BIODIVERSITY OFFSETTING IN ONTARIO:
Issues, accomplishments and future directions
Summary of Ontario Nature's 2014 – 2016 Project

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Prepared by
Ontario Nature

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Please note that the views presented in this paper reflect those of Ontario Nature and not necessarily those of the aforementioned individuals.

Contents

A. Introduction

Biodiversity offsetting is a promising yet controversial market-based mechanism that is increasingly being considered and implemented in Ontario and worldwide. Simply put, it involves a transaction between development proponents and offset providers (e.g., landowners, land trusts, Indigenous communities) to compensate for harm to biodiversity at one site by creating, restoring or enhancing biodiversity elsewhere, generally on a "like-for-like" basis. At its core, biodiversity offsetting entails a trade-off: accepting harm on the condition that it is counterbalanced by beneficial actions so that in the end nature is no worse off – or ideally even better off. It is risky business, fuelled in part by that ever-so-irresistible desire to have our cake and eat it too.

Since 2013, Ontario Nature has been exploring the promise and pitfalls of biodiversity offsetting with support, advice and expert input from dozens of organizations and individuals. It has been a fascinating yet troubling journey. There is a strong desire to make it work for nature, communities and all parties involved. At the same time, there is a deep unease about scientific uncertainties, technical limitations, potential abuses and the lack of a consistent, comprehensive policy framework (to say nothing of fundamental ethical quandaries[1]). Such apprehension is warranted. Biodiversity offsetting has achieved only limited success internationally. According to a 2014 International Union for Conservation of Nature (IUCN) technical paper, "[b]iodiversity offsets have the potential to provide net gains in biodiversity in the right context, but this has rarely yet been realised in practice."[2]

This report, *Biodiversity Offsetting in Ontario: Issues, accomplishments and future directions,* presents the results of the second phase of Ontario Nature's biodiversity offsetting initiative, and covers activities from July 2014 to June 2016. Building on advice from participants in the first phase of our project,[3] we conducted case studies, hosted topical workshops, and did our best to broaden engagement, for instance with municipalities and Indigenous people. Our key objectives were:

1) to build collective understanding of and a shared vision for biodiversity offsetting in Ontario among conservationists, farmers, business leaders, policy-makers and Indigenous people; and
2) to identify workable, effective and widely supported policy recommendations that build on best practices and aim to achieve benefits for nature, communities and all parties involved.

Our report outlines the highlights of this work, including four workshops (section B), insights from conversations with Indigenous people (section C), and four case studies of inspiring biodiversity offsetting projects in Ontario (section D). It also offers a set of recommendations for policy-makers, offset providers and development proponents, stemming from an analysis of key issues and challenges (section E).

As our 2014–16 biodiversity offsetting initiative unfolded, there was a variety of opportunities to bring forward insights to help inform emerging practice in Ontario. This ranged from input into the draft voluntary aggregate standard of the Cornerstone Standards Council,[4] to the draft policies of a couple of conservation authorities, to the province's draft *Strategic Plan for Ontario Wetlands*. In this sense, the initiative has proven to be both extremely timely and useful. Our hope in moving forward is that the conversations among stakeholders, policy-makers and Indigenous people will continue in an open, yet critical fashion so that we can learn from each other and from our collective experiences to realize the positive potential of biodiversity offsetting.

B. Summary of Workshops

From May 2015 to March 2016, Ontario Nature held four workshops to bring diverse individuals and organizations together to learn about and discuss emerging issues regarding biodiversity offsetting in Ontario.

In total there were 239 participants, some attending as interested individuals and others representing one of the 118 organizations that took part. Seventy-nine participants attended more than one of the four workshops.

At each of the workshops, there were presentations from individuals with experience in and/or expert knowledge about biodiversity offsetting and related topics. (See Table 1.)

Table 1. Workshop Summary

Workshop	Objectives	Attendees	Presentations
Biodiversity Offsetting for Planners May 6, 2015	1. Promote awareness and encourage dialogue among planners about the opportunities and risks that biodiversity offsetting presents. 2. Create an informal network among planners to help guide and inform the development and implementation of biodiversity offsetting at the municipal level.	68 participants representing 44 organizations, including: • 15 municipalities • 13 consultancies • 9 conservation authorities • 2 environmental and community groups • 1 farm organization • 3 industry representatives • 1 government agency	• Biodiversity offsetting for planners – Michael Wynia, MCIP • Examples of offsetting in a municipal context panel: o Tony Iacobelli, City of Vaughan o Kim Barrett, Conservation Halton o April Nix, City of Guelph
Biodiversity Offsetting Law and Policy June 8, 2015	1. To introduce participants to a range of policy options on a number of key biodiversity offsetting issues. 2. To advance dialogue about biodiversity offsetting law and policy development in	61 participants representing 39 organizations, including: • 3 municipalities • 6 consultancies • 7 conservation authorities • 10 environmental and community groups • 4 farm	• Presentation of *Key Issues in Biodiversity Offset Law and Policy* report – Dave Poulton, Poulton Environmental Strategies • Offsetting law and policy in Ontario: Where we are panel: o Stephen Casselman, Ministry of Natural Resources and Forestry o Ron Reid, Couchiching Conservancy

Workshop	Objectives	Attendees	Presentations
	Ontario.	organizations • 5 industry representatives • 3 government agencies • 1 academic	o Ralph Toninger, Toronto and Region Conservation Authority (TRCA) • Offsetting law and policy in Ontario: Where should we go from here? panel: o Dave Poulton o Peter Clarke, Alternative Land Use Services (ALUS) Canada o Kim Barrett, Conservation Halton o Larry McDermott, Plenty Canada
Wetlands Policy and Biodiversity Offsetting October 26, 2015	1. To share information and perspectives about policy gaps and policy options with respect to wetlands, the mitigation sequence and biodiversity offsets. 2. To identify common interests, where possible, across sectors and opportunities to work together to achieve desired policy outcomes.	85 participants representing 57 organizations, including: • 4 municipalities • 12 consultancies • 10 conservation authorities • 14 environmental and community groups • 6 farm organizations • 7 industry representatives • 2 government agencies • 2 academics	• Effective wetlands policy: needs and lessons learned panel: o Christie Ward, Government of New Brunswick o Tom Whillans, Trent University • Ensuring adherence to the mitigation hierarchy panel: o Dave Chin-Cheong, Ontario Power Generation o Kevin Rich, Ducks Unlimited Canada o Lilli Duoba, City of Markham • Biodiversity offsets in wetlands policy for Ontario panel: o Wendy Cridland, Nature Conservancy of Canada o Peter Clarke, ALUS Canada o Darren Steedman, DG Group o Michelle Cavanagh, South Nation Conservation
Conservation Banking	1. To enhance our collective understanding of	104 participants representing 50 organizations,	• *Conservation Banking 101: The Basics* – Dave Poulton • *Conservation Banking: Where*

Workshop	Objectives	Attendees	Presentations
March 29, 2016	conservation banking and its associated risks and benefits, including the business case. 2. To explore emerging conservation banking options and practices in Ontario, within both voluntary and regulatory frameworks. 3. To identify and discuss policy options and governance models, including needs and opportunities (federal, provincial and municipal levels).	including: • 10 municipalities • 10 consultancies • 10 conservation authorities • 9 environmental and community groups • 3 farm organizations • 4 industry representatives • 4 government agencies	*does the buck stop?* – Marian Weber, Alberta Innovates Technology Futures • Law, policy and governance: what we have and what we need panel: o Dave Poulton o Alwyn Rose, Department of Fisheries and Oceans o Norman DeFraeye, City of Toronto o Ralph Toninger and Kelly Jamieson, TRCA • *Habitat compensation banking in TRCA: What it is and how it works* – a case study – John Stille and Ralph Toninger, TRCA • Conservation banking in Ontario: Where we are and where we want to go panel: o Nigel Finney, Conservation Halton o Susan Doka, Department of Fisheries and Oceans Canada o Bryan Gilvesy, ALUS Canada o Dan Cooper, Rideau Valley Conservation Foundation

Biodiversity Offsetting for Planners (May 6, 2015) Land-use planners in Ontario are involved in biodiversity offsetting in a variety of ways. To help guide and inform the development and implementation of biodiversity offsetting at the municipal level, we brought 68 people together for a workshop to promote awareness and encourage dialogue among planners about the opportunities and risks that biodiversity offsetting presents. This workshop allowed participants to hear from planning experts about current municipal policies and practices in Ontario with respect to biodiversity offsetting, exploring guiding principles, learning about the associated opportunities and risks, and conversing and networking with peers to better understand if and how biodiversity offsetting might work in municipalities.

Key outcome:

- There was strong support for a consistent and clear approach to interpreting policy and implementing biodiversity offsetting across municipalities.

Biodiversity Offsetting Law and Policy (June 8, 2015)
We commissioned a study to compare the strengths and weaknesses of leading-edge law and policy on biodiversity offsetting through a multi-jurisdictional review. The aim was to identify best practices, pinpoint gaps and inform recommendations for policy-makers. Dave Poulton, who completed an LL.M. thesis on conservation offsetting for Alberta, conducted the research, wrote the report and presented at our workshop on June 8, 2015.

The workshop was attended by 61 people from diverse groups and communities, including municipal and provincial governments, Indigenous communities, conservation authorities, farmers, consultants and environmental groups. The afternoon portion of the workshop was comprised of two panel discussions, the first focusing on direct experiences with biodiversity offsetting law and policy in Ontario and the second reflecting on recommendations in the report and providing insight on the road ahead. The report is available in hard-copy format and on Ontario Nature's website at ontarionature.org/offsetting.

Key outcomes:

- Eight recommendations for policy-makers based on a review of six jurisdictions (See Box 1 for the summary of recommendations from *Key Issues in Biodiversity Offset Law and Policy*.).
- A strong desire for continued dialogue and information-sharing to inform policy development.

Box 1. Summary of Recommendations from *Key Issues in Biodiversity Offset Law and Policy*

1. **The mitigation hierarchy** should be clearly stated as part of any biodiversity offset policy. Development proponents should be required to document all measures taken to avoid and minimize negative impacts on biodiversity, including consideration of alternative locations, designs, construction and operational techniques, on-site restoration methods, etc., which might reasonably and practicably serve the same purpose with less environmental damage. Regulators should not defer to proponents with respect to these matters, but carry out their own analysis and reach their own conclusions. Where insufficient efforts have been made to avoid or minimize negative impacts on biodiversity, permits should be denied or projects sent back for redesign.
2. **Any offset system** should have clear goals that are capable of objective measurement. In the absence of other compelling policy objectives, that goal should be, at a minimum, no net loss, and where possible a net gain, of identified ecosystem components or functions of value. Departure from no net loss should follow clear policy objectives.
3. **Any offset systems** should identify those conditions under which offsets are unlikely to produce the desired outcomes, whether because the ecosystem components lost to development are irreplaceable, or the consequences of offset failure are unacceptably high. Under these circumstances, policy-makers should be forthright about the choice they face between protecting the valued environmental component or sacrificing it in order that development might proceed. Offsets that are unlikely to succeed should not be used to mask this decision.
4. **A biodiversity offset** policy should include a set of principles for the drawing of equivalency between impacts and offsets. The application of these principles in particular circumstances should be flexible. The initial onus might be placed on project proponents, but this should be reviewed by public servants with a combination of understanding and rigour.
5. **The proximity of the** impact and offset sites should be determined by reference to the objectives of the offset program, the ecological characteristics at each site, and the equitable distribution of social costs and benefits. This is not amenable to a single formula or prescription, so guidelines in this respect should provide flexibility for application of these principles.
6. **The crediting of averted losses** as offsets should only be allowed where there is clear objective evidence of an imminent threat, and where long-term legally binding protection is arranged that neutralizes that threat. Caution should be taken that the protective action on the offset site does not simply displace the threat to another site in the area where environmental values might then be threatened.

