



GRAND Actions

The Grand River watershed newsletter



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Harvesting native seeds

By Janet Baine
GRCA Communications Specialist

Moritz Sanio loves collecting native seeds that are used to bring degraded ecosystems back to life.

He is a member of the GRCA restoration team which works to bring back fields of wildflowers and grasses that would have been here before European settlers arrived. Restoration takes a helping hand, because without the seeds of native grasses and wildflowers, invasive plants take over.

“We take a marginalized field or degraded natural area and restore it back closer to the native self-sustaining ecosystem it once was,” Sanio says, explaining the work of restoring heritage ecosystems. This increases biodiversity right away and provides native habitat.

In the past when land was restored, a non-

native cover crop such as red clover was planted to stabilize the land and stop invasive weeds and exotics from taking over. Trees were planted and as they grew, the clover would give way to the trees and keep invasives out. But red clover is non-native and only one species, so it doesn't encourage natural biodiversity. It also wasn't a natural home or food source for native insects and birds.

Since 2008 the GRCA has been planting native wildflowers and grasses instead of red clover. The GRCA started out by buying the seeds which were provided by Mary Gartshore of St. Williams Nursery and Ecology Centre, a leader in restoration. But for the past three years the GRCA has also been harvesting native seeds from its own properties for use in nearby restoration. It is important to have genetically adapted seeds for restoration, and that's why the prairie and savanna

Cover photo

Moritz Sanio checks this field of flowers at Guelph Lake. It is a newly-restored wildflower meadow from which native seeds are harvested.

Photo by Martin Neumann.





Photo by Janet Baine

Moritz Sanio holds up some wiry wild Canadian rye seeds that are among the 20 varieties collected by GRCA staff in 2011.

remnants on GRCA land are the ideal seed source for GRCA land restoration projects.

These native seeds are very expensive because they need to be collected at the right time and place, usually by hand, and cleaning them takes time and specialized equipment. The GRCA seed collection program has grown since the first year in 2009 when about five kilos of seeds were collected. In 2010 GRCA staff collected about 25 kilos. In 2011 that grew to 55 kilos of seeds made up of more than 20 different species of native grasses and wildflowers from nine GRCA sites. These seeds would be worth many thousands of dollars to purchase and are enough to cover 50 to 100 hectares of land.

Some of the seeds are the size of gold dust, and just about as expensive, Sanio jokes. Others are big and wiry.

Sanio is the Trees for Guelph co-ordinator and he says that while native trees are important, he always likes to add some wildflowers and native grasses to any site that is being planted with trees. In nature, they all grow together.

Native plants have co-existed with native trees and shrubs for thousands of years.

“Because many different species of seeds

are planted together, they increase biodiversity right away,” Sanio explains. “Within two years of the initial planting, lots of seeds can be harvested from a restoration location for use at other spots.”

Once they have been cleaned and processed, the seeds can be planted out in new locations near where they were originally collected. Late fall is the best time to sow the seeds, because these seeds have a natural mechanism that prevents them from germinating until spring, even if they become wet.

“These seeds need to be sown as soon as possible in the fall, because that’s what happens in nature. Imitating nature gives them the best chance of success,” Sanio says. “They don’t germinate right away. They need cold, wet periods in the fall and winter and have an internal mechanism that prevents them from germinating until they come up in the spring. The biochemistry of seeds is amazing.”

By the second year on GRCA restoration sites planted in the Dunnville Marsh and at Guelph Lake the plants were established and any trees that have been planted can grow up among them.

“You plant the seeds, set the ball in

motion, and it just takes off,” Sanio says. “You don’t need to invent anything new, just see what happens in nature and replicate that.”

Anyone can plant native seeds and plants in their own yard and this is an excellent way to increase biodiversity.

