Municipality of Port Hope

Ecological offsetting Policy

Policy (or Procedure) number:	**PP-XX-XXXX**
Department:	**Development Services**
Section:	**Parks Planning**
Sub- section:	**Policy**
Subject:	**Ecological Offsetting Policy**
Effective Date:	**XX-XX-XXXX**
Revision date:	**06/08/2024**

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1. Executive Summary

This Ecological Offsetting and Compensation Plan provides a policy framework for the Municipality of Port Hope to guide the protection, enhancement, and restoration of natural heritage features impacted by development. The plan establishes clear processes for determining offset requirements, calculating compensation ratios, and implementing restoration projects in alignment with federal, provincial, and municipal legislation, including the Fisheries Act, Endangered Species Act, and Provincial Planning Statement (PPS 2024).

The framework draws on best practices from comparable jurisdictions, including the City of Barrie, Nottawasaga Valley Conservation Authority (NVCA), and Toronto and Region Conservation Authority (TRCA), while tailoring guidelines to the municipality's specific ecological context. It outlines procedures for habitat loss assessment, valuation of ecological functions, and the delivery of equivalent or greater environmental benefits through on-site restoration, off-site compensation, or cash-in-lieu contributions.

Implementation of this plan will ensure that ecological losses are effectively mitigated, biodiversity is maintained, and development proceeds in a manner consistent with the Municipality's commitment to environmental stewardship. By adopting this framework, the Municipality of Port Hope will establish a transparent, consistent, and enforceable approach to balancing growth with the long-term protection of its natural heritage systems.

Key Deliverables:

This project aims to deliver the following:

- A complete policy framework for the Municipality of Port Hope for Ecological Compensation due to future developments in the key natural features in the area.
- Implementation of the policies on the Pilot project that demonstrates the ability of the policies to enhance, conserve and compensate the nature's components lose due to development.

1.1 Definition

Ecological Compensation is defined as compensation 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). Compensation is typically considered a last resort, applied only after all reasonable efforts to avoid and minimize impacts (according to the Mitigation hierarchy chat) have been considered

and compensation is the only option, and must be implemented within the same ecological context to ensure functionality, biomechanism and long-term monitoring.

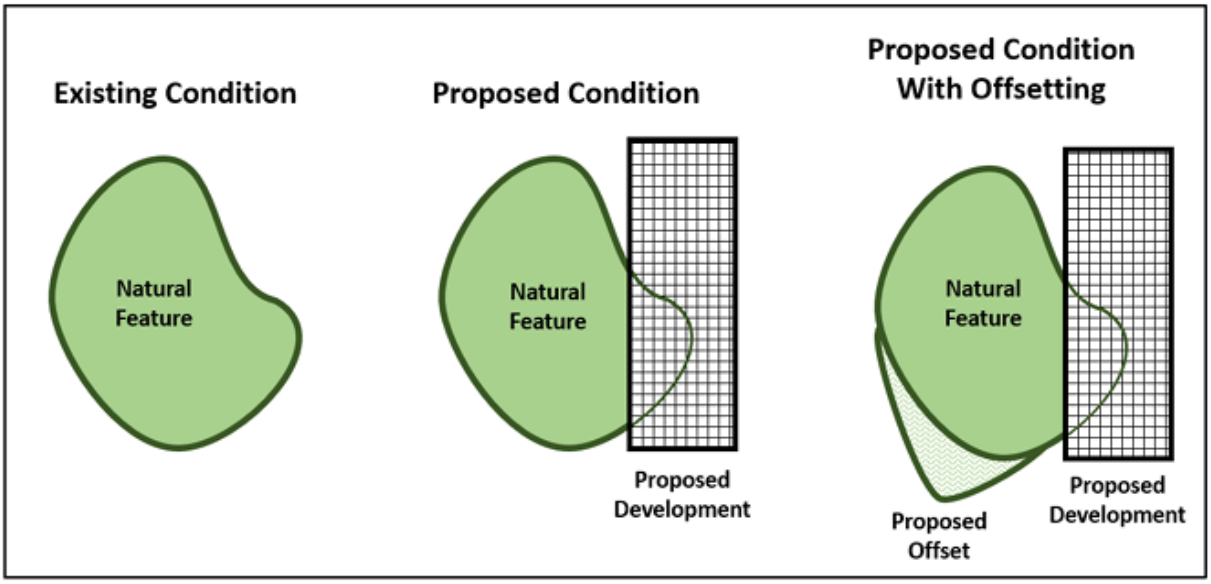


Figure 1.: Ecological compensation.

