



*Conservation & Connectivity*  
*Strategy and Plans: 2015–2019*





see real wonders





experience new sights





Photo by J. Dillon and J. Moser

hear new voices









remember forgotten smells





Photo by D. Crowell

make conservation matter



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# Overview of Environmental protection

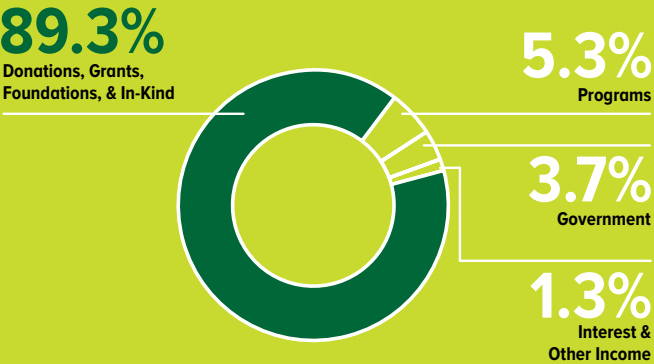
900+  
ACRES

3,348  
SPECIES

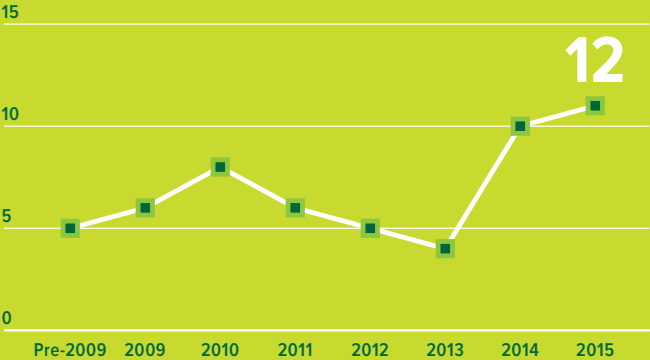
30 SPECIES AT RISK  
(LISTED PROVINCIALY OR FEDERALLY)

24 HABITATS

## FUNDING

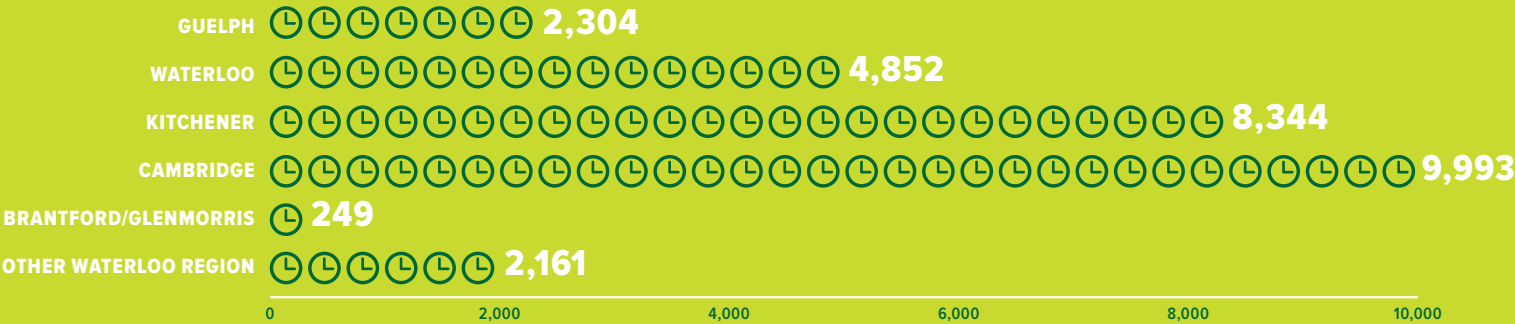


## NEW RESEARCH PROJECTS STARTED ANNUALLY

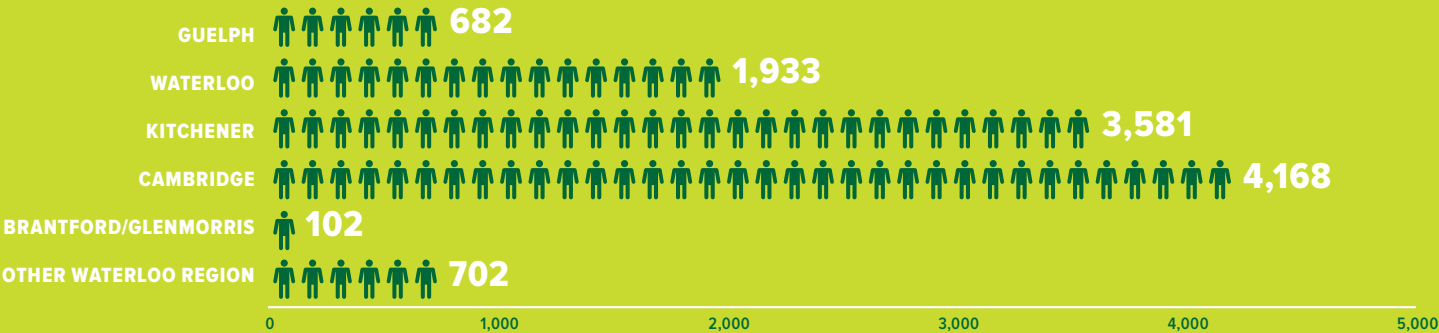


## EDUCATIONAL PROGRAMS FOR 2009 TO 2015

### HOURS OF STUDENT PARTICIPATION



### STUDENT PARTICIPANTS





## Director's Letter



Photo by P. Leather

This report is your invitation to participate in the ongoing development of a unique environmental organisation, a charity that is making contributions, not only in our community, but globally.

By explaining *rare's* mission, vision, values and goals, we are fulfilling a commitment that we take very seriously — a commitment to be transparent and accountable to the public we serve. As a land trust, *rare* protects, intact and in perpetuity, over 900 acres of environmentally significant lands for public benefit. We steward those lands, not only by furthering the science that will result in best practices, but also by training the next generation of conservationists and creating an entire community of support for them and for conservation goals.

