Ecological Offsetting in the Cataraqui Region
Summary Report and Draft Recommendations

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Overview

Development pressures have been steadily increasing in parts of Ontario, challenging planning authorities to balance environmental conservation goals while accommodating growth. To compensate for the impacts of development on the environment and avoid losses in the area and function of natural heritage systems, ecological offsetting policies have been implemented by municipalities and conservation authorities. The Cataraqui Region Conservation Authority (CRCA) is considering the development of an ecological offsetting policy due to increasing development pressures, the rising use of Ministerial Zoning Orders (MZOs), and the formation of offsetting policies by other conservation authorities (CAs) and municipalities across the province. To determine whether an ecological offsetting policy may be appropriate, the CRCA engaged the School of Urban and Regional Planning at Queen's University to study ecological offsetting in theory and practice.

Project Goal and Objectives

The goal of this project was to prepare a report outlining considerations for the potential development of an ecological offsetting policy framework for the Cataraqui Region. The study explored how, where, and when ecological offsetting may be an appropriate tool and provides guidance on the application of offsetting to the CRCA and municipalities within the Cataraqui Region. This work builds on the CRCA report: *IR-033-22-PPAHC, Ecological Offsetting in the Cataraqui Region – Discussion Paper*, which was received by the board on March 16, 2022, and introduced the concept of ecological offsetting within the CRCA context. The final report will be submitted to the CRCA on December 23, 2022 and will contain an in-depth discussion of each section of this summary. The purpose of this summary is to provide an overview of the research methods, key findings, and recommendations to generate preliminary feedback to incorporate into the final report.

Project Objectives

The objectives of this study were:
1. Provide a review of current laws, regulations, and policies which may impact the implementation of an ecological offsetting program in the Cataraqui Region
2. Identify and synthesize current best practices, challenges, and opportunities in ecological offsetting policy
3. Identify the circumstances where it may be appropriate to consider ecological offsetting as a land use planning tool in the Cataraqui Region
4. Recommend appropriate offsetting methods and best practices in the development of an ecological offsetting policy framework

What is Ecological Offsetting?

Ecological offsetting is used to compensate for the natural features (*i.e.*, wetlands, wildlife habitat, woodlands, *etc*.) lost due to a proposed development by recreating those features at another location on the development site, in the surrounding area, or elsewhere (see **Figure 1**).
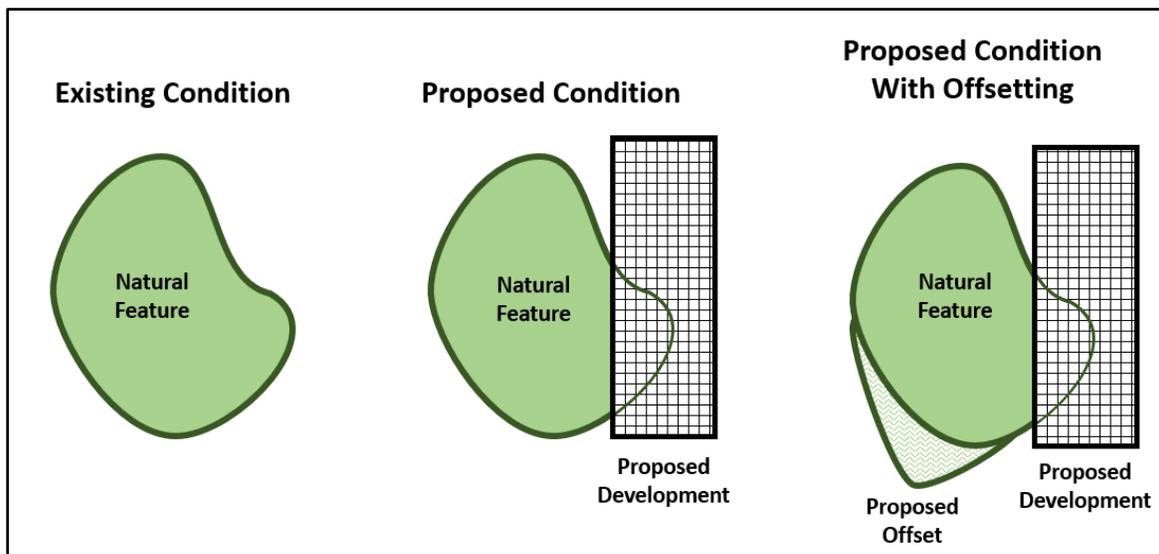
Figure 1. Ecological offsetting example

Research Methods and Key Findings

The research informing the final recommendations involved a qualitative research approach, including:

- Site observations
- Legislative, regulatory, and policy review
- Literature review of academic articles and reports
- Comparative case study analysis of selected CAs and municipalities in Ontario.