(Queen's university School of Urban and Regional Planning, 2022)

1.2 Scope

This policy framework applies to the Municipality of Port Hope's land use planning processes for both private and public lands, including municipal infrastructure projects, undertaken in accordance with the *Planning Act*, and *Environmental Assessment Act* of Canada.

Development proposals on private lands, or infrastructure projects subject to approval under the *Planning Act*, *Municipal Act*, or *Environmental Assessment Act*, which result in the removal of natural heritage features despite adherence to the Mitigation Hierarchy will be required to provide ecological compensation for the loss of those features.

Exclusions

- Recognizing that there are limits, and certain natural heritage features may be irreplaceable, offsetting will not be considered for features that contain rare vegetation communities as defined by the Natural Heritage Reference Manual (MNRF, 2010), and forested wetlands.

- Offsetting will also not be considered for watercourses or for the minimum vegetation protection zone abutting the Key Natural features and biodiversity habitat in the municipal boundary, as defined by the Conservation Authorities Act.

(City of Barrie, Ecological Offsetting Policy, 2023)

2. Background

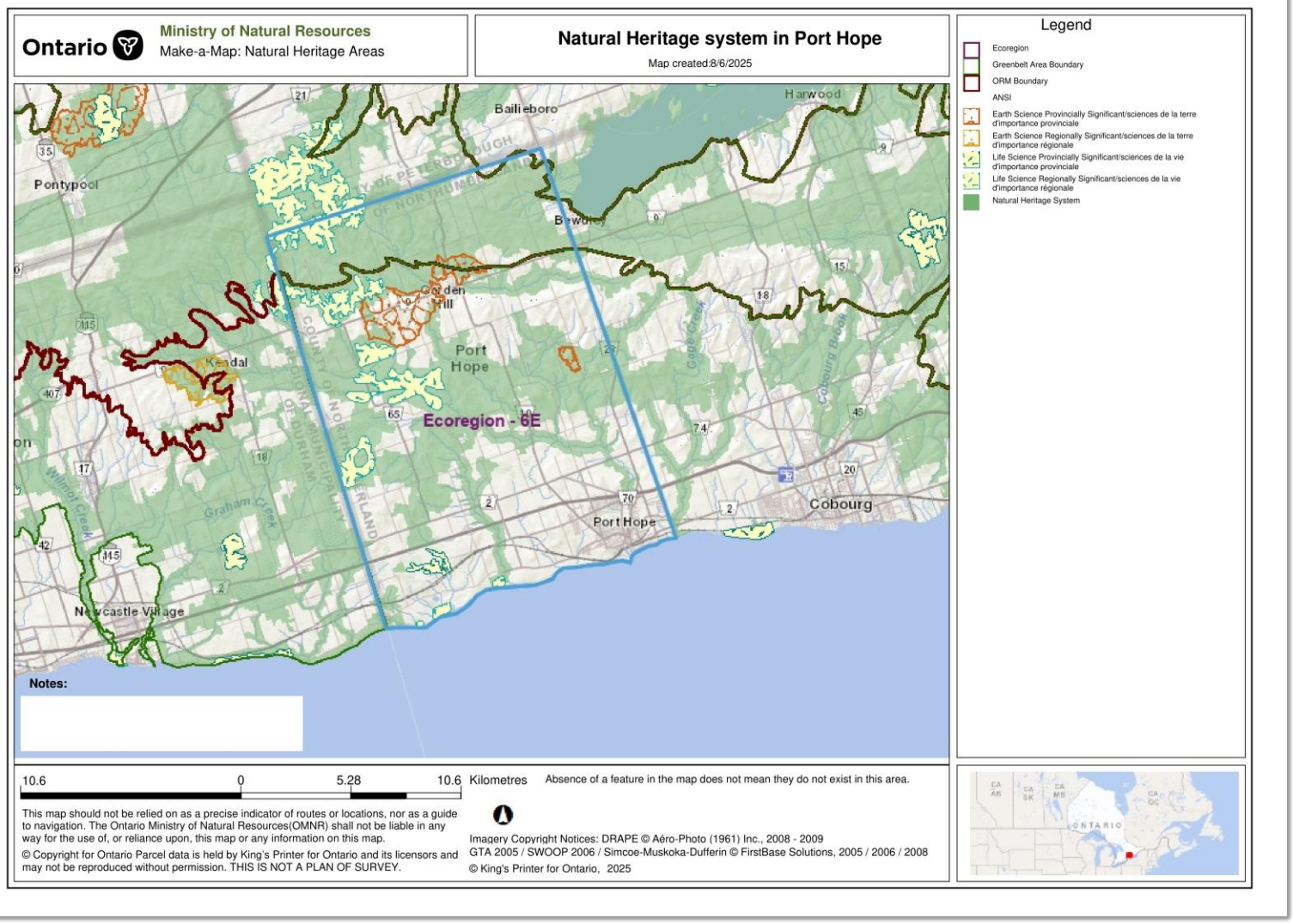
The Municipality of Port Hope recognizes the importance of balancing sustainable development with the protection and enhancement of its natural heritage systems. Ecological offsetting and compensation provide a structured approach for addressing unavoidable impacts to natural features by ensuring that equivalent or greater ecological value is restored, enhanced, or created elsewhere.