7. **For the reasons set out** above and in Section 2.h. of this report, it is best if the agency that is responsible for the day-to-day administration of an offset system be separate and distinct from that which is responsible for substantive environmental outcomes. The latter may then independently assess the adequacy of the outcomes produced by the work of the former, and the former may strive for administrative efficiencies. A healthy dialogue may be created between process efficiency and substantive outcomes.
8. **Secondly, the formation** of a standing independent committee consisting of experts and stakeholders, ought to provide at least periodic oversight over an offset system. This will not only assure the proper operation of the system, but will be able vouch for its bona fides to concerned citizens.

Wetlands Policy and Biodiversity Offsetting (October 26, 2015)

In partnership with Ducks Unlimited Canada and with sponsorship from the Ontario Home Builders' Association, we held a workshop on wetlands policy and biodiversity offsetting to address a key biodiversity offsetting policy opportunity. The Province of Ontario had announced a consultation on the development of a Strategic Plan for Ontario Wetlands in July 2015; as part of this policy announcement, wetland offsetting was identified as a potential piece of the new strategic plan.

The workshop brought together 85 participants to share information and perspectives about policy gaps and options in light of the province's proposed strategic plan. It focused in particular on the mitigation sequence and key issues that should be addressed in developing biodiversity offsetting policy for wetlands. It featured speakers representing diverse interests who offered their insights on the policy outcomes needed to reverse the trend of ongoing wetland loss in Ontario.

Key outcomes:

- Strong agreement that the government's strategic plan should focus on providing a comprehensive policy framework for wetlands to address current inconsistencies within legislation and policies.
- Strong agreement that the strategic plan should require the achievement of a net gain in wetland habitat and function.
- Full agreement that wetland evaluation should occur prior to any development approvals so that Provincially Significant Wetlands are identified and relevant policies can be applied.

Conservation Banking (March 29, 2016)

In partnership with the Toronto and Region Conservation Authority (TRCA), we held a workshop on conservation banking.[5] Our goal was to enhance our collective understanding about its risks and benefits, explore emerging practices and discuss policy options and governance models.

The workshop brought together 104 participants to share insights and learn from those with conservation banking experience, including two experts from Alberta, Dave Poulton and Marian Weber. Presentations outlined the risks and benefits of conservation banking and highlighted conservation banks that are already being used in Ontario and Canada, including a case study featuring TRCA's habitat compensation bank. Panel presentations and group discussions explored policy options and other considerations that should inform conservation banking if it is to be used on a broader scale in Ontario.

Key outcomes:

- Through a survey, participants indicated their level of support for conservation banking in Ontario:
    - 43% support conservation banking in Ontario;
    - 26% strongly support conservation banking in Ontario;
    - 22% were unsure about conservation banking in Ontario;
    - 9% oppose conservation banking in Ontario.

- Through small group discussions, participants identified a number of conditions for success in Ontario (for which there was strong but not necessarily unanimous support), including:
    - Clear policy to provide consistent, high-level guidance across jurisdictions and multiple regulators, and to establish a standardized playing field across the province;
    - An independent oversight body to regulate, monitor and keep track of projects and to deal with conflicts of interest;
    - Clear policy restrictions defining features and other elements of biodiversity that would be off-limits to offsetting;
    - Effective tools for evaluating and determining equivalence between the development and offset sites, including ecosystem services and societal value to communities;
    - Effectiveness monitoring to evaluate achievement.

C. Indigenous Peoples and Biodiversity Offsetting

It is important to acknowledge that there is a variety of Indigenous perspectives on how or whether to engage in biodiversity offsetting. For many Indigenous peoples, the idea of biodiversity offsetting is troubling. Many refer to a first responsibility "to all living things" and the need to "remember our instructions."[6] Algonquin elder and Officer of the Order of Canada William Commanda often counselled that "man can make all the laws he wants but if those laws don't respect the laws of Mother Earth and her limits to support life then the Mother Earth will be destroyed."[7]

Given these responsibilities, some believe that there should be no involvement in the type of tradeoffs that offsetting entails. But others feel that, under certain conditions, offsetting may create opportunities to restore healthier relationships with the earth, in accordance with traditional values. In such cases, communities may wish to consider opportunities while insisting on conditions that respect Indigenous rights, values and interests. Some communities have already identified and taken advantage of such opportunities.

Alongside the workshops and meetings described in section B of this report, one of Ontario Nature's primary objectives has been to identify effective and appropriate ways to support Indigenous communities wishing to learn, share information about and/or potentially engage in biodiversity offsetting. Conversations with members of several Indigenous communities in southern Ontario have underlined the need to build capacity at the community level to inform decisions about whether and how to participate in biodiversity offsetting projects. We have heard that capacity could be enhanced, for example, through the development of tools such as draft principles and protocols, case studies of Indigenous experiences with biodiversity offsetting, and a concise explanation of risks and benefits to guide decision-making. Such tools are especially important given:

- illiteracy about Indigenous responsibilities and rights among stakeholders;
- a lack of familiarity with the concept and practice of biodiversity offsetting among many Indigenous communities;
- increasing demands from developers for involvement (in addition to requests for engagement in other environmental processes and approvals, all of which place great strain on community capacity); and
- the risk that biodiversity offsetting, if not carefully implemented, could undermine biodiversity conservation as well as community interests (including but not limited to cultural relationships to the natural world, food sovereignty and medicinal integrity).

It is critical that these tools adequately reflect Indigenous interests, responsibilities and rights and that they uphold high standards for biodiversity conservation. To this end, Ontario Nature has been working with members of six Indigenous communities to develop and test the tools needed.[8]

To date, we have jointly drafted and refined a set of guiding principles to provide important reference points for communities considering involvement in biodiversity offsetting. These principles are meant to set high standards and support decision-making so that biodiversity offsetting initiatives serve to safeguard species, ecosystems and Indigenous cultural values while creating opportunities for community-led restoration and conservation initiatives and cultural capacity development. Presented below, the principles are to be understood as a work in progress, to be further tested and refined with broader input from Indigenous communities.

1. Free, Prior and Informed Consent

The right to Free, Prior and Informed Consent is one of the key principles of international and domestic human rights law to protect Indigenous peoples from destruction of their lives, cultures and livelihoods. A community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. To ensure effective participation of Indigenous communities in decision-making about biodiversity offsets, these internationally and nationally recognized rights must be honoured in principle and in practice. This includes, but is not limited to, the evaluation, selection, design, implementation and monitoring of biodiversity offsetting projects. All Indigenous communities affected by a proposed project must have the opportunity to give or withhold their consent.

2. Limits to offsetting

Some sites, features and habitats should be off-limits to offsetting, based for example on vulnerability, irreplaceability and their cultural significance for Indigenous peoples. In determining which sites should be off-limits to development, Indigenous knowledge and sound science must be considered and applied, according to protocols established by the community.[9]

2.1 Cultural Significance (Values)

In determining limits to offsetting, cultural significance for Indigenous Peoples must be respected and determined on a community-by-community basis unless directed by the community otherwise. Cultural significance may include access by elders, hunting, fishing and gathering relationships, sacred sites, economic importance and ceremonial values, for example.

2.2 Vulnerability

In determining limits to offsetting, the vulnerability of the natural features or systems affected must be taken into account. Vulnerability may also have to do with the vulnerability of community relationships with the features or systems involved, including the relationships of the knowledge keepers. Age, health, economics and the number of knowledge keepers all factor into these relationships and the risk that offsetting might sever or damage the relationships.

2.3 Irreplaceability
Some types of natural features or systems cannot in anyway be compensated for through offsetting. In such cases, the development proposal should not proceed.

3. Mitigation sequence
Offsetting should be set within a clear mitigation sequence, the first step being to define areas that are off-limits to development and to be protected from negative impacts as defined through both Indigenous knowledge and sound Western science. The next step is to ensure that even where offsetting is allowed to occur, negative impacts are avoided wherever possible. Following this, any unavoidable negative impacts must be minimized. Offsetting then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm. In implementing the mitigation sequence, Indigenous community protocols will be respected and utilized. Western science that is trusted by the community can be utilized.

4. Net gain
Offsetting should require achievement of an overall net gain for biodiversity calculated on the basis of in situ (on-the-ground), measurable conservation outcomes for the Earth and all of its parts. If the proposed development negatively impacts cultural values, these impacts must also be offset on a net gain basis, according to protocols established by the community and in a culturally appropriate manner that satisfies community interests and needs.

5. Calculating equivalence
In a fundamental sense, the destruction of a natural system or any of its components is never "equivalent" to their restoration elsewhere.[10] Nevertheless, offsetting proceeds on the assumption that such tradeoffs can be justified in some circumstances when they result in a net benefit for nature and communities. In establishing equivalence between the impacts and the offset, the offset must take into account not only quantity (size) but also quality with respect to the condition and biodiversity values of both the impact site and the offset site as well as their landscape contexts.[11] The full range of Indigenous cultural values and interests must be integrated into the determination of equivalence, according to protocols established by the community.

6. Duration of offset
The beneficial outcomes secured through an offset should extend beyond the project's impacts, and ideally should last in perpetuity. Impacts to be considered include harm to biodiversity as well as harm to Indigenous cultural values and interests.

7. Location of offset
The offset location should be based on desired biodiversity conservation outcomes and cultural values including the potential for long-term success and viability. The

offset agreement should include ecological and cultural capacity benefits to communities that are negatively impacted by the development, even if the offset location is not close to the disturbed site.

8. Equity and co-operation

A biodiversity offset should be designed and implemented in an equitable and co-operative manner, according to protocols established by the Indigenous community and with the effective participation of the community and other interested parties in all aspects of decision-making (e.g., planning, implementation, monitoring and evaluation).

9. Transparency and communication

Both the development proponent and the offset provider (i.e., the parties involved in negotiating, designing, implementing and overseeing offsets) should share information in a transparent manner and according to an established timeline. They should openly communicate project plans and results with one another, with their communities, with other partners and with the public. Communication about Indigenous values, mitigation and other Indigenous viewpoints shall be either generated or delegated by the Indigenous representatives who are involved.

10. Full-cost accounting of offsets

The development proponent should cover the cost of the offset, based on a full-cost accounting approach. For Indigenous communities, this would include the full cost of raising awareness and engaging the community (e.g., communication, education, relationship-building), of entering into an agreement (e.g., research, legal fees), of creating and maintaining the offset (including in most cases community, cultural and scientific capacity building), and of monitoring and reporting.

To complement the above principles, Ontario Nature aims to work with Indigenous partners to draft a template community protocol for biodiversity offsetting, to be used and adapted as communities deem appropriate. While many Indigenous communities have established protocols for development proposals that concern them, these typically do not include considerations specific to biodiversity offsetting. The template protocol would provide an approach to implementing the principles in practice, and could be integrated into or included as an addendum to existing protocols regarding development.

In addition, Ontario Nature has commissioned case study research about the experiences of Indigenous communities with biodiversity offsetting in Ontario. The goal is to document practical, real-life examples to inform and support decision-making among interested communities. This research will include an analysis and summary of risks and benefits.