Resources:

- *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants* by Douglas Tallamy
www.plantanative.com
- The Society for Ecological Restoration International has a 15-page primer on ecological restoration available at www.ser.org.
- www.tallgrassontario.org
- www.treesforguelph.ca

Tips for native seed collection

- Properly identify plants, avoiding non-native species and aggressive natives
- Scout native populations through the growing season to monitor seed viability and ripeness
- Ripe seeds are generally tan to dark brown coloured
- Leave seed behind for natural regeneration and wildlife
- Remove seed with care, being sensitive to the plant and site
- Seeds are living, avoid wide temperature fluctuations
- Sow seeds in the fall for the best results
- Store in a dry and cool place

Grand Actions now in colour

This issue of Grand Actions is the first that is being printed in full colour so that it appears the same way as the online version.

We are sorry that a self-addressed envelope was not included with the last edition to assist you with updating your contact information.

Thank you to our readers for overcoming this oversight, and sending the form in anyway as well as many donations. We really appreciate your comments and your continued support of Grand Actions and the GRCA. We have also added the mailing address onto the back page. Together we are making a difference to improve the Grand River watershed.

Rocks tell ancient secrets

Many ancient secrets have been revealed to geologists who have studied the famous rocks at Rockwood and in the Grand River valley. Limestone cliffs, potholes and caves tell a tale of an inland sea, volcanic eruptions, earth quakes and a melting glacier that had been more than one kilometre thick.

410 million years ago: a tropical sea

The Grand River area was in the tropics. The days were only 20 hours long, because the world was spinning faster than today.

Most of southern Ontario was covered by a tropical inland sea. Rockwood was located in a shallow part of the sea where there was a thriving coral reef. The coral grew in pinnacles to the top of the water because it needed sunlight. It would die back when the water level fell.

Mollusks, such as snails and clams, lived in among the coral. They are now extinct, but are ancient relatives of today's edible shellfish. Over millions of years, their shells piled up eventually becoming limestone cliffs that are up to 36 metres tall.

60 million years ago and more: continents collide

Gradually, the super continent Pangaea began to break apart. A piece of Pangaea, called Laurussia, began to drift north.

During this change, the earth moved, volcanoes erupted and the landscape transformed.

The climate changed completely and became very cold.

11,000 to 16,000 years ago: the Ice Age and the Wisconsin Glacier

This was the peak of the Ice Age in the area. Instead of being covered by a tropical sea, the Grand River watershed was covered by the Wisconsin glacier that was a kilometre thick.

As it grew, the great glacier worked like a bulldozer, smashing everything in its way. The glacier was so large, it went from the Rocky Mountains to Newfoundland.

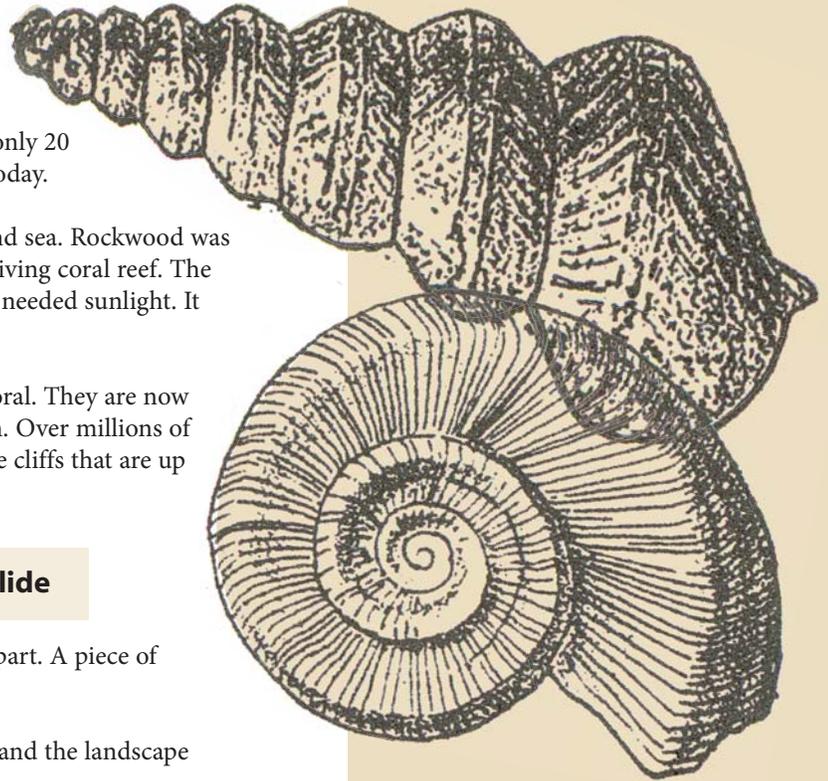
10,000 years ago: the modern climate begins

