

Regreening Program 2018 ANNUAL REPORT

40

• FORTY YEARS •



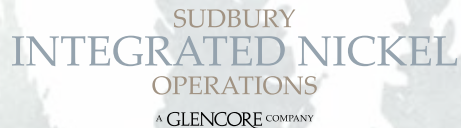
2018 Partners

Regreening Program



Ugliest Schoolyard Contest

Corporate Sponsor



Azilda Greenhouses

Brown's Concrete Products Ltd.

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Greater Sudbury Regreening Program

Jetty's Landscaping Supplies

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Southview Greenhouse Growers

Vale

Valley Shrubs & Trees

Table of Contents

Message from the Manager.	2	Ugliest Schoolyard Contest.	19	Red Oak Forest Tour.	31
2018 Highlights	3	Winner Projects.	19	Regreening the Moon – 40 Years of	
The Regreening Process.	5	Labour	21	Regenerative Landscape Design	31
Crushed Limestone, Fertilizer and Seed.	5	Volunteers	22	Canadian Land Reclamation Association	31
Area Limed 1978 to 2018	6	Partners.	22	Norilsk, Russia.	32
Map – Manual Liming Site 2018	7	Sudbury Regional Tree Fund.	23	Student Knowledge Sharing	32
Vale Aerial Seeding Program.	8	Funding	24	Pontifical Catholic University of Chile	32
Fun Fact	8	Funding Contributions by Source 2018.	25	Planning For Closure.	32
Tree Planting	9	Yearly Program Costs 1978 to 2018	25	Communications	33
Map – Tree Planted Areas 2018	10	Percent Funding Contributions by Source		Radio Interviews:	33
Quality Assessments	11	1978 to 2018	26	Publications / Websites	34
Volunteer Tree Planting Events.	11	Events	27	Afterward	36
Number of Trees Planted 1979 to 2018.	12	Environment Commissioner		VETAC Members 2018	37
Percent of Species Planted 1979 to 2018.	12	of Ontario (ECO)	27		
Percent Coniferous Species Planted		Annual Tree Giveaway	27		
1979 to 2018	13	TD Tree Days	27		
Percent Deciduous Species Planted		Academic Bursaries.	28		
1979 to 2018.	13	40th Anniversary Events	28		
Percent Shrub and Understory Tree		Council Presentation	28		
Planted 1979 to 2018	14	Proclamation	28		
Seed Collecting	15	40th Anniversary Trail Tour Series.	28		
Increasing Biodiversity.	16	Tours and Presentations	29		
Biodiversity Phase.	16	American Society of Mining and Reclamation	29		
Forest Floor Transplants	16	Sudbury Horticultural Society Tour	29		
Long-Term Monitoring	17	Conservation Sudbury Speaker Series	29		
Shrub Transects	17	Communities in Bloom.	30		
Flora of Greater Sudbury.	17	Ugliest Schoolyard Contest Tour	30		
Regreening Outreach Coordinator	18	Society of Ecological Restoration	30		
Educating Our Youth	18	AECOM Planting	30		

Message from the Manager

Greater Sudbury's landscape has been radically changed by over a century of forestry, mining and smelting activities. Early smelting operations resulted in elevated levels of sulphur dioxide in the air and metals in the soils that together virtually eliminated vegetation over 82,000 hectares.

Loss of vegetation resulted in large-scale erosion of topsoil and loss of habitat for the numerous animal species that lived in the former forests. For decades, only a few tufts of metal tolerant grasses and mosses could survive. The only animal species that were left were those few that preferred the barren and semi-barren conditions.

For many Canadians, a drive through Sudbury on the Trans-Canada Highway meant a chance to view the infamous "moonscape" first-hand. For local residents, daily life meant coping with frequent dust and downdrafts of sulphurous clouds from the smelter stacks.

Starting in the 1970s, bold experiments by Laurentian University researchers showed that native trees and shrubs could re-establish themselves on land that had previously been bare of vegetation for decades.

Based on these results, a municipal program was developed to scale up the experimental techniques and the application of regreening techniques to large areas began in 1978. Continuous improvements in smelting processes and massive capital investments by local mining companies over the years greatly improved local air quality. With cleaner air, the newly developing vegetation could now survive and thrive, which in turn improved the quality of local lakes and rivers.

Four decades later, the regreening techniques have been applied to thousands of hectares of land and nearly 10 million trees have been planted. We have reason to be proud of our regreening accomplishments considering our past "moonscape" image.

Together we've shared the experience of renewing our landscape. Since 1978, thousands of residents have helped regreening efforts by spreading crushed limestone to reduce soil acidity and planting tree seedlings. Our community is rightly proud of its healthier, living landscape. Happy 40th Anniversary!

Dr. Stephen Monet,
Manager of Environmental Planning Initiatives,
City of Greater Sudbury



DR. STEPHEN MONET

2018 Highlights

2018 marked the 40th anniversary of the Regreening Program and work continued as directed by the 5 YEAR PLAN 2016-2020. Thanks to external funding, material and in-kind contributions from our many partners, 2018 was another successful year.

Regreening Component	2018	To Date (since 1978)
Tree Seedlings Planted	92,539	9,815,711
Shrubs and Understory Tree Seedlings Planted	33,809	394,848
Area Limed	6.8 ha	3,478 ha
Area Fertilized	6.0 ha	3,252 ha
Area Seeded	6.0 ha	3,179 ha
Forest Floor Transplants	0.119 ha	1.72 ha
Program Cost	\$864,022	\$32,701,769
Temporary Employment Opportunities	29	4,775
Awards	—	14
Number of Schoolyards Regreened	2	45
Volunteer Tree Planters	687	12,349
Trees Planted by Volunteers	2,838	377,884
Trees Provided for Residential Plantings	1,387	430,414

The Regreening Program created 29 temporary employment opportunities, limed 6.8 hectares of barren land in the Garson-Coniston area and planted over 92,000 tree seedlings and almost 34,000 shrubs and understory trees throughout Greater Sudbury.

The 14th annual “Ugliest Schoolyard Contest” hosted by VETAC continued again this year. The winners were Confederation Secondary School and Lo-Ellen Park Secondary School. In all, a dozen local businesses, corporations, special interest groups as well as private citizens provided funding, materials and offered services to complete the schoolyard Regreening projects. Corporate funding from Sudbury Integrated Nickel Operations, a Glencore Company (Sudbury INO), in the amount of \$20,000 enabled these schools to become greener, more engaging environments for students. Schoolyard transformations occurred from late August until the end of October.

The large-scale forest floor transplant project proceeded again in 2018 thanks to continued and new partnerships. KGHM allowed Program staff to access vegetation near the North Range Exploration Property north of Hanmer as did a private sponsor in Chelmsford. This year, 19 sites containing 105 plots received forest floor mats contributing to the total area of 0.172 ha since 2010.

The Biodiversity Research Assistants conducted several monitoring activities this year including long-term monitoring of forest floor transplants and shrub transects. They also continued with the flora of Greater Sudbury project by contributing plants to the herbarium at Laurentian University (LU).



LIMING ACTIVITY

The Regreening Process

Crushed Limestone, Fertilizer and Seed

The liming activity this year focused on an area of barren land along Garson-Coniston Road as a continuation of the 2017 manual lime site. A total of 6.8 hectares of barren land were manually limed using a crushed dolomitic limestone. Fertilizer and seed consisting of agricultural and native species was applied to 6.0 hectares of the site in early October.

The seed mix contained:

40% fall rye (*Secale cereale*)

20% Canada wildrye (*Elymus canadensis*)

20% little bluestem (*Schizachyrium scoparium*)

10% slender wheatgrass (*Elymus trachycaulus*)

10% alsike clover (*Trifolium hybridum*)

Approximately 1 kg of uncleaned poverty oat grass seed collected locally by the crew weeks in advance and was added to the regular seed mixture.

Refer to the page 7 for a map of the location of liming activities.

To date, 3,478 hectares of barren land have been treated with crushed limestone by the City's Regreening Program.



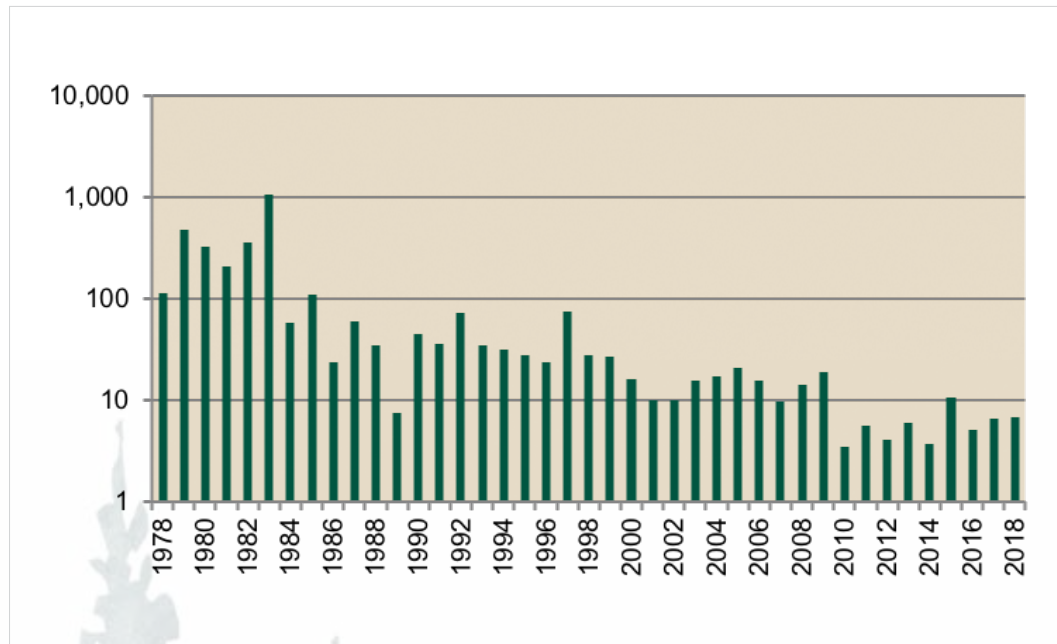
NATIVE GRASS SEED MIXTURE



COLLECTING POVERTY OAT GRASS SEED

Area Limed 1978 to 2018

The bar graph indicates the area in hectares per year that were limed by the municipal Regreening Program since 1978 with a grand total of 3,478 ha limed to date.