The research results will be presented at a two-day gathering, hosted in partnership with the Indigenous Environmental Studies (Science) program at Trent University,

Plenty Canada[12] and Walpole Island Land Trust in October 2016. This gathering will bring together interested members of Indigenous communities from across Ontario to share information on and experiences with biodiversity offsetting and to discuss emerging policy and practice in light of Indigenous rights, responsibilities and interests.

D. Case Studies of Biodiversity Offsetting in Ontario

The four case studies presented in this section of the report are intended to provide practical, tangible examples of the scale and diversity of biodiversity offsetting projects in Ontario as well as opportunities, successes, challenges and lessons learned. They were selected with input and assistance from our advisory group[13] to satisfy a number of criteria, including:

- **best practice approaches** in terms of the following criteria:
  - adherence to the mitigation sequence
  - striving for net gain
  - calculating equivalence between the development site (biodiversity losses) and the offset site (biodiversity gains)
  - locating the offset based on desired conservation outcomes
  - ensuring offset outcomes last at least as long as the impacts
  - transparency and communication
  - full coverage of costs
- **diversity** in terms of:
  - voluntary and regulatory (i.e., required by law or policy) offsets
  - the type of industry and offset provider involved
  - geographic location
- **promising** ways to address issues and challenges.

The four case studies stand out as inspiring examples of what can be accomplished through biodiversity offsetting. There is a mix of voluntary offsets and offsets required by law or policy. The development proponents include energy developers, land developers, a municipality and a beverage manufacturer. The offset providers include land trusts and conservation authorities. (Though farmers and First Nations are providing biodiversity offsets in Ontario, we were unfortunately not able to arrange a case study illustrating this). The offset sites are located in Toronto, North Oakville, the Rice Lake Plains and Carden Township (Kawartha Lakes). Each case is quite distinct in terms of illustrating promising outcomes and opportunities.

The case studies involved in-depth interviews with both the development proponents and offset providers, where possible. Through the interviews we explored a number of topics including: reasons for being involved in an offsetting project; desired and anticipated outcomes; implementation of the mitigation sequence; approach to calculating the equivalence between the harm incurred and the offset; engagement of stakeholders and Indigenous communities; lessons learned; and recommendations for policy-makers. Implementation of best practice criteria is summarized in tables for each case study.

1. Couchiching Conservancy and the Kingston Solar project

In 2014, the land trust Couchiching Conservancy initiated a grassland restoration project to offset the loss of 154 hectares of habitat for bobolink and eastern meadowlark, two grassland birds at risk. The loss occurred at the large (100-megawatt) Kingston Solar project in Kingston and adjacent Loyalist Township, initiated by Samsung Renewable Energy. Couchiching Conservancy provided the offset in Carden Township (Kawartha Lakes), about 180 kilometres northwest of Kingston, where it has been leading land securement and restoration efforts since 1993. Required as part of the permitting process under the *Endangered Species Act, 2007* (ESA), the offset involves ongoing habitat securement, restoration and maintenance of open grassland habitat for the two at-risk birds.

Rationale

Required under the ESA to offset the destruction of bobolink and eastern meadowlark habitat, the Kingston Solar ownership team was pleased to partner with Couchiching Conservancy, an organization with a solid reputation for field knowledge of grassland birds, site management and monitoring. According to Daniel Soper, chief financial officer at CarbonFree Technology, part of the ownership team, "we were looking for an expert who could establish the lands and maintain them for 20 or 50 years."

For the Couchiching Conservancy, involvement in the project offered an opportunity to augment its ongoing land securement and restoration initiatives in the Carden Alvar, a biodiversity hot spot recognized as an Important Bird Area and home to over 30 species at risk.

Process and logistics

Preparation for the project began in late 2011, and involved securing a number of environmental approvals, including an ESA permit, which was granted in early 2014. Having heard through word of mouth about the work of Couchiching Conservancy, the Kingston Solar team contacted the land trust in September 2014 about partnering to provide the offset. "They met with our board, and let us know how they proposed to cover the habitat offset costs, which set the framework for negotiations," explains Ron Reid, Carden program co-ordinator of the conservancy. Given the scale of the project, potential financial risks and the length of the commitment (20 years or more), negotiations were lengthy and complicated, involving a lease-and-services agreement between the two partners as well as a sublease with a rancher whose lands were to be used in addition to property owned by the conservancy. The agreements were finalized by February 2015, and monitoring began that summer, with habitat restoration work ensuing in the fall. Meanwhile, construction of the solar project began in the summer of 2014 and was operational in the fall 2015.

Assembling the land base for the offset was a particular challenge for Couchiching Conservancy, given the tight timelines. As Reid says, "We were unable to purchase lands in this short amount of time. But we were able to use suitable land that was

donated as well as 300 acres [121 hectares] leased from a farmer, which we hope to be able to purchase in the longer term." If the purchase doesn't work out, then the conservancy intends to purchase land elsewhere and shift the restoration site.

Adhering to the mitigation sequence at the development site was an important consideration in designing the over 324-hectare Kingston Solar project (of which only 154 hectares required an offset). The project team hired Dillon Consulting to assess the land base for the entire project (which was implemented on a number of non-contiguous parcels of land), as part of the Renewable Energy Approval process. In light of the assessment, it aimed to avoid species-at-risk habitat, reshaping the project a number of times to make modifications and avoid sensitive areas such as loggerhead shrike habitat and wooded areas. As Soper explains, "In areas that were too environmentally sensitive we were able to relocate a good portion of the project off those lands to avoid them completely and ended up using lands that had much less environmental sensitivity."

Outcomes

While the project is still in the early stages, Reid hopes that over time it will bring over 163 hectares into conservation ownership and that ongoing management will increase the number of breeding pairs of bobolink and eastern meadowlark. Couchiching Conservancy has experienced such success on its Bluebird Ranch where, after two years of active management, the number of breeding pairs of bobolink rose from one to seven.

Another positive outcome, according to Reid, is the conservancy's enhanced sophistication and expertise in dealing with substantial projects, including the development of board policy around habitat offsets. For example, unlike smaller-scale offset projects where the developer pays all of the costs upfront, the Kingston Solar agreement is based on annual payments, which required an assessment of any future financial risks. "We now have other projects potentially lined up with various partners, and the process becomes smoother as we gain experience," he explains. "There is a lot of potential for doing good things in terms of land securement and land management."

For the Kingston Solar team, an important environmental outcome was the creation of Canada's largest renewable solar project, using solar panels manufactured exclusively in Guelph and London. According to Soper, the project now generates enough electricity to power over 17,000 homes.

Longer-term benefits to the community also include payments to two local funds, the Community Vibrancy Fund and the Municipal Benefit Fund, at the rate of $2,700 per megawatt and $1,250 per megawatt respectively per year for 20 years. These funds will support the purchase of parklands in the rural part of Kingston as well as projects associated with the waterfront.[14]

Reflections and insights

- Both the Kingston Solar team and Couchiching Conservancy were very pleased with their partnership on this project. Soper underlines the benefits of the partnership model: "The conservancy understands the nuances of biodiversity management much better than a developer ever can and while it may not be the cheapest option, I strongly recommend it. It puts the biodiversity project in the management of a group experienced in this and dedicated to this and provides some funding for them."
- While Reid recommends that others get involved in offsetting, he notes that there is no legal template to follow. "We were largely developing the agreements as we went through the negotiations with Kingston Solar, since this project was so much larger and more complex than those we had done previously. You learn by doing – but it's important to start small and have a competent lawyer," he cautions.
- In the future, Reid hopes to see Ontario embrace conservation banking to help get biodiversity offsetting off the ground. He'd like to be able to create "restoration credits" in advance of development projects, something currently not permitted under the ESA. "This would allow for an increase in efficiency especially for smaller scale projects," he claims. Safe Harbour agreements are also needed, he suggests, to address the concerns of wary landowners and to engage them as offset providers.

Adherence to best practice criteria

Offsetting principle		**Project Implementation**
Mitigation sequence	√	The Kingston Solar project was redesigned in many respects to avoid environmentally sensitive areas.
Net gain		The offset was based on a no-net-loss 1:1 replacement ratio, set by the MNRF. However, project partners expect that in the end there will be a net gain based on 1) projected gains in breeding pair numbers of bobolink and eastern meadowlark within the restored habitats, and 2) potential for species to re-inhabit the disturbed area after construction (The solar panels are 5.5 metres apart and elevated a metre off the ground, allowing space for grasses, birds and other species to return.)
Equivalence between the impacts and the offset		The natural heritage assessment was completed by Dillon Consulting, which identified potential species at risk and other biodiversity, biological and cultural values at the development site. Couchiching Conservancy conducted pre-restoration monitoring at the offset site, to have a baseline to track changes,

		providing similar information. This information was then reviewed by MNRF as part of the permitting process. The Kingston Solar team also consulted with Indigenous communities listed by the ministry. One piece of important information not collected at the development site, however, was the number of breeding pairs of the target bird species, which would have been desirable in terms of assessing equivalence and calculating gains over time.
Location of offset	√	The location of the offset was based on desired biodiversity conservation outcomes and long-term viability. Located in the same eco-region as the development site, it is in an area with relatively high nesting bobolink and eastern meadowlark density and potential to be restored to good quality bobolink habitat.
Duration of offset	√	The conservancy is committed to permanently protecting and managing the acreage for the full offset – if not on the leased lands, then on an equivalent site that it will purchase within five years.
Transparency and communication	√	According to Soper, the project has received very strong community support, including from both the township and the City of Kingston. There are annual community liaison meetings on an ongoing basis. There is annual monitoring of bobolink and eastern meadowlark, according to MNRF's protocol, and results are filed with the ministry. In addition, the conservancy has done field tours with visiting naturalists and is planning one for local farmers. It has also highlighted the project in conference presentations, with the hope of inspiring other groups to participate in similar initiatives.
Complete costs of delivery covered	√	The project is based on full-cost accounting, including legal fees and the cost of maintenance for the duration of the 20-year agreement.

2. North Oakville

Biodiversity offsetting can be part of comprehensive large-scale development and natural heritage conservation planning, as is illustrated by this North Oakville example, which involves the development of about 3,000 hectares of land that eventually will be home to over 55,000 residents. Formerly a rural area with agriculture, a few small settlements and some significant natural features, it is gradually being urbanized, with some developments completed and others not yet started. Where offsetting is

required, it is proceeding in step with development. The types of development being offset to date include a regional road, residential development and realigned watercourses. These have had negative impacts on deciduous forest, ephemeral wetlands, species-at-risk habitat, and watercourse and wildlife features. The impacts are being offset within the Town of Oakville's new Natural Heritage System (NHS) in North Oakville. So far offsets have been accommodated within lands managed by Conservation Halton (the regional conservation authority) or by the developers themselves.

Rationale

The 3,000-hectare North Oakville area was being brought into the urban area of the Town of Oakville through an amendment to the Official Plan, approved in 2002. There was a keen interest to maintain natural features and functions where possible and to establish an NHS, building on existing core features. It was recognized, however, that some features (e.g., isolated small wetlands) would be lost, and would have to be offset. "In an urbanized landscape, it is very difficult to sustain these less significant features over time," explains Brenda Axon of Conservation Halton. "The Natural Heritage System being created is bigger than the existing features of significance and includes buffers, linkage areas and important stream corridors." There are many competing interests in land development, and in some instances it is possible to establish a more robust NHS with offsetting than to protect every individual feature and encircle them with development.

Agreements with developers about offsetting requirements stem from negotiations and the settlement of an Ontario Municipal Board (OMB) hearing regarding the proposed Official Plan amendment (initiated in 2003 with a final decision rendered in 2008).