Finally free of its heavy load of ice the earth's crust began to rebound.

This left bald limestone and water at Rockwood and other locations, as well as interesting rock formations that are visible today.

First lichens appeared on the land and algae on the water. Together, they formed the first moss. Then ferns evolved, followed by grasses, wild flowers, shrubs and eventually soft wood.

These two mollusks are samples of ancient creatures. Their bodies piled high to form the limestone caves and cliffs at Rockwood seen in the photos below.





David Westfall on his property where a variety of species of trees have been planted. He says he enjoys seeing the trees grow as well as the biodiversity that they bring back to the property.

Growing a forest on his land

By Janet Baine
GRCA Communications Specialist

The pleasure of seeing things grow was part of the inspiration for a St. Agatha family to grow a 12 acre forest.

Dave Westfall, his sister Sandy Hill and her husband Jamie share a house on property that their parents purchased in 1979. Westfall designed the house while Sandy has been working hard to return the surrounding landscape to nature. This started modestly enough, when they planted a few trees to extend a wind break.

“We live above the aquifer that provides the City of Waterloo with its water, so it is environmentally sensitive,” Westfall said. “We started planting trees on our own. But with the help of the GRCA’s Rural Water Quality Program, we found we could do much more. We started in 2007 by planting over 3,000 trees and shrubs. Since then, we have converted 10 to 12 acres of land back to forest. We are motivated partly from concern for the environment and partly because we enjoy seeing these trees grow.”

Last June their home and gardens were on a tour to help raise funds for the Kitchener Waterloo Symphony. Someone in Brantford read about this tour, and asked to bring a bus

LOOK WHO'S TAKING ACTION

load of people up from the Brantford Garden Club a few days later. As the Brantford gardeners were milling around the garden, a swallowtail butterfly was hovering in the area of some Indian paintbrush, creating a stir among the visitors.

“That is the kind of thing that you get when you have lots of native plants,” Westfall said. “It is those little moments, rather than the grand things that are important. Those fascinating things of creation are such an incredible gift to us.”

Even more butterflies should be fluttering around their property soon. They read an article about pollinators in *Grand Actions* and decided to take on their own project. In 2010, GRCA staff hand-seeded three acres of land where young trees were growing with native wild flowers.

The GRCA has hand seeded native wildflowers only on GRCA land, such as at Guelph Lake Nature Centre and the Dunnville Marsh, as is described in the previous story. The GRCA doesn't usually create pollinator habitat on private property, but took it on as an experiment.

Large tracts of forest are really needed in the Grand River watershed to encourage biodiversity and provide habitat for species of plants and animals that only live in the centre of a large forest. Private landowners can now get even more assistance in turning land back to nature.

Since 2007, Trees Ontario has been in partnership with the Ontario Ministry of Natural Resources to plant 50 Million Trees by 2020 as a way to mitigate climate change, sequester carbon and enhance biodiversity and wildlife habitat throughout southern Ontario. The GRCA is one of the many conservation authorities and planting agencies working with Trees Ontario to deliver the program. GRCA staff work with landowners to reforest large areas at a significantly reduced cost. Many local municipalities also provide funding assistance.

To qualify for the program, the planting area must be at least two hectares (five acres) in size and is meant for plantation or block style plantings.

Smaller plantings such as farm windbreaks and riparian buffers may also qualify for the GRCA tree planting program with potential cost-share through other funding agencies.