The Municipality of Port Hope has area of approximately 28,095 ha and is home to a diverse and interconnected network of natural heritage features centered around the diverse range of watercourses that provide essential ecosystem services to both the environment and the community. The north side of the Municipal boundary is covered by Oaks Ridges Moraine Area. The Ganaraska River that passes through the urban regions of port hope is comprised of various tributaries. These natural services contribute directly and indirectly to the well-being of residents, landowners, businesses, and other stakeholders across the municipality. However, with increasing population growth and associated urban development pressures, the continued protection, enhancement, and integration of these features into the planning process is becoming more complex and essential.

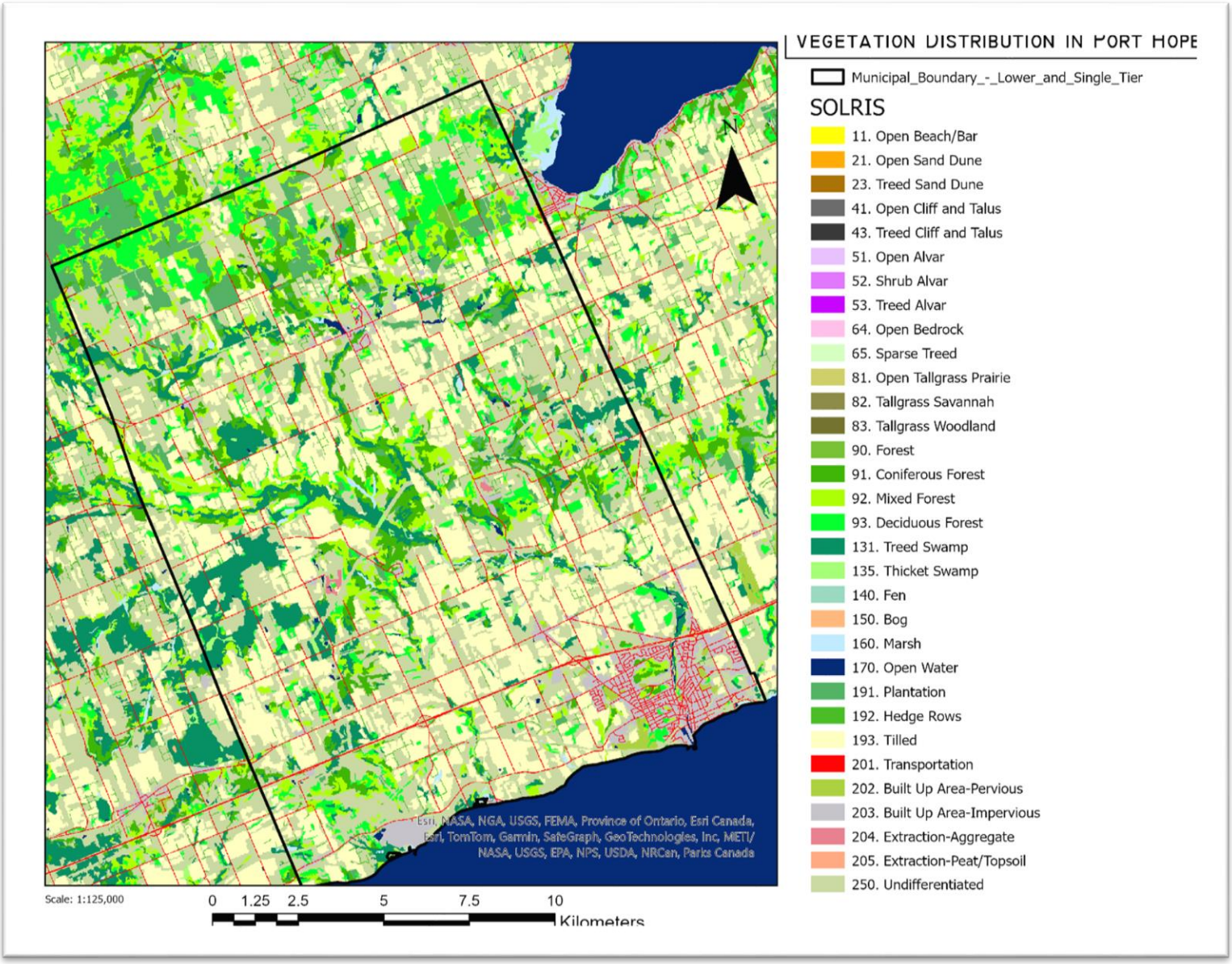
With ongoing population growth and the associated pressures of urbanization across the Greater Golden Growth Area, the protection, enhancement, and conservation of key natural heritage features within the Municipality of Port Hope are increasingly challenged. To address this issue, the Municipality has given us with task of the development of policies that incorporate ecological compensation or offsetting into official plan that can be used as a tool to manage the loss of natural assets, including wetlands, woodlands, watercourses, and other features.