Process and logistics

In preparation for the extension of the urban boundary, the Town of Oakville initiated a sub-watershed study and created a Planning Authorities Interagency Review to develop a common policy framework. The agencies involved in the review, including the town, Halton Region and the Ministry of Municipal Affairs and Housing (with technical expertise from Conservation Halton and the Ministry of Natural Resources and Forestry), placed a high priority on the development of an NHS, an approach that was upheld by the OMB.

The NHS comprises approximately 900 hectares of protected land. Potential areas for restoration are identified within the NHS. There are many examples of biodiversity offsets to date located within NHS core and linkage areas (see Table 2), and these are tied to development approvals. As subdivisions are approved, parts of the NHS come into public ownership. Developers who were involved in the settlement negotiations have the ability to transfer the lands at any time.

Because the NHS is clearly defined, only minimal refinements are needed at the time of development. For instance, according to Axon:

Only in a couple of locations are there planting requirements or financial contributions to offset a stormwater management pond encroaching into an opening in a core or linkage area. For example, one of the developers is responsible for making a financial contribution to the Town of Oakville of an amount equal to $10 per square metre for each square metre where the stormwater management pond encroaches into a core area. The contribution will be used to assist in the establishment of a wooded area in the same core area. The payment is to be indexed.

Table 2: This table includes some of the North Oakville offsets, but not those implemented by the development corporations themselves.

Offset Seeker	Offset Provider	Development Type	Offset Requirement	Timing
Halton Healthcare	Halton Healthcare	Realigned Watercourse	Watercourse feature, Drainage swap	2013–14
Region of Halton	Conservation Halton	Regional road	Area of deciduous forest	2015–17
Region of Halton	Conservation Halton	Regional road	Area of ephemeral wetland	2015–17
Region of Halton	Conservation Halton	Regional road	Area of bobolink and eastern habitat managed/restored	2016–35
Developer	Conservation Halton	Residential development	Area of ephemeral wetlands, deciduous forest, wildlife features	2017–19

Outcomes

Through the development process, all of the NHS will come into public ownership and will be protected. “We see this as a really positive example of creating an entire Natural Heritage System that can still function within urbanization,” says Axon. “It will be a great asset for Oakville and Halton and we are very supportive of it. Hopefully the approach can be implemented elsewhere.”

Offsetting impacts to biodiversity and hydrological functions will contribute to the realization of the NHS. For example, the Region of Halton is developing the William Halton Parkway, a major road that is going to cross North Oakville. Under the ESA, offsetting is required for impacts to bobolink, a grassland bird at risk. Conservation Halton will be providing the offset on a net gain basis, replacing 4.1 hectares of habitat destroyed with 5.1 hectares restored in an NHS linkage area. The parties have negotiated a 20-year management agreement. To further offset the impacts of the road

development, the region has also provided funding to achieve a net gain in wetland area.

Reflections and insights

- "We can have urban development and protect a Natural Heritage System in an intelligent and thoughtful way," comments Axon. Indeed, in her decision, the OMB hearing officer validated this systems-based approach to planning:

  > The Board finds that such an approach constitutes a superior and forward-looking method of protecting this Province's natural heritage. The Board accepts the evidence of the Town's and Region's witnesses that the systems approach is the best hope a municipality has to preserve not only "pockets of green," but also to preserve and enhance vital, living natural systems.

- It is really important to do detailed background research and "know what you have," advises Axon. Looking at the whole system at a watershed scale was vital.
- Lots of consultation to build political and community support was essential. "It's important to have buy-in," says Axon. "We weren't saying 'no' to development; we were looking at how this development could be done the best way possible and still protect the Natural Heritage System."
- Axon contends that offsetting should only be undertaken with "much thought and much knowledge." Guidance is needed to ensure that impacts are first avoided, and then minimized. "We were looking to ensure we were protecting all of the features, with the exception of some very minor ones that could be replicated somewhere else," she explains. "In many cases the habitat can't be replicated so that it remains functional and in these cases offsetting would not be considered."

Adherence to best practice criteria

Offsetting principle		**Project Implementation**
Mitigation sequence	√	The mitigation sequence was carefully followed. This involved in-depth study of the area to identify features and functions that needed to be maintained and/or protected (included in the NHS). No development was allowed to impact significant features, and these were included in the NHS where no development can occur.
Net gain	√	Net gain is the intent, especially with respect to enhancing function and establishing connectivity among natural features through a system-based approach.
Equivalence between the impacts and the	√	Features were measured and their functions were assessed to determine whether they should be protected or whether they could be "relocated" in a linkage area or stream

offset		corridor, depending on their size, their function and the habitat they provided. For example, headwater tributaries deemed to be significant were protected; but small wetlands in the middle of farm fields that were regularly ploughed under were considered available for offsetting. Where watercourses were offset, their length needed to be maintained, an appropriate meander belt had to be selected, and the correct width of the creek block had to be achieved for proper flood controls and fish habitat.
Location of offset	√	The offsets occur within the same planning area as the impacts, based on a NHS approach to achieve desired biodiversity conservation outcomes and long-term viability.
Duration of offset	√	As lands are developed, all of the NHS will come into public ownership and be protected.
Transparency and communication	√	There was a high level of consultation and many agencies involved. The Métis Nation of Ontario was engaged in some aspects of species selection and planting through the Hydro One Biodiversity Initiative as part of forest restoration at Glenorchy Conservation Area.
Complete costs of delivery covered	√	The cost of offsetting will be borne by the developers. In some instances the developers will have the option to pay for the works, which Conservation Halton or the Town of Oakville could then design and implement.

3. Nature Conservancy of Canada and Ontario Power Generation

Eastern meadowlark is a grassland bird listed as threatened under the ESA. In 2015, the Nature Conservancy of Canada (NCC) completed the restoration of 25 hectares of grassland habitat to offset for the loss of about six hectares of eastern meadowlark breeding and foraging habitat that occurred at Ontario Power Generation's (OPG) Darlington Nuclear Generating Station site. The loss had resulted from construction activities at the station.

The offset was located on the Rice Lake Plains in Northumberland County and contributed to a larger landscape-scale grassland habitat restoration project already initiated by NCC. The offset work involved removing portions of a uniform, low diversity conifer plantation, conducting a prescribed burn to promote grassland establishment, and planting of the site with native grassland seed. The offset was based on a 3:1 habitat gain:loss ratio, substantially exceeding ESA requirements.

Rationale

Providing the offset was very much in line with the company's internal Environmental Policy, online: opg.com/about/management/open-and-accountable/Documents/Environmental_Policy.pdf, "Where disruption is required, OPG

shall take reasonable steps to manage the residual impact to these areas and species." According to Lindsay Parks, OPG's environmental adviser, "We understand that every business or industry has effects on biodiversity; whether through habitat loss or fragmentation, or through emissions to land, water or air, we have an impact. By entering into this agreement with NCC we are demonstrating that industry really has a role to play in protecting Ontario's biodiversity."

For NCC, partnering with OPG on this offsetting initiative provided an opportunity to provide a net benefit for grassland birds, several species of which have shown steady declines across North America, and to undertake a restoration project that NCC would not have had funding to do otherwise. The choice of the offset site, within a complex of 283 hectares of contiguous or adjacent properties in the Rice Lake Plains, also reflected NCC's strategic approach to restoration. As Mark Stabb NCC's central Ontario program director explains, "We are working at a landscape scale, in the context of a larger grassland and grassland bird management area. It wasn't right in their neighbourhood [i.e., Darlington], but it was in an area where we are committed to undertaking grassland bird restoration in the long term."

For OPG, one of the key advantages of working with NCC was having a partner that promoted a landscape-scale approach to restoration.

Process and logistics

Negotiations and planning for the offset began in 2012. Neither OPG nor NCC reported any difficulty in negotiating their agreement. For OPG, it helped to have internal guidelines in place to provide consistency with approaches taken on other on-site or regional biodiversity projects that OPG supports.

Restoration work started in the fall of 2013. There were a few technical challenges in terms of scheduling tree removal, dealing with invasive plant species, and ensuring that the native grass species selected for planting were also suitable as eastern meadowlark habitat. NCC's experience with grassland restoration in the area was an important asset in addressing such challenges. With matching funds, NCC was ultimately able to expand the project to restore about 30 hectares in total.

Outcomes

The immediate outcome of the project was the creation of 25 hectares of grassland habitat to replace approximately six hectares of breeding and foraging habitat for eastern meadowlark at the Darlington site. For NCC, exceeding a 3:1 replacement ratio was a critical element in helping to improve the odds that there would ultimately be a net gain for grassland birds. "We are very cautious," explains Stabb. "We want to be as confident as we can that a net gain will be achieved. We will monitor the site over a number of years, to see how the grassland birds respond to what we've done there." For OPG, the hope is to see the successful regeneration of native vegetation that will not only benefit grassland bird species at risk, but other species as well. According to Parks, the project provided a great example of how business and non-profits can work together to achieve common goals.

Reflections and insights

- NCC has set high standards for involvement in offsetting projects, which include striving for a 3:1 replacement ratio as well as coverage of the full costs of the initiative by the development proponent, including habitat creation, maintenance and monitoring of the offset site. In this case, OPG was willing to meet these standards. As Stabb points out, however, high standards can limit uptake by others: "For us, that is OK, because we want to make sure that the projects we are getting involved in are very successful. If we can proudly demonstrate success, that will likely lead to more uptake."
- To deal with risk and uncertainty in offsetting, Parks notes that where it is feasible, there is an advantage to developing and implementing biodiversity offset projects in advance of potential loss, "so that the improvements can be measured and documented prior to the loss." However, it is recognized that even with proactive planning, offsetting in advance of a loss is a challenge to business and each case needs to be evaluated independently.
- To help offsetting succeed, Parks suggests that policy-makers should co-ordinate efforts across various levels of government to improve and align biodiversity offsetting so that landscape and habitat connectivity is considered. In this manner broader ecological and biodiversity benefits are realized, relative to multiple, small fragmented areas. Parks further recommends that conservation banking frameworks and associated mechanisms need to be further developed in Canada "to manage aquatic and terrestrial credits and withdrawals under federal and provincial jurisdictions."

Adherence to best practice criteria

Offsetting principle		**Project Implementation**
Mitigation sequence	√	For both NCC and OPG, the mitigation sequence provided a means to define and describe the sequential process of impact avoidance, minimization, rehabilitation, residual impact definition and offset strategy.
Net gain	√	The project was based on a 3:1 replacement ratio with the goal of achieving a net gain for biodiversity.
Equivalence between the impacts and the offset	√	Establishing equivalence involved assessing the size, condition and landscape context of the two sites. Each of these aspects was examined prior to implementation to increase confidence that an acceptable net gain would ultimately be achieved.
Location of offset	√	The location was chosen based on desired biodiversity conservation outcomes and long-term

		viability. The offset site is in the same ecozone as the impact site and was anticipated to be accessible to the same regional bird populations.
Duration of offset	√	NCC will manage the site going forward, with a stewardship endowment provided by OPG.
Transparency and communication	√	NCC's work in the Rice Lake Plains is part of a larger partnership (Rice Lake Plains Joint Initiative) with Alderville First Nation, Northumberland County, Ontario Parks, local naturalists, the local land trust, conservation authorities and others. All project plans were shared with these partners.
Complete costs of delivery covered	√	The project was based on full-cost accounting, up to and including the stewardship endowment to maintain the site going forward.