The content of this report is the work of many people, over many years. It began with the development of an extensive Environmental Management Plan for the property, first undertaken in *rare's* early years and recently updated. The latest step in this report's development took place during 2014 when a number of community stakeholder groups met to provide input and advice on plans presented by the staff at *rare*. As with all good plans, this one will continue to be updated as we learn from our programs and evaluate our progress. We invite you to join in, whether it's to walk the trails, rent a garden plot, volunteer in our education programs or be an active supporter. With your help, we know the plans outlined in this report are just the beginning of our next stage of development.

I look forward to seeing you on the reserve!



Stephanie Sobek-Swant  
*Executive Director*

## Conserving Biodiversity, Strengthening Science, Building Community, Training the Next Generation of Conservationists

### INTRODUCTION TO *rare*

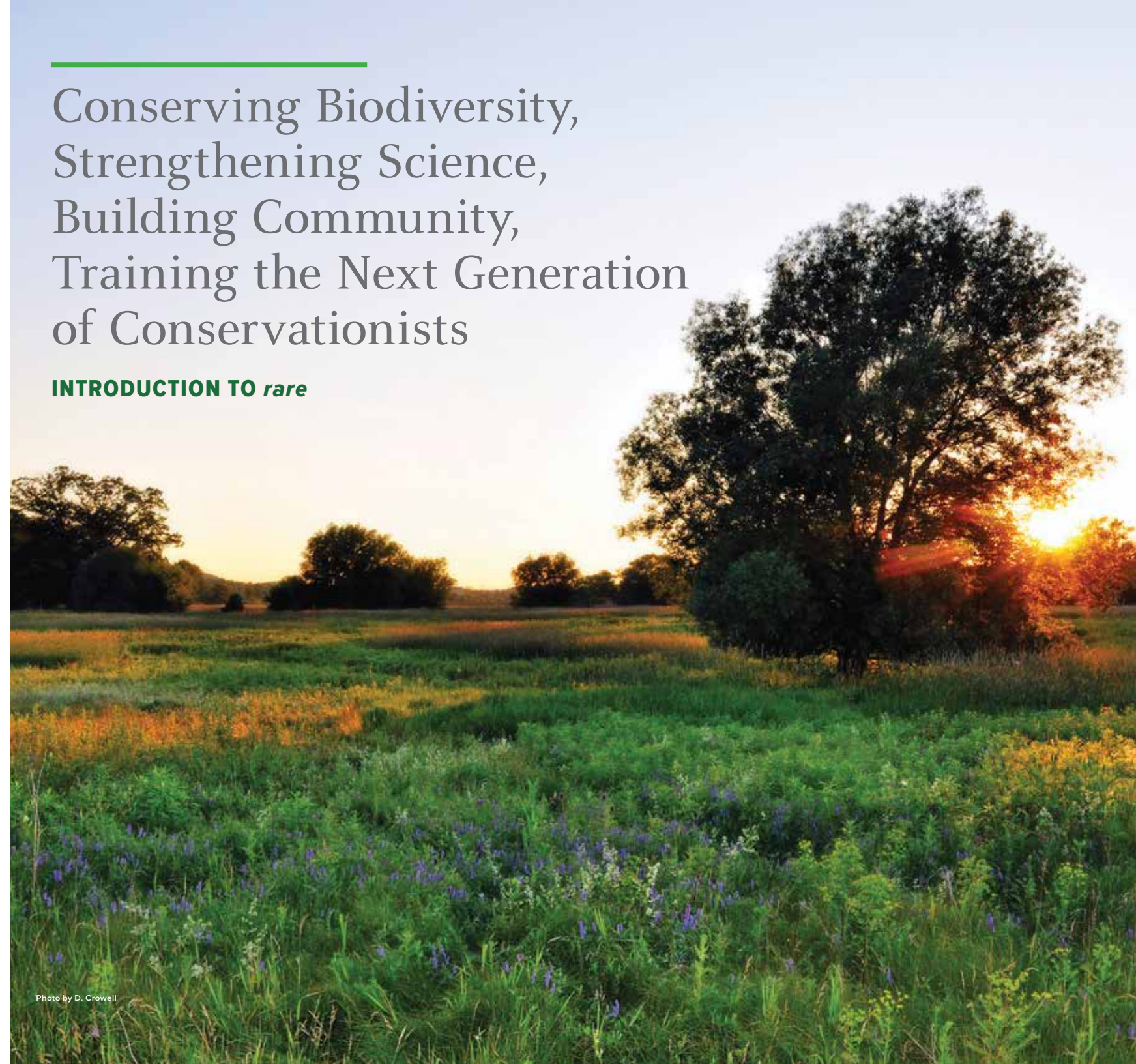


Photo by D. Crowell



Founded in 2001, the *rare Charitable Research Reserve* is a community-driven urban land trust headquartered at the confluence of the Grand and Speed Rivers in the heart of Waterloo Region. The Grand River watershed is the largest watershed in Southern Ontario, feeding into Lake Erie. Within this watershed, *rare* is comprised of 24 different habitat types, including three cold-water streams.

The forests, wetlands, alvars and other ecosystems of *rare* form a beautiful and culturally-significant landscape. Trees more than 240 years old support a rich biodiversity reminiscent of the original biota of Southern Ontario prior to extensive human land use. Our original property is home to an incredible array of flora and fauna, with species that are ranked significant or at risk regionally, provincially, nationally, and even globally. Our village hub property is known for its historical significance as the first stagecoach inn in Upper Canada.

The vision of *rare* is to preserve our sites and their ecosystems intact and in perpetuity, for the community to enjoy in their natural states. The dedicated staff at *rare* believes that protection and conservation of natural spaces and the ecological goods and services they provide is vital to both the population health of local species, as well as the physical, social, and economic health of the community.

The mission of *rare* goes beyond land preservation and restoration by also facilitating research and delivering education, thereby fostering community engagement, encouraging cultural appreciation and training the next generation of conservationists who will perpetuate these values. At *rare*, the community is invited to participate in restoration and research in areas that are free and open to access on trails, or via hands-on education programs. The core programs of *rare* are conservation, research and education.