Offsetting presents a methodology by which an objective of no net loss of ecological function, and in the case where possible, a net gain in natural features across the development area, may be achieved. Within such an approach, a definite obligation is vested on the proponent to compensate the consequences of adverse effects, as far as the loss of ecological value and functioning is concerned, and to make sure that important ecosystem services are sustained or enhanced.

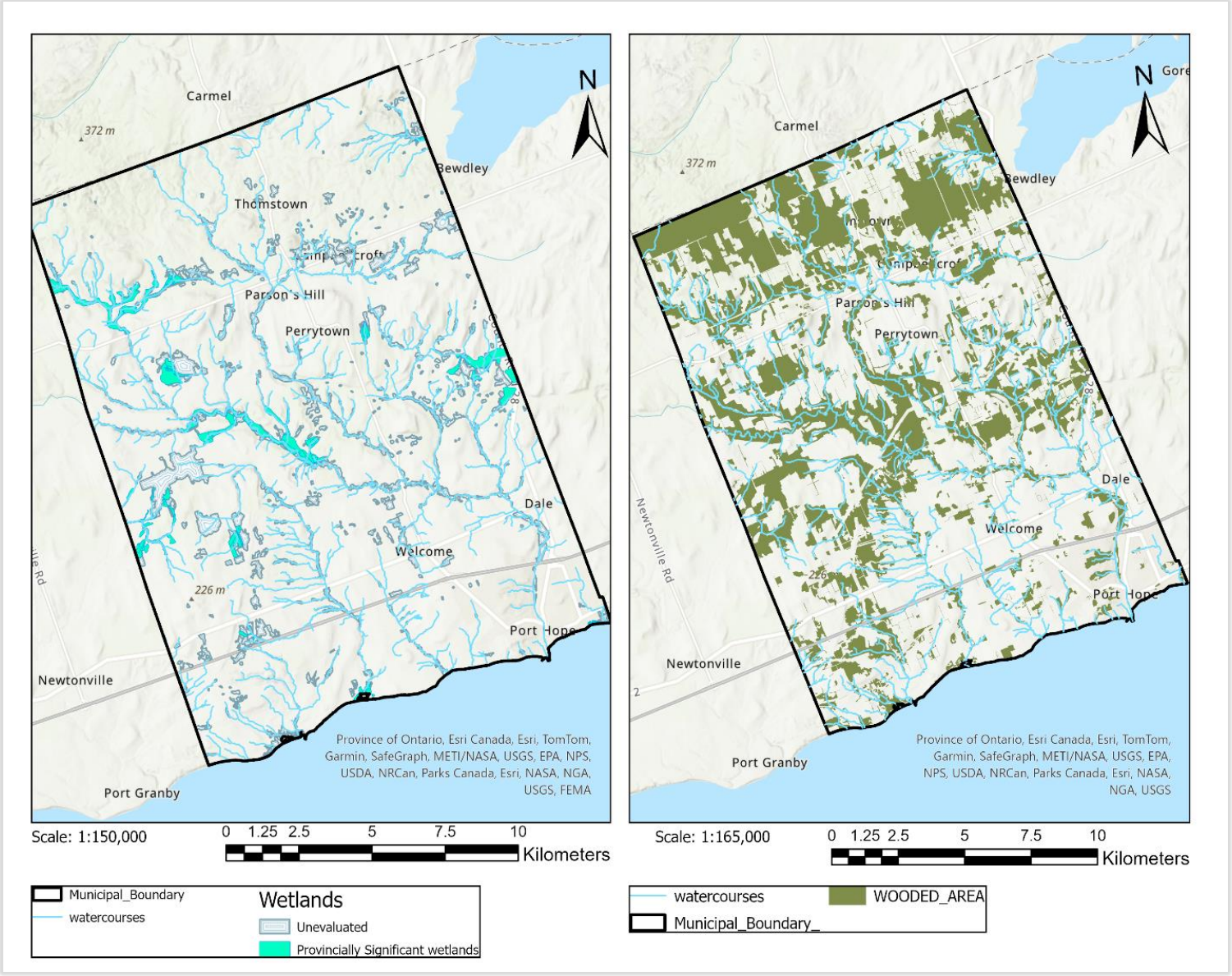
This policy framework is intended to limit further loss of regulated natural heritage features within the municipal boundary and, where loss is unavoidable, require compensation that results in equal or greater gains in ecological area, value, and function.



Map 1:Natural Features, ANSI, Green Belt and Oak Ridges Moriane Area



Map 2: Vegetation distribution in Port Hope



Map 3: Demonstrating how the wetlands and woodlands are formed around the watercourses.

3. Policy Context and Applicability

3.1 Policy context

Ontario has put in place a strong policy framework in relation to facilitating the protection and improvement of the natural heritage system. The *Planning Act* (part 1 Section 2) recognizes the protection of ecological systems including natural areas, features, and functions as a matter of provincial interest. In alignment with this, the *Provincial Planning Statement 2024 (PPS)* (section 4) directs that the long-term ecological function and biodiversity of natural heritage systems must be maintained, restored, or enhanced, wherever possible.

The legislative research 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.

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.

(Queen's university School of Urban and Regional Planning, 2022)

The Municipality of Port Hope has in place an initial policy foundation on the protection and regulation of city trees. These consist of By-law 75/2021 - Tree Protection By-law which aims to control the harm or demolition of trees related to an application in development. It is recommended either have a Certificate of Compliance before the removal of trees or should be given a form of compensation in form of a replacement tree at the sight or financial compensation to the experts. The policy of the Municipality on Tree Planting and Protection has a tree replacement formula that is used as a guide in valuation. Some exceptions are allowed such as trees that are in unhealthy conditions or trees that are in infrastructure zones that are accepted. The Municipality Official Plan (2017) also puts forward more general objectives that are aimed at retaining and improving ecological functions, preserving key elements of the natural environment, as well as developing development with the help of Environmental Impact Studies (EIS), drafted in cooperation with the Ganaraska Region Conservation Authority (GRCA).

