and re-assessed every 5 years (2023, 2028) including:

  - No unauthorized motorized vehicle signs;
  - Pedestrian access only signs'
  - Species at Risk habitat protection signs.
  - Signage around the no hunting buffer at ZNT; and

Additional signage may be installed around sensitive habitats (e.g., the provincially significant wetland) to increase compliance with restrictions on recreational activities.

- Trail signage:
  - Trail maps and information on permitted uses and restrictions will be posted on the property identification signs situated at the designated parking areas.
  - All trails will be signed as "Use at Own Risk".
  - The authorized trail network will continue to be identified with consistent trailhead signage indicating permitted uses, and trail markers for navigation purposes (see Recreational Opportunities section).

- Interpretive signage:
  - The existing interpretive signage and panels will be maintained.
  - Additional interpretive signage may be developed and installed as needed (e.g. informing users of the cultural history, goals of the ecological restoration operations, etc.).

7.3.2 SWCR Website

The SWCRCC will continue to maintain a comprehensive website with information about SWCR (www.swcr.ca).

Key information on the SWCR website (as of 2018) that will be maintained and updated as needed includes:

- the SWCR management and 2009-2018 operations plans,
- contact information for the MNRF Aylmer District (phone, mailing address),
- contact information for reporting infractions (MNRF TIPS line, CrimeStoppers),
- contact information for SWCRCC (info@swcr.ca, mailing address, social media links),
- the Code of Conduct for SWCR users,
- maps of the current authorized trail network
- the Special Event application form,
- a link to the Ontario Parks Research Permit application form,
- information about the SWCRCC.

Information that will be added to the website by 2020 includes:

- the 2019-2028 SWCR operations plan,
- maps of the signed pedestrian routes, and
- a Frequently Asked Questions (FAQ) page.

7.3.3 SWCRCC social media

The SWCRCC will continue to use social media to inform the public about the conservation reserve. The SWCRCC hosts a Facebook page (@SWCRCC, 639

followers as of May 2018) and a Twitter account (SWCR@SWCRCC, 765 followers May 2018) with information and news about the SWCR and upcoming events.

7.3.4 Print Material

The SWCRCC will continue to produce and distribute various print material including:

- General brochure about SWCR and SWCRCC (last updated in 2010).
- SWCR trails brochure that features the authorized trails network and the SWCR Users Code of Conduct (last updated 2017).

SWCR trail brochures are available at local information centres, libraries, government offices, and local businesses catering to SWCR users.

7.3.5 Forestry Station Interpretive Centre

MNRF and SWCRCC will continue to support and cooperate with the efforts of the Port Rowan/ South Walsingham Heritage Association (PRSWHA) to operate the Canada's First Forestry Station Interpretive Centre (see Cultural Heritage section). The Interpretive Centre programming does an excellent job of educating visitors about the history of the forest station. There is a wealth of interpretive material available at the Centre, including information on SWCR such as the trails brochure.

7.3.6 Events and Tours

As part of its ongoing community engagement strategy, the SWCRCC will endeavour to participate in local community events (e.g. booth at the Norfolk Woodlot Owner's Association annual conference and the PRSWHA Forest Fest), have a presence at special events held at the SWCR (e.g., Smuggler's Run trail race), provide presentations and/or group tours on request, and partner with other organizations to participate in or host workshops or special events.

7.3.7 Volunteer Engagement

The SWCRCC will continue to organize work bees or other events to engage volunteers in a range of activities at the SWCR. Work bee activities may include trail maintenance, garbage clean ups, assisting with habitat restoration projects, and monitoring work. Education and training are important aspects of the SWCRCC volunteer engagement strategy.

7.3.8 Public Surveys, Open House and Consultations

The MNRF and/or SWCRCC may from time to time organize public Open House events to inform the community and users about the conservation reserve and changes to the trail system.

Open houses, surveys and/or other consultations will also be carried out in conjunction with the next update to the Operations Plan (starting around 2027). Among other purposes, these consultations should be used to gauge the educational awareness targets identified in this operations plan, track the effectiveness of efforts to increase awareness, and to target future educational efforts.