Resources:

Interested landowners should visit www.grandriver.ca/treesales for information or e-mail ruralwater@grandriver.ca.

GRCA Forestry Specialists can be contacted at 519-621-2763 Jessica Robbins ext. 2277, Nathan Munn ext. 2262, or Myles Henderson ext. 2259.

More information about 50 Million Trees is here: www.treesontario.ca.

The story of groundwater

By Janet Baine
GRCA Communications Specialist

People who want to tell Cambridge's water story joined together in 1997 to form a committee called Cambridge WATERS (Water Awareness Through Education and Resource Stewardship) that is still going strong today.

This committee was one of five recipients of a 2011 Grand River Watershed Award.

Researchers study river health

What can fish, mussels and other organisms tell us about the health of water in the Grand River system?

That's the question that a team of researchers hope to answer in a three-year study financed by a \$600,000 grant from the Canadian Water Network.

The research team is led by Mark Servos, the Canada Research Chair in Water Quality Protection at the University of Waterloo. The team includes nine other researchers at six universities and government agencies.

They'll study the impact that pollutants



Mark Servos

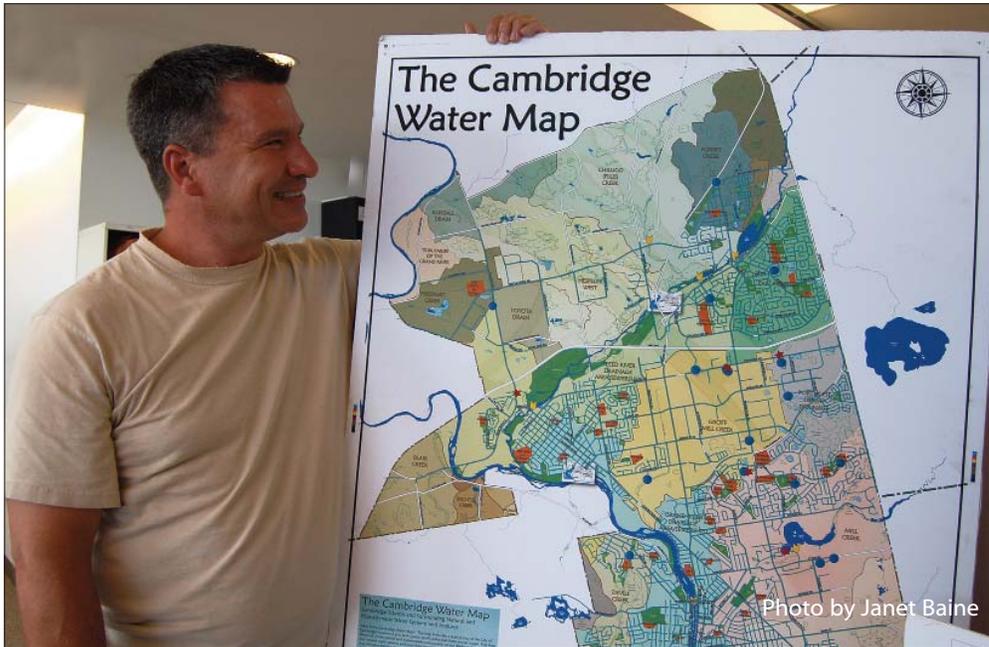
have on organisms that live in the waters of the Grand River and its tributaries. Some species are more sensitive than others to the presence of pollutants, so studying them provides insight into river health.

That information is important to the GRCA, municipalities, provincial ministries and others who manage water resources in the Grand River watershed. They will work with the research team to develop a framework that can be used in the future to evaluate the impact on water quality caused by changes in land use practices, sewage treatment plant upgrades and other activities.

The GRCA and those agencies will support the project by providing access to data and technical support and advice.

The researchers will study several selected species – often called “indicator” species – and look at things that could be affected by the presence of pollutants: the number of organisms, their ability to reproduce, sex ratio, genetics and other factors.