4. Toronto and Region Conservation Authority and Coca-Cola Canada

In 2013, the Toronto and Region Conservation Authority (TRCA) began a nine hectare coastal wetland restoration project at Tommy Thompson Park, on the Toronto waterfront. This project was supported by Coca-Cola Canada as a part of its global commitment to replenish 100% of the freshwater used in the production of its beverages. The five-year project will result in the creation of nine hectares of productive coastal wetland that will improve the quality of the freshwater entering Lake Ontario and provide additional benefits in terms of wildlife habitat.

Rationale

This voluntary initiative is part of Coca-Cola Canada's global water replenishment program. TRCA and Coca-Cola Canada have worked together on other conservation programs, and when notified of the water offset opportunity, TRCA submitted several projects for consideration. Coca-Cola Canada selected the Cell 2 coastal wetland restoration project at Tommy Thompson Park.

TRCA recognized potential ecological benefits that would result from the coastal wetland project in addition to improved water quality and cycling. As Ralph Toninger, senior manager of restoration projects at TRCA, explains:

> We want to dovetail the water quality benefit with a variety of other goods and services, including Blanding's turtle habitat, colonial water bird nesting features, fish spawning structures, increased fisheries productivity and essential habitat for the reintroduction of musky on Toronto's waterfront.

The project is located in Ashbridges Bay, former site of a large coastal marsh at the mouth of the Don River that was gradually lost to over 150 years of development.

For Coca-Cola Canada, the initiative stood out as an ecologically significant and highly visible project in a public park along the Toronto waterfront. It was a natural fit with the company's global water replenishment commitment. Since the project was already designed and funded in part by the federal Ministry of Environment and Climate Change, funds could go towards implementation and not the potentially lengthy time required for planning and approvals.

Process and logistics

The project stems from work that TRCA had initiated in Tommy Thompson Park in the mid-1990s. When Coca-Cola Canada notified TRCA that it was looking for a water offset project in spring 2013, the conservation authority submitted the idea for the Cell 2 wetland among others. The project met the company's objectives most directly and TRCA and Coca-Cola Canada negotiated a five year agreement. Restoration began in late 2014.

Prior to the agreement, Cell 2 was a cold-water embayment and a series of confined areas where dredgeate from the Toronto Harbour and other local construction sites was to be disposed, capped and turned into recreational lands. Instead, Coca-Cola Canada agreed to provide $500,000 over five years to create a nine hectare coastal marsh. While this still involves disposal of dredgeate, the cap is a wetland. As Toninger explains, "by capping this dredged material and placing a healthy productive marsh on top, you're getting water cycling and quality improvement, providing additional benefits for the ecosystem as a result."

From the TRCA's perspective, one of the big challenges has been calculating equivalence of the water offset as the conservation authority had no standardized processes to follow. TRCA used modelling data that were subject to peer-review and heavy scrutiny to confidently achieve a 1:1 offset.

TRCA developed and oversees a detailed monitoring protocol. The challenge for the conservation authority, however, is to fully cover the cost of the $2.5 million project, including long-term monitoring. The Department of Fisheries and Oceans and Environment Canada are providing some funds, and TRCA is pursuing additional funding to increase and enhance habitat.

Other important project partners include the City of Toronto and the Toronto Port Authority.

Outcomes

The project will result in nine hectares of productive coastal wetland to offset 100 percent of Coca-Cola Canada's water use. Since the provision of wildlife habitat is over and above the water quality benefits, the project will achieve a net benefit for biodiversity.

Reflections and Insights

- From Toninger's perspective, it is important that offset providers have projects planned and ready to be considered by an offset seeker. He shares, "it can be difficult to attract significant funding if the project still has to go through design work, planning, approvals and so on."

Adherence to offsetting principles

Offsetting principle		Project Implementation
Mitigation sequence	N/A	Since no habitat was damaged, the mitigation sequence doesn't easily apply. Note that Coca-Cola Canada has undertaken a number of mitigative measures to minimize water consumption by improving bottling processes and recycling grey water for irrigation.
Net gain	√	The project was based on a water quality replacement ratio of 1:1. A net gain will be provided by the provision of wetland habitat for many species, including species at risk such as Blanding's turtle.
Equivalence between the impacts and the offset	√	TRCA used research on embayment cycling and lake processes to estimate how much water would flow through the wetland on an annual basis in order to calculate and achieve a 1:1 replacement in water quality. The method was subject to rigorous scrutiny and peer review by an independent third party.
Location of offset	√	TRCA is restoring the wetland on Toronto's waterfront to offset Coca-Cola Canada's water use in the Toronto area for its production process.
Duration of offset	√	TRCA will monitor and manage the site moving forward. The wetland is secure, though after the five year agreement expires additional funding will be required for monitoring and further habitat improvements.
Transparency and communication	√	There was a high level of public engagement in designing the project through public meetings and review by TRCA's public advisory committee. The master plan went through a full environmental assessment. The project has also been communicated through media releases, a formal ribbon-cutting event, social media and public education tours at Tommy Thompson Park.
Complete costs of delivery covered		Coca-Cola Canada's contribution (along with contributions from the federal Ministry of Environment and Climate Change and the federal Ministry of Oceans and Fisheries) will cover the costs of creating the wetland as well as some monitoring and reporting. TRCA is seeking additional funding to fully cover project costs such as long-term monitoring.

E. Issues and Recommendations

There is considerable interest in biodiversity offsetting in Ontario. Over the past two years, Ontario Nature staff members have been invited to give numerous presentations on the topic at meetings of industry and conservation organizations and at other forums.[15] Interest has been further demonstrated by attendance at our 2015 and 2016 workshops; as noted in section B, 239 individuals representing diverse organizations and interests attended, with a third participating in more than one workshop.

In many cases this interest translates into support for biodiversity offsetting. At the wetlands workshop, for example, 76 percent of the participants agreed that biodiversity offsetting "can create new opportunities to advance conservation goals through the positive engagement of many sectors of society in wetland protection and restoration."

However, this optimistic outlook is generally tempered with a notable degree of skepticism, a consistent appeal for precaution and a long list of necessary conditions to make it work. There is concern that biodiversity offsetting may be a "slippery slope" that will open the door to development where it otherwise wouldn't occur and undermine efforts to protect nature.

Based on the evidence, such qualms are warranted. According to a 2014 IUCN report, "[b]iodiversity offsets have the potential to provide net gains in biodiversity in the right context, but this has rarely yet been realised in practice."[16] Indeed, wetland offsetting has been occurring in the United States for over 20 years, yet there is little solid proof of its conservation benefits.[17] In their 2012 global meta-analysis of wetland restoration, Moreno-Mateos et al. conclude: "If markets for ecosystem services and mitigation offsets from restored or created wetlands are used to justify further wetland degradation, net loss of global wetland services will continue and likely accelerate."[18]

Biodiversity offsetting involves accepting certain losses for uncertain gains. Thus it is inherently risky business. It will realize its promise and gain public acceptance only if policy-makers, offset providers and development proponents successfully address these risks and grapple with the issues outlined below.

1. Clear and consistent policy framework

Biodiversity offsetting is occurring in Ontario without a clear, consistent policy framework. It has been taking place for years under the federal *Fisheries Act*, and more recently through permits under the provincial *Endangered Species Act, 2007.* Some municipalities are permitting offsetting under the Provincial Policy Statement – though this practice is contentious. A survey conducted by Nigel Finney of Conservation Halton, found that 14 conservation authorities have been involved in offsetting under

these laws and policies as well as Ontario's *Conservation Authorities Act*.[19] While these laws and policies open doors, they provide little guidance or consistency for those interested in engaging with biodiversity offsetting.

Participants in our 2014 and 2016 workshops highlighted time and again the lack of adequate policies and guidelines and the need to address this gap. At the planners workshop, for example, there was strong support for a well-defined, consistent approach to designing, interpreting and implementing biodiversity offsetting policy at the municipal level. At the wetlands workshop 72 percent of participants indicated that comprehensive policy was required to address inconsistencies and provide certainty. Whether this objective could best be achieved by creating a new overarching policy or by aligning and refining existing policies was keenly debated. Similarly, at the conservation banking workshop, many participants called for a coherent policy framework to provide consistent, high-level guidance across jurisdictions and multiple regulators, and to establish a standardized playing field across the province.

In *Key Issues in Biodiversity Offset Law and Policy*, Dave Poulton explains that coherence, consistency, fairness, transparency and cost-effectiveness are the hallmarks of good public policy.[20] All Ontarians have a stake in biodiversity offsetting policy that embodies these qualities and is designed to reverse the ongoing trend of biodiversity loss and degradation. In developing such a policy, the province has a duty to consult with Indigenous communities to ensure their rights, responsibilities and interests are respected and fully incorporated in the policy framework. Because of cultural differences this process may have to proceed with greater patience and must proceed in a culturally acceptable manner.

> **Recommendation 1:** The province should work with Indigenous communities, municipalities and stakeholders to establish a coherent policy framework for biodiversity offsetting that provides consistent, high-level guidance, ensures fairness and transparency, respects Indigenous rights, responsibilities and interests, and aims to restore, enhance and protect biodiversity across Ontario.

2. Governance

Governance was a topic of significant interest at the conservation banking workshop where there was considerable unease about the lack of clear authority and responsibilities with respect to offsetting generally and conservation banking in particular. It was noted that there were many regulators, including federal, provincial and municipal governments and conservation authorities, but no independent body to provide oversight, monitor projects and deal with conflicts of interest.

With respect to the administration of offsetting programs, Poulton points to an inherent tension between the desire on one hand to avoid uncertainty, delay and transaction costs, and on the other to gather the information needed to fully understand site-specific circumstances and address the inevitable risks and uncertainties. Regulators and development proponents, he explains, share a common interest in efficiency. But the public interest in biodiversity conservation may best be served by taking the time to gather detailed information, which tends to increase costs and slow down decisions.[21] He observes that "there is a danger that the focused, shared interest of administrators and development proponents in having the system function smoothly may dominate the diffuse public interest in environmental protection."[22]

In response, Poulton recommends a distinct separation between the agency responsible for the day-to-day administration of the offsetting program and the agency responsible for the substantive environmental outcomes. By separating these roles and responsibilities, the former agency can focus on administrative efficiencies while the latter can independently assess the outcomes against policy goals and objectives. He notes that in many jurisdictions there is a division of responsibilities among levels or agencies of government. In the United States, for example, the U.S. Army Corps of Engineers directly administers wetland offsets while policy development and oversight is provided by the Environmental Protection Agency.[23]

> **Recommendation 2:** The province should identify or establish an independent oversight body with the mandate and capacity to monitor and assess the adequacy of outcomes of biodiversity offsetting policies and programs and to ensure accountability and transparency.

3. Engaging Indigenous peoples

Our discussions with members of Indigenous communities have highlighted a number of important issues that need to be understood and addressed by policy-makers and development proponents. First is the right to Free, Prior and Informed Consent, one of the key principles of international and domestic human rights law to protect Indigenous peoples from destruction of their lives, cultures and livelihoods (see section C of this report). It is important to note that both the governments of Canada and Ontario are committed to implementing the United Nations Declaration on the Rights of Indigenous Peoples,[24] several articles of which apply to the respectful engagement of Indigenous peoples in conservation offsets, including Free, Prior and Informed Consent.