8.0 Research and Monitoring

8.1 Context

The primary research priority of the SWCR is to encourage and guide the maintenance and restoration of the site's biological diversity using the adaptive management model. This includes monitoring the effectiveness of stewardship and ecological restoration operations.

Various long-term forest research projects initiated when the site was part of the St. Williams Forest Station are ongoing (see Legacy Research in Cultural Heritage section).

8.2 Research and Monitoring Targets, 2019-2028

Over the next decade, the aim is to encourage research related to the maintenance and restoration of the site's biological diversity, improve monitoring capacity, and improve information tracking.

Targets for this objective over the next 10-year period include:

- Every year, the record of current research at SWCR is updated;
- By 2023, a bibliography of historical and recent research at SWCR with a focus on research relevant to the current management objectives, is compiled;
- Over the 2019-2028 period, the number of active research projects at SWCR related to ecological restoration and biodiversity conservation ranges between two and ten projects per year.
- By 2023, establish and implement a practical monitoring program to assess the effectiveness of ecological restoration, biodiversity conservation and other management activities.
- By 2023, engage in collaborative learning and research opportunities related to ecological restoration, monitoring and protected areas management with the managers of at least two other protected areas.

8.3 Research Application and Review Procedures

Research activities at SWCR will be compatible with the management guidelines, as set out in the SWCR Management Plan (MNR 2005) and are subject to MNRF approvals.

Applications for research, scientific collection and other field work at SWCR should be submitted to MNRF Protected Areas Section using the Ontario Parks research application process (online form available at http://www.ontarioparks.com/email/research). Research proposals will be reviewed annually and decisions to approve or disapprove proposals are normally made within 60 days of receipt of a complete research application.

New proposals for work at SWCR only will be presented to SWCR DTAC for approval following the procedures found in '*Research Authorization Procedure for Provincial*

Parks and Conservation Reserves'[18]. Proposals involving more than one protected area are reviewed and approved by MNRF Protected Areas Section.

Research authorizations stipulate that copies of research findings, theses, and other scientific study be provided to MNRF Protected Areas Section during (in the event of a multiyear undertaking) and/or following the conclusion of any research approved on the SWCR.

All new research projects in the CR, new approvals and permits issued, and any relevant amendments must meet the legal requirements of the '*Class Environmental Assessment for Provincial Parks and Conservation Reserves*'[19].

8.4 Research and Monitoring Activities

8.4.1 Information on Past and Current Research

MNRF Protected Areas Section will maintain a record of all current and new research projects at SWCR, including copies of all applications and reports. The total number of active research projects at SWCR related to ecological restoration and biodiversity conservation will be tracked annually by DTAC and SWCRCC. The SWCRCC will work with MNRF (Aylmer District, Protected Areas Section, SAR Branch, NHIC, etc.) and the research community to compile and maintain a bibliography of research at SWCR relevant to the current management objectives.

8.4.2 Monitoring and Adaptive Management

The SWCRCC and DTAC will endeavour to establish and implement a practical monitoring program to assess the effectiveness of ecological restoration, biodiversity conservation and other management activities. A monitoring plan will be prepared by 2023. Monitoring and research results will be used to guide the ecological restoration and inform recreation management at SWCR using the adaptative management approach (see section 2.4).

8.4.3 Promoting Natural Heritage Research and Monitoring

The MNRF and SWCRCC will promote research opportunities at SWCR related to ecological restoration, biodiversity conservation, and protected areas management and monitoring. Priority research needs at SWCR are similar to other protected areas in Ontario including monitoring and inventory, human use impacts, and invasive species[20].

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[18] Ontario Ministry of Natural Resources and Forestry, Natural Heritage, Lands and Protected Spaces Branch, *Research Authorization for Provincial Parks and Conservation Reserves (PAM 13.01)* (Ontario Ministry of Natural Resources and Forestry, 5 February 2014).

[19] Ontario Ministry of Natural Resources, Environmental Assessment Report Series, *A Class Environmental Assessment for Provincial Parks and Conservation Reserves* (Ontario Ministry of Natural Resources, 2005).

[20] Ontario Parks. 2013. *Protected Area Research Needs Survey: 2013 Report.* 102 pp.

The MNRF and SWCRCC will engage in collaborative learning and research opportunities with the managers of other protected areas and conservation lands to acquire and share knowledge.