The pollutants come from three primary sources – runoff from farmland, urban stormwater and the treated effluent from sewage treatment plants. The pollutants



Paul Willms looks at a water map of Cambridge that the volunteer group Cambridge WATERS is working with the GRCA to create. This is one of many projects they have undertaken since forming in 1997.

These awards were given out last September at the GRCA headquarters in Cambridge and a story about each of them is running in each issue of Grand Actions.

The group is made up of volunteers who often work behind the scenes and keep a low profile, but they are dedicated to increasing groundwater education and awareness. Cambridge WATERS is made up of people from a wide array of backgrounds including business, agriculture, education, government and citizens. It is a committee of the Cambridge Environmental Advisory Committee and meets monthly.

Cambridge WATERS is associated with the Groundwater Foundation, based in Nebraska. Cambridge is listed by the foundation as the only Groundwater Guardian community in Canada, but there are more than 100 Groundwater Guardian communities in the United States. Waterloo Region is an affiliate member and has helped Cambridge WATERS by providing resources and staff members for events.

“There is no doubt that people’s understanding of groundwater is getting better, but there is still a long way to go — our mandate has not run dry,” said Dave Smyth, a hydrogeologist and one of the founders of the group. Like others, he helps out at events and gives talks about groundwater to students and groups.

Waterloo Region is the largest urban area in Canada that is dependent on groundwater, while Cambridge relies on 27 water supply wells. Some of these date back to the 1900s so there is a history and tradition of water management and quality control.

Cambridge WATERS committee members are John Goodwin (Chair), Larry Schut, David Smyth, Paul Willms (City of Cambridge), Jim Graham, Susan Galvao, Jonas Duarte, Colleen Brown (Region of Waterloo), Dan Meagher (Region of Waterloo) and Tammy Emm-Pietrkiewicz.

Cambridge WATERS members help to make citizens aware of water conservation programs such as rain barrels, toilet replacement, drinking water protection areas and educational resources. They set up displays at RiverFest, the Waterloo Wellington Children’s Groundwater Festival, Grand River Water Forum and participate in the Communitech Business Education Partnership program. The group has created posters, a teacher guide, a colouring book and many other educational materials. More recently they have been working with the GRCA on groundwater maps.

To learn more about the GRCA award recipients from 2011 and earlier as well as to find the form to nominate someone for a 2012 award, visit the website ‘URL:

www.grandriver.ca/Awards.



Photo by Gregg Zwiers

This photo was taken while doing research on the recovery reach of the Grand River between Cambridge and Paris, where lots of groundwater enters the river, rejuvenating it.

include chemicals such as phosphorus and nitrogen which are found in animal waste (e.g. manure and treated sewage) as well as chemical fertilizers. Excessive nutrients can lower water quality in rivers.

Sometimes called “biotic monitoring,” the process of examining living creatures to assess water quality is fairly common. But, it has not been done consistently or on a watershed-wide basis in the Grand River basin. The research team will build a framework to ensure that future biotic monitoring is done in a complementary manner to produce the best information.

The GRCA and the province also team up to do regular chemical analysis of water samples from throughout the watershed.

Servos is a leader in environmental toxicology and chemistry and has been conducting research for many years on the impacts of contaminants in the Grand River as well as other watersheds.

Team members

Other members of the team are Sherry Schiff, William Taylor and Ken Oakes of the University of Waterloo, Deborah MacLatchy of Wilfrid Laurier University, Adam Yates of the University of Western Ontario, Glen Van Der Kraak of the University of Guelph, Joseph Culp of the University of New

Brunswick and Patricia Chambers and Mark McMaster of Environment Canada.

The grant to the team is one of four recently announced by the Canadian Water Network which is based in Waterloo. It also awarded grants to research teams looking at the Muskoka River in Ontario, the Northumberland Strait in Prince Edward Island and the Tobacco Creek in Saskatchewan. The grants total \$2.1 million.

Established in 2001, the Canadian Water Network was created by the Networks of Centres of Excellence (NCE) Program to connect Canadian and international water researchers with decision-makers engaged in priority water management issues.