Photo by P. Kelly



Photo by P. Kelly

As a research organisation, *rare* has attracted more than 55 research projects over the years. Located in Waterloo Region and so close to millions of people, engaging students and the community is essential. The organisation's education program, called *Every Child Outdoors* (ECO), is a model of experiential learning, inspiring youth to adopt a sense of curiosity in the natural world through hands-on, inquiry-based environmental learning in the out-of-doors.

Interestingly, ECO is not your run-of-the mill outdoor education program. Just like *rare*'s conservation efforts, the community offerings and programs of *rare* are also science-based and transmitted via the *rare Chain of Learning*. Beginning with an emphasis on peer-reviewed scientific research as the basis of all educational programs, knowledge passes from the most senior experts, to community members, and extends to the community's youngest learners, starting at kindergarten.

At *rare* it is common to find summer camps where both Canada's leading researchers and excited children team up to don rubber boots and go out to skim the mud for hidden critters. Making fascinating discoveries is the foundation for a lifelong appreciation of science and nature.



Multiple curriculum-based environmental programs at *rare* offer opportunities for school-aged children to learn in an outdoor environment, where they can see for themselves the impact these natural sites are making, and how humans in turn affect their environment. Since 2008, over 10,000 students have enjoyed the programming at *rare*, now averaging 2500 student visits each year.

Through class visits from *rare* scientists and field trips to *rare* sites, students have the opportunity to take part in hands-on experiential research and monitoring activities led by *rare* staff and others around the country.

In all programs, students are encouraged to ask questions and hypothesise about current and future implications of global environmental issues, such as climate change.

Part of the ECO program takes place at *rare*'s Springbank Farm, which is the largest privately owned and regionally accessible urban agriculture project in the Region with 110 community garden plots, and extensive education, demonstration and Food Bank gardens. Every year, volunteers, many of them seniors, harvest up to 2000 pounds of produce for the Cambridge Self Help Food Bank. Programs at the gardens cover numerous subjects, such as healthy soils, organic produce, and sustainable living.

North House, Canada's award-winning entry to the 2009 International Solar Decathlon, and a \$4 million research investment at the University of Waterloo, found a permanent home along Blair Road, at the foot of Springbank Farm. It provides the opportunity to research cutting-edge engineering technology and is a tangible way to let the community experience sustainable design and technology. Along with research by outside organisations, a writer-in-residence brings cross-disciplinary interactions, and is just one of many examples how art, culture and nature are intertwined at *rare*.

Artefacts found on the property go back more than 10,500 years and the *rare* Charitable Research Reserve acknowledges the Chonnonton people ("people of the deer") on whose traditional territory we live and work, and we offer respect to our Haudenosaunee, Anishinaabe, and Métis neighbours as we strengthen our relationships with them. As well, there are heritage buildings from the mid-19th century — such as the Lamb's Inn, a historic stagecoach building; and the *Every Child Outdoors* (ECO) Centre, a renovated farmhouse and 1840s limestone slit barn that is now a lively hub for education and research programs — the first three properties purchased in trust by *rare* have already become a showcase for our environment. They demonstrate richness in art and culture; and promote healthy water, soil, air and the diversity of plants and animals that are paramount for human well-being and ongoing economic stability.

Photo by L. Harnett



Photo by J. Quinn





# Our Mission, Vision and Values

## OUR MISSION

The reserve’s network of natural landscapes are held in trust as a common possession, set aside for their natural and heritage value and to provide unprecedented engagement opportunities in ecological and cultural research, education, community engagement and recreation. Through the combined efforts of the community and *rare*’s team of staff and advisors we will discover best practices and answers to environmental problems, stewarding these diverse lands for ecological integrity and future generations.

## OUR VISION

To offer the community, including the international community and future generations, a diverse network of connected natural areas, protected intact and in perpetuity. As an international leader in conservation, research, restoration and education, *rare* will show leadership and serve as a model system to demonstrate the link between ecological integrity and economic sustainability that is critical to enhanced quality of life for the planet.

## OUR VALUES

- Conserving Biodiversity
- Strengthening Science
- Building Community
- Training the Next Generation of Conservationists

# Our Organisational Goals for the Next Five Years



- Continue to establish *rare* as a collaborative, multi-disciplinary environmental institute with local, national and international recognition.
- Ensure *rare sites* becomes a model of science-based conservation with diverse ecosystems protected and connected throughout the Grand River Watershed and beyond.
- Advance ecological integrity and economic stability in Waterloo Region by protecting these ecosystems and their goods and services.
- Engage the entire watershed community through education, stewardship and research in conservation science and the arts, promoting and fostering an understanding of how to protect all ecosystems and their goods and services.
- Grow our protected natural heritage, while improving financial stability and operational excellence.

## The Institute Vision for *rare*

We plan to become a premier environmental institute with international academic expertise, which at the same time is true to its grassroots heritage and operated as a financially sustainable not-for-profit charitable organisation.

We are confident that *rare* fills a gap, not only across Waterloo Region, but also nationally and internationally, by providing a platform where academic excellence is part of the community, and stakeholders of different backgrounds can meet and learn from each other.

Everything *rare* does will be driven by research, with a strong (but not sole) focus on applied environmental questions. We define the term “environmental” broadly including not only the ecological research *rare* has



Photo by J. Grealey

facilitated over the past decade, but also inviting other disciplines to collaborate, including but not limited to the social sciences, humanities, archaeology, psychology and the arts.

We want to become a truly collaborative, multidisciplinary site where resources can be used most sustainably to tackle big questions as comprehensively as possible, and where ideas can soar in an environment that fosters cross-pollination of (but not limited to) internationally renowned experts, aspiring early-career researchers, artists and the larger community.

The organisation has already established a unique position in the international eNGO landscape with its strong focus not only on conservation *per se*, but also on research and education; the majority of other organisations have a more narrow focus. Traditional land trusts, for example, are mainly concerned with preservation and little else. We can strengthen our unique position further by elevating *rare sites* to become scientific case studies, or model systems for land preservation and management actions that are scientifically sound, tested, critically reviewed and monitored, not only for years, but for decades — as opposed to providing only a snap-shot in time.