Liming Phase

A crushed dolomitic limestone must be applied to barren lands to neutralize soil acidity and reduce metal toxicity to encourage plant growth.

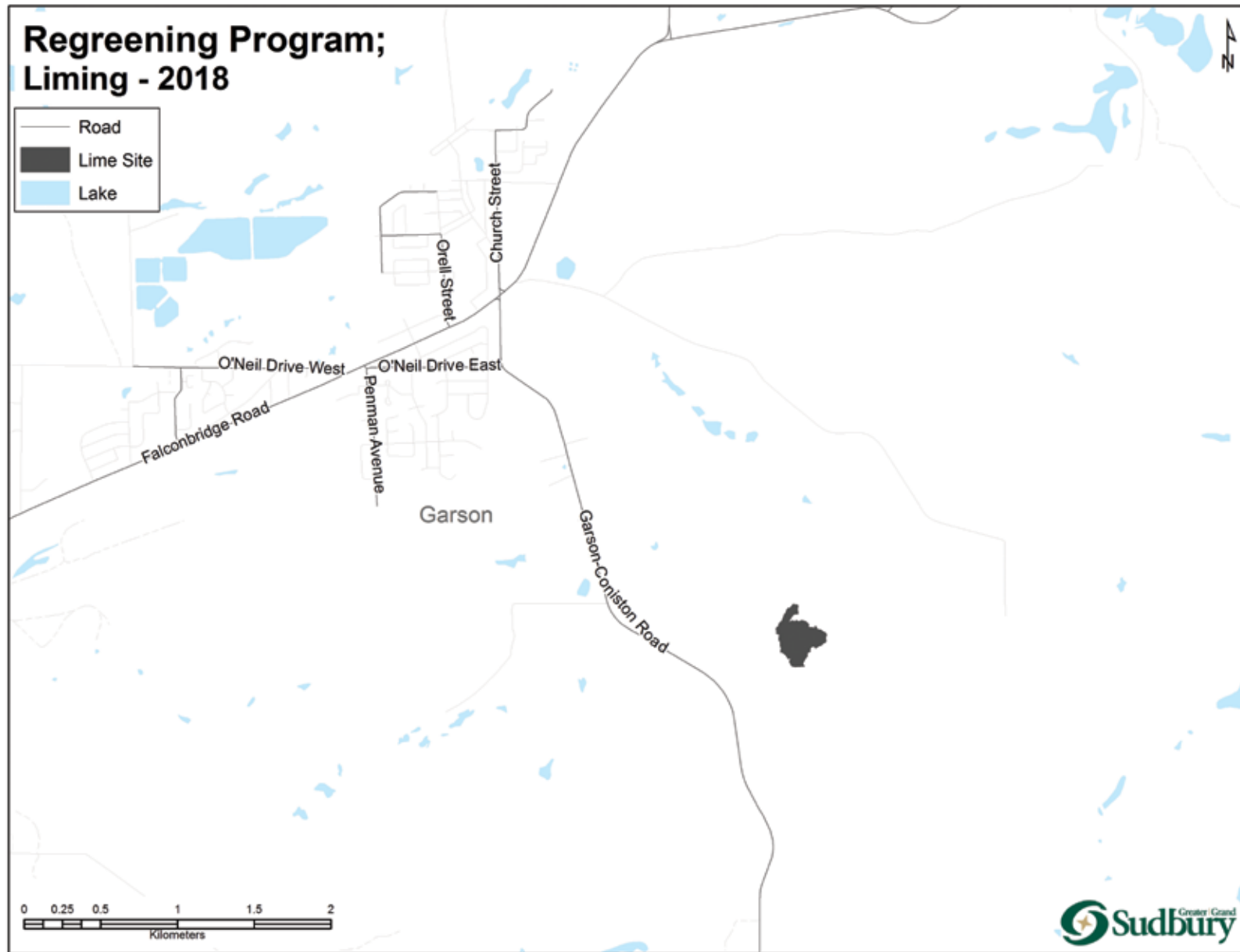
Fertilizer Phase

Long-term erosion of the soil has caused nutrient loss. To provide future plants with a source of nutrition, a commercial fertilizer is applied to increase nutrients for plant growth.

Seeding Phase

A seed mixture consisting of native grasses and a nitrogen-fixing clover is spread over areas that have been limed and fertilized. A green cover develops within the first growing season, which prepares the site for subsequent tree planting by reducing frost heaving of soil and lowering summer temperatures at ground level.

Map – Manual Liming Site 2018



Vale Aerial Seeding Program

As part of its ongoing collaboration with the City's Regreening Program, Vale aially seeded barren land northwest of Alice Lake using a pelletized limestone, fertilizer and the same agricultural/native seed mixture as the Regreening Program. The total area covered measures approximately 100 ha and will be the main focus site for tree planting activities in the spring of 2019.



HELICOPTER USED IN AERIAL LIMING ACTIVITY

Fun Fact

In the early years of regreening, the barren, wind-swept, rocky lands prevailed, creating difficult growing conditions for planted seedlings. Only jack pine and red pine seedlings could withstand the harsh, dry conditions. It wasn't until 1983 that white pine and white spruce seedlings were added to the mix as conditions improved. Over time, given the suitable state of the recovering forests, a shift to increase the diversity of plants was initiated. Starting in 2011, over 40,000 shrubs have been planted annually. Today, 79 different species of trees and shrubs are a part of the regreening mix.

Tree Planting

The Planting Phase

One year after establishing a grass/legume cover, tree seedlings are planted in random groupings to mimic natural tree distributions in forests. Although mostly native conifers (needle-like leaves) are planted, several native deciduous (broadleaved) tree species are also planted each year. White birches and poplars, whose seeds are wind-dispersed, germinate on their own once soil conditions improve.

Spring and fall planting activities resulted in 92,539 tree seedlings and 33,809 shrub/understory tree seedlings planted throughout Greater Sudbury. Since 1978, a total of 9,815,171 trees and 394,848 shrubs/understory trees have been planted by the Program.

Tree Canada provided funding for 40,000 trees and shrubs this year and tentree donated funds to have all 119,624 tree seedlings planted. In addition, Vale donated over 48,000 seedlings to the Program, including jack pine, red pine and white spruce.

A total of seven species of deciduous understory trees, eleven shrub species and ten canopy tree (conifer and deciduous) species were planted in 2018. To date, 28 species of canopy trees (13 conifer and 15 deciduous), 11 species of understory trees and 40 species of shrubs have been planted. That is a total of 79 different tree and shrub species planted to date.

Vale aerially limed and seeded 120 hectares of barren land located to the south east of Alice Lake in the fall of 2017. This was the main planting site for the crew this spring. Species planted included the typical first phase planting mix of jack pine, red pine, white pine, white spruce and green alder. Six 1-ha plots were established within this area and planted additionally with balsam fir, smooth serviceberry, chokecherry, buffalo berry, staghorn sumac, red oak, tamarack and red maple. The carbon accumulation and biodiversity of these long-term plots will be characterized over time through the L-CARE (Landscape Carbon Accumulation through Reduction in Emissions) project led by Laurentian University (LU) with the collaboration of the City's Regreening Program, industrial partners and Collège Boréal. Over time there will be a comparison of the normal first phase planting with a more biodiverse planting strategy.

Other planting sites were selected from the 5 Year Plan 2016-2020 and several others were selected to accommodate Tree Canada trees. A site was also selected for the planting of species in transect plots and supplemental planting at past manual liming sites and planting sites.

Refer to the tree planting map on the next page for locations of the planting sites.