Site Observations

Site visits were conducted on September 23, 2022, with CRCA staff to gain a better understanding of offsetting related projects completed in the CRCA jurisdiction. The sites consisted of three locations in the City of Kingston, where offsetting projects had been completed as compensation for impacts associated with municipal and provincial infrastructure projects. Site observations and analysis (including photos) are contained in the final report.

Legislative Review

The legislative review included major provincial legislation such as the *Planning Act*, the *Conservation Authorities Act*, and the *2020 Provincial Policy Statement* (PPS), as well as important regional policies such as the CRCA *Guidelines on Implementing Ontario Regulation 148/06*. The legislative review considered:

- How ecological offsetting may be implemented through applications under the *Planning Act* or through applications under the *Conservation Authorities Act*.
- Which natural features may be eligible for offsetting and the potential effects of provincial legislation on both approaches.
- The requirements for planning authorities to engage with Indigenous communities and coordinate on land use planning matters as identified in the PPS.
- Existing municipal planning policies in the Cataraqui Region to determine if any municipalities have policies that either enable or restrict offsetting, or any policies that potentially conflict with an ecological offsetting policy for the Region. Municipal planning policies reviewed include Official Plans, tree by-laws, and Environmental Impact Assessment Guidelines.

The legislative review found that there are two approaches to implementing an ecological offsetting policy. The first is to have CAs request offsetting as a condition for granting a development permit under the *Conservation Authorities Act.* The CA would act as the approval authority for the offsetting project. The second is to have municipalities request offsetting as a condition of approving an application under the *Planning Act*. In this approach, the municipality would act as the approval authority. If offsetting were to be implemented through the *Conservation Authorities Act*, it could only be applied in scenarios where:

- Development is proposed within a CA regulated natural feature or adjacent areas (wetlands, watercourses, shorelines, river and stream valleys, and hazardous lands).
- Proposed development would affect the control of flooding, erosion, dynamic beaches or unstable soil or bedrock.

By contrast, if offsetting were to be implemented through the *Planning Act* by municipalities, offsetting may be applied as compensation for any development application under the *Planning Act* that would impact a natural heritage feature not protected by other policy or legislation. To enable offsetting through the *Planning Act*, municipal Official Plans would require policies which allow for the consideration of offsetting and identify a legal mechanism to establish offsetting requirements such as Development Agreements.

Having municipalities implement offsetting for *Planning Act* applications that impact natural features is advantageous compared to the *Conservation Authorities Act* approach, as municipalities may consider offsetting for more features of natural heritage systems and are not constrained by the narrow requirement to only consider factors such as flooding and erosion. However, given the risks inherent in offsetting, each municipality in the Cataraqui Region should determine whether offsetting is a tool they wish to deploy, and if so, which natural heritage features and types of development would be eligible to consider offsetting. Given that each municipality's natural heritage system differs in terms of size, diversity, and overall health, the

project team felt that a blanket recommendation in favour of offsetting for all municipalities in the Cataraqui Region was not appropriate. Rather, the merits of offsetting should be debated by each municipality, in collaboration with the CRCA, based on its environmental context.

While the project team has attempted to identify and address possible impacts the *More Homes Built Faster Act* may have on the provided recommendations, fully incorporating the legislative changes within the project analysis and recommendations was not possible given the project scope, recency with which the legislation was enacted, and a lack of guidance currently available from the Province. Therefore, the legislative review and recommendations may require additional analysis and consideration once more information from the Province becomes available. The Province appears to be moving in a policy direction which would be more permissive to offsetting and the CRCA and municipalities should consider this in the development of offsetting policy within the Cataraqui Region.

Literature Review

A literature review was conducted to provide an understanding of the types and systems of ecological offsetting, current practices, and implementation considerations. The findings provided background information to guide the selection, evaluation, and interpretation of case studies and recommendations. Over 100 academic articles and research reports published within the past 15 years were reviewed and interpreted. The findings were classified into 14 themes capturing the technical, governance, social, and ethical issues of ecological offsetting policies (see **Table 1**).

Table 1. Summary of key findings and best practices in the 14 literature review themes with the theme title and descriptive question in bold and literature review findings below.