## Our Fundraising & Communications Vision for *rare*

### Rooted In Our Communities

Recent research conducted by Parks Canada indicates that Canadians spend 90% of their time indoors. This, combined with a sedentary lifestyle, elevated stress levels and the hectic pace of urban lives, has produced an increasingly ailing population, disconnected from nature. Located in one of Canada’s fastest growing regions, *rare* offers many ways to reconnect with the environment, thereby providing a remedy for both species and people, and leading to an overall healthier community.

With academic excellence in mind, wanting to attract the brightest minds and tackling the big questions in pure, peer-reviewed, environmental research, we must not forget that we are first and foremost firmly rooted in our local communities. By asking applied research questions, we ultimately act on behalf of the community, since ecological integrity and human well-being are closely intertwined and dependent on each other. However, often this crucial link is not apparent, and our role will be to address this gap and to communicate science to the community in a meaningful, accessible way.

People will protect and appreciate only what they know and understand. As we develop *rare sites*, we take the foresight of those who realise the importance and potential of sensitive lands, and we use our considerable experience with grassroots communications, to develop a community of concern around these sites. We have to make sure that we take guidance from and disseminate the most reliable information that makes environmental research and protection relevant to a broad audience of

different backgrounds, starting with the youngest students. We have to continue to develop and strengthen our successful *Chain of Learning* model with its *Every Child Outdoors* program.

We are fostering inclusiveness and zero tolerance for elitism; at *rare* researchers are part of the community and engage on a peer-to-peer level with old and young alike. We provide hands-on experiences, and our learning is active, problem-based, and driven by inquiry. At *rare*, everything is a research opportunity, and every research opportunity is also a learning opportunity for the community as a whole — including for the researchers themselves. In fact, we believe that everyone is born as a researcher, and the way children appreciate the world with a sense of wonder, and ask inquisitive questions, demonstrates this every day.



Photo by R. Moore



In their book *The Big Picture* David Suzuki and Dave Robert Taylor make an important claim: “We must never lose sight of why we are conducting experiments in the first place—hope. Science is hope—the hope of new discoveries, the hope of making a better tomorrow, of improved health and long life, of understanding our past, our present, our future.”

At *rare*, hope is what we want to share with our community: hope for a future where 50 or 100 years from now our children and grandchildren can still experience the ecological integrity of our remaining natural habitats the same way we can, with all the ecosystem goods and services we cherish and so heavily rely upon.

As a model incubator for environmental research with strong community roots, protected intact and in perpetuity, *rare* will be central in Waterloo Region and beyond—both with regard to its persistence in protecting green spaces, set aside for conservation in a developed world, but also with regard to its impact on many levels, both in the academic and lay worlds.

With the addition of new sites, we will provide critical research results to ensure that every action taken and every dollar spent on critical environmental questions have the best chance of achieving the desired results. Our leadership will encourage citizens to value and protect lands they may not ever personally see.

We firmly believe that our vision will make us a strong stakeholder in maintaining and enhancing Ontario’s ecological integrity while providing for sustainable economic growth.

As with other areas of the organisation, Fundraising & Communications intends to attract and engage, motivate, develop and retain talented individuals—staff, volunteers, committee members, ambassadors—who understand *rare*’s Vision and Mission and the steps it intends to take to realise them.

It works to be fully embedded in Conservation, Research and Education goals, receiving regular input of successes and needs, and providing expertise in proposal writing, sources of funds, donor stewardship, media coverage and reporting.

Our Key Goals for Fundraising & Communications at *rare*

- 1 Create long-term financial sustainability of operations.
- 2 Increase the donor base to ensure ongoing, broad-range organisational support.
- 3 Become a well-understood household name in Waterloo Region and the Grand River watershed.
- 4 Increase web and social media engagement to reach at least 10,000 followers.
- 5 Become known as an environmental research institute and as a leader in conservation of ecologically-significant land in both the academic and lay world.