ATV USED TO TRANSPORT SEEDLINGS TO PLANTING SITES

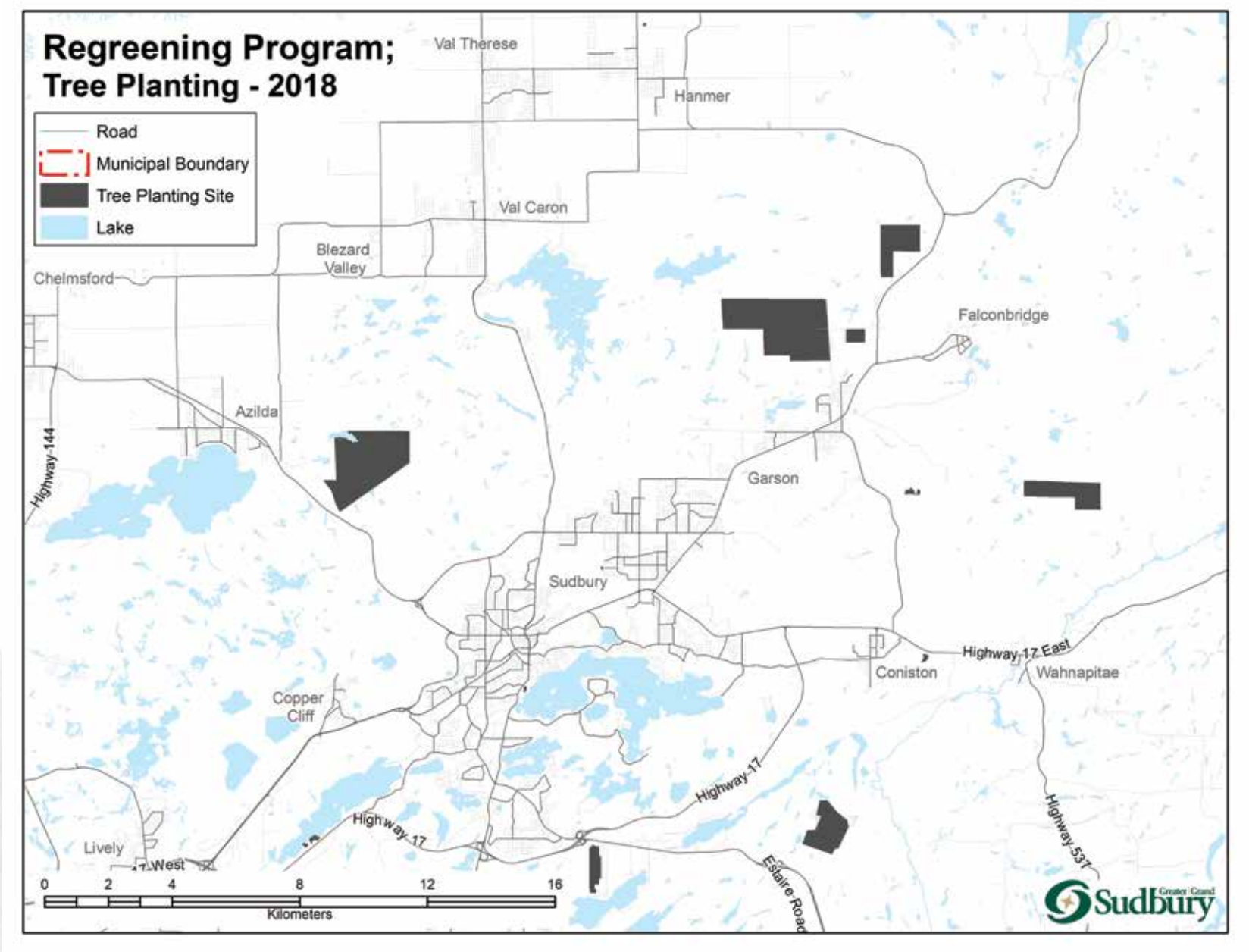


CREW LOADING UP WITH TREES



PLANTING CREW

Map – Tree Planted Areas 2018



Quality Assessments

Tree Canada requires that funded plantations be evaluated for quality and survival. The quality assessor visited the planting crew on-site in the spring and in the fall. Overall, he found the crew's quality was 93% for all species planted. The survival assessments will be conducted in the spring of 2019.

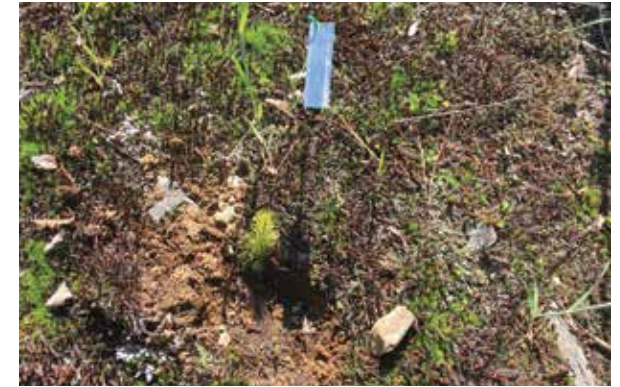
Volunteer Tree Planting Events

The Regreening Program is able to offer seedlings, planting equipment and guidance to local groups wanting to participate in the regreening effort. Volunteer participation provides an educational opportunity on environmental issues and information on the City's Regreening Program, tree planting experience as well as a sense of community pride and ownership of the natural environment.

Since the volunteer program began, 12,349 volunteers planted 377,884 seedlings.

This year, the main planting groups were local students that received the school presentation by VETAC's Regreening Outreach Coordinator. As a follow-up to the presentation, many schools were offered a planting activity on or close to their school property as allowable. The Regreening Program was able to supplement Conservation Sudbury's seedling donation with nearly 1,400 seedlings. In total, 637 students from 14 schools participated in planting over 2,100 seedlings.

Other group planting activities included St. Patrick's Church Youth Group and Laurentian University Ski Trails members. Together, 687 volunteers planted 2,838 seedlings this year.



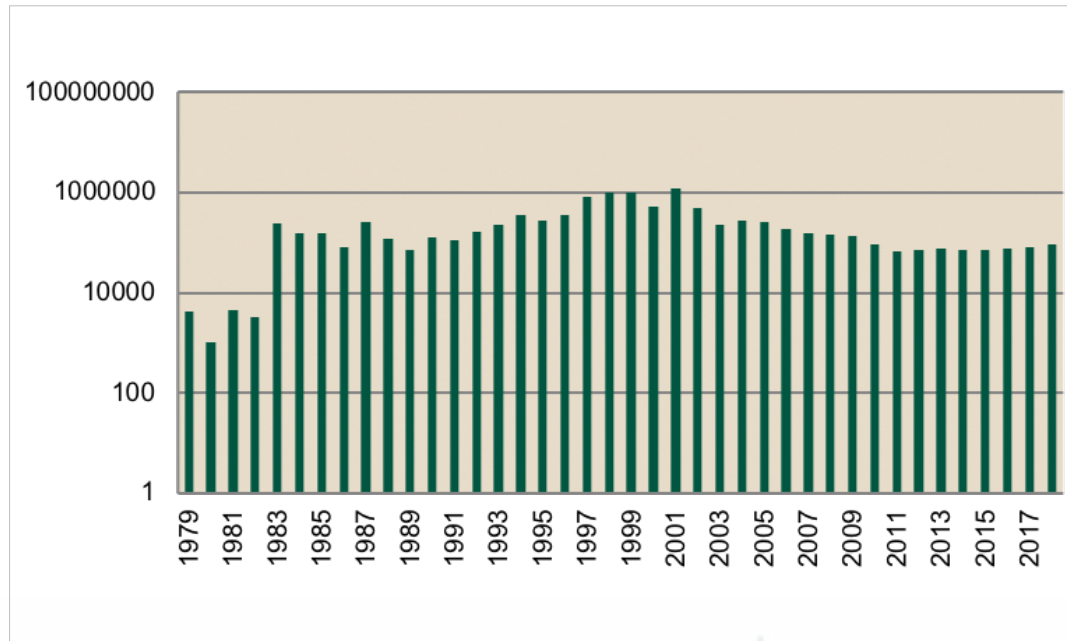
SURVIVAL ASSESSMENT SPECIMEN



VOLUNTEERS PLANTING

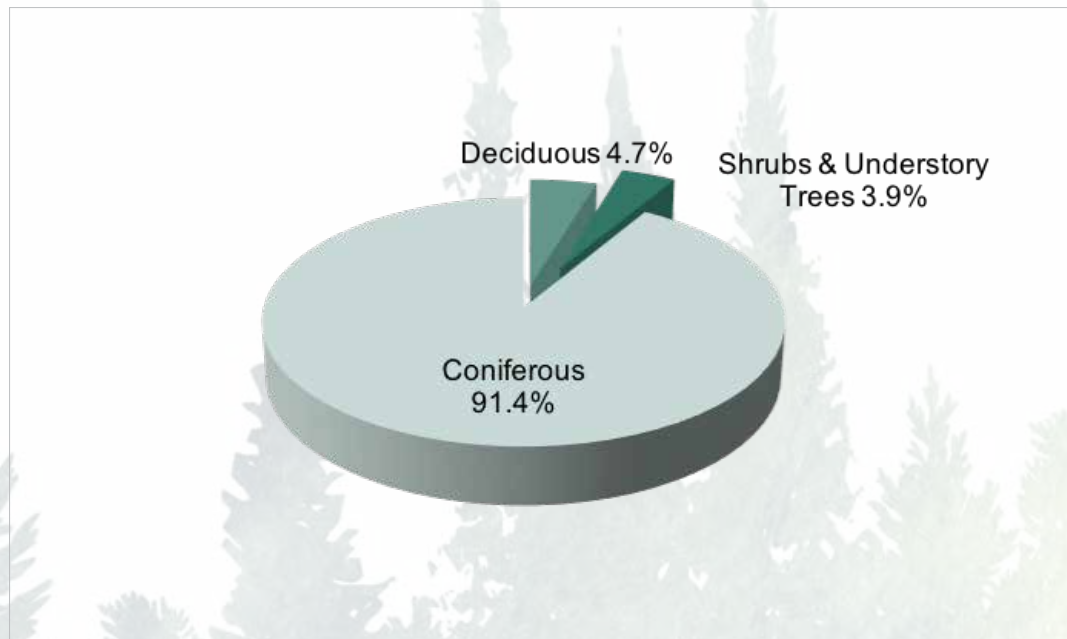
Number of Trees Planted 1979 to 2018

The bar graph indicates the number of trees planted each year since 1979 for a grand total of 9,815,711 trees.



Percent of Species Planted 1979 to 2018

The pie graph illustrates the percentage of each type of species planted since 1979 for a grand total of 10,210,059 plants.

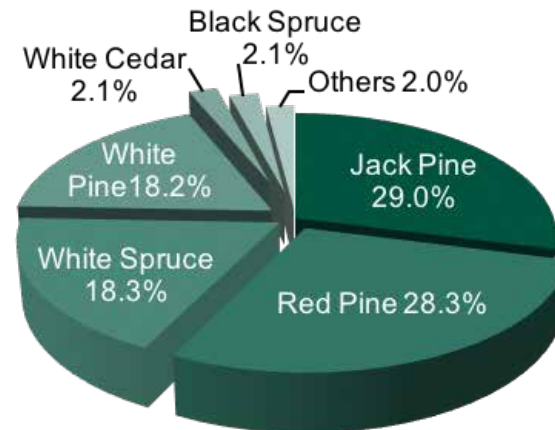


Percent Coniferous Species Planted 1979 to 2018

The pie graph illustrates the percentage of each coniferous tree species planted since 1979 for a total of 9,333,402 trees.