\$903,000 grant for Grand River WMP

The Ontario government is investing \$903,000 in a project to develop a water management plan for the Grand River watershed.

John Milloy, Minister of Community and Social services and MPP for Kitchener Centre, made the announcement in Kitchener in January.

The provincial money will pay half of the cost of developing a plan to address critical issues in the Grand River watershed. The other half will be paid by the GRCA with contributions from some of the other partners in the planning process.

Milloy said the province is “seizing the opportunity to become a leader in water technologies.”

The development of the water management plan has been underway for about two years. It is being led by a steering committee representing the GRCA, municipalities, provincial ministries, federal departments and First Nations. The plan is scheduled to be released by March 2013.

Jane Mitchell, chair of the GRCA said “the investment the Ontario government is making in the water management plan will pay dividends for decades.”

“It will help the GRCA and the other partners of the plan make the right decisions to protect our water resources and the environment,” said Mitchell. “It will help ensure the continuing health and prosperity of the residents and communities of the Grand River watershed.”

The plan involves research into water issues and the development of a series of action steps to address those issues.

The last comprehensive study of water issues was the 1982 Grand River Basin Study which issued recommendations that were implemented in the 1980s and 1990s.

The new plan will update that plan to address 21st century issues of population growth, climate change and intensive agriculture.

In addition to the grant to the GRCA, the province has also announced other grants to municipalities in the Grand River watershed under the Showcasing Water Innovation Program.

Other Grand River projects:

- The City of Guelph received \$1,000,000 to implement a treatment process to reduce the amount of ammonia in the effluent from its sewage treatment plant. Guelph received another \$89,000 to install a rainwater harvesting and water reclamation system for its transit department to reduce the amount of drinking water used to wash buses.
- Guelph and the Township of Centre Wellington, along with the Municipality of

Bowstring bridge builder

The bowstring bridges that cross the Grand River and many of its tributaries have also stolen the hearts of many residents.

Builder Charles Mattaini constructed over 70 concrete, reinforced bowstring bridges and culverts in Wellington and Waterloo counties, between 1902 and 1930. Many of these have fallen into disrepair and more have been replaced with newer bridges of a different design. But some are maintained due to their heritage value and they are one of the reasons for the 1994 designation of the Grand as a Canadian Heritage River.

In 2004 the County of Wellington had the foresight to save a 1924 bowstring bridge from Eramosa Township and relocate it to the museum. Since then, the bridge has deteriorated even more, and it is being restored.

On her website, Pat Mestern of Fergus writes about the disappearing bowstring bridges in a piece she calls *An Ode to Charlie's Bridges*. Charles Mattaini was a bridge builder and Mestern's grandfather. Mestern often visits the bowstring bridges before they are demolished.

Mattaini was born in Italy in 1873 and came to Canada during the 1890s. No one was more surprised than he when he received the contract to build his first bridge in Wellington County, according to Mestern. He had experience with dynamite, building tunnels and with concrete, but had not constructed a bridge before. Due to the number of bowstrings built each summer, Mattaini would take on the task of building one and then put crews of 10 to 12 experienced men on the other two or three projects. Mestern writes: "Each project was overseen by a foreman who at the end of construction put his name in the wet concrete on the bridge. Hence some of the bridges are signed by "Johnny Cornpone" or "George Who-done-it". One bridge in the northern part of the county has – "Contractor: Marie Mattaini" – a joke that Charlie played on his wife because Marie was



Photo by Dave Schultz

The announcement for the \$903,000 grant for the Grand River Water Management Plan was made with MPP John Milloy on Jan. 12. From left are GRCA CAO Joe Farwell, GRCA Chair Jane Mitchell, MPP John Milloy and Lorrie Minshall, director of the Water Management Plan.

Chatham-Kent, are sharing a grant of \$945,546 to make their water systems more efficient to reduce water losses in the distribution systems.