Photo by P. Kelly



Photo by P. Kelly

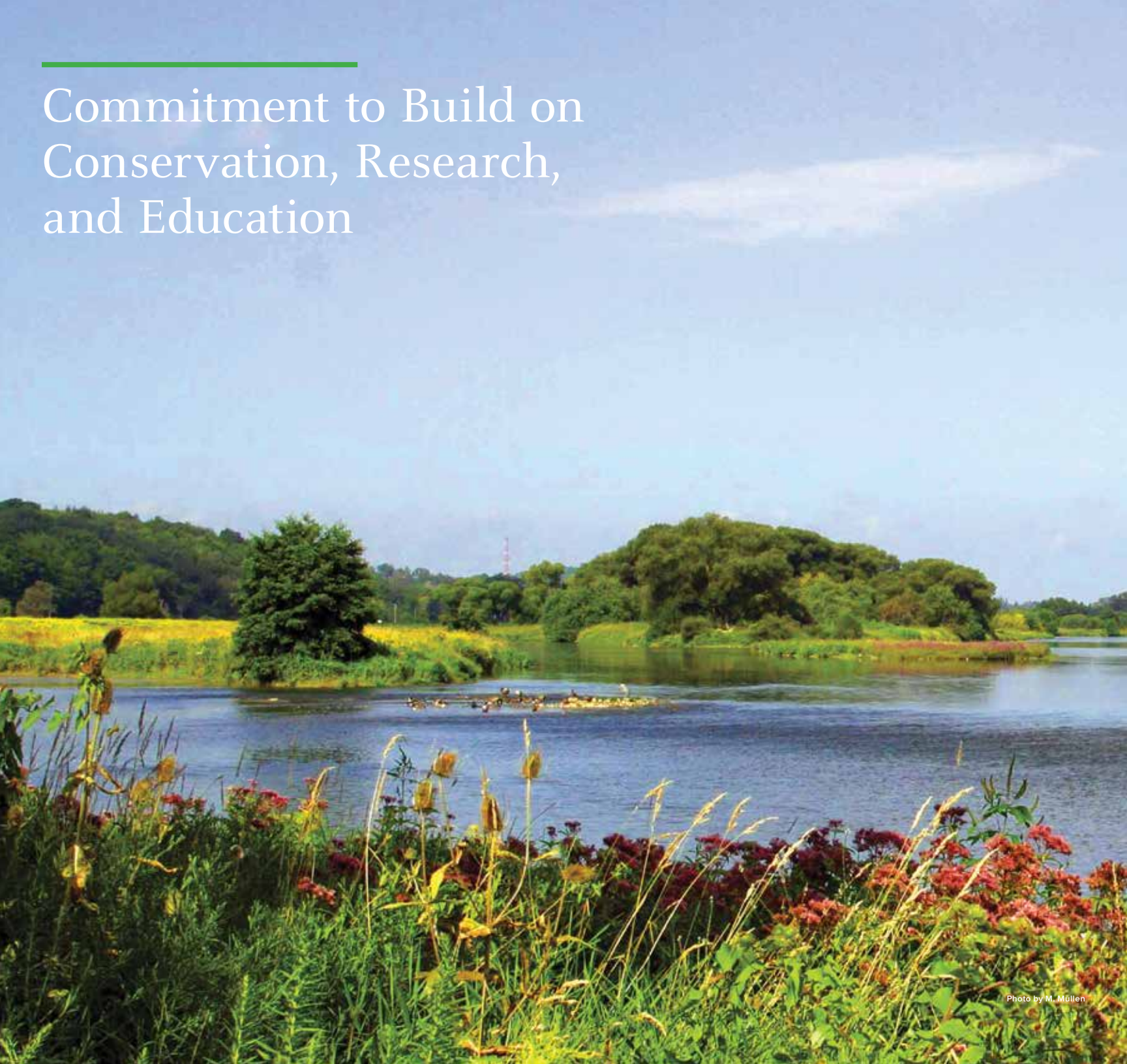
Our Fundraising & Communications Strategies

- Further develop the culture of integrated, ongoing planning and assessment so that all areas of the organisation are attuned to the needs of stakeholders and the goal to recruit more of them.
- Develop two inter-related strategies that build on one another, one for grassroots engagement and support and one for emphasis on national and international contributions.
- As an organisation, generate story ideas and identify key people who can become the faces of *rare*, whether as archetypal community members, volunteers, committee members, students, teachers, researchers, donors, ambassadors, advisors, or partners. Create a story-telling team that takes this input and generates vibrant media stories.
- Assess the success of various outreach strategies and vehicles, selecting those that resonate well for increased attention.
- Recruit experts in website design and development, perhaps by asking professors of well-known programs to recommend their best students for work placements.

- Assess the success of various partnerships and develop the ones with most potential to help *rare* reach its goals.
- Develop the International Ambassador program to ensure the recruitment of members who can further the organisation’s key goals. This involves assessing expertise, network, environmental commitment, accessibility and ease of communication. Significant, periodic involvement for each Ambassador should be built in to *rare*’s plans.
- Develop the Campaign and Community Cabinet to ensure the recruitment of members who can further the organisation’s key goals. In addition to assessing the traits listed above, this effort requires regular interaction to learn about and follow up on suggested leads.
- Enhance the fledgling Planned Giving and Memorial Program to offer a consistent and focussed way for donors to make lasting gifts and to honour loved ones.
- Rather than focussing on traditional special events that are a diversion for staff whose expertise is in other areas, make program activities into opportunities for community involvement and media attention, and leave special events to the expertise of volunteers.
- Continue to grow the Walk/Run for *rare* by recruiting new team leaders and enhancing current offerings.
- Develop a government relations strategy to build political will for *rare* and to make strong links with provincial and federal politicians and programs.
- Work closely with journalists and filmmakers and be featured in national environmental communications.



# Commitment to Build on Conservation, Research, and Education



## Our Conservation & Land Management Vision for *rare*

Preserving land intact and in perpetuity has been a central goal of *rare* since its inception in 2001. Through wise management and since the time of European settlement, much of the original *rare* property is in excellent ecological condition, and there are some features that are representatives of old-growth Ontario forests. A second purchase of 93 acres in 2010 added an important buffer to the remnant old-growth Carolinian site and secured the headwaters of an important cold water creek, Bauman Creek.

As an urban land trust, *rare sites* face pressures from multiple sources including residential development and associated human activity, aggregate extraction, changes in water quality and quantity, conventional agriculture, and fragmentation of the surrounding habitat. Increased human presence is expected to increase negative effects associated with trespassing and related activities (i.e. dumping, litter and garbage, illegal construction, campfires, trampling of vegetation, illegal trail creation), in addition to increasing invasive species pressure.

### Our Key Conservation & Land Management Goals

- 1 Mitigate damage to our properties in the face of growing urbanisation and other threats to biodiversity.
- 2 Maintain, restore and enhance habitat with science-based methods.
- 3 Ensure that land management projects are used as research opportunities when possible.
- 4 Encourage sustainable farming methods and increased habitat connectivity and restoration.
- 5 Strengthen operations of the Springbank Farm Community Gardens and other connections to our local communities.

### Our Conservation & Land Management Strategies On All Our Lands:

- Use our Environmental Management Plan (EMP) as a guiding roadmap.
- Work with Fundraising & Communications to develop financial strategies for paying for the original land base (the second and third properties are fully paid for), and for future acquisition and stewardship.
- Explore partnerships, while developing a land securement and conservation easements strategy to create *rare sites*.
- Prioritize management of human traffic in sensitive areas to control negative effects, while working with Operations staff and advisors to create a Master Plan for lands and facilities.
- Focus on invasive plant research and, if necessary, removal or other control means where appropriate.



Research the original state of the lands and work towards restoring their structures and functions. For example, opportunities exist to undertake projects in Blair Flats (Grand River floodplain), the Thompson Tract plantations (deciduous or mixed forest), and Blair Road Plantation (expand Hogsback forest feature).