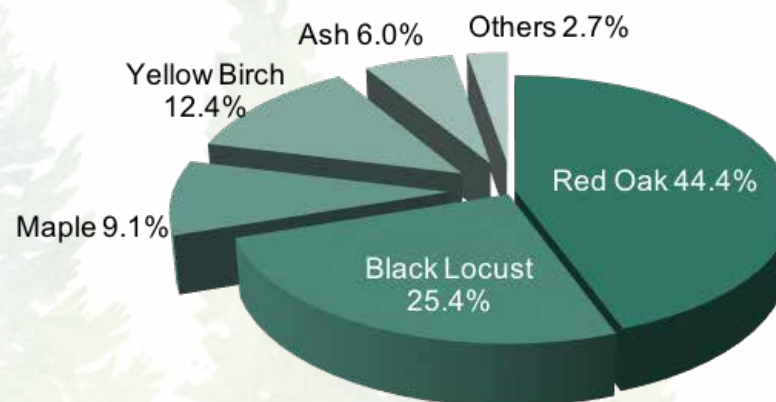
CONIFEROUS SEEDLINGS



Percent Deciduous Species Planted 1979 to 2018

The pie graph illustrates the percentage of each deciduous tree species planted since 1979 for a total of 482,309 trees.

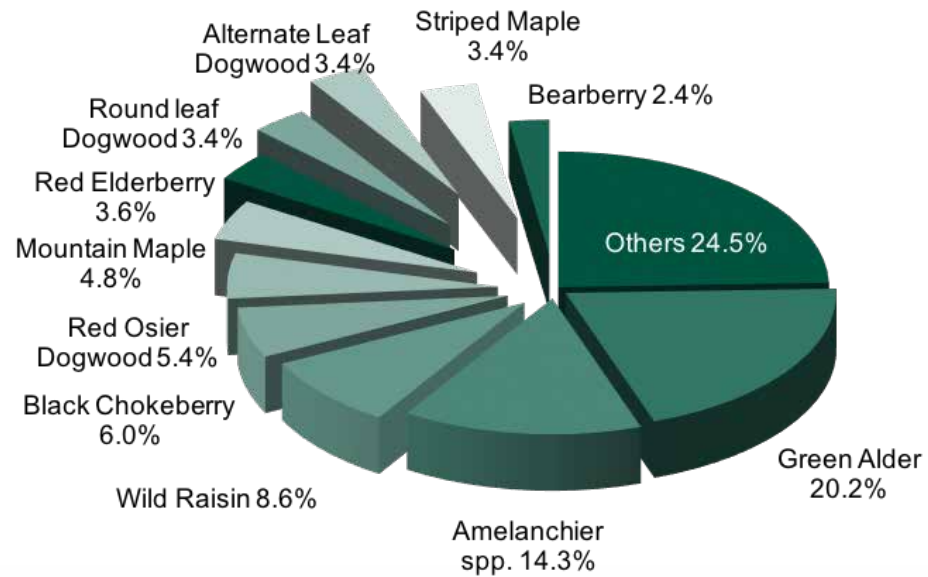
Others Include: Russian olive 1.1%, bur oak 0.8%, ironwood 0.3%, American beech 0.1%, bitternut hickory 0.1%, white oak 0.1% and basswood 0.1%.



Percent Shrub and Understory Tree Planted 1979 to 2018

The pie graph illustrates the percentage of each type of shrub or understory tree species planted since 1979 for a total of 394,348 plants.

Others include: common elderberry 3.1%, staghorn sumac 2.3%, caragana/Siberian pea shrub 1.9%, mountain-holly 1.8%, bush honeysuckle 1.6%, winterberry holly 1.3%, smooth wild rose 1.2%, American mountain-ash 1.1%, hardhack 1.1%, high-bush cranberry 0.9%, swamp rose 0.9%, common juniper 0.8%, choke cherry 0.8%, clematis 0.7%, buffalo berry 0.6%, showy mountain-ash 0.5%, white meadowsweet 0.4%, mugho pine 0.4%, nannyberry 0.4%, ninebark 0.4%, prickly wild rose 0.3%, snowberry 0.3%, broad-leaved meadowsweet 0.2%, hobblebush 0.2%, buttonbush 0.2%, pin cherry 0.2%, Canada yew 0.2%, black chokeberry 'Viking' 0.2%, wild black currant 0.2%, flowering raspberry 0.1%, sweet gale 0.1%, wintergreen 0.1%, red chokeberry <0.0%, American hazel <0.0%, sandcherry <0.0%, and Canada plum <0.0%.



BUFFALO BERRY SEEDLINGS

Seed Collecting

Over 55 kg of seeds/berries of various species were collected by staff / crew / volunteers this year and shipped to the nursery to grow for future stock. See the table for species and quantity of uncleaned seeds/berries collected in grams. Ontario Parks has generously allowed access to Windy Lake Provincial Park over the last several years for the collection of seeds from two species.

The crew also collected approximately 1 kg of uncleaned poverty oat grass seed, thanks to K. J. Beamish Construction Co. Ltd. in Hanmer for allowing the crews access to their site. Seeds for these native grasses are not readily available commercially and therefore must be collected manually from local sources.



RED OAK ACORNS COLLECTED IN PLANTING BAGS

Species	Uncleaned Seed Weight (in grams)
Red Oak	36,000
Wild Raisin	6,500
Running Serviceberry	4,000
Red Osier Dogwood	3,600
Mountain-holly	3,500
Black Chokeberry	2,000
Green Alder	1,800
Round Leaved Dogwood	400
Bristly Sarsaparilla	400

Increasing Biodiversity

Biodiversity Phase

Once the planted trees grow tall enough to create a canopy, a variety of native understory tree and shrub seedlings can be added to the site to increase diversity. In addition, small forest mats containing additional shrubs and herbs are carefully harvested from healthy surrounding forest sites that are to be altered due to development. The vegetation mats are transplanted into the young stands of trees growing on formerly barren areas. In time, plants from these small nodes will disperse and enhance the diversity of the young forest.

Forest Floor Transplants

The practice of transplanting forest floor plants has occurred yearly since 2010 as a technique to re-introduce species, improving habitat, creating a seed bank and increasing the diversity of older reclamation sites. Continued partnership with KGHM allowed for the ongoing forest floor transplants north of Hanmer near the North Range Exploration Property. A private landowner also provided access to a site in Chelmsford. From June to September, vegetation was harvested from both sites, providing a greater variety of species represented in the mats recovered.

The Regreening crews hand dug the top 10 cm of soil containing plants, seeds, microorganisms and invertebrates from the donor site. The vegetation was then watered overnight and transported to regreened (receptor) sites in Greater Sudbury for transplanting. The focus this year was understory sites for shade tolerant species, but several exposed mats for shade intolerant species were also transplanted at various sites.

Criteria for selecting receptor sites for the understory transplants included sufficient canopy cover, low understory species diversity, sufficient soil depth and organic layer (>5cm) and large enough areas to allow the species to spread. Plots were established each measuring approximately 4m by 4m.

In 2018, 3,730 trays of plant material were transplanted covering an area of approximately 0.119 ha. Of these, 339 trays went into exposed sites and the remaining 3,391 trays went into understory sites. There were 19 sites in all, 105 plots and 65 species re-introduced to the regreening sites.

Over the 9 years of this initiative, a total of 1,188 plots have received understory transplants covering a total area of approximately 1.62 ha, 213 plots received exposed transplants covering an area of 0.105 ha and 184 different species have been introduced. The grand total of 1.72 ha of forest floor is the equivalent of 11 hockey rinks in size.



PLACING VEGETATION IN AN EXPOSED MAT



TRAY OF UNDERSTORY VEGETATION

Long-Term Monitoring

Eleven sites established in 2010 have been set up as long-term monitoring sites to track success of transplants and examine species composition over time. This year, 10 of those sites were monitored which included 51 4x4m plots. Results are showing that 55 species are spreading out of the original plots, ranging from 2cm for mountain-holly (*Ilex mucronata*) to 691cm for starflower (*Trientalis borealis*), making the edges diffuse and corners difficult to find.

The most common species found in past plots has been wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), starflower (*Trientalis borealis*), wavy hair grass (*Deschampsia flexuosa*), red maple (*Acer rubrum*) and low sweet blueberry (*Vaccinium angustifolium*).

Shrub Transects

Adding a variety of shrub and understory trees to recovering landscapes has many benefits from enhancing habitat to increasing the resistance and recovery from effects of natural disturbances such as climate change, disease or insect infestations. To gauge the success of these species, transect plots are established to test their survivability and suitability through compiling long-term monitoring data.

This year 6 species were planted in transect plots including smooth rose, staghorn sumac, buffalo berry, hemlock, mountain maple and wild raisin. This adds to the 26 species already established in transect plots at 6 other locations for a total of 32 species being monitored over the past 8 years.

After assessing past transect plots it has been found that the majority of species have relatively high survival rates with only 4 species (yellow birch, bitternut hickory, common elderberry and round leaved dogwood) with survival rates lower than 50%. Some species are the preferred browse (food source) of snowshoe hares: serviceberries, ironwood, yellow birch, American basswood and maple at >80% browsed and bitternut hickory at 100% browsed. It was also observed that plants can withstand the pressure of browsing as they showed signs of re-growth of stems and lateral branches. Two species, bearberry and steeplesbush showed no signs of browsing.

Flora of Greater Sudbury

An inventory of the flora of Greater Sudbury continued again this year through collecting new samples and recording species diversity. This year 147 species were identified, 19 of which were mounted and added to the herbarium's collection at Laurentian University. Of those, 5 had not previously been documented in Greater Sudbury: yellow sedge (*Carex flava*), creeping buttercup (*Ranunculus repens*), kidney-leaf buttercup (*Ranunculus abortivus*), amur maple (*Acer ginnala*), and snake-mouth orchid (*Pogonia ophioglossoides*).