Literature Review: Key Findings and Best Practices	
Technical and Governance	
No Net Loss/ Net Gain	**Will natural heritage systems be restored or improved?** • Policies should consider net gain of ecosystem services and area as an objective and a timeframe for achieving net gain. Ecosystem function and sociocultural value are to be included in assessing impacts and net gain against a baseline from a landscape frame of reference.
Mitigation Hierarchy	**Consider avoidance, minimization, and mitigation before offsetting** • Strictly enforce the mitigation hierarchy. Policies should require developer documentation and independent review and analysis by the approval authority.
Eligibility	**What natural features and development types can consider offsetting?** • Clearly identify what features and development types are eligible for offsetting, while considering the vulnerability, irreplaceability, and cultural significance of features.
Currency	**How will the impacts to ecosystem function be measured?** • Identify ecosystem function and extent of impact requiring compensation. Identify a measurement system that appropriately accounts for loss across various feature types.

Equivalence	**How will the required offset compensate for the assessed loss?** • Account for quantity (area), the quality of features and functions, landscape context of development and offset sites, associated ecosystem services, and social and economic values. Out-of-kind trading (replacing a lost ecosystem with a different type) is generally not recommended.
Location	**Where should the offset site(s) be located?** • Policy guidance is shifting from rigid requirements for in-kind offsets (replacing a lost ecosystem with one of the same type) as close to the development site as possible towards the identification of environmentally preferable options in the watershed or landscape.
Time Lag	**Is there a delay between impacts and replacement of full ecosystem function?** • The impact of natural feature destruction is immediate, while compensation measures may take significant time to achieve the same ecological value. Multiplicate ratios and time discounting can be used to help address time lag.
Longevity	**Are impacts temporary or permanent? How long will the offset be required?** • Offsets should be designed to last the same duration as the project impacts at minimum or in perpetuity. Given time lags, offsets should be in place before the impact occurs where possible.
Uncertainty	**Are there risks associated with the offset that may result in failure?** • Development proximity, climate change, and shifting priorities can impact offsetting projects in the future. Offsetting policy should be flexible enough to adapt to these changes. Multiplicative ratios may provide a way to compensate for uncertainty in the future.
Offset Ratios	**Should the area of the offset be larger than the area of impact?** • Considerations for a higher offset area ratio are influenced by factors such as, time lag, uncertainty, and equivalence. A 1:1 area replacement ratio may reinforce loss and fail to account for all value lost.
Monitoring Outcomes & Compliance	**How will the offset be monitored, and achievement of the objectives ensured?** • Offsetting is a long-term exercise involving monitoring to ensure no net loss. An adaptive management approach can support continuous improvement in the compensation process.
Social	
Consultation	**How should consultation be involved in offset policy development and action?** • Consultation is necessary to support transparency in offsetting methods and determine alternative viewpoints otherwise missed by regulators. Consultation should occur throughout the development of the policy and determine if, when, and how consultation will occur through the deployment of offset projects.
Planning with Indigenous Peoples	**Planning authorities should engage with Indigenous communities** • Support engagement and decision-making with Indigenous communities about whether or how to participate in offsetting.

Philosophical/Ethical	
Ethics	**What are the ethical implications of offsetting which must be considered?**
	• The spatial and temporal distribution of impacts and offsets must be considered. Offsetting must acknowledge limitations in our knowledge and not seek to apply solutions beyond which we can understand and realistically achieve.

Comparative Case Study Analysis

The purpose of the case study analysis was to provide a greater understanding of the practical application of ecological offsetting. To provide relevant guidance on the development of an offsetting policy for the Cataraqui Region, the project team examined case examples consisting of both CAs and municipalities in Ontario.

Seven CAs with existing offsetting policies in place were included as well as six single- and upper-tier municipalities within Southern Ontario (south of and including Simcoe County) to provide a sample which was feasible for review within the scope of the project (see **Table 2**).

Table 2. Summary of CA and municipal cases selected for analysis.

Conservation Authority Cases	Municipal Cases
Credit Valley Conservation Authority	County of Peterborough
Nottawasaga Valley Conservation Authority	City of Peterborough
Toronto and Region Conservation Authority	York Region
Hamilton Conservation Authority	City of Markham
Otonabee Region Conservation Authority	City of London
Niagara Peninsula Conservation Authority	City of Brampton
Lake Simcoe Region Conservation Authority	

Using a comparative analysis approach, all 13 cases were reviewed and evaluated based on the themes defined within the literature review (See **Table 1**). Each case was interpreted through the applicability of each theme and compared to identify the spectrum of approaches currently deployed (See **Table 3**). The results of this analysis were further refined to identify best practices for the Cataraqui Region, which then informed recommendations.

Table 3. Sample of key findings of the comparative case study analysis.