- All lands should be managed, as far as is possible, to restore examples of pre-settlement habitats with the full complement of species and biodiversity. Land management efforts should be prioritized according to the EMP (2014), section five.

On Agricultural Lands:

- Undertake agricultural projects to develop new research tools, to increase sustainability of food production, and to provide educational and outreach methods that will connect people to the land and their food supply, but also to *rare* itself. Small-scale, fully integrated farming systems, including multiple crops and small livestock will provide demonstration and educational tools in a workable model on some lands that will develop professional farmers with business skills.

Photo by J. Quinn



- Recruit new and interested gardeners to rent plots, retain existing gardeners, and create a strong volunteer base for the Food Bank Gardens through increased communication and engagement, e.g. via events, thereby creating a base of dedicated gardeners who return to their plots and volunteer year after year.
- Maximize produce donations to the Cambridge Self Help Food Bank by engaging a key group of returning volunteers who will gain heightened awareness that will allow them to plan ahead and execute their plans year to year.

Our Research & Monitoring  
Vision for *rare*

Research Opportunities In All We Do

Every land management action on our properties has the potential to be a research opportunity, and we should use these opportunities to inspire and conduct “just-in-time” environmental research, using *rare sites* as a living laboratory. Rather than just facilitating research as we have in the past, we want to start driving our own research, mainly focused on applied questions — the questions that are relevant not only for ourselves, but also transferable to inform the work of other organisations nationally and internationally. We want to inform conservation policy, and disseminate and share the results of our work with others to develop best practices for stewardship actions in an increasingly developed world. In this way, *rare* will promote scientific rigour and help ensure that important environmental decisions are not just based on anecdotal evidence or knee-jerk reactions in the face of threats to biodiversity, such as those posed by climate change, invasive species and urbanisation.

The goal with every action should be to protect our properties intact and in perpetuity — this means we need to ensure that all steps we take are geared towards ecological integrity and increased habitat size and connectivity, while decreasing fragmentation of the landscape. These basic principles of conservation ecology are relevant far beyond the original *rare* property; on a landscape scale we should be striving to create “*rare sites*” and to connect these sites.

This will include land acquisition or other forms of securement, as well as collaboration with other organisations to connect properties across the map — ideally physically via corridors; however, realizing that there may be limitations, research can form a network across organisations and properties that will allow us to have a meaningful number of field sites to provide for large-scale field projects and statistically sound experimental opportunities. We are actively seeking opportunities for securing other lands, including opportunities to phase out intensive agriculture in favour of more sustainable

methods and restoring areas from production entirely to enhance connectivity.

In-House Research at *rare*

We will conduct our own research by developing a catalog of research questions, grouped under big-picture umbrellas, and collaborate with researchers and other organisations to answer these questions. Our intention is to remain an independent organisation that will operate as a strong partner with other stakeholders. For independent, in-house research to happen at *rare*, a formal partnership with a university (or universities) may be desirable, providing, for example, offerings that count toward degrees or joint research appointments, or giving us opportunities to apply for funding resources we can’t currently tap into, such as many NSERC and other research grants.

Photo by J. Dillon & J. Moser





We have increasingly built in-house scientific expertise among staff, and plan to continue to do so. Our staff will work together with researchers to supervise graduate students, who will spend significant amounts of time at *rare*, both in the field and the office. One way to attract more researchers for larger projects with *rare* in a lead role could be to offer sabbatical opportunities where *rare* is able to house resident researchers for collaborative projects. At the same time, we will still continue to facilitate research of others the way we always have, and invite researchers to work independently on our properties, particularly to tackle questions of basic scientific interest. For our applied research to thrive, we need to be firmly rooted in the basics — basic science is what will eventually lead to the new big questions that we are not even thinking about asking yet (Suzuki and Taylor, 2009).

Overcoming Boundaries; Thinking Long Term

The *rare* properties encompass many ecosystems, subject to varying degrees of historic and current human impact. This variety allows *rare* to focus on environmental research at a landscape level, as well as to study rapid alteration of the environment due to global change and other human impact.

With our research, we want to overcome disciplinary boundaries between natural sciences, social sciences, and arts, and provide information and answers to problems faced by a society striving to achieve sustainability in a changing world. Our research will follow an agenda of testing and demonstration to serve our partners from both public and private sectors, with the goal of moving research findings into practice in a timely manner.

We will continue to make a commitment toward the collection of long-term monitoring data at *rare sites*. With our rapid regional growth we are first in line in exposing threats to biodiversity. We monitor key organisms that are known to respond quickly to ecosystem changes,

thereby providing excellent indicators of environmental stress or improvement. This aids in our work to maintain the health of the watershed and beyond. Collecting annual data on various organism groups in perpetuity will allow us to react quickly to environmental threats and to work to preserve and enhance the quality of our ecosystems and their services, including the provision of clean water, air, and soil, with a high diversity of plants and animals.

Our Key Research & Monitoring Goals

- 1 Conduct *rare*-driven research, asking our own questions and working towards answers.
- 2 Increase the amount of applied research conducted at *rare sites*.
- 3 Foster multi-disciplinary research for a full understanding and better protection of ecological integrity in a developed world.
- 4 Broaden our impact by sharing data and removing barriers between research and the application of new ideas and methods by practitioners, policy makers, and the general public.
- 5 Establish a sustainable, fully financed training program as part of the *Chain of Learning* to foster technical and field skills for young graduates in the environmental sciences.
- 6 Optimise a monitoring program to include a full suite of biological indicators and make best use of *rare* resources.