Since 2014, the Biodiversity Research Assistants have contributed 700 plant specimens to the herbarium, bringing the total number of Flora of Greater Sudbury specimens to 4096.



UNDERSTORY VEGETATION TRAYS



CATALOGING VEGETATION SAMPLES AT THE HERBARIUM

Regreening Outreach Coordinator

Educating Our Youth

To help celebrate the 40th anniversary of Regreening in 2018, members of VETAC expressed the importance of reaching out to the younger people who are no longer growing up in an environment as impacted as their parents did. By sharing the regreening story VETAC can ensure that it is not forgotten and mistakes are not repeated.

VETAC partnered with Conservation Sudbury to seek funding for a Regreening Outreach Coordinator who would visit schools and deliver a talk to students about the history of Sudbury's past and the successes of the Regreening Program. The Coordinator began in August of 2017 and gathered all background information and formulated two presentations, one for grade 6 and the other for grade 11 students. Those grade levels were chosen for their direct link to the Ontario Curriculum. The presentations were modified to accommodate grade levels 3 through 12 as required, with the most popular being grade 6 in elementary and 9 in high school.

By the end of the school year 2017-2018, 34 schools were visited and 75 presentations were delivered, which reached 108 classes involving 2,184 students. Additionally, presentations were given at the Heritage Fair, Earth Day event, a Path Finders group and the Sudbury Horticultural Society. Students at St. Paul were also offered a "seed bomb" crafting session. In the spring, 14 schools participated in a tree planting activity. Thirty-one classes involving 637 students planted 2,103 tree seedlings on either school board property or city property within walking distance of the school.

So far for the 2018-2019 school year, over 25 schools have requested presentations reaching over 1,200 students. A booth was also set up at the Children's Water Festival September 19-20 to communicate the importance of forests to lakes and rivers. A presentation was also given to first year environmental studies students at Laurentian University and at a principal's meeting for the French public school board (CSPGNO).

To date, the Regreening Outreach Coordinator has presented to over 3,000 students at 47 different schools. Each teacher receives educational material including a grade 6 lesson plan on local biodiversity and printed posters of different local habitats with links to the on-line interactive versions. Colouring posters are provided to the younger grades.

Funding agreements were secured to retain this position into the New Year (2019) and other applications are pending to extend further into the school year. The presentation is in the initial stages of being video recorded so it can be used in the future to allow the same message to be shared with local youth.



CLASSROOM PRESENTATION

Ugliest Schoolyard Contest

The Canadian Biodiversity Institute and Earth Day Ottawa initiated the first Ugliest Schoolyard Contest in Ottawa in 1998. Based on this example, VETAC's local version of the Contest launched in 2005 thanks to the efforts of Wayne Hugli, a new member of VETAC at the time. After collaborating with Ann Coffey, the coordinator of school grounds transformation program for the Canadian Biodiversity Institute and initiator of the Contest in Ottawa, Mr. Hugli thought it was a great idea for Sudbury, and for VETAC. The initiative seemed to meet all the right criteria: engaging youth, regreening urban spaces, and providing volunteer and sponsorship opportunities within the community. VETAC was quick to approve the initiative, which has resulted in 45 local schoolyards regreened through the generous support of dozens of local businesses and organizations. Thousands of local students are benefitting every day from the improved schoolyard environments.

The regreening work continued at local schools again this year as a result of VETAC's 14th annual Ugliest Schoolyard Contest. Thanks to the generous grant of \$20,000 from Sudbury INO and numerous sponsors providing material, supplies, services and financial support, two schools received assistance in transforming their schoolyards. The grand prize winner was Confederation Secondary School and the runner-up was Lo-ellen Park Secondary School.

In addition to the Sudbury INO funding, schools also received a voucher for the purchase of concrete materials from Brown's Concrete Supplies, and topsoil donated by Vale. Other financial contributions were received from Sudbury Horticultural Society, Sudbury Master Gardeners, KGHM and a private donation from Vanessa Felix. Other in-kind donations from Azilda Greenhouses, Futurescape Landscaping Supplies, Jetty's Landscape Supplies, Southview Greenhouse Growers, and Valley Shrubs and Trees ensured the projects were a great success.

Winner Projects

Confederation Secondary School

Confederation Secondary School was selected as the grand prize winner. On August 27-28, the staff from Azilda Greenhouses planted 5 large silver maple trees in raised planters near the new gym. Planting beds were created along the side of the school building and 3 apple trees were planted in a courtyard where students had already been gardening.

Planting day with students at Confederation was scheduled for September 12. Volunteers from the Sudbury Horticultural Society and Sudbury Master Gardeners directed the planting of perennials and shrubs with the students. The City's Regreening Program staff was also available to assist by delivering all supplies and aiding students in planting, mulching and watering of new garden beds.

Many more excellent project photos covering the entire process to transform this schoolyard are available at smugmug.com/gallery/n-3wgSsK/. The link can also be accessed through greatersudbury.ca/VETAC.



ADDING PERNNIALS TO STONE PLANTERS



LARGE TREES INSTALLED AT CONFEDERATION SECONDARY SCHOOL

Lo-Ellen Park Secondary School

On August 21, the staff from Southview Greenhouse Growers prepared the site at Lo-Ellen Park Secondary School for sod laying in the fall and planted 5 large silver maple trees in raised planters created with large concrete stones. Three were located in front of the city's sports facility and two were located at the north-west corner of the sports field. Those trees were planted, fertilized and watered before the end of the day.

The new Environmental Council lead at Lo-Ellen Park Secondary School worked with students to plant shrubs and perennials on September 18-19. The City's Regreening Program staff assisted the students laying sod in their new green corner on October 17.

Many more excellent project photos can be found at: <https://www.smugmug.com/gallery/n-wxLGFd/>. The link can also be accessed through www.greatersudbury.ca/VETAC.

Sponsors

Generous funding from Sudbury INO and numerous other donors (see page 2 for list) enabled VETAC to provide greatly improved environments for the students and teachers at these two schools.

Media

A communication strategy was implemented to promote the Contest focusing on Social Media. On June 1 the City issued a News Release announcing the winning schools for the year.

An advertisement appeared in the Northern Life on Thursday, December 6 thanking all the sponsors of the project.



STONE PLANTERS



TREE INSTALLATION



FINAL TOUCHES

Labour

The Regreening Program relies on manual labour to undertake the task of improving our local environment. To date, 4,775 temporary positions have been created, 60% of which were made possible through Federal and Provincial programs. Student positions represent 32% of all positions ever offered through the Regreening Program.

Program staff included one foreperson, four crew leaders, fifteen workers and six summer students involved in regular regreening activities. The Biodiversity Research Assistants were mainly engaged in data collection in the field. An additional summer student was shared with the Lake Water Quality Program in field activities. In total 29 temporary positions were created in 2018.

The table outlines the temporary positions created and the number of weeks worked, with a total of 29 positions created in 2018.



CREW HEADING OUT TO PLANTING SITE

Position Title	# Positions	# Weeks	Cost to City	Activity
Foreperson	1	31	100%	Supervision
Crew Leader	4	30	100%	Supervision
Biodiversity Research Assistant	1	48	100%	Field data collection and analysis, seed collection
Biodiversity Research Assistant	1	31	100%	Field data collection and analysis, seed collection
Worker	15	24	100%	Tree planting, liming, transplanting, fertilizing, seeding, seed collection
Summer Student	6	17	78%	Tree planting, liming, transplanting, seed collection
Summer Student	1	17	100%	Assist in field data collection, tree planting, liming, transplanting, seed collection
Total Positions	29			

Volunteers

The MNRF Stewardship Rangers joined the crew again this summer with the group from Windy Lake participating from July 30 to August 2 and the group from the Sudbury office the week of August 7-9. Each group consisted of one leader and 4 youth rangers. They were able to experience the vegetation mat transplants, liming activities, poverty oat grass seed picking and spreading woodchips at the Jane Goodall Reclamation Trail which also included a tour of the trail. The Rangers were able to use the online tour to get the information on each station along the trail which contributed to the learning experience.

Partners

The success of the Regreening Program depends heavily on the support of its many partners. Long time support from the two major mining companies, Vale and Sudbury INO, through in-kind and financial assistance has grown substantially since the release of the Sudbury Soils Study in 2009.

Tree Canada has been a partner since 1997 contributing over 3.8 million trees to the Program. The Sudbury earthdancers have contributed over \$42,000 since 1999. The Ontario Ministry of Transportation (MTO) and KGHM provided access to some of their properties for Regreening crews to salvage forest floor plants.

Collège Boréal has been conducting survival assessments and quality control assessments, provides storage and care of seedlings prior to planting and is participating in the creation of a local seed bank of native trees and shrubs. Laurentian University has provided support to the Regreening Program's Biodiversity Research Assistants in terms of expertise and use of facilities, particularly the Herbarium.

Conservation Sudbury continues to allow long-term vegetation monitoring plots to be established in the Lake Laurentian Conservation Area and occasionally is able to provide financial assistance towards the purchase of trees. More recently it has cooperated in hosting the Regreening Outreach Coordinator.

tentree has contributed towards wages to have over 300,000 trees planted to date since the partnership began in 2015.

It is the financial and in-kind support of these partners that ensures the Regreening Program continues to function effectively.



MNRF STEWARDSHIP RANGERS WITH UNDERSTORY MAT



Regreening
Reverdissement

Sudbury Regional Tree Fund

In 1993, Gerry Loughheed Jr. requested that the Regional Government establish a 'tree foundation' to house and accept memorial donations from Mr. Loughheed and any others willing to support community tree planting activities. Funds from the Foundation would be used to purchase and plant trees in various areas of the community as part to the Regreening Program. Monies were to be disbursed consistent with Regional tree planting strategies overseen by VETAC. Corporate commitment from Loughheed's to kick-off the project was \$10,000 representing trees in memory of 1,000 families served. Subsequently, ongoing monthly donations were made. Council instructed VETAC to oversee the tree planting activity and passed resolution #93-451 on July 14, 1993 establishing the fund.