Case	Theme	Key Findings
Conservation Authorities		
Toronto and Region Conservation Authority	**Currency**	• Ecosystem function and land area are independently considered when determining replacement requirements for an offsetting project.
	Location	• Establishes hierarchy of locational considerations for an offsetting project: (1) within same municipality and sub-watershed; (2) outside of but connected to the natural heritage system of the municipality; (3) outside of municipality but within upper portion of the same watershed when land for offsetting is unavailable.
	Systems of Offsetting	• Allows proponent led offsetting projects, cash-in-lieu offsetting projects where the CA is responsible for implementation, and third-party offsetting where a separate public agency or non-profit organization is responsible for delivering the offset.
Hamilton Conservation Authority	**Eligibility**	• Offsetting can only be utilized for MZOs or provincially or municipally lead infrastructure projects. • Offsetting not eligible for developments requiring *Planning Act* approvals (i.e.: Subdivision, Site Plan, etc.).
Credit Valley Conservation Authority	**Monitoring Outcomes & Compliance**	• Monitoring reports are to be uploaded into compensation database to help inform future compensation decisions and implementation plans.
	Offset Ratios	• Requires higher compensation ratios for heavily treed ecosystems to account for the time lag in replacing ecosystem function.

Case	Theme	Key Findings
Municipalities		
City of London	**Currency**	• Environmental Impact Study (EIS) provides description of natural feature type, ecological structure and functions of natural feature to be removed or impacted.
	Uncertainty	• Incorporates adaptive management and climate resiliency measures into offsetting project plans.
	Equivalence	• Requires same ecosystem structure and associated function to be replicated.
	Location	• Offset site must be able to support size of compensation, associated buffer(s), as well as function and services provided by the natural feature. • Preference for offset to be located within urban growth boundary.

County of Peterborough	Planning with Indigenous Peoples	• Indigenous communities must be consulted in accordance with Official Plan policy when considering offsetting.
	Longevity	• Offsetting projects will be recognized and protected through related Official Plan Amendments, Zoning By-law Amendments and/or Site Plans, as applicable.

Recommendations

The following section presents key recommendations to guide the discussion of considering an ecological offsetting policy within the Cataraqui Region based on the research findings. The project team developed additional recommendations regarding policy details and suggested approaches which have not been included in this summary and are to be provided in the final report. The recommendations from this study address the third and fourth project objectives.

Following the precautionary principle, the recommendations suggest using offsetting as a last resort measure and strictly limiting its application, acknowledging that there will be some cases where offsetting can generate a benefit when compared to the status quo. The recommendations are not intended to suggest an increase in the use of offsetting but rather formalize the process to produce better transparency and outcomes when it is to be deployed. The project team acknowledges the limitations of offsetting which can only recreate an approximation of the loss to the natural heritage system. However, the recommended offsetting methods and best practices address many of the current challenges faced by offsetting schemes and represent a sound policy framework to generate improved outcomes.

Ecological Offsetting as a Land Use Planning Tool

The project team has identified a recommended approach for the CRCA to deploy in the development of an ecological offsetting policy framework and consideration for its application in the Cataraqui Region. The following recommendations demonstrate a proposed sequence of actions by the CRCA and are provided in the approximate order to be completed. The recommendations reflect the current state of policy within the Cataraqui Region and may be impacted by ongoing and future changes to provincial and municipal policy and regulations. A brief rationale and additional information are provided under each recommendation.

1. The CRCA should only consider offsetting in the instance of an MZO issued by the Province, or a provincial or municipal public infrastructure development.
   - Municipal Official Plan policies do not enable offsetting and would restrict its use within the existing natural heritage system for other development applications.
   - Offsetting should be considered for development where the CRCA is required to permit, and the status quo may enable loss without compensation or ad hoc offsetting.

2. Engage with municipalities in the Cataraqui Region to determine the interest in deploying ecological offsetting under the *Planning Act* for development applications beyond scenarios involving MZOs or public infrastructure.
   - Further application of offsetting requires a deeper understanding of the local context and should be determined by local decision-making and strategic priorities.
   - Offsetting should only be considered where there is a clearly identified need to balance development pressure with natural heritage system preservation and enhancement.

3. Develop and deploy an engagement plan to enable collaboration with Indigenous communities and support meaningful engagement and relationship building.
   - Engage with Indigenous communities on interest and potential for collaborative involvement in ecological offsetting policy development.

4. Develop and deploy an engagement plan for public and stakeholder consultation in the development of an offsetting policy.
   - Engage with the public and stakeholders to generate input on ecological offsetting policy framework and guide policy development.