Photo by J. Dillon & J. Moser

Our Research & Monitoring Strategies

- Strengthen the relations between *rare* and academic institutions, in part by staff accepting thesis committee roles, attaining adjunct positions for *rare* staff, providing associate positions to university professors doing extended research at *rare*, and providing fellowship opportunities.
- Recruit researchers by hosting sessions at conferences to highlight research at *rare*.
- Continue to secure funding to lead *rare*-driven research projects and to offer stipends to research associates or fellowships, e.g. via corporate sponsorships.
- Expand field site access by acquiring land or collaborating with other private reserves and lands (e.g., other land trusts, privately held land parcels).
- Create opportunities to showcase applied research ideas and methods to the community, including via demonstration sites, workshops, webinars etc.
- Advertise North House as a research opportunity to facilitate the development of green building technology. Educational and other research organisations, such as colleges and universities will be made aware of their ability to use the space as a “real world” lab that would be hard to come by otherwise. Foster these partnerships to leverage upgrades or other in-kind support.
- Widely share monitoring data with international, national, provincial and regional initiatives, including citizen science programs.
- Make our results accessible in plain language to academic and lay audiences.
- Analyse long-term monitoring data and publish results independently or together with collaborators.
- Offer monitoring internships for young graduates with the financial support of corporate and government partners.



Research Themes

All forms of peer-reviewed research, both applied and fundamental, are encouraged at *rare*. Over the next five years, we will concentrate on four broad themes to guide our outreach to attract new research and in our *rare*-driven research projects.

These themes are closely linked to our organisational goal to advance ecological integrity and economic stability by protecting ecosystems and their goods and services and to promote *rare sites* as a model for science-based conservation:

- 1 Ecosystem processes and global change
- 2 Conserving, restoring and enhancing natural areas in a developed world
- 3 Biodiversity and human wellbeing
- 4 Science-based governance and policy development

1 Ecosystem processes and global change

Using a landscape-scale approach, we need to understand the connectivity between organisms and biogeochemical cycles, as well as the flow of materials and energy between components of the system. Not only do we need to collect baseline data to understand these systems better, but in a changing world there are numerous human-induced threats to biodiversity, including climate change, habitat loss and degradation, introduction of alien invasive species, over-exploitation of natural resources, and pollution. Many questions have emerged regarding how ecological systems will respond, and how their functions may change. What are the thresholds of ecosystem change and resilience? How do we measure resilience? What are the responses of species to niches opened by environmental change? What are the effects of assisted

migration or other actions in developing ecosystem balance? With *rare* as a long-term research site and its long history of human exploration, numerous opportunities exist to examine how ecosystem processes change over time.

2 Conserving, restoring and enhancing natural areas in a developed world

The original *rare* property comprises 24 different habitat types. Habitat diversity — the variety of places where life exists — makes species diversity possible because each kind of habitat is home to a number of species, many of which are dependent upon a particular kind of habitat. In an increasingly developed world, many natural habitats are at risk of being destroyed, or have been destroyed already. Should a habitat disappear, many species that live in that habitat disappear as well. A habitat seldom disappears entirely or all at once but rather is “nibbled” away until only small fragments remain. At *rare* we are committed to conservation and restoration at a landscape level. The long-term protection of habitat at *rare* allows us to conduct long-term scientific research to build an understanding of how ecological systems function within the natural landscapes of Southern Ontario. Understanding how these natural systems function will provide both a knowledge base and evaluation of our land management efforts. Research opportunities exist to further the understanding of community development and ecosystem restoration practices needed to manage natural systems on the front line of human disturbance.



Photo by J. Dillon & J. Moser

3 Biodiversity and human wellbeing

Biodiversity includes genetic, species and ecosystem diversity. Simply put, *rare* is more than an impressive collection of plants and animals. The species diversity of *rare* is significant. On the core property, located along the boundary of the Carolinian forest and Northern Hardwood forest zone, more than half of the plants of Waterloo Region are found together with over 78% of the birds, 80% of the amphibians and reptiles and 70% of the mammals. As well, about two dozen species of fish inhabit the rivers and streams of *rare*.

We significantly contribute to preserving local genetic diversity of species, and cover a range of ecosystems including forests, cold water streams, and tall grass prairie. Research opportunities exist to examine the multifaceted relation between humans and biodiversity. Most obviously, biodiversity provides us with numerous resources we rely upon, but it also has many social benefits, such as cultural and recreational values.

We contribute in significant ways to the Biodiversity Institute of Ontario (BIO) at the University of Guelph, the birthplace of the field of DNA barcoding, whereby short, standardised gene sequences are used to accelerate species discovery and identification. An important publication by *rare* staff & affiliates as co-authors reported on a BioBlitz, involving volunteers from 17 countries and over 30 institutions. Held at *rare* in the summer of 2015, the findings included one new mammal species (Hoary Bat); 181 spiders previously unknown to the property, including three new records for Ontario; over 1100 newly recorded species for the property; and an estimation that the *rare* inventory is only 30% complete.

4 Science-based governance, policy development and innovation

Research opportunities exist to examine the socio-ecological system and develop successful strategies for ecological, social and economic sustainability. All the research outlined above will ultimately lead to better informed conservation practices that may shape governance and policy. In bringing North House to *rare*, we gained the opportunity to test cutting edge engineering technology. Using this new and innovative green housing model that makes sustainable living attractive and rewarding, we can explore ways to decrease our energy and resource consumption. This will benefit our overall conservation goal by working towards reducing society’s ecological footprint, and will also provide a platform for non-profits, higher education, government and industry to collaborate.



# Our Vision for Education at *rare*

In an increasingly urbanised and virtual world, time spent in nature is decreasing, and opportunities to do so have become scarce. People will only protect what they know; but in the school system, while frameworks for environmental education exist from JK to Grade 12, their implementation is spotty, and little is done to raise a new generation of conservationists.

Opportunities to experience nature and scientific inquiry hands-on are lacking, and often the focus is on mere interpretation rather than on providing learning opportunities to foster critical thinking and long-lasting engagement with the environment and sustainability.

The *rare* Charitable Research Reserve, with its growing network of sites, will be a place where everyone is a researcher and where asking hard questions is encouraged. The seeds for creating environmentally responsible citizens who drive sustainable economic development in all fields need to be planted early, and they need solid ground and ongoing engagement to grow strong roots. At *rare* we will offer research-linked educational opportunities that will promote experience and connection with our natural ecosystems, protected intact and in perpetuity. The education program at *rare* is called *Every Child Outdoors* (ECO), because we want all children to have a chance to experience nature. The ECO program is part of our *Chain of Learning* model in which information flows between researchers and students of all ages.