Poulton's jurisdictional review of biodiversity offsetting law and policy revealed rather cursory acknowledgment of this right and the duty to consult more generally. The New Zealand Guidance on Good Practice Biodiversity Offsetting reproduces principle # 7 from the Business and Biodiversity Offsets Programme (BBOP) regarding equity: "Special consideration should be given to respecting both internationally and nationally

recognised rights of indigenous peoples and local communities."[25] The American 2008 wetland mitigation rule requires "government-to-government consultation with Indian tribes" where an offsetting program may affect "tribal resources, tribal rights, or Indian lands."[26] Further, U.S. Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' requires agencies to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''[27] [28]

Another key issue raised several times during discussions was the importance of integrating Indigenous knowledge into assessments, planning and decision-making, according to protocols established by the community. The primacy generally accorded to Western science was deemed inadequate to fully understanding the Indigenous cultural values and interests at stake, stemming from a deep spiritual connection with the land. In contrast, the integration of Indigenous knowledge offered an opportunity to frame biodiversity offsetting in a more positive light, as a means of maintaining traditional values and rebuilding the cultural capacity for restorative ecological work (through investment in capacity building as part of the offset mitigation).

To properly address either of the aforementioned issues, one of the most daunting challenges facing communities is that of capacity. Informed consent with respect to biodiversity offsetting requires the time, resources and ability to consult with community members, document Indigenous knowledge, seek legal counsel and fully understand the risks and benefits. Several Indigenous communities in Ontario have been involved in offsetting projects as offset providers. But they have proceeded largely in isolation from each other, with few opportunities to share stories, insights and information or discuss desirable standards and outcomes (including fair market value for the offsets they provide and opportunities for employment, education and training).

Recommendation 3: Provincial policy for biodiversity offsetting should be developed in consultation with Indigenous communities and should explicitly recognize Indigenous rights, including the right to Free, Prior and Informed Consent.

Recommendation 4: Development proponents should provide Indigenous communities (both those affected by a proposed biodiversity offsetting project or those invited to participate in a proposed project as an offset provider) with the resources required to consult with community members, document Indigenous knowledge, seek legal counsel and fully understand the risks and benefits.

4. Limits to biodiversity offsetting

The need to set limits to biodiversity offsetting is widely acknowledged. In situations where it is not possible to fully compensate for the damage to biodiversity or where the risk of failure is unacceptably high, offsetting is not appropriate. This may be due to the irreplaceability or vulnerability of the biodiversity elements in question[29] or because of their cultural significance for Indigenous peoples.

At our wetlands workshop, 73 percent of participants believed that Great Lakes coastal wetlands should be strictly off-limits to development; 64 percent felt the same way about Provincially Significant Wetlands. In both cases, these features are currently protected from development (not including infrastructure development) under the *Provincial Policy Statement, 2014*. The question – and the fear – is whether biodiversity offsetting will undermine these and other existing protections.

Participants at our conservation banking workshop identified limits to offsetting as a necessary condition for success. They underlined the need for clear policy restrictions defining features and other elements of biodiversity that would be off-limits to offsetting.

Discussions with members of Indigenous communities have highlighted the importance of drawing on Indigenous knowledge to establish limits to offsetting. Community relationships, values and practices are integral to the determination of significance, vulnerability, irreplaceability and accessibility from an Indigenous perspective.

It is notable that despite broad recognition of the need to set limits, none of the jurisdictions surveyed by Poulton provides explicit criteria for determining limits to offsetting. He calls for transparency about choices made when either protecting biodiversity or "sacrificing it in order that development might proceed."[30]

> **Recommendation 5:** The province should set criteria for determining limits to biodiversity offsetting, taking into account the irreplaceability and vulnerability of the biodiversity elements in question and their cultural significance for Indigenous peoples. In so doing, it must uphold or strengthen current policies and protections for natural features, systems and functions.

5. Net gain

There is broad agreement that the goal of biodiversity offsetting should be no net loss or preferably net gain.[31] However, Ontario Nature and many others are calling for an unequivocal goal of net gain.[32] Given ongoing biodiversity losses in Ontario, across Canada and around the world, holding the line with a no-net-loss approach is simply not good enough.

Dan Kraus of NCC, provides an incisive critique of the no-net-loss approach:

> Although the science of restoration ecology has advanced significantly, trying to replicate nature is fraught with uncertainty and complexity. A review of Canada's no net loss policy for fish habitat in 2006 concluded that 63 percent of projects resulted in loss of habitat productivity.

> Similar results are documented from compensatory mitigation under the U.S. Clean Water Act to provide no net loss of wetlands and from no net loss policies in France. The lag time between loss and restoration can also result in biodiversity losses that last for a very long time.
>
> The other issue of no net loss is that it fails to solve the problems of habitat loss, degradation and species at risk that already exist. In a country where we have lost large amount of our wetlands, grasslands and forests in the southern regions where Canadians live, no net loss and the incremental continued losses that occur under this policy just continue a trend of habitat declines. In a twisted conservation outcome, it may even increase this loss because policies to protect key areas could be watered down under the auspices that we can offset any impacts.
>
> Perhaps most importantly, no net loss sends the wrong message about nature. Why, in a country that has a long list of rare species and where habitats such as wetlands in southern Ontario and Quebec and BC, and native prairies are reduced to a small fraction of their former extent, would we want to legislate the status quo? If your money manager had been losing on your investments for 20 years, and then claimed a couple of years of breaking even as a success, it may certainly be an improvement, but still woefully lacking.[33]

NCC requires a significant net gain for nature as a condition for involvement in a biodiversity offsetting project. The NCC–OPG project presented in section D of this report is based on a replacement ratio of 3:1 (hectares lost/hectares gained) and aims to achieve net gain in size, condition and landscape context.

Though net gain was the goal for only two of the case studies presented in this report, it is anticipated that net gain will be achieved for all four projects.

There is broad support for the goal of net gain. For example, at our wetlands workshop, 91 percent of participants agreed that "policy for compensation/biodiversity offsetting should require the achievement of a net gain in wetland habitat and function." In determining net gain, participants suggested that in addition to the size of the development and offset sites, the quality and functions of the sites should be taken into consideration.

Our discussions with members of Indigenous communities confirmed strong support for a net gain approach to offsetting, broadly defined to include both biodiversity values and cultural values. Participants stressed the need to restore, on a net gain basis, the quality of ecosystems and to offset, in a culturally appropriate manner, negative impacts to communities.

None of the jurisdictions reviewed by Poulton has a clear goal of net gain, though the policies of both New Zealand and Canada enable this possibility. Four jurisdictions

explicitly or implicitly embrace no net loss, while two leave goal-setting to the discretion of decision-makers. In response, Poulton underlines the importance of clear goals that can be objectively measured.[34]

Recommendation 6: Provincial and municipal policy for biodiversity offsetting should require the achievement of overall net gain for biodiversity, on the basis of in situ (on-the-ground), measurable conservation outcomes. If the proposed development negatively impacts Indigenous cultural values, these impacts should also be offset on a net gain basis.

Recommendation 7: Offset providers should adhere to a standard of net gain for biodiversity as a condition for involvement in an offsetting project.

6. Mitigation sequence

It is widely acknowledged that biodiversity offsetting should proceed only as a last step within the mitigation sequence (or hierarchy). The first step is to avoid negative impacts, for example, by defining areas that are off-limits to development. The second is to ensure that even where offsetting is allowed to occur, negative impacts are minimized wherever possible. Finally, offsetting offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.

At our wetlands workshop 88 percent of participants agreed that offsetting "should be employed only as a final option within a clear mitigation hierarchy that prioritizes avoidance of impacts." Some participants expressed concerns about the lack of discipline in applying the sequence (developers jumping straight to offsetting without first avoiding or minimizing harm) and about the need for an option to simply say "no" to development.

Adhering to the mitigation sequence was a high priority for three of the case studies presented in this report (NCC–OPG, Couchiching Conservancy–Kingston Solar, North Oakville). In terms of implementation, the North Oakville initiative involved detailed studies of the features and functions that needed to be maintained to conserve biodiversity and hydrological systems. No development was allowed to impact these features, which were included in the Natural Heritage System for permanent protection. Similarly, at the Kingston Solar site, the project was designed to avoid environmentally sensitive areas such as woodlands and the habitat of the endangered loggerhead shrike.

Our discussions with members of Indigenous communities also validated the importance of the mitigation sequence. They highlighted the need to integrate

Indigenous knowledge and values into the application of the sequence, in accordance with community protocols. This may mean, for example, consideration of species, such as black ash and white birch, which may not valued by Western science but are of high importance to some Indigenous peoples.

According to Poulton, commitment to the mitigation sequence is "near universal" in offset policies, including the six jurisdictions reviewed in his report.[35] Typically, however, these policies provide no clear direction on implementation beyond recommending, in some cases, that the application of the sequence be documented. Particularly problematic is the application of the first step, avoidance, which is interpreted in many ways. In some cases key project variables, such as project purpose and location, are not subject to the duty to avoid. Consequently, "alternatives that might bring greater avoidance are effectively ruled out from the moment the application is drafted."[36]

To ensure better application of the mitigation sequence, Poulton recommends that development proponents be required to "document all measures taken to avoid and minimize negative impacts on biodiversity" including the consideration of alternatives. He also suggests that regulators carry out their own analyses and refuse to grant permits where efforts to implement the mitigation sequence have been insufficient.

Recommendation 8: Provincial and municipal policy for biodiversity offsetting should clearly position biodiversity offsetting within the mitigation sequence, the first step being to define areas that are off-limits to development and to be protected from negative impacts as defined through sound science and Indigenous knowledge. Following this, any unavoidable negative impacts must be minimized to the extent possible. Offsetting then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.

Recommendation 9: Regulators should require development proponents to document all measures taken to avoid and minimize negative impacts on biodiversity, including consideration of alternatives. They should carry out their own assessments of proponents' efforts to avoid and minimize impacts. Where efforts have been insufficient, regulators should refuse to grant authorizations for proposed developments.

Recommendation 10: In implementing the mitigation sequence, development proponents must engage affected Indigenous communities in order to integrate Indigenous knowledge according to community protocols.

Recommendation 11: As a condition for participating in a biodiversity offsetting project, offset providers should ensure that the mitigation sequence is applied and that sufficient measures have been taken to avoid and minimize impacts.

7. Establishing equivalence

Establishing equivalence between the negative impacts of development at one site and compensation for those impacts at another site can never be a perfect science, given the unique attributes and values of each site. Notwithstanding, for offsetting to proceed, common metrics must be established to enable a comparison of the damage anticipated or incurred and the compensation proposed or achieved. As Poulton wryly observes, establishing equivalence is one of the "stickiest issues" in biodiversity offsetting as it requires "the mixing of social values (always uncertain) with scientific knowledge (always incomplete) to arrive at a conclusion that is both scientifically justifiable and socially acceptable."[37]

Establishing equivalence entails prioritizing select ecosystem features, functions and values to design and evaluate the offset, giving rise to the inherent tension (described above) between gathering sufficient information on one hand and avoiding delay and transaction costs on the other. As Poulton explains: "The assessment of equivalency between the impact and offset is inherently problematic. The more one seeks to take into account the particular features of either site or activity, the further one strays from the commonalities that must underlie equivalency."[38]

This tension was apparent at our conservation banking workshop. Participants highlighted the need for effective evaluation tools, including approaches to assessing the quality and value of ecosystem functions and services. Many noted that the societal value to affected communities should also be part of the calculation. At the same time, however, many participants underscored the need for an efficient process to balance high standards and ecological benefits with fiscal responsibility and flexibility.[39]

The importance of integrating the full range of Indigenous cultural values and interests when calculating equivalence was emphasized in our discussions with members of Indigenous communities. One individual observed that all land is important from an Indigenous perspective, and that biodiversity offsetting was a "difficult and slippery slope." Another noted that consideration of the landscape context was essential and suggested that offset replacement ratios could be useful in calculating equivalence between areas that have lost a great deal of habitat and those that have not.

