

SOUTH NATION
CONSERVATION
DE LA NATION SUD

2019 Final Report: Regional Biodiversity Funding Program

Ontario Power Generation

SOW # 2017-JW-01-02

December 16, 2019



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Executive Summary

South Nation Conservation (SNC) received funds from the OPG Regional Biodiversity Funding Program to complete three lakes/ivers and wetlands restoration projects for the 2017 to 2019 timeframe.

The first project was a partnership with the United Counties of Prescott-Russell (UCPR) and occurred in Larose Forest. A 0.5-hectare salvage cut completed by UCPR in 2012 created an opportunity for SNC to develop a project that consists of wetland restoration, channel naturalization and an increase to native plant biodiversity. During 2017 and 2018, approximately 1,500 metres of watercourse was restored to a natural design, over 100 pit and mounds were created to add habitat diversity, and over 1,500 native plants were added to the site. In 2019, survival assessments of the new vegetation were undertaken at the site and overall survival was good with some replacement planting completed. Monitoring of the naturalized watercourses and pit and mounds was also completed in 2019. The features were well stabilized and there was evidence of amphibian breeding seen in several areas. Invasive *Phragmites australis* was discovered within the project site and a targeted removal activity was carried out to control this species.

The second project involved shoreline stabilization and instream habitat improvement at SNC's J. Henry Tweed Conservation Area. This 17.9 acre Conservation Area has several different forest types, walking trails and infrastructure, watercourses, and multiple access points for recreational users. In 2019, approximately 75 metres of shoreline was restored and stabilized against erosion using natural design principles. In-stream structures were installed to reduce erosion while also providing valuable habitat for aquatic life. The shoreline was planted with a variety of shrubs and trees to further aid in stabilization and improve the riparian buffer habitat. Monitoring of this site will occur annually to assess plant survival and the functionality of the stabilization and instream structures.

The third project built on an existing buffer demonstration project which improved riparian habitat through the planting of buffers, with a focus on promoting alternative crops such as fruit/nut trees and native grasses/pollinator species. A workshop was held in 2019 in partnership with Boisés Est on edible trees and the benefits of pollinator buffers. Additionally, the project was presented at the A.D. Latornell Conservation Symposium and it generated a great deal of interest from other groups looking to implement similar projects in their regions. The project also involved local high school students in a Specialist High Skills Major program who helped to plant the buffers and earned certifications towards their program certificate. First Nations partners were involved in all aspects of the project and attended the workshops and certification events to provide traditional knowledge to the participants.

1.0 Introduction

South Nation Conservation

South Nation Conservation (SNC) has a strong history in watershed management and leadership in applying sustainable practices. As an agency established under the Conservation Authorities Act of Ontario in 1947, SNC has decades of practical experience in protecting our environment and engaging communities. Today, SNC employs more than 40 staff while leading hundreds of stewardship projects to success, throughout a 4,384 km² jurisdiction in Eastern Ontario.

Vision

'Improved Water Quality for a Healthy Ecosystem: Our vision encompasses water levels which satisfy the needs of humans and the environment, healthy rivers and natural shorelines, and safe wastewater management practices.'

Expertise

Conservation is our core competency. SNC offers natural resource management expertise and experience to help our partners contribute to a healthy region. These contributions include forest, wetland, wildlife, fisheries, urban trees, floodplain, natural hazards and water management. Community education and awareness initiatives are also an important component of our conservation efforts.

Working Together

As one of Ontario's 36 Conservation Authorities, SNC protects and restores regional ecosystems. We do this in partnership with 16 Municipalities, comprising portions of: United Counties of Prescott and Russell; United Counties of Stormont, Dundas and Glengarry; United Counties of Leeds and Grenville; and the City of Ottawa. The member municipalities appoint a 12-member, plus past chair, Board of Directors to govern all of SNC's work.

SNC's mandate to manage the natural resources in its jurisdiction includes the following primary roles:

Water Resources Management – SNC manages water resources using integrated, ecologically sound environmental practices to maintain secure supplies of clean water, to protect communities from flooding and to ensure that environmental planning is an integral part of community development.

Forest Resources Management – SNC manages a large forest resource using sound sustainable forest management practices involving agriculture and wildlife habitat improvements which contribute to the health of the watershed’s natural environment.

Lifelong Education and Recreation – SNC creates educational and recreational experiences in natural environments that enrich the lives of people of all ages by instilling awareness and appreciation of the watershed’s natural heritage.

2.0 Deliverables

2.1 Larose Forest Project

Larose Forest is owned and managed by the United Counties of Prescott and Russell (UCPR) who operate the forest for recreation, timber production and wildlife. SNC worked with UCPR to restore an area that was planted as a Red Pine plantation that experienced localized die-off due to wet conditions. The main goals of the project were to restore straightened agricultural channels, increase terrestrial habitat diversity and increase overall biodiversity within the project area (Figure 1).

Activities completed in 2017 included an inventory of plants at the site, design of the restored channels, brushing and clearing along the channels for access, and restoring the channels following the prepared design. The three channels were flagged to identify the areas requiring vegetation removal which provided access for the excavator to work on restoring the channels. Once access routes were created, the existing channels were then re-configured to have a less linear shape. The excavator added meanders and “zig-zags” to help re-create channel sinuosity. Natural sloughing, erosion and deposition during high-water periods (typically spring frechet) will, over time, further shape the channel into a more natural form. A detailed account of project activities in 2017 can be found in Appendix A – 2017 Summary Report: Regional Biodiversity Funding Program Ontario Power Generation SOW#2017-JW-01-02.

In 2018, monitoring activities were initiated in the spring and continued throughout the year. Frogs and salamanders were observed to be using the newly excavated drains. Egg masses of several species were documented. Changes in vegetation along the drains also occurred. The newly excavated site allowed sunlight to penetrate down to the soil layer. This resulted in dormant species such as the Pink Ladyslipper Orchid being able to emerge. The pit and mound topography creation was also completed in 2018. Over 100 Red Pine stumps were flipped over to create the new features. Potted trees, shrubs and perennials were then planted to stabilize the disturbed areas and to add more diversity. Native grasses were seeded onto any remnant open soils. A detailed account of project activities in 2017 can be found in Appendix B – 2017

Summary Report: Regional Biodiversity Funding Program Ontario Power Generation
SOW#2017-JW-01-02.

The final year of the Larose Forest Project began in the spring with survival assessments of the plant material and amphibian monitoring. Monitoring occurred from April 17th to May 28th. Potted stock survival after planting is expected to be in the range of 89-98%. In the Larose project site, percent survival was found to be 83%, with an additional 10% that looked to be in poor/deteriorating condition (Figure 1). This was likely due to the heat wave at planting time, the early freezing air temperatures before deep snow arrived, and deer browsing. Replacement stock was purchased and planted comprising of Northern Bush Honeysuckle, White Swamp Oak and Tamarack; all species that showed good tolerance and survivability at the site.



Figure 1: Eastern Hemlock (*Tsuga canadensis*) With Top Browning

Amphibian monitoring at the project site proved successful with observations of Wood Frog and Blue-spotted Salamander egg masses (Figure 2), and continuous auditory calling of Wood Frogs.



Figure 1: Wood Frog (*Lithobates sylvaticus*) Egg Masses in Naturalized Channel

A targeted Phragmites removal event occurred on August 29th. *Phragmites australis* is an invasive alien plant native to Eurasian countries. In Canada, Phragmites outcompetes native vegetation and lowers the local plant biodiversity. A small pocket of Phragmites was discovered in the project site, approximately 20 metres by 30 metres in area, loosely dispersed among the vegetation (Figure 3). The most likely route of introduction was via the heavy equipment used to perform the salvage cut approximately 7 years ago. With a lack of bio-controls, a small piece of Phragmites root can quickly establish itself. Staff used a new method promoted by the Ontario Invasive Plant Council that involves hand-wicking herbicide directly onto the leaves of the Phragmites plant. SNC will continue to monitor the project site for Phragmites and will carry out further control efforts as needed.



Figure 3: Phragmites Reed Grass (Phragmites australis) Discovered in the Project Site

Ontario Power Generation featured the Larose Biodiversity Project in an episode of their series titled “The Power of Nature”. In the video, SNC staff discuss the project, the ecological benefits it provides, as well as how First Nation traditional knowledge was incorporated into the activities. A project sign was designed and installed that describes the project objectives, partners and outcomes.

On September 24th, 2019, SNC co-hosted the Eastern Ontario First Nation Working Group, where the Larose Biodiversity Project site was toured by the 15 meeting attendees, representing the Mohawks of Akwesasne, Algonquins of Ontario, and local First Nation people working/interested in the environment. Other agencies represented include the Mississippi and Rideau Valley Conservation Authorities, Eastern Ontario Model Forest, Boisé Est, Canadian Parks and Wilderness Society, and Algonquin 2 Adirondack.

The project is highlighted on SNC’s website: <https://www.nation.on.ca/water/projects/larose-forest-project>. It was also featured in Nation Valley News: <https://nationvalleynews.com/2017/09/30/larose-forest-tapping-river-wetland-enhancements>.

2.2 J. Henry Tweed Project

Situated within the village of Russell, J. Henry Tweed is a 17.9-acre Conservation Area owned and managed by South Nation Conservation, see Figure 4 for location map. This conservation area is a highlight amongst the community as it acts as a naturalized area, adjoining many subdivisions within the village of Russell to amenities and public services. Annually, it is estimated that nearly 21,000 people visit this Conservation Area. This property is situated next to and connects directly with the Russell Township Recreational Trail.

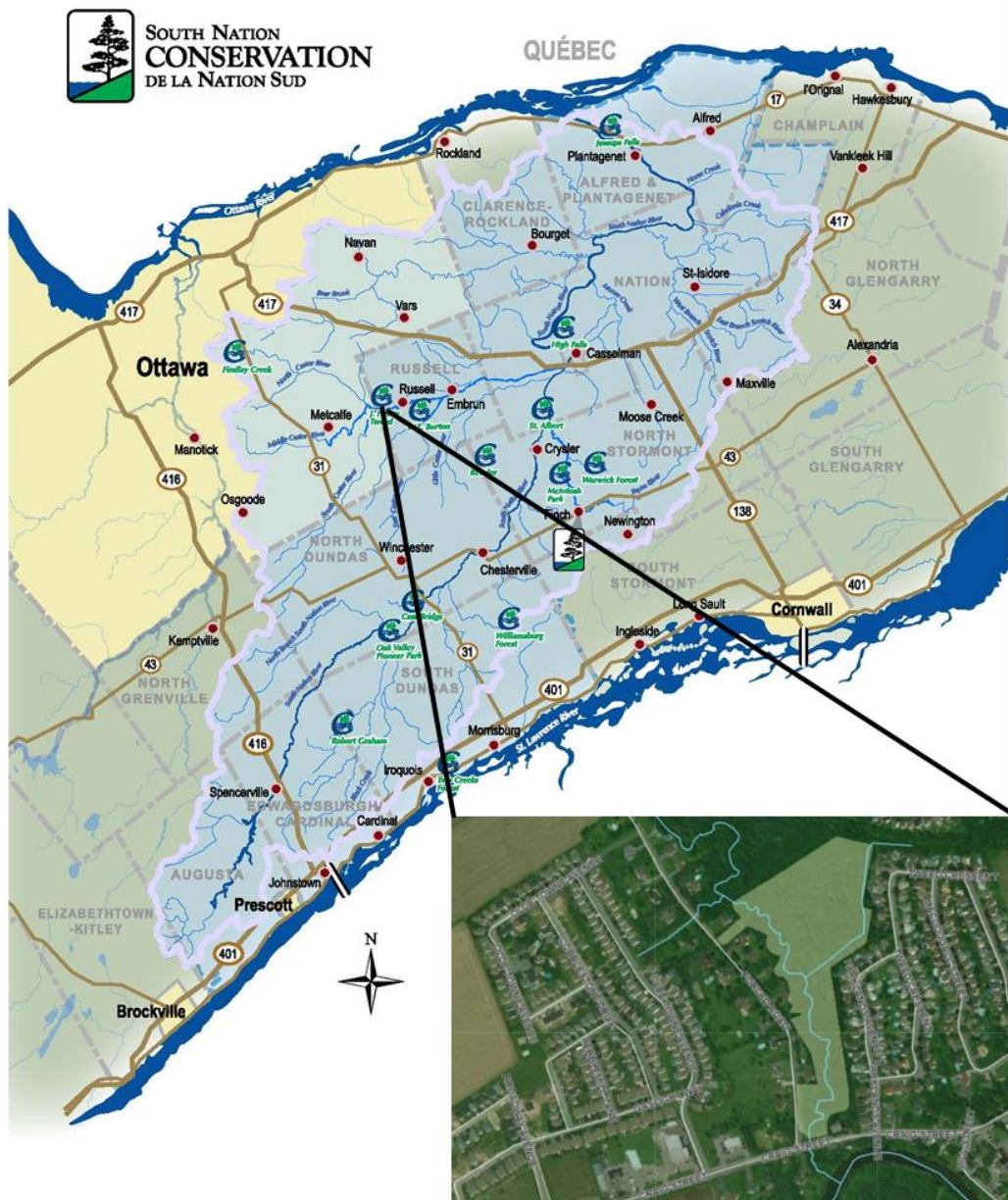


Figure 4: J. Henry Tweed Conservation Area

J. Henry Tweed CA has many ecological features which contribute to the uniqueness of the conservation area. There are several different forest types, walking trails and infrastructure, watercourses, and multiple access points for recreational users. The objective of this project was to improve the ecological features of the Conservation Area by addressing issues along the trail system and watercourse. This included hazard tree removal, shoreline stabilization along several sections of the watercourse, instream habitat enhancements, bridge replacement, and trail re-surfacing. All hazard tree removal, infrastructure, and trail related projects at this site were funded by SNC.

Multiple sections of the watercourse in the Conservation Area were eroding (Figure 5) which was causing excess sediment loading and decreasing water quality. SNC surveyed all erosion areas and prioritized two locations for restoration work in 2019.



Figure 5: Streambank Erosion

SNC's Engineering team created the design for the shoreline stabilization. Principles of natural channel design were used to ensure a more natural, resilient channel would be created while also increasing in-stream habitat features. A combination of log vanes, boulders, rip-rap, and live stakes were incorporated into the design (Figure 6). Appendix C contains the drawings and

notes for the stabilization designs. The log vanes gently redirect the water away from the streambank to the stream centre. They also add structural elements to the stream bed and additional in-stream habitat for fish and other aquatic organisms.

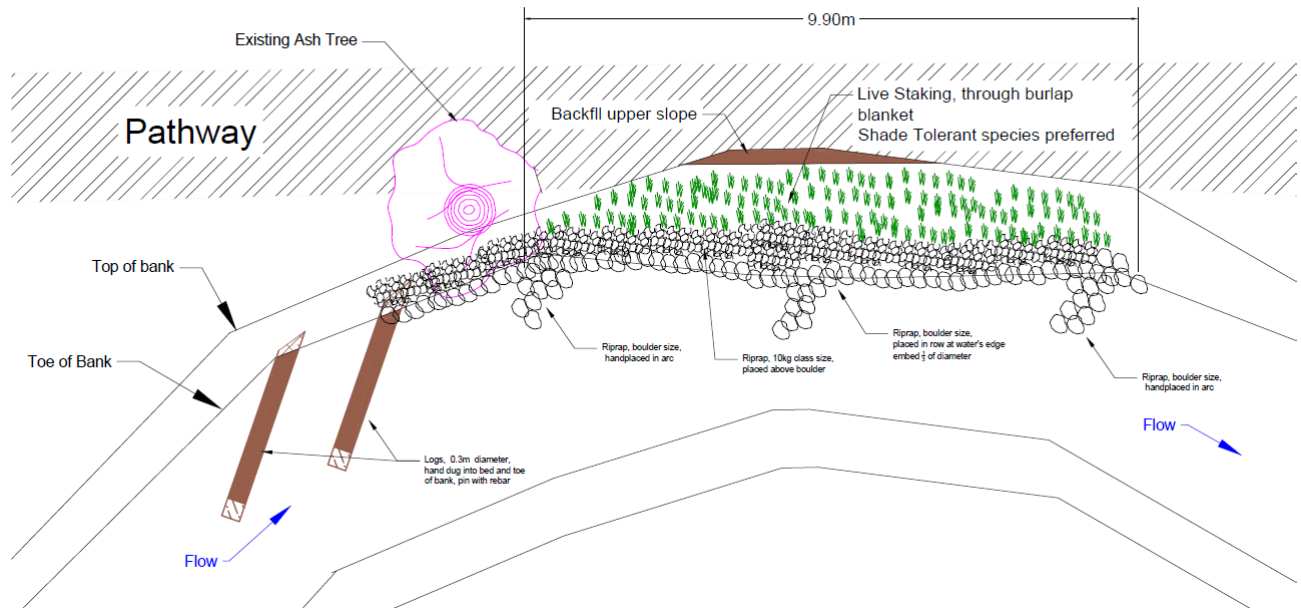


Figure 6: Design Drawing for Shoreline Stabilization at J. Henry Tweed Conservation Area

In order to gain access to the two erosion locations along the creek, 35 trees had to be removed. Ash trees were mainly selected for removal as they were dead or dying due to the Emerald Ash Borer. The tree removal provided an access route to the erosion sites and allowed for room along the creek where equipment could be operated to complete the stabilization work.

SNC staff used ATVs with trailers to transport all of the materials from the roadway to the project site. This included the erosion and sediment controls, various sizes of stone, coconut matting, and the plant material. The wood for the log vanes was cut to size using some of the trees that were removed from the site. Erosion and sediment controls were then installed to ensure the project did not cause any negative impacts downstream. A straw bale check dam was installed 15 metres downstream from the work area to trap any disturbed sediments.

At the first erosion location, SNC staff worked by hand to re-shape the bank and place the larger stone material at the toe of the slope. The area behind the large stone was then backfilled with smaller stone material (Figure 7). Staff continued to place large stone material along the eroded bank, following the design specifications. Once all stone placement was complete, the adjacent pathway was re-instated and work could begin on the second erosion site.



Figure 7: Completed Shoreline Stabilization at First Erosion Site

The second erosion location was larger and required the use of a small excavator. Three log vanes were installed by embedding one end into the bank and the other end into the streambed. They were secured in place with 3 metre long rebar driven through the log and into the substrate, and large stones were placed around the logs where they were embedded in the bank (Figure 8). Each log vane was inspected by SNC's engineer who designed the project to ensure the installation was done correctly. Additional logs were placed along the toe of the slope between the log vanes to help stabilize the bank and catch any further slumping of the bank. The soils that do slump in behind the logs will be able to re-vegetate naturally.

SNC staff continued to place large stone material in the remaining eroded areas at this site, following the design specifications.



Figure 8: Log Vane Installation at Second Erosion Site

Coconut matting was placed over the construction area where the soils were disturbed to stabilize the area until native vegetation re-grows (Figure 9). A total of 200 live willow stakes were installed on the banks in all areas with open soils. As the willow stakes grow, the above ground vegetation will help to reduce flow velocity and prevent erosion, and the vigorous rooting of the willow stakes will help strengthen the soils of the bank.

Based on the conditions at the two sites, SNC selected suitable native tree and shrub species for planting. At both sites combined, 84 potted shrubs were planted consisting of Red-Osier Dogwood, Alternate-Leaved Dogwood, Nannyberry, Meadowsweet, Elderberry, Serviceberry, and Speckled Alder. A total of 68 trees were purchased for the project and included Red Maple, Black Cherry, Sugar Maple, White Pine, Yellow Birch, Eastern Hemlock, and Balsam Fir.

Shoreline plant material provides important inputs into the watercourse for aquatic organisms. The leaves and branches that fall into the water provide nutrients and shelter for aquatic life. This occurs not only in the immediate vicinity but also to downstream habitats. As they grow, the plants themselves also provide shade in the summer and help to regulate the temperature of the water.



Figure 9: Coconut Matting and Plant Material Installed at Second Erosion Site

The final step in the construction of the project was to remove the straw bale flow check dam from the creek. Approximately 75 metres of shoreline was restored and protected from further erosion. SNC will continue to monitor the project to ensure it is functioning as designed and additional funding will be sought in order to complete the three other sites identified with erosion issues.

Throughout the duration of the project, updates on progress were provided on SNC's website and through our social media accounts. The project was also highlighted through a project unveiling coordinated with a visit from staff at OPG (Figure 10). The event was picked up by local media with stories in The Review and Nation Valley News.



Figure 10: Project Unveiling at J. Henry Tweed Conservation Area

2.3 Buffer Demonstration

In 2019, SNC established four (4) riparian buffer demonstration sites across its jurisdiction; these sites were comprised of edible trees and shrubs, and native grasses and pollinator species. The sites are located in Navan, Casselman, St. Isidore, and Hanesville (Figure 11).

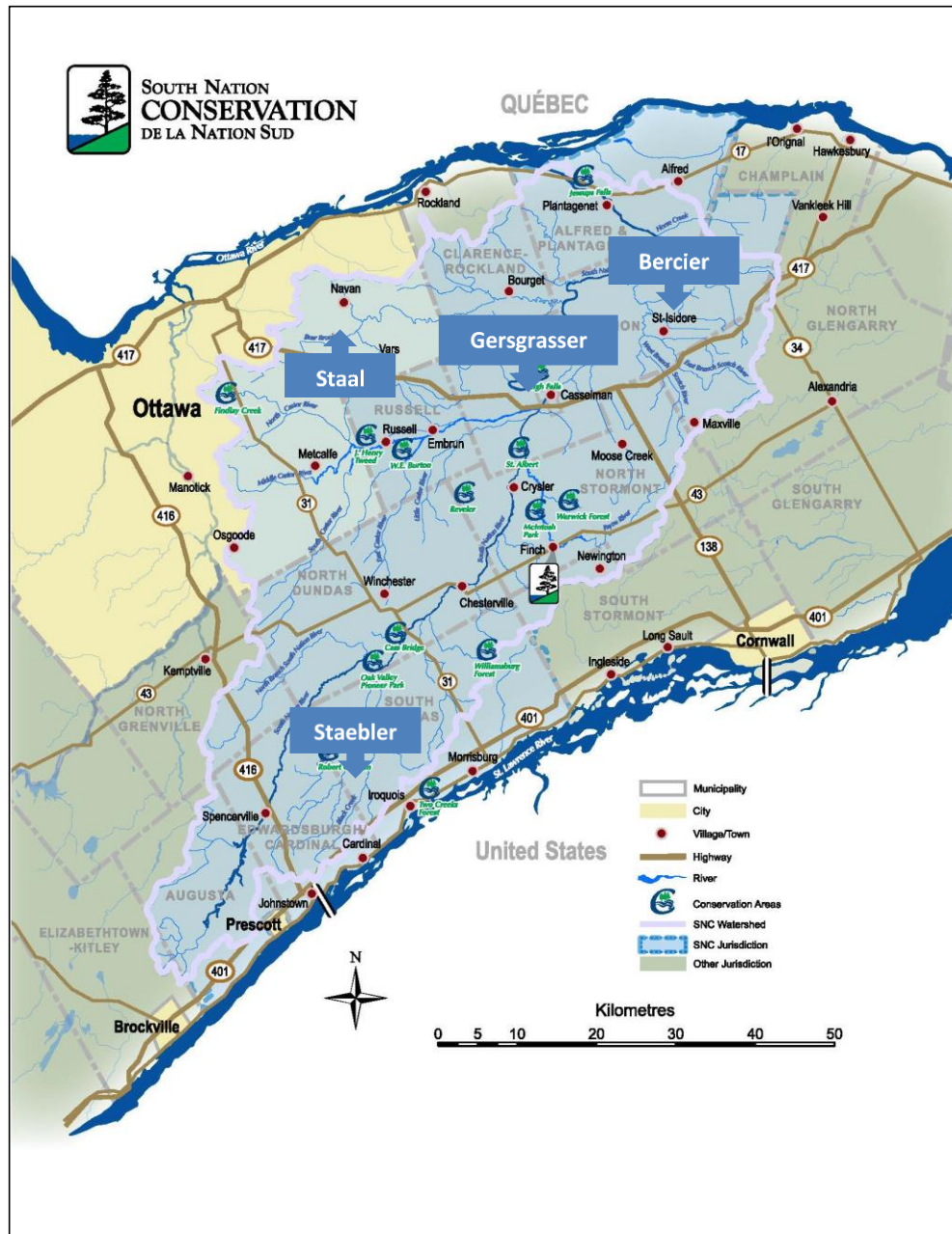


Figure 11: Location of Edible Buffer Demonstration Sites

Each of the demonstration sites is approximately 500m in length along both sides of the watercourse, trees and shrubs planted on one side and native grasses on the other, see Figure 12 for buffer conceptual design. This configuration allows for future access for municipal drain maintenance. The treed buffer will help to stabilize the shoreline of the watercourses and filter runoff from the adjacent fields. The native grasses planted will help stabilize the soils and provide habitat for birds, insects, and animals. The sites also have the potential to be harvested

in the future, providing an Eastern Ontario seed source for native grasses that is not currently available.

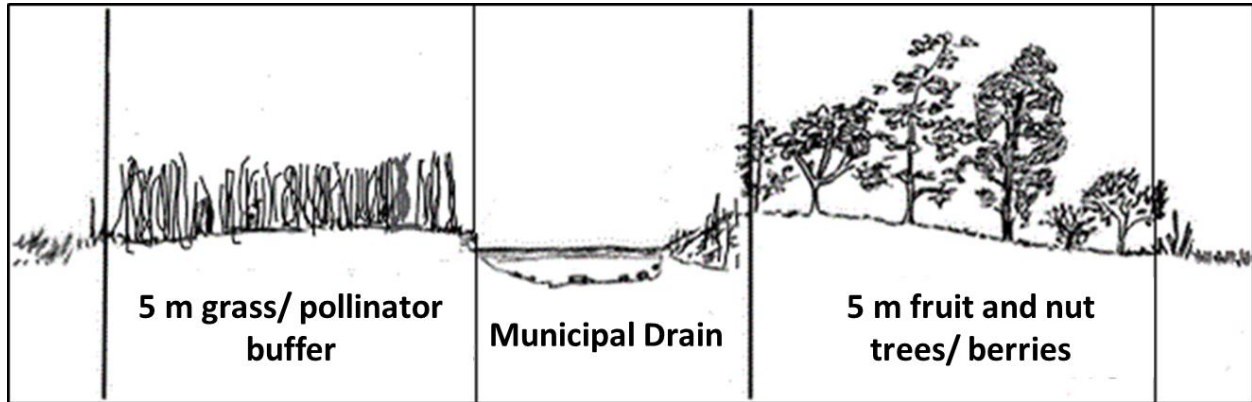


Figure 22: Conceptual Design of Edible Buffer

SNC worked with local high schools to plant each site, offering Specialist High Skills Major (SHSM) certification to students at the same time (Figures 13 & 14). A local Scouts Canada troop from Clarence-Rockland also assisted with planting one of the sites. First Nation partners provided traditional knowledge to students, Scouts, and volunteers at each of the planting events. A member from Plenty Canada, a not-for-profit Algonquin organization, or SNC's Chris Craig, an Algonquin, provided participants with an understanding of their connection to the environment and how fruit and nut trees were an integral part of their culture as a food source. The Mohawks of Akwesasne Department of the Environment also provided traditional knowledge to the project design. Approximately 120 students and teachers assisted with the planting of the buffer sites, along with about 10 local Scouts.



Figure 13: Students Planting Buffer at Hanesville Demonstration Site



Figure 14: Seaway District High School SHSM Students at Hanesville Demonstration Site

Support from OPG allowed SNC to host an additional SHSM certification for a local high school. Twenty students assisted with the installation of coconut mats at one of the buffer sites following their training session. SNC also co-hosted a workshop with Boisés Est, a local French woodlot owners association, in November; where this project was highlighted. The workshop was attended by 43 participants. The project was presented at the A.D. Latornell Conservation Symposium on November 21st, 2019. The presentation was very well received with several other Conservation Authorities expressing interest in creating a similar project. Finally, SNC worked with Tagwi Secondary School to cut and assemble birdhouses to be installed at the buffer demonstration sites in the spring (Figure 15).



Figure 15: Students Assembling Birdhouses for Demonstration Sites

SNC has produced a short video for the project. Video footage was captured during the SHSM certification and planting events. The English and French subtitled videos are posted on SNC's YouTube channel: <https://www.youtube.com/watch?v=vzxO7mRj8HI>. Chris Craig, SNC Senior Forestry Technician, was also filmed at the St. Isidore demonstration site by an OPG crew, for the new OPG "Power of Nature" series.

3.0 Budget Summary

The following table provides the total funding contribution amounts from the original three year project proposal.

Table 1: 2017-2019 Scope of Work Proposal Budget

2017-2019 Proposal	Total Budget	OPG	SNC/Partner
YEAR 1 (2017)	\$92,489	\$60,000	\$32,489
YEAR 2 (2018)	\$88,250	\$60,000	\$28,250
YEAR 3 (2019)	\$83,058	\$50,000	\$33,058
Total	\$263,797	\$170,000	\$93,797

As discussed in the 2017 and 2018 summary reports, significant cost savings were realized under the Larose Forest project. Table 2 outlines the revised Larose Forest Project budget. These savings provided SNC with the opportunity to carry out two additional projects in 2019 to further enhance biodiversity within our jurisdiction.

Table 2: 2017-2019 Larose Forest Project Budget

	Budget	Revised Budget	OPG	SNC		Other Partners	
			Cash	Cash	In-kind	Cash	In-kind
YEAR 1 (2017)							
Materials, Supplies, Contracted Services	\$43,000	\$17,603	\$17,603				
Outreach and Education	\$4,691	\$604	\$604				
Other (monitoring, transportation, planting, office equipment, financial and senior management support)	\$38,798	\$29,167	\$13,911	\$15,256			
Contingency	\$6,000	\$0	\$0	\$0			
Sub-Total	\$92,489	\$47,374	\$32,118	\$15,256	\$0	\$0	\$0

	Budget	Revised Budget	OPG	SNC		Other Partners	
			Cash	Cash	In-kind	Cash	In-kind
YEAR 2 (2018)							
Materials, Supplies, Contracted Services	\$38,000	\$21,873	\$21,873				
Outreach and Education	\$3,953	\$2,189	\$0	\$2,189			
Other (monitoring, transportation, planting, office equipment, financial and senior management support)	\$39,297	\$54,955	\$42,955				\$12,000
Contingency	\$7,000	\$0	\$0	\$0			
Sub-Total	\$88,250	\$79,017	\$64,828	\$2,189	\$0	\$0	\$12,000
YEAR 3 (2019)							
Materials, Supplies, Contracted Services	\$23,745	\$2,510	\$642				
Outreach and Education	\$12,780	\$2,000	\$554				
Other (monitoring, transportation, planting, office equipment, financial and senior management support)	\$41,533	\$34,918	\$21,203	\$4,315	\$2,330		\$6,660
Contingency	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sub-Total	\$78,058	\$39,428	\$22,399	\$4,315	\$2,330	\$0	\$6,660
TOTAL	\$258,797	\$165,819	\$119,345	\$21,760	\$2,330	\$0	\$18,660

The first additional project was the J. Henry Tweed Erosion Control Project. The project was carried out in 2019. The following table provides the budget for the project.

Table 3: 2019 J. Henry Tweed Project Budget

	Budget	Revised Budget	OPG	SNC		Other Partners	
			Cash	Cash	In-kind	Cash	In-kind
YEAR 3 (2019)							
Staff Time	\$0	\$26,755	\$26,388	\$2,373			
Equipment Rental and Mileage	\$0	\$3,370	\$4,302				
Contracted Services and Materials	\$0	\$31,940	\$20,463	\$12,019			
Other Expenses (permits, overhead, reporting)	\$0	\$4,750	\$2,110		\$2,000		
TOTAL	\$0	\$66,815	\$53,263	\$14,392	\$2,000	\$0	\$0

The second additional project was the Buffer Demonstration Project. This project was also carried out in 2019. The following table outlines the project budget.

Table 4: 2019 Buffer Demonstration Project Budget

	Budget	Revised Budget	OPG	SNC		Other Partners	
			Cash	Cash	In-kind	Cash	In-kind
YEAR 3 (2019)							
Staff Time - workshops and SHSM events	\$0	\$16,600	\$6,198	\$6,746	\$1,180		\$3,500
Other Expenses (mileage, overhead, reporting)	\$0	\$3,750	\$1,610	\$0	\$2,000	\$0	\$0
TOTAL	\$0	\$20,350	\$7,808	\$6,746	\$3,180	\$0	\$3,500

The changes to the original scope of work and associated budget resulted in the actual budget shown in Table 5 below.

Table 5: 2017-2019 Actual Budget for Revised Scope of Work

2017-2019 Actual	Total Budget	OPG	SNC/Partner
YEAR 1 (2017)	\$47,374	\$32,118	\$15,256
YEAR 2 (2018)	\$79,017	\$64,828	\$14,189
YEAR 3 (2019)	\$126,593	\$83,470	\$43,123
Total	\$252,984	\$180,416	\$72,568

The total contribution from OPG for 2017-2019 was approved at \$170,000. The amount of \$180,416 showing for OPG in the table above is a result of funds that were deferred from 2016 under SNC's previous 2014-2016 Biodiversity Project.

4.0 Conclusion

The partnership between SNC and OPG through the Regional Biodiversity Funding Program has resulted in significant contributions to biodiversity, exciting new landowner relationships, and a connection to nature for all ages. We are proud of the progress we have made throughout the execution of this project, and we will continue to monitor the work completed through this program to ensure its continued success. We look forward to promoting the work this partnership has achieved well beyond the three year lifespan of the project, and celebrating the important environmental benefits it has created.