- The City of Kitchener received \$1 Million to investigate reusing sediments from stormwater management ponds instead of sending them to the landfill. The project will also help assess the feasibility of a stormwater sediment treatment facility in Waterloo Region.

- Kitchener received an additional \$1 Million to demonstrate a community-based approach to reducing stormwater pollutants and volume in Kitchener and Waterloo. The project will use intensive community-based social marketing and financial incentives to encourage landowners to carry out actions on their property.

Navigating the Nith River

Members of the Waterloo Wellington Canoe Club paddled the Nith River from top to bottom last summer and several completed all the paddles.

The river was broken down into 13 shorter sections that were canoed and kayaked during evenings or weekends. The

first Nith River paddle was above Poole in April when flows were higher. All the sections were completed by October, although some were revisited in November when water levels were up.

In total, the navigable part of the Nith River is 146.6 km, or just under half the length of the Grand River. It is the Grand's longest tributary. New Hamburg to Haysville got the biggest crowd of canoeists and kayakers when more than 20 people started out at the river's edge on a paddle at the end of May. But many other paddles were nearly as popular.

The river travels through Mennonite country and includes the communities of Nithburg, Phillipsburg, New Hamburg, Hayesville, Plattsville, Ayr and Canning. The Nith is part of the 1994 Heritage River designation because it is a main tributary of the Grand River.

The Nith changes from a small river to one with rapids for the last kilometre before Paris. This section is especially popular among white water paddlers who travel from across Ontario to paddle there.

Six members of the club completed the Nith End-to-End and received a plaque for "Nailing the Nith."

For info about the club check www.waterloowellingtoncanoecub.ca.



Photo by Janet Baine

A bowstring bridge across Irvine Creek north of Fergus.

nowhere near the bridge during its construction and certainly wasn't the contractor.

"Charlie didn't patent his design. As he said, 'It is for, and of, the world – my contribution to my chosen country'.

He worked closely with people like engineers Barber and Young to fine-tune the design. After the Depression, in which Charlie lost all his money – close to \$2.5 million – a fortune in those days, Barber and Young took up the cause and built a number bridges with three, five or seven arches, some spanning the Grand River in Kitchener and Cambridge. As a result, Charlie's basic design

lived on.

The biggest bowstring bridge is the nine span in Caledonia constructed in 1927 by the Randolph MacDonald Company of Toronto. This one is being restored. A seven-span bow string in south Kitchener at was refurbished by Waterloo Region in 2005 and a five span in Bridgeport was also recently restored. The bridge inventory undertaken by the GRCA in 2004 listed 16 bowstring bridges, but this listing was not complete, since not all municipalities participated in the bridge survey.

Compiled with information provided by Wellington County Museum and Pat Mestern.

THE GRAND CALENDAR

Heritage Day Workshop, Feb. 17, 8:30 a.m. to 4:30 p.m., South Dumfries Community Centre, St. George

The Heritage Day Workshop will explore the influence of the Grand River in shaping military strategies during the War of 1812-14. Registration information is posted online.

Deadline to order trees from the GRCA is March 1, 2012

This is for trees to be planted by landowners themselves. Orders must be for 200 seedlings or 20 saplings or more. For more information, check the Forestry section of

www.grandriver.ca, e-mail ruralwater@grandriver.ca or call 519-621-2763.

March Break Environmental Day Camp at Guelph Lake Nature Centre, and Laurel Creek Nature Centre, March 12-16

Please visit www.grandriver.ca or call Guelph Lake Nature Centre at 519-836-7860 or Laurel Creek Nature Centre at 519-885-1368 for more information.

Note: Events at the GRCA's conservation areas and nature centres are posted on www.grandriver.ca/Calendar.

About Grand Actions:

This newsletter is produced bi-monthly by the Grand River Conservation Authority.

More information:

Current and back issues as well as complete subscription information is available online at www.grandriver.ca/GrandActions.

Submission deadlines:

The 15th of February, April, June, August, October and December. Submissions may be edited for length or style. Photos and event information is also welcome. We do our best to publish items, but we are not able to guarantee publication.

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