The four case studies illustrate both challenges and accomplishments with respect to establishing equivalence. Challenges include the lack of established methods (e.g., TRCA–Coca-Cola Canada) and the difficulty of making comparisons, especially when different parties conduct the assessments at the development and offset sites (e.g., Couchiching Conservancy–Kingston Solar). In terms of accomplishments, one of the merits of the NCC–OPG project was the evaluation of the size, condition and landscape context in determining equivalence. The North Oakville project also stands out in terms of the detailed assessments of features (e.g., creek length and width, meander belts) and functions (e.g., fish habitat, flood control) impacted so that these can be recreated through offsets.

In all of the jurisdictions reviewed by Poulton, the government agencies place the onus of establishing equivalence on the development proponents, with varying requirements and few details about what needs to be considered. Wetlands offsetting policy in the United States, for example, looks at hydrological, biochemical and physical habitat considerations and measures. In Germany, offsetting policy requires the consideration of ecosystem services and functions as well as esthetic and recreational value of impacted landscape, but provides no specific method.

> **Recommendation 12:** In establishing equivalence of impacts and offsets, provincial and municipal policy for biodiversity offsetting should require consideration of the size, condition and landscape context of the development and offset sites as well as associated ecosystem components, services and functions. Indigenous cultural values must be fully considered in accordance with Indigenous rights, responsibilities and interests.

8. Monitoring

Though biodiversity offsetting has been occurring for many years, there has been a lack of long-term monitoring to demonstrate success. In fact, shortcomings in monitoring are a key factor in the failure of offsetting projects.[40] The need to address this deficiency is widely recognized. For example, the international Business and Biodiversity Offsets Programme (BBOP) considers monitoring to be an essential element of both stakeholder participation and the securement of long-term outcomes.[41]

While workshop participants generally recognized the utility of monitoring, they raised many questions and concerns. For instance, who conducts the monitoring, and who pays for it, especially over the long term? When monitoring results reveal problems, how can they be tied to adaptive management? Balancing effectiveness and efficiency with respect to monitoring was a recurring theme in small group discussions.

The importance of monitoring was also considered with members of Indigenous communities, especially in the context of discussions about Free, Prior and Informed Consent, equity and full-cost accounting. In summary, a community's Free, Prior and Informed Consent is needed for monitoring to occur; the community and other interested parties should be able to participate in monitoring; and development proponents should cover the full cost of monitoring.

The case studies illustrate approaches to addressing a number of issues related to monitoring, including costs, responsibilities and duration. For instance, as a basic condition for involvement in an offsetting project, NCC requires the development proponent to cover the cost of monitoring. Its project with OPG will involve monitoring outcomes over a number of years, to be carried out by NCC. The Couchiching Conservancy conducted baseline monitoring of the offset site prior to initiating restoration efforts. There is now annual monitoring of bobolink and eastern meadowlark, carried out by the conservancy according to government protocols. Results are filed with the Ministry of Natural Resources and Forestry. TRCA developed and oversees a detailed monitoring protocol for its wetland project. Coca-Cola Canada covers the cost of monitoring for the five-year agreement and TRCA will seek additional funding for longer-term monitoring.

While Poulton did not specifically focus on the issue of monitoring in his report, he did find that New Zealand recommends that a monitoring regime be established with adequate financing "for the duration of the impact of the development which may be perpetual," and that stakeholders be involved in ongoing monitoring.[42]

> **Recommendation 13:** Provincial and municipal policies for biodiversity offsetting should set clear requirements and high standards for monitoring. These should stipulate that development proponents must cover the cost of monitoring. They should require baseline surveys prior to impacts as well as long-term monitoring sufficient to determine whether outcomes have been achieved.

9. Equity and location

Apprehension about biodiversity offsetting stems, in part, from the understanding that offsets entail trade-offs, with potential winners and losers. At our conservation banking workshop, for example, participants asked whether offsetting would occur at the expense of some municipalities. Would decisions about where to site offsets be based on price (where it's cheapest), creating greater disparity among regions depending on land values?

Certainly the location of the offset, including land values, is central to the issue of equitable outcomes. Five of the jurisdictions surveyed by Poulton express a preference for proximity of impact and offset sites (e.g., in the same vicinity, watershed, biogeoclimatic zone, landscape unit, catchment, ecological district). Of these, New Zealand most explicitly recognizes the social dimension of selecting offset locations, specifically that this selection has important implications for equity.[43] Poulton himself recommends that "the equitable distribution of social costs and benefits" be factored into decisions about locating the offset site.[44]

Our case studies illustrate a variety of approaches to locating offsets. In both the TRCA–Coca-Cola Canada and North Oakville projects, the offset sites are located in close proximity to the development site and will be protected and accessible to the public. In the Couchiching Conservancy–Kingston Solar project, where the offset was located at some distance from the development site, the company recognized the need to compensate the Kingston and area community. It agreed to make annual payments of hundreds of thousands of dollars to two local funds for the 20-year duration of the agreement, some of which will be directed to acquiring parkland.

Offset locations, land values and equity for communities were also discussed with members of Indigenous communities. It was suggested that the project should be designed to benefit all, and that this would help to build community support. The issue of equity was understood to include, more broadly, respect for community protocols and the effective participation of the community in all aspects of decision-making. Sustaining accessibility, especially for elders who may be the only knowledge keepers of cultural values tied to a specific landscape, was also identified as an important concern.

Recommendation 14: Provincial and municipal policies about biodiversity offsetting should explicitly address the equitable distribution of social costs and benefits and require the effective participation of communities in decision-making.

Recommendation 15: Development proponents should recognize and address the social costs and benefits of offset-siting decisions and invite meaningful community participation in decision-making.

10. Transparency

As Poulton explains, biodiversity offsetting is not simply a scientific exercise, but a social exercise as well, which should openly involve the larger community in dialogue:

> Local residents will have special knowledge of development and offsets sites, and their experience of those sites will have created special connections, meaning and values. In no realm is this truer and more important than with Aboriginal peoples who have formed connections with lands and waters over millennia. Their traditional knowledge, and their values and traditions derived from the landscape, are particularly deserving of attention and respect as land use and offset planning is undertaken.[45]

The importance of public involvement and transparency is widely acknowledged.[46] At our planners workshop, for example, participants noted the need to demonstrate good decision-making in the public interest and to avoid backroom deals. During small group discussions at our conservation banking workshop, individual participants put forward a variety of suggestions including: sharing information about costs; setting up a publicly accessible registry to allow everyone access to banking opportunities and to show who owns which credits; and educating the public about impacts being offset.

The case studies illustrate a variety of efforts to enhance transparency. Consultations to build political and community support were essential to the success of the North Oakville initiative. Public meetings and communications, including media releases, educational tours and a ribbon-cutting event are helping to raise public awareness about the TRCA–Coca-Cola Canada project. NCC shared plans about its project with the partners involved in the Rice Lake Plains Joint Initiative, which include Alderville First Nation, Northumberland County, Ontario Parks, local naturalists, the local land trust and conservation authorities. With respect to the Couchiching Conservancy–Kingston Solar project, transparency has been enhanced through field tours, conference presentations and annual community liaison meetings in Kingston and Loyalist Township.

Our discussions with members of Indigenous communities highlighted a number of important issues with respect to transparency. They identified, for instance:

- the need to set high standards in terms of communication;
- the need for both the development proponent and the offset provider to share information, according to an established timeline;
- the need to seek input from communities both where the development and where the offset are occurring;
- the importance of asking these communities about their needs and expectations with regard to transparency and communication;
- the need to negotiate culturally appropriate communication methods and to fully involve communities in managing communications;
- the importance of face-to-face communications and plain language; and

- the role of the developer in providing resources for communications as part of the offsetting agreement.

Recommendation 16: Provincial and municipal policy should establish requirements to ensure adequate transparency and public input into biodiversity offsetting initiatives.

Recommendation 17: Both the development proponent and the offset provider should share information in a transparent manner and according to an established timeline. They should openly communicate project plans and results with one another, with their communities, with other partners and with the public.

Recommendation 18: The development proponent and the offset provider should build the cost of communications and public outreach into their agreement, with costs covered by the development proponent.

11. Conservation banking

Conservation banking refers to the restoration and protection of lands that serve to offset adverse impacts to species or habitats elsewhere through the use of conservation credits. It involves undertaking conservation actions prior to any particular corresponding development and creating credits to be applied at a later date to development projects needing offsets.

Conservation banking is an issue that generated a mixed reaction at our biodiversity offsetting forum in 2014: only 59 percent of participants (17 out of 29) agreed that "it is important to set up conservation banking alongside biodiversity offsetting." Participants indicated that they needed more information, and we subsequently held our conservation banking workshop in March 2016. At that workshop, there was a shift in the level of support, with 46 percent indicating support and 26 percent indicating strong support (= total of 69 percent support) for conservation banking in Ontario. A significant number – 22 percent – still indicated uncertainty. Interestingly, 95 percent of participants said that conservation banking would be "somewhat helpful" or "helpful" to them in their professional or volunteer work.

During small group discussions, participants articulated many "hopes" for conservation banking, including:

- it could be an opportunity to bring new revenue to conservation efforts, including farm stewardship;
- it could enable a strategic, landscape-based approach to restoration;
- it could help reduce the transaction costs of biodiversity offsetting;

- it could help demonstrate the economic value of ecosystems, and the financial costs and risks associated with destroying or degrading them; and
- it could provide incentives for developers to use land for offsetting/conservation credits.

In addition to these hoped-for benefits, however, participants expressed considerable concern about potential abuse, liability, private sector uncertainty, pricing, the availability of offsetting sites, putting a price on nature, and many other issues discussed more fully above. It is important to note that there was limited Indigenous participation at this workshop, and that the topic still needs to be discussed with Indigenous peoples.

The province should carefully examine and provide direction on conservation banking, with input from Indigenous communities, municipalities and stakeholders. For one thing, conservation banking is already occurring in one form or another, but without government policy or guidance. At our conservation banking workshop, we asked participants whether they already used a form of conservation banking. Participants from six organizations (one conservation authority, one municipality, one federal government agency, two consultants and one anonymous) responded "yes," and participants from 12 organizations (one industry, two conservation authorities, two municipalities, two government agencies, two consultants, two non-government organizations and one anonymous) responded "somewhat."

Further, biodiversity offsetting on a broad scale is unlikely to happen without a conservation banking system to connect development proponents and offset providers, provide security for investment and reduce transaction costs. According to Ron Reid (Couchiching Conservancy) and Lindsay Parks (OPG), conservation banks would make things run more smoothly and efficiently even at the smaller scale.

This will require clear direction and involvement from the provincial government.

> **Recommendation 19:** The province should carefully examine and provide direction on conservation banking, with input from Indigenous communities, municipalities and stakeholders. If it decides to enable conservation banking through law and policy, it must address such issues as governance and oversight, limits to offsetting, equity, transparency, the mitigation sequence, establishing equivalence, monitoring and enforcement.

F. Conclusion

Biodiversity offsetting serves to remind us that there are real costs to damaging and destroying the natural world. At the same time it offers an opportunity to make amends for the loss. It is a hopeful practice, which brings together people from all walks of life seeking to achieve positive, on-the-ground outcomes for biodiversity.

The four case studies presented in this report are a true testimony to such well-meaning collaborations. Though it is too early to assess the outcomes, the projects were designed and implemented according to the highest standards with caution, care and due regard for the species, ecosystems and communities affected. Those involved have reason to feel optimistic.