5. Develop a formal ecological offsetting policy and integrate this policy with the CRCA's existing Environmental Planning Policies and Guidelines for Implementing O. Reg 148/06.
   - Amendment to Environmental Planning Policies and regulatory Guidelines to formalize offsetting application.
   - Develop a stand-alone offsetting policy document or guideline to direct deployment of offsetting methods and best practices.

Offsetting Methods & Best Practices

The development of an offsetting policy will be contingent on numerous factors specific to the Cataraqui Region and natural heritage strategies. However, several guiding principles for offsetting policies have been identified which consider the initial development, implementation, and long-term monitoring of an offsetting policy based on the best practices from the literature review and supporting evidence from case studies.

6. Require no net loss of natural heritage system area, ecosystem structure and function, and sociocultural value, with a preference for net gain.
   - Baseline conditions at the impact and offset sites are to be assessed through an EIS to enable accurate measurement of loss due to development and gains from offset action.
   - Establish a clear and defined timeline for an offset to achieve no net loss.

7. Project proponents should be required to demonstrate compliance with each step of the mitigation hierarchy.
   - Document how avoidance, minimization, and mitigation were considered or implemented.
   - Independent review by the approval authority to assess acceptability of proponent efforts.

8. Develop a full list of natural heritage feature types which are eligible and ineligible for offsetting based on the qualities of vulnerability, irreplaceability, and cultural significance.
   - Must align with related federal, provincial, and municipal policies and regulations.
   - Provincially significant wetlands, bogs, fens, and features with rare vegetation communities should generally be considered ineligible for offsetting.
   - Additional analysis to determine eligibility based on local environmental conditions and cultural importance.

9. Measurement of offsetting requirements should consider impacts to natural heritage system area, ecosystem structure and function, and sociocultural values.
   - Ecosystem function and natural heritage system area assessed through an EIS.
   - Sociocultural value assessment method based on engagement during policy development.

10. Offsets should achieve the same ecosystem function, size, and value as the lost feature.
    - Offset plan should demonstrate how impacts identified in the EIS are to be compensated.

11. Establish an offset site selection hierarchy to guide the preferred location of offset project sites.
    - Ensure ethical distribution of development impacts and associated offset benefits.
    - Integrate with natural heritage system strategy and conservation objectives.

12. Offset sites should be able to accommodate the appropriate buffer or setback to adjacent development and meet municipal natural heritage system requirements.
    - Enables the protection of natural features created or rehabilitated through offsets.

13. Offset area ratios greater than 1:1 should be used to account for uncertainty and time lag in the restored natural feature reaching the required ecological function.
    - Some ecosystem functions take a significant time to re-establish (i.e.: functions provided by trees) or may have an increased likelihood of partial failure or uncertain performance.
    - Increased offset ratios may be applied to generate the equivalent ecosystem function in the desired time-period by requiring a larger area of ecological restoration.

14. Offsetting plans should include adaptive management strategies and contingency plans.
    - Identify actions to address potential challenges or failures due to environmental factors to reduce the uncertainty of offset success.

15. Require proponents provide security payments to the approval authority to be held until offsetting projects achieve acceptable performance measures.
    - Reduce risk of offset failure due to poor compliance or financial difficulties of proponent.

16. Offsets should be established and designed to exist in perpetuity with the appropriate legal protections established to protect the offset feature in the long-term.
    - Development impacts are permanent and not realistically reversible which should be reflected in the permanence of the associated compensation.
    - Consider conveyance of land, conservation easement, zoning and Official Plan designation.

17. A monitoring program which identifies the required frequency, duration, and scope of monitoring activities to be completed should be established prior to offset approval.
    - Enable the assessment of the offset performance against the objectives based on the required compensation established by measurements of the EIS.

18. Monitoring of the offset feature(s) should be conducted until the feature(s) achieves the objectives of the offsetting agreement.
    - Ensure offsets achieve the stated objective of no net loss or net gain.

19. Implement a continuous improvement plan to review policy outcomes and identify areas of policy or guideline improvement.
    - Utilize collected data on offset projects to assess policy performance.
    - Generate lessons learned and update policy with improved understanding.

20. Offsetting projects should be led and fully paid for by the proponent with project approvals and compliance monitoring by the regulator.
    - Utilize a full cost recovery – proponents to pay for offset implementation and administration of approval process.

21. A project sponsor model, in which the proponent could select an approved project sponsor to implement the offsetting project on their behalf, should be considered.
    - Engage with local organizations which may be able to deliver offsetting projects (i.e.: Ducks Unlimited Canada, Nature Conservancy of Canada, etc.) on behalf of proponents.
    - Consider if the CRCA will deliver offsets through cash-in-lieu under certain circumstances.