In 1997, the Tree Protection Reserve Fund was transferred to the Sudbury Community Foundation and is now known as the 'Sudbury Regional Tree Fund'. The initial capital transferred at that time was \$59,181.90. Today, that fund continues to grow, with the interest income granted to the Regreening Program to further enhance the city with tree planting activities.

A Gift That Grows



DONATION CARD

Funding

The Regreening Program relies on donations to operate the yearly Program. Many successful partnerships have been developed over time and new opportunities are always being investigated.

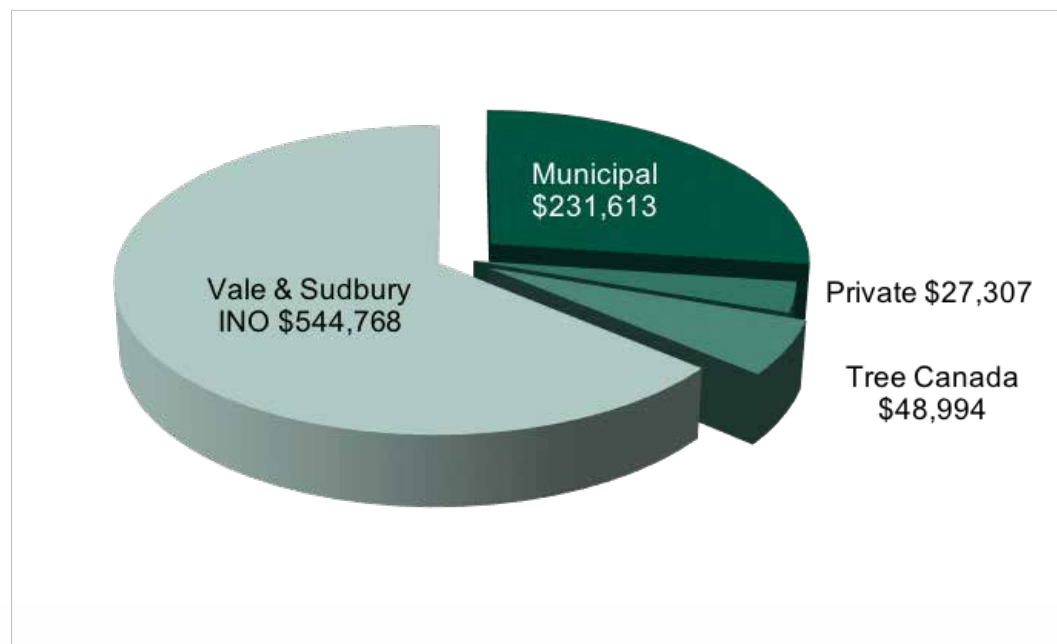
The table outlines the program contributors and the dollar amount associated with their contributions in 2018 for a total of \$864,022.

Program Contributor	Description	Source	Amount
Labour			
Employment & Service Development Canada	Wage subsidies for 6 summer students over a 9 week period	Federal	\$11,340
tentree	Financial support to have 119,624 seedlings planted	Private	\$11,962
Cash			
Vale	Financial contribution	Mining Co.	\$250,000
Sudbury INO	Financial contribution	Mining Co.	\$265,000
Sudbury earthdancers	Financial contribution	Private	\$3,245
Sudbury Community Foundation	Financial contribution	Private	\$9,200
Materials			
Tree Canada	Funding to purchase 40,000 seedlings	Private	\$48,994
Vale	Donation of 48,840 pine seedlings	Mining Co.	\$9,768
Ugliest Schoolyard Contest *			
Sudbury INO	Financial contribution	Mining Co.	\$20,000
KGHM	Financial contribution	Private	\$1,000
Vanessa Felix	Financial contribution	Private	\$1,000
Sudbury Horticultural Society	Financial contribution	Private	\$600
Sudbury Master Gardeners	Financial contribution	Private	\$300
Subtotal	Sum of external funding sources	Various	\$632,409
City of Greater Sudbury	Financial contribution	Municipal	\$231,613
Grand Total	Sum of all funding sources	Various	\$864,022

*(does not include material and in-kind donations provided by sponsors)

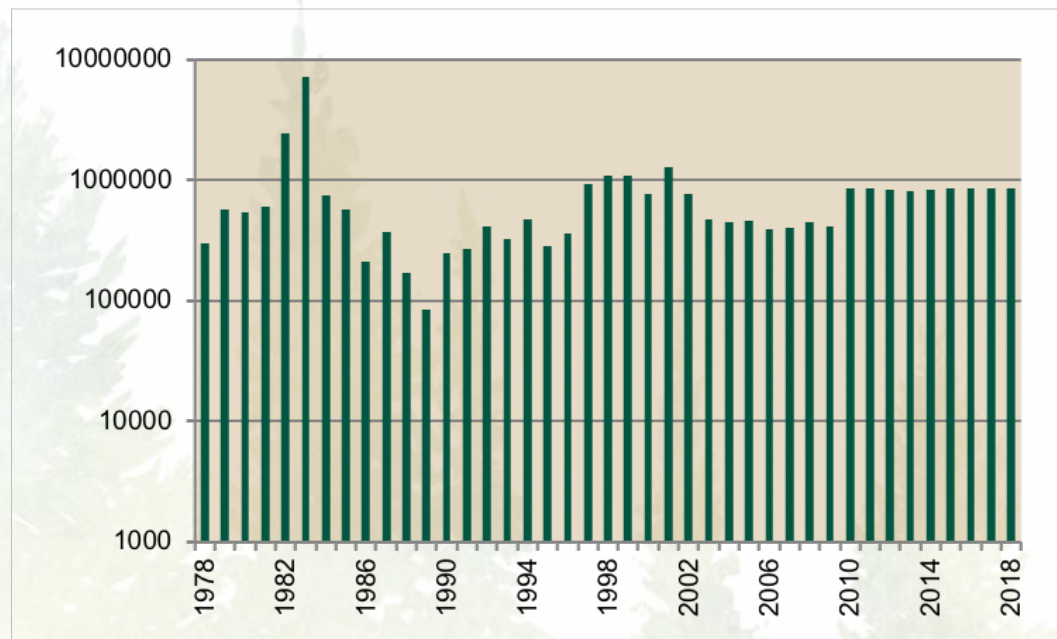
Funding Contributions by Source 2018

The graph illustrates 2018 funding contributions by source.



Yearly Program Costs 1978 to 2018

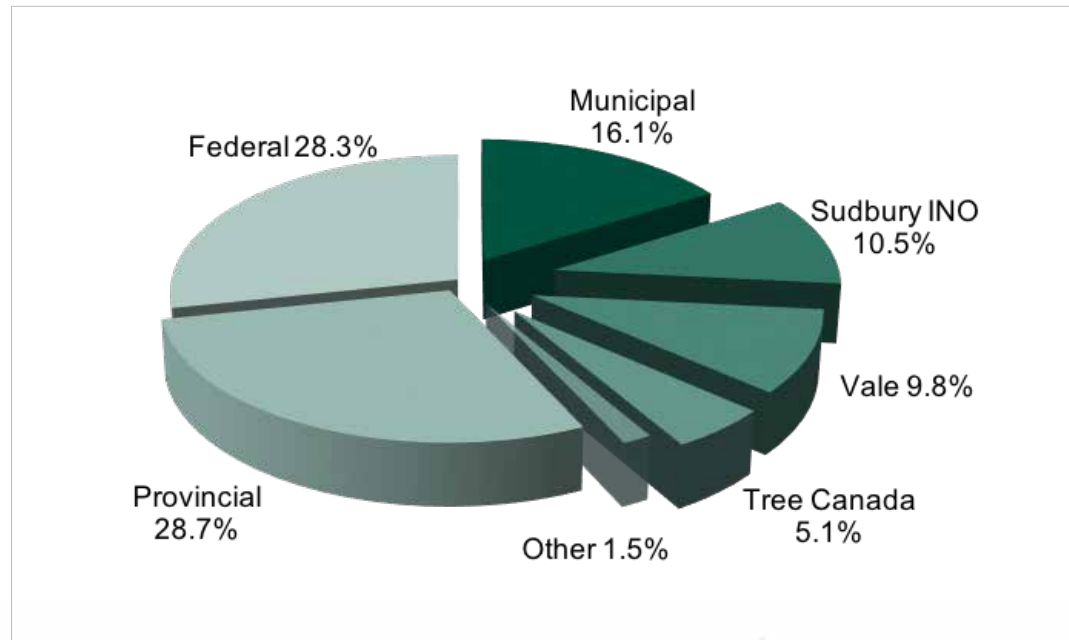
The bar graph indicates yearly program costs from 1978 to 2018 with a grand total of \$32,701,769.



Percent Funding Contributions by Source 1978 to 2018

The graph illustrates funding contributions in percentages by source from 1978 to 2018.

Since 1978, the City's contribution to the Program has averaged 16% of the total costs with 84% coming from external sources. To date, the Program costs exceed \$32 million.



Events

Environment Commissioner of Ontario (ECO)

Conservation Sudbury (CS) staff had an opportunity to meet with Dianne Saxe, the ECO when she visited Greater Sudbury on April 12. CS staff member Sarah Woods (also Co-Vice Chair of VETAC) presented on a few topics including regreening. The ECO showed a lot of interest and asked several questions. EarthCare Sudbury also hosted an event with the ECO the next day and had invited individuals from several environmental groups in Greater Sudbury and included mining company representatives. Stephen Monet presented the Commissioner with a copy of *Healing the Landscape*.

Annual Tree Giveaway

VETAC's Annual Tree Giveaway began in 1976 to engage and enable the community to plant tree seedlings at home, thereby contributing to the urban tree canopy. Beginning in 2012 there was a shift away from tree species to native shrubs, which provide added diversity and, for some species, edible berries. This initiative has been very well received by the community. To date, 430,414 trees and shrubs have been distributed to local residents.