(Municipality of Port Hope, 2021)

These local policies are supported by a strong provincial policy framework. The *Planning Act* (part 1 Section 2) identifies the protection of ecological systems as a matter of provincial interest, while the *Provincial Planning Statement 2024 (PPS) (section 4)* requires that natural heritage systems be maintained, restored, or enhanced over the long term. Together, these municipal and provincial policies provide the foundation for implementing a consistent and transparent ecological compensation approach ensuring that where impacts to natural features are unavoidable, they are offset through appropriate and measurable gains in ecological value, area, or function.

3.2 Project policy Conformity

The no net loss principle of ecological offsetting of loss of natural heritage features is an imperative measure in the infinite goal of a sustainable environment in Ontario. The below provincial, municipal policies present a policy base and rationale of the need to introduce an ecological compensation policy that is structured within the Municipality of Port Hope. Key Supporting Policy Documents include (but not limited to):

- The Planning act, 1990
- Provincial Planning Statement (PPS), 2024
- Municipality of Port Hope Official Plan, 2017
- Municipality of Northumberland official plan, 2016
- Oak Ridges Moraine Conservation Plan
- Ganaraska Region Conservation Authority (GRCA)
- Greenbelt Plan, 2017

3.3 Project Applicability

The framework contains a comprehensive overview of its applicability. The Policies:

- applies to all new applications or project undertakings that come before municipality of Port Hope on or after XXXX (effective date) and to any existing applications or project undertakings before Municipality of Port Hope on which the decision has not yet been determined.
- applies to any natural feature (e.g., woodlands, wetlands, thickets, and meadows) that has been determined through the review of development applications, infrastructure or GRCA permits, to require compensation.

- does not apply to street trees or trees in parks that are not associated with natural features (the provisions area already included in the tree By-laws).
- requires compensation be applied to re-establish natural ecosystems.
- is not intended for the provision or improvement of engineered green infrastructure, such as green roofs.
- does not contain stipulations for determining compensation for the loss of fish habitat and defers to provincial and federal ministries (*Fisheries Act*)
- recognizes and supports other compensation programs such as municipal by-laws for tree replacement.

4. Approval Process

Ecological compensation may be authorized through an Environmental Impact Study (EIS) prepared under the *Planning Act*, or through a comparable environmental study undertaken for public infrastructure projects subject to the Environmental Assessment process. In all cases, compensation for impacts to components of the Natural Heritage System (NHS) under the Municipality's jurisdiction will not be permitted by default, and will only be considered where all reasonable avoidance, minimization, and mitigation measures have been fully exhausted.

Prior to the approval of any application proposing ecological compensation or replacement, proponents must demonstrate:

- Full compliance with relevant legislation, regulations, and municipal policy.
- That the proposal meets the requirement of no negative impacts, in accordance with the Provincial Planning Statement (PPS).
- That a clear rationale is provided showing that all options to avoid or minimize the impact have been evaluated, and that the remaining impacts are unavoidable.
- That the compensation achieves no net loss or ideally results in a net environmental benefit.
- That the compensation site is located within the same sub watershed, preferably in close proximity to the affected feature, or alternatively in a location that enhances the NHS through improved connectivity and ecological function.
- That a detailed Ecological offsetting and Compensation Plan is prepared and submitted as part of, or as an appendix to, the broader Environmental Management Plan (EMP).

4.1 Mitigation Hierarchy

Any mitigation to proposed land use change or infrastructure projects likely to influence natural heritage features must address the mitigation hierarchy. The practice is in line with the best

practices in environmental planning and measures that ecology could be saved or otherwise limited to their maximum number before compensation is put into considerations. The hierarchy is as follows:

1. **Avoidance:** Prevent negative impacts to natural heritage features and their ecological functions wherever possible by selecting alternative locations, designs, or timing for the proposed activity.
2. **Minimization:** Where avoidance is not possible, reduce the scale, duration, or intensity of the impact through project design modifications, construction best practices, or other mitigation measures.
3. **Restoration/Rehabilitation:** Where impacts are unavoidable, restore the affected area to its original ecological condition to the extent possible, either on-site or nearby.
4. **Compensation/Offsetting:** When after considering all options of avoidance, minimization, and restoration measures and only one option is left, ecological compensation shall be required to ensure no net loss of ecological function. Compensation must be implemented through measures that are ecologically equivalent or superior in value and function and located within the same watershed or ecological planning area whenever feasible.