## Our Key goals for Education at *rare*

- 1 Ingrain the *Chain of Learning* in all education program at *rare*.
- 2 Spread the ECO movement across Waterloo Region and the Grand River watershed.
- 3 Increase teacher engagement to serve as positive role models for the next generation of budding environmentalists and conservationists.
- 4 Raise environmentally responsible citizens by fostering ongoing, repeated engagement of students as they progress through the school system.
- 5 Expand the program to include specialised learning opportunities for underserved groups and adults.

Photo by J. Quinn



## Our Education Strategies

- Promote the ECO and *Chain of Learning* model by participating in or hosting conferences and workshops.
- Expand the *rare* *Chain of Learning* program via pilot programs, tailored to new communities so that we can learn what is needed to bring the *rare* *Chain of Learning* to scale across Canada.
- Use “Train the Trainer” and peer-to-peer approaches to build a strong base of teachers and student volunteers to create continuity and repeated touch-points for programming.
- Use new research projects to keep our educational modules current and relevant.
- Translate research projects and findings into easily understandable information for the general public.
- Feed stories of successes and people who can be the “voices and faces of *rare*” to the Fundraising & Communications staff.
- Develop Mirrored Research Programs to include Bird Monitoring and North House.
- Expand Mirrored Research programs to grades six, seven, and eight, modifying to grade-appropriate levels.
- Formalize relations/institutional membership with such organisations as COEO (The Council of Outdoor Educators of Ontario), OSEE (Ontario Society for Environmental Education), ETFO (Elementary Teachers Federation of Ontario), ACER (Association for Canadian Educational Resources), EECOM (Canadian Network for Environmental Education and Communication), EEON (Environmental Education Ontario), and university centres interested in environmental education.

- Continuously evaluate programs and use findings of education research completed at *rare* and participate in its dissemination.
- Develop closer ties with school boards to promote program attendance by schools.
- Liaise at provincial level to promote outdoor environmental education with the ministry of education.
- Offer targeted skills training for high school students, university students, environmental practitioners and other community members.

Photo by J. Quinn







# Our Vision for Operational Excellence

MANAGEMENT FOR A SUSTAINABLE FUTURE —  
IN PERPETUITY

Mindful of our academic excellence mandate, we need to ensure that we attract, engage, motivate, develop and retain talented individuals on all levels — staff, board members, committee members and other volunteers. Talent management strategies must be aligned with our charity’s strategy and plans to ensure we have the right people to achieve these desired results: the right people in the right jobs.

As a regional urban land trust required to provide functional work areas and experiences for all stakeholders, *rare’s* property and buildings pose a special challenge. Ranging from historic to technologically advanced, the facilities, regardless of their age, must provide safe, efficient and cost effective work environments.

As with any leading information management practice organisation, data inconsistency is a threat to success. Policies and procedures must be maintained as relevant, and consider all data needs. Necessarily, it is imperative that managers take ownership of their applicable data, while ensuring standardised practices throughout the organisation to ensure consistency and accuracy. Systems and related applications should be integrated and/or interfaced to promote efficiency and accuracy, ultimately creating reliable reporting. Overall, the reserve will need to maintain relevant, efficient and effective data management practices that will allow its stakeholders easy access to records to make informed, strategically-aligned decisions for the organisation as a whole.

## Our Key Operational Goals

- 1 Create sustainable operations of all facilities.
- 2 Increase organisational stability and efficiency by recruiting and retaining the right people for the right jobs.
- 3 Grow the volunteer base and make volunteerism and committee engagement attractive and integral to all departments.
- 4 Create relevant, efficient and effective data management practices that will allow staff easy and quick access to records to make the best-informed and strategically-aligned decisions for the charity, whether dealing with the results of monitoring and research or the development of relationships with those who use or support the programs.

## Our Operational Strategies

- Being cognizant of both current and future needs as laid out in this document, operational facility assessments will assist in determining the appropriateness of *rare’s* existing and future capacity requirements.
- Create facilities master plans for all sites and implement recommendations to improve current status and use of facilities, particularly Lamb’s Inn and Springbank Farm House.
- Once needs, both core and non-core in nature, have been prescribed, initiatives including, but not limited to, building modifications, cost savings, technology and energy management and sustainable programs will be embedded into daily practices.



- Create a better experience for volunteers by improving job descriptions and stressing the value of volunteer opportunities as skill development, work experience and meaningful purpose.
- Recruit new volunteers to alleviate pressure on the existing base and to avoid burning out current volunteers. Spread regular tasks out over a larger group of people and gain momentum by including more grassroots-driven committees with a particular focus on key areas of development, such as research, land securement, marketing, etc.
- Redefining and standardising our recruitment, screening and selection processes will promote a larger pool of talented and diverse applicants, and ensure fairness and consistency in our approach throughout the organisation.
- Providing timely formal and informal feedback and recognition will allow our existing talent to continue to develop in knowledge and experience, resulting in their continued engagement and commitment to *rare*.

- Nonetheless, recognising that talent turnover is likely to occur, especially where young experts at the beginning of their careers are involved, continuity and succession plans, including, but not limited to, knowledge transfer processes, will allow the charity to ensure uninterrupted excellence to all of our stakeholders.
- Policy and procedures must be maintained as relevant, and consider all data needs. Project managers take ownership of their applicable data.
- Employing and adhering to standardised practices throughout the organisation, where possible, will ensure that data is captured and recorded consistently and accurately.
- Systems and related applications will be integrated and/or interfaced to promote efficiency and accuracy, ultimately creating pragmatic and useful reporting and avoiding duplication.

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Again, we invite you to join in, whether it’s to walk the trails, rent a garden plot, volunteer in our education programs, become a citizen scientist, or be an active supporter. With your help, we know the plans outlined in this report are just the beginning of our next stage of development.


We value your input. Please give us your feedback or feel free to be in touch with any questions.


To view the Environmental Management Plan that guides all actions on the *rare* properties, or for more information, please see our website at [raresites.org](http://raresites.org).




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