The annual tree giveaway was held on May 26 at the 8th annual Garden Festival. VETAC members and staff distributed 800 native clematis (*Clematis virginiana*) plants and 587 black chokeberry shrubs to residents for planting at home. A second room was set up for people to explore the regreening website and obtain additional information.

TD Tree Days

A tree planting event on September 22 was organized by EarthCare Sudbury and Regreening Program staff who secured funding from TD Tree Days. Planting took place behind the old St. Joseph's Hospital parking area. Native plants such as White Pine, White Spruce and Tamarack were planted as well as several deciduous trees including a few to test the limits of climate change. They included Kentucky Coffee Tree, Basswood, Hackberry, Ironwood, Bitternut Hickory and White Oak. Thirty people, mostly TD Bank employees, attended the event and planted 92 trees in 1-2 gallon pots. Staff from Parks assisted the effort by digging the holes in advance with machinery, providing additional soil for planting and securing mulch.



ANNUAL TREE GIVEAWAY



TD TREE DAY PLANTING EVENT

Academic Bursaries

Funds have been put aside from surplus conference funding from the Mining and the Environment Conferences that occur every four years. These funds have been used to create bursaries for PhD, Masters and Undergraduate students in the Mining Reclamation program. Bursaries in the name of Ann Gallie, Douglas Goldsack, Peter Beckett, Graeme Spiers, Tom Peters and VETAC were awarded at events on April 30 and November 16. A total of \$85,500 was awarded to 20 students.

40th Anniversary Events

Council Presentation

On April 4th Stephen Monet with the assistance of Peter Beckett and Tina McCaffrey and support of VETAC members in the audience, made a presentation to council to kick off the 40th anniversary.

Proclamation

The Mayor read a 40th anniversary proclamation on May 1st at the Northern Water Sports Centre in the company of VETAC members and Regreening Program staff.

40th Anniversary Trail Tour Series

Every year, VETAC members and staff provide additional information on the Regreening Program to visiting conference attendees and other out of town groups by providing guided tours of regreening sites and by delivering informative presentations. This year, a series of four tours were scheduled for the local general public to attend, hosted by VETAC Chair Dr. Peter Beckett with assistance provided by various VETAC members. Rainbow Routes hosted the trail tour information on their website and provided the sign up logistics.

On May 27th 17 participants attended a tour of the Jane Goodall Reclamation Trail in Coniston. Later Sarah Woods provided an interview with Radio-Canada (French). There was also a video crew from the Communications Department at Laurentian University. The resulting video can be viewed at: <https://www.facebook.com/laurentian/videos/1994342047252790>

Over 30 people took part in the Dynamic Earth tour on June 24th including a number of tourists. The tour consisted of an introduction and brief environmental history of Sudbury, general reclamation procedure, liming to tree planting, understory plots and biodiversity, the 3 millionth tree, view of Sudbury's regreening efforts, the Vale slag reclamation, the Prince of Wales Forest and sign, Regreening exhibit inside Dynamic Earth and finally a stop to the Café for a general discussion.



PROCLAMATION READING ATTENDEES

Despite the rain, 8 participants attended the Princess Anne Public School tour on August 25th. They were able to see the work completed through the Ugliest Schoolyard Contest and walk a trail behind the school to see some past regreening efforts and vista points.

September 30th was the final trail tour in the series. For this tour of the Kelly Lake Trail, 17 participants were able to experience well established forested areas as well as those in early stages of recovery. Several residents out for a routine walk joined in on the tour along the way.

Tours and Presentations

American Society of Mining and Reclamation

The 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO took place from June 3-7 with the theme “The Gateway to Land Reclamation”. Graeme Spiers presented an oral paper entitled “Reclamation in Smelter-Impacted Landscapes in Northern Regions – A Comparison of Canadian and Russian Experiences”. This paper was co-authored by Graeme Spiers, Professor of Environmental Monitoring, School of the Environment along with Peter Beckett, Restoration Ecologist, Biology Department, Laurentian University, and Sergey Kopstik, Faculty of Physics and Galina Kopstik, Faculty of Soil Science, Lomonosov Moscow State University, Leninskie Gory, Moscow, Russia.

Sudbury Horticultural Society Tour

On June 16th about 25 participants from the Sudbury Horticultural Society participated in a tour of the Jane Goodall Reclamation Trail and planted some wildflowers along the way including Black-Eyed Susans, Wild Lupines, and Blazing Star. Northern Wildflowers had a display of native wildflowers suitable for home gardens and the Sudbury Master Gardeners offered advice clinics.

Conservation Sudbury Speaker Series

The Conservation Sudbury Speaker Series is a periodic event where they host talks on topics that are relevant to the conservation areas. On July 5th Peter Beckett provided a talk entitled “Healing the Sudbury Landscape: 40 years and Still Going Strong” to 10 attendees from the general community held at the Bioski Cottage.



KELLY LAKE TRAIL TOUR ATTENDEES



DYNAMIC EARTH TOUR ATTENDEES

Communities in Bloom

On July 24th a tour of the Jane Goodall Reclamation Trail was provided for two Communities in Bloom judges who were accompanied by Capreol Railroad Museum staff. Capreol went on to capture 5/5 Blooms as well as two provincial awards for Heritage Preservation and Urban Forestry and Trails.

Ugliest Schoolyard Contest Tour

The Ugliest Schoolyard Contest Tour was held August 29th starting at Sudbury Secondary then moving to Princess Anne, Lo-Ellen Park Secondary and finally to the very first Contest winner, St. Paul the Apostle in Coniston. Many VETAC members attended as did the Mayor and many volunteers from the Sudbury Horticultural Society. School staff was also available to discuss their regreened schoolyards.



TOUR AT PRINCESS ANNE PUBLIC SCHOOL

Society of Ecological Restoration

On Sunday, September 16, Restoration Graduate Students (Dr. Peter Beckett, Restoration Ecologist, Dr. Graeme Spiers, Soil Scientist and Miranda Virtanen, Junction Creek Stewardship Committee Coordinator) gave a workshop and tour to members of the Ontario Chapter of the Society of Ecological Restoration (SERO) in conjunction with the Laurentian University Student Chapter of SERO. The day started with a general introduction to the Sudbury scene with a presentation entitled “Healing the Sudbury Landscape: 40 Years and Still Going Strong” and a few short graduate student presentations on local restoration/conservation topics. The rest of the day was spent at various stops around Sudbury to view ongoing restoration. Paul Kennedy, host of the program ‘Ideas’ on CBC Radio, was in attendance and indicated his plan to create an episode on the Regreening Program in late January or March 2019. Information on the SERO can be found at: <https://chapter.ser.org/ontario/activities/2018-sudbury-landscape-restorationworkshop/>

AECOM Planting

On Sunday, September 21, Peter Beckett led employees of AECOM in planting 400 seedlings and discussed 40 years of Regreening in conjunction with Rainbow Routes.

Red Oak Forest Tour

A tour of the Red Oak Forest on October 8th was provided to members of the Minnow Lake Restoration Group where they discussed 40 years of Regreening.

Regreening the Moon – 40 Years of Regenerative Landscape Design

On October 11th staff offered a 3-hour regreening bus tour for 32 participants of the Ontario Professional Planners Institute (OPPI) Symposium which was held at Laurentian University. The tour included visits to various sites relevant to the Regreening Program. Concurrently, some VETAC members lead another group of about 30 land-use planners on a Copper Cliff History Hike, interjecting regreening comments along the way. (<https://ontarioplanners.ca/oppi/conferences/symposium-2018/program/day-1/mw2-regreening-the-moon-40-years-of-regenerative-landscape-design>)

Canadian Land Reclamation Association

On October 15th the Canadian Land Reclamation Association (CLRA) were given a talk on how regreening can be transferred to similar situations in Russia.

Norilsk, Russia

Staff gave a powerpoint presentation on October 17 regarding Sudbury's green transformation to a delegation from Russia including the Mayor of Norilsk and the owner of Norilsk Nickel. The next day, the delegation headed to Laurentian University to discuss further with faculty from the biology department.

Student Knowledge Sharing

Students from Sir Sanford Flemming and Trent University were given a presentation and tour of regreening featuring the difference between naturally recovering areas and those that have had the regreening treatment.

Pontifical Catholic University of Chile

On November 5 Peter Beckett made a presentation to Pontifical University in Chile on the Sudbury story.

Planning For Closure

From November 7-9 Peter Beckett was in Santiago, Chile giving a talk on Regreening at the 2nd International Congress on Planning for Closure of Mining Operations. The presentation was on a paper entitled "Reclamation in Smelter-Impacted Landscapes in Northern Regions – A Comparison of Canadian and Russian Experiences". This paper was co-authored by Graeme Spiers, Professor of Environmental Monitoring, School of the Environment and Peter Beckett, Restoration Ecologist, Biology Department, Laurentian University, and Sergey Kopstik, Faculty of Physics and Galina Kopstik, Faculty of Soil Science, Lomonosov Moscow State University, Leninskie Gory, Moscow, Russia.