Notwithstanding, in moving forward with biodiversity offsetting, we should be mindful of the pitfalls identified in the following statement by the International Union for the Conservation of Nature:

> The principal reason that offsets fail to achieve No Net Loss or Net Gain appears to be lack of clear policy requirements that offer unambiguous guidance to developers and offset providers, limited capacity for implementation of mitigation, inadequate monitoring and enforcement, and – particularly – insufficient political will to require and enforce best practice in offsetting.[47]

These failings point above all to the vital role that governments must play in policy development, monitoring and enforcement. Accordingly, most of our recommendations, summarized below, are directed at government. Some, however, also touch on the key responsibilities of offset providers and development proponents, based on the evidence presented in this report.

Summary of recommendations:

1. The province should work with Indigenous communities, municipalities and stakeholders to establish a coherent policy framework for biodiversity offsetting that provides consistent, high-level guidance, ensures fairness and transparency, respects Indigenous rights, responsibilities and interests, and aims to restore and protect biodiversity across Ontario.
2. The province should identify or establish an independent oversight body to monitor and assess the adequacy of outcomes of biodiversity offsetting policies and programs and to ensure accountability and transparency.

3. Provincial policy for biodiversity offsetting should be developed in consultation with Indigenous communities and should explicitly recognize Indigenous rights, including the right to Free, Prior and Informed Consent.
4. Development proponents should provide Indigenous communities (both those affected by a proposed biodiversity offsetting project or those invited to participate in a proposed project as an offset provider) with the resources required to consult with community members, document Indigenous knowledge, seek legal counsel and fully understand the risks and benefits.
5. The province should set criteria for determining limits to biodiversity offsetting, taking into account the irreplaceability and vulnerability of the biodiversity elements in question and their cultural significance for Indigenous peoples. In so doing, it must uphold or strengthen current protections for natural features, systems and functions.
6. Provincial and municipal policy for biodiversity offsetting should require the achievement of overall net gain for biodiversity, on the basis of in situ (on-the-ground), measurable conservation outcomes. If the proposed development negatively impacts Indigenous cultural values, these impacts should also be offset on a net gain basis.
7. Offset providers should adhere to a standard of net gain for biodiversity as a condition for involvement in an offsetting project.
8. Provincial and municipal policy for biodiversity offsetting should clearly position biodiversity offsetting within the mitigation sequence, the first step being to define areas that are off-limits to development and to be protected from negative impacts as defined through sound science and Indigenous knowledge. Following this, any unavoidable negative impacts must be minimized to the extent possible. Offsetting then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.
9. Regulators should require development proponents to document all measures taken to avoid and minimize negative impacts on biodiversity, including consideration of alternatives. They should carry out their own assessments of proponents' efforts to avoid and minimize impacts. Where efforts have been insufficient, regulators should refuse to grant authorizations.
10. In implementing the mitigation sequence, development proponents must engage affected Indigenous communities in order to integrate their knowledge according to community protocols.
11. As a condition for participating in a biodiversity offsetting project, offset providers should ensure that the mitigation sequence is applied and that sufficient measures have been taken to avoid and minimize impacts.
12. In establishing equivalence of impacts and offsets, provincial and municipal policy for biodiversity offsetting should require consideration of the size, condition

and landscape context of the development and offset sites as well as associated ecosystem components, services and functions. Indigenous cultural values must be fully considered in accordance with Indigenous rights, responsibilities and interests.

13. Provincial and municipal policies for biodiversity offsetting should set clear requirements and high standards for monitoring. These should stipulate that development proponents must cover the cost of monitoring. They should require baseline surveys prior to impacts as well as long-term monitoring sufficient to determine whether outcomes have been achieved.
14. Provincial and municipal policies about biodiversity offsetting should explicitly address the equitable distribution of social costs and benefits and the effective participation of communities in decision-making.
15. Development proponents should recognize and address the social costs and benefits of offset-siting decisions and invite meaningful community participation in decision-making.
16. Provincial and municipal policy should establish requirements to ensure adequate transparency and public input into biodiversity offsetting initiatives.
17. Both the development proponent and the offset provider should share information in a transparent manner and according to an established timeline. They should openly communicate project plans and results with one another, with their communities, with other partners and with the public.
18. The development proponent and the offset provider should build the cost of communications and public outreach into their agreement, with costs covered by the development proponent.
19. The province should carefully examine and provide direction on conservation banking, with input from Indigenous communities, municipalities and stakeholders. If it decides to enable conservation banking through law and policy, it must address such issues as governance and oversight, limits to offsetting, equity, transparency, the mitigation sequence, establishing equivalence, monitoring and enforcement

[1] These quandaries are grounded in concerns about our human relationship with the more-than-human world and our presumptions about trading and putting a price on nature and granting licences to destroy certain elements. While we did not tackle these ethical issues directly through this project, they arose nonetheless in many meetings and workshops and are deserving of serious attention.
[2] International Union for the Conservation of Nature, *Biodiversity Offsets Technical Study Paper* (Gland, Switzerland: IUCN, 2014), p. 2.
[3] See Ontario Nature, *Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013-2014 Project* (Toronto: August, 2014), pp. 32-33.
[4] cornerstonestandards.ca/standards
[5] "A conservation bank is a parcel of land managed for its conservation values. In exchange for permanently protecting the land, the bank owner is allowed to sell credits to parties who need them to satisfy legal requirements for compensating environmental impacts of development projects." (Business and Biodiversity Offsets Programme (BBOP), *Glossary*, 2nd updated edition (Washington, D.C.: Forest Trends, 2012), forest-trends.org/documents/files/doc_3100.pdf.
[6] As explained by Chris Craig (Algonquin), quoted in *Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013-2014 Project* (Toronto: August, 2014), p. 28.
[7] Larry McDermott, Personal communication, August 23, 2016.
[8] Ontario Nature gratefully acknowledges the contributions of individuals from Walpole Island First Nation, Curve Lake First Nation, Six Nations of the Grand River First Nation, Algonquins of Pikwàkanagàn First Nation, Alderville First Nation, and Shabot Obaadjiwan First Nation.
[9] Protocols are established on a community or First Nation by First Nation basis. They are established, for example, to engage Western science holders, especially those who are representing the Crown, in the process of the duty to consult. Indigenous knowledge cannot be understood from a Western viewpoint alone, and time must be invested in order to bridge the two world views and to ensure meaningful application.
[10] As memorably noted by Chris Craig at our biodiversity offsetting symposium in 2014, "Offsetting is like spitting in someone's glass of water and then giving a fresh glass of water to someone else." (Ontario Nature, 2014, p. 28)
[11] The landscape context refers to the broader ecological and cultural setting within which a project is sited. The appropriate scale of the landscape context to be considered would depend on the interests and objectives of the parties involved. It could be based, for example, on a watershed, an eco-region or a community's traditional territory.
[12] Plenty Canada is a registered non-profit organization that facilitates access to and shares resources with Indigenous peoples and other community groups around the world in support of their environmental protection and sustainable development goals (plentycanada.com).
[13] In January 2015, we established an advisory group of 13 individuals representing diverse interests and perspectives (agriculture, industry, conservation, land-use planning, Indigenous) to provide guidance on biodiversity offsetting and the basis of a strong network for information sharing, planning and outreach.
[14] Paul Schliesmann, Solar panel project paying dividends, *Kingston Whig Standard*, (March 22, 2016) thewhig.com/2016/03/22/solar-panel-project-paying-dividends .
[15] For example, we presented at meetings of the Ontario Mining Association, the Ontario Stone, Sand & Gravel Association, and the Ontario Land Trust Alliance, and at the Ontario Biodiversity Summit 2015, the Latornell Conservation Symposium 2014, the Carolinian Canada Ecosystem Recovery Forum 2014, and Nature Network regional meetings (2016).
[16] International Union for the Conservation of Nature, p. 2.
[17] Presentations from G. Radford and J. Tosilano at the Biodiversity Offsets in Canada Conference, Ottawa, February 2014.
[18] D. Moreno-Mateos, M. E. Power, F.A. Comin and R. Yockteng Structural and functional loss in restored wetland ecosystems, *PLoS Biology*, (2012) 10(1), e1001247, p.6.
[19] Nigel Finney, "Conservation Banking Survey: Implementing Compensation Projects." Presentation at the Conservation Banking Workshop, hosted by TRCA and Ontario Nature, March 29, 2016.
[20] Poulton, 2015, p. 11.
[21] Ibid,, pp. 11 –12. The conflict is even more challenging when Indigenous communities are involved. The capacity of regulatory bodies and developers to negotiate in a respectful cross-cultural way and to provide appropriate accommodation is extremely limited. Furthermore the duty to consult is a provincial responsibility that cannot be transferred.
[22] Ibid., p. 12
[23] Ibid., pp. 39 –40.
[24] Joanna Smith. Canada will implement UN Declaration on Rights of Indigenous Peoples, Carolyn Bennett says. *Toronto Star*, November 12, 2015.

https://www.thestar.com/news/canada/2015/11/12/canada-will-implement-un-declaration-on-rights-of-indigenous-peoples-carolyn-bennett-says.html; Ontario. *The Journey Together: Ontario's Commitment to Reconciliation with Indigenous Peoples*. https://www.ontario.ca/page/journey-together-ontarios-commitment-reconciliation-indigenous-peoples
Note that Article 43 states: "The rights recognized herein constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world."

[25] New Zealand Government, *Guidance on Good Practice Biodiversity Offsetting in New Zealand* (August 2014), doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting.

[26] U.S. Environmental Protection Agency. Compensatory Mitigation for Losses of Aquatic Resources – Final Rule, 33 CFR § 325,
§ 332; 40 CFR § 230 (2008).

[27] U.S. Department of Energy. Executive Order 13175, ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000)

[28] Dave Poulton. Personal communication. July 5, 2016.

[29] The Business and Biodiversity Offsets Programme (BBOP) principle #2 expresses international multi-stakeholder acknowledgement of limits: "Limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected." *BBOP Principles on Biodiversity Offsets*. bbop.forest-trends.org/documents/files/bbop_principles.pdf. Factors that should be taken into consideration when determining limits include vulnerability, size or extent of the impact, cumulative impacts, irreplaceability, long-term security, location and time lags. See Ontario Nature, 2014, p. 15.

[30] Poulton, p. 35.

[31] See BBOP principle #4: "No net loss: A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity." bbop.forest-trends.org/documents/files/bbop_principles.pdf.

[32] For example, 24 out of 29 participants at our 2014 biodiversity offsetting forum agreed that offsetting should require achievement of an overall net gain. (Ontario Nature, 2014, p. 27)

[33] Dan Kraus, "Why no net loss in biodiversity offsets fails nature and people." November 25, 2015. natureconservancy.ca/en/blog/why-no-net-loss-in.html.

[34] Poulton, pp. 34–35.

[35] Poulton, pp. 7, 33.

[36] Poulton, p. 33.

[37] Poulton, pp. 8–9.

[38] Poulton, p. 37.

[39] One Indigenous participant expressly did not support this latter view.

[40] International Union for the Conservation of Nature, p. 34.

[41] See principles #6 (stakeholder participation) and #8 (long-term outcomes). BBOP Principles on Biodiversity Offsets. bbop.forest-trends.org/documents/files/bbop_principles.pdf.

[42] Poulton, pp. 25–26.

[43] Poulton, p. 38.

[44] Poulton, p. 38.

[45] Poulton, p. 13.

[46] See, for example, BBOP principle #9: Transparency: The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

[47] International Union for the Conservation of Nature, p. 2.

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