Communications

Radio Interviews:

Ça parle au Nord

On May 4, Tony Fasciano, an original member of VETAC, was interviewed for a radio segment on Ça parle au Nord with Patricia Sauzede-Bilodeau of Radio-Canada. The segment was entitled 'De paysage lunaire à végétation luxuriante - Quarante ans de reverdissement pour la ville du Grand Sudbury'. (<https://ici.radio-canada.ca/premiere/emissions/ca-parle-au-nord/segments/entrevue/70951/cpan-sudbury-reverdissement-fasciano>)

Morning North with Markus Schwabe

Peter Beckett and Stephen Monet appeared on Morning North with Markus Schwabe on May 7 to discuss 'Sudbury's greening program is celebrating 40 years'. (<https://www.cbc.ca/listen/shows/morning-north/segment/15542696>)

Stephen Monet was on Morning North with Markus Schwabe on July 16 for their 'Year of the bird' segment. Stephen highlighted the ovenbird's return thanks to greening efforts. (<https://www.cbc.ca/listen/shows/morning-north/segment/15557899>)

On October 3 Peter Beckett was interviewed for Morning North with Markus Schwabe to discuss greening efforts in Sudbury that started 40 years ago. (<https://www.cbc.ca/listen/shows/morning-north/segment/15609114>)

Le matin du Nord

A radio interview entitled "40 ans d'efforts de reverdissement à Sudbury" was given by Sarah Woods on Radio-Canada's Le matin du Nord with Martine Laberge regarding the first scheduled 40th anniversary Regreening Tour on May 27 at the Jane Goodall Reclamation Trail in Coniston. (<https://ici.radio-canada.ca/premiere/emissions/le-matin-du-nord/episodes/408149/audio-fil-du-lundi-28-mai-2018>)

Up North

On July 16, Peter Beckett was on the radio show Up North with Wendy Bird discussing 'What's next in Sudbury's re-greening future?' (<https://www.cbc.ca/listen/shows/up-north/segment/15557977>)

On the Up North show on September 19, Vale showcased the completion of its Clear AER project. The 7 minute video with Angie Robson and Glen Watson covers a great deal of greening talk and several mentions to VETAC. (<https://www.cbc.ca/news/canada/sudbury/superstack-demolitionbegins-1.4829643>)



ÇA PARLE AU NORD.
PHOTO CREDIT: RADIO-CANADA

L'heure de pointe Toronto

On August 29 Sarah Woods was interviewed by Daniel Aubin for L'heure de pointe Toronto with Isabelle Fleury. They discussed the Ugliest Schoolyard Contest Tour / Visite dans le cadre du concours de la cours d'école la plus laide. (<https://ici.radio-canada.ca/premiere/emissions/l-heure-de-pointe-toronto/episodes/414437/audio-fil-du-mercredi-29-aout-2018>) (Select «17 h 10 Ouverture de l'émission » and navigate to 14:50 minutes into the interview).

Publications / Websites

Northern Ontario Business

March 26: Laurentian to study efficacy of greening program (<https://www.northernontariobusiness.com/regional-news/sudbury/laurentian-to-study-efficacy-of-greening-program-874048>)

May 1: Sudbury celebrates 40 years of greening (<https://www.northernontariobusiness.com/regional-news/sudbury/sudbury-celebrates-40-years-of-greening-910639>)

Sudbury Star

April 28: Column: Praising our 'regreening' volunteers (<https://www.thesudburystar.com/2018/04/28/column-praising-our-regreening-volunteers/wcm/85c279ad-7d19-d503-2d9a-bf55a6894275>)

May 2: Sudbury celebrates greening program (<https://www.thesudburystar.com/2018/05/02/sudbury-celebrates-greening-program/wcm/7868d7ed-b5fb-8e34-007b-1ea0820a3e19>)

The Northern Life/Sudbury.com

May 2: Sudbury celebrates 40 years of greening (<https://www.sudbury.com/local-news/sudbury-celebrates-40-years-of-greening-911621>)

CBC News

May 8: 'Still got lots to do in Sudbury's regreening program', ecologist says. (<http://www.cbc.ca/news/canada/sudbury/regreening-40-yearanniversary-1.4652024>)

Radio-Canada

May 26: Changer l'image d'une ville grâce au jardinage, Ici Radio-Canada Nord de l'Ontario. (<https://ici.radio-canada.ca/nouvelle/1103368/sudbury-gardening-festival-jardinage-plantes-reverdissement>)

Glencore Report to Community

Glencore Sudbury INO produced its 2018 Our Report to the Community. On page 10 in 'Enhancing our Environment', there is a section on the Ugliest Schoolyard Contest.

Green Living Summer 2018

The 2018 Green Living Magazine, published by EarthCare Sudbury, focused on the 40th Anniversary of the Regreening Program with cover theme and several articles surrounding the anniversary. (https://edition.pagesuite-professional.co.uk//launch.aspx?eid=a3e536e9-f816-4257-a77a-4346766c6c8f&utm_source=sudbury.com&utm_campaign=sudbury.com&utm_medium=referral)

Laurentian University Promotional Brochure

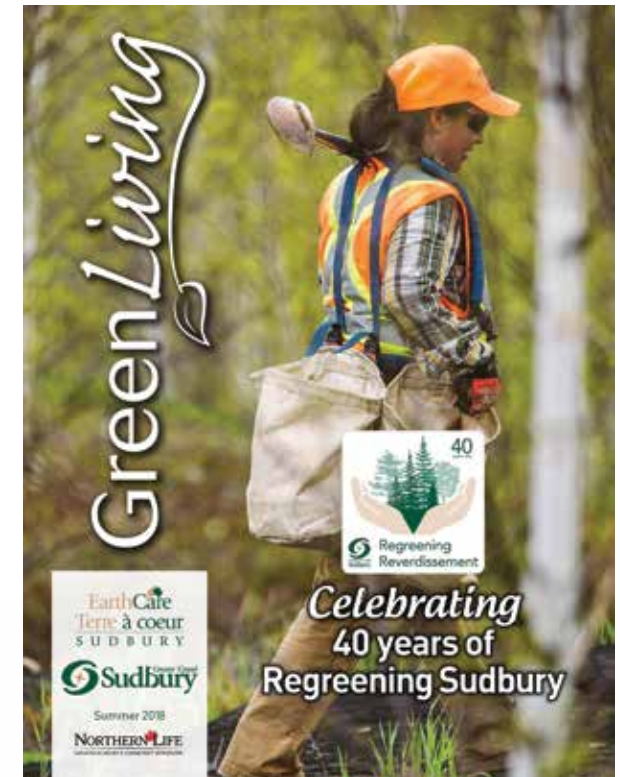
"From 'Moonscape' to Living Landscape: 45 years of regenerative landscape in Greater Sudbury" was the afterword written by Stephen Monet for Laurentian University's promotional brochure.

Advertising

For most of the month of June and part of July, the digital billboard at Bell Park was used to advertise the 40th Anniversary of Regreening and promote the Over to You platform for the general public to share their own personal stories of Sudbury's transformation. Those stories can be viewed and added to by visiting <https://overtoyou.greatersudbury.ca/40th-anniversary-of-regreening>

Television

Video coverage of the Sudbury Gardening Festival on the CTV Northern Ontario Evening News on Saturday, May 26th covered a great deal on the regreening program with Tina McCaffrey interviewed by Molly Frommer. (<https://northernontario.ctvnews.ca/video?clipId=1403378>)



GREEN LIVING MAGAZINE

Afterward

Forty years of regreening effort has achieved remarkable results, transforming a barren, rocky landscape into a green and living one. But, there are still thousands of hectares of land that have not yet received regreening treatments. With guidance from City Council and VETAC and collaboration from community partners, the Regreening Program will continue to apply its treatments to the remaining areas to maintain the momentum of ecological recovery in the years ahead.

New challenges to local regreening efforts are also coming to the fore.

Climate change will continue to threaten northern forests in the decades ahead. Certain models indicate that growing conditions for some of the dominant tree species in Greater Sudbury may no longer be optimal in a few decades. In preparation for these changes, the Regreening Program has been planting seedlings of species that currently grow slightly to the south. This action will continue and new species will be monitored for success.

Carbon sequestration through tree planting can help counter greenhouse gas emissions and mitigate climate change. A research project led by Laurentian University is currently underway that will assess the amount of carbon sequestered by the regreening efforts in Greater Sudbury and examine ways to increase both carbon storage and biodiversity of the developing forest. The results may lead to modifications to restoration work in the near future.

Completion criteria will be developed and tested to signal when a specific regreened area has received all of the interventions that are deemed required and can now be handed back completely to Nature to chart its future course. Management units have been developed to assist in geographically partitioning the regreening work to be accomplished. The next step will be to determine the best approach to adequately reflect ecosystem structure and function of the developing forests given the numerous ecological measures possible.

In her book *Hope for Animals and Their World*, Jane Goodall uses Sudbury's remarkable turn-around as a story of hope in a world too often besieged with negative environmental experiences. Smelter cities in countries like Russia and China still look to Greater Sudbury as an example of what can be done. Advice is sought on every aspect of our achievements, including project initiation, mining company involvement, community engagement, and the technical aspects of the land treatments. It is rewarding to know that Greater Sudbury's experience in ecological recovery still shines a beacon of hope for other municipalities facing similar challenges throughout the world.



CARRYING VEGETATION MAT TRAY

VETAC Members 2018

Chair

Dr. Peter Beckett, Laurentian University

Co-Vice Chairs

John Negusanti, Citizen

Sarah Woods, Conservation Sudbury

Members

Nathan Basiliko	Laurentian University
Hannah Burke	Wahnapitae First Nation
Tony Fasciano	Citizen
Vanessa Felix	KGHM
Enzo Floreani	Sudbury Master Gardener
Jim Found	Ontario Soil and Crop Improvement Association-Sudbury District
Marc Hébert	Collège Boréal
Wayne Hugli	Sudbury Horticultural Society
Jim Ilnitski	Citizen
Bill Lautenbach	Citizen
Tim Lehman	MNRF
Serena Maki	Blue Heron Environmental
Franco Mariotti	Citizen
Stephanie Marshall	Sudbury INO
Tina McCaffrey	CGS, Regreening Program
Stephen Monet	CGS, Environmental Planning Initiatives
Laura Mucklow	Sudbury INO
Mike Peters	Citizen
Quentin Smith	Vale
Graeme Spiers	Laurentian University
Ben van Drunen	Hollandia Land & Environmental Solutions



For further information please contact:

Regreening Program

Environmental Planning Initiatives
City of Greater Sudbury

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💻 greatersudbury.ca/regreening

Accessible version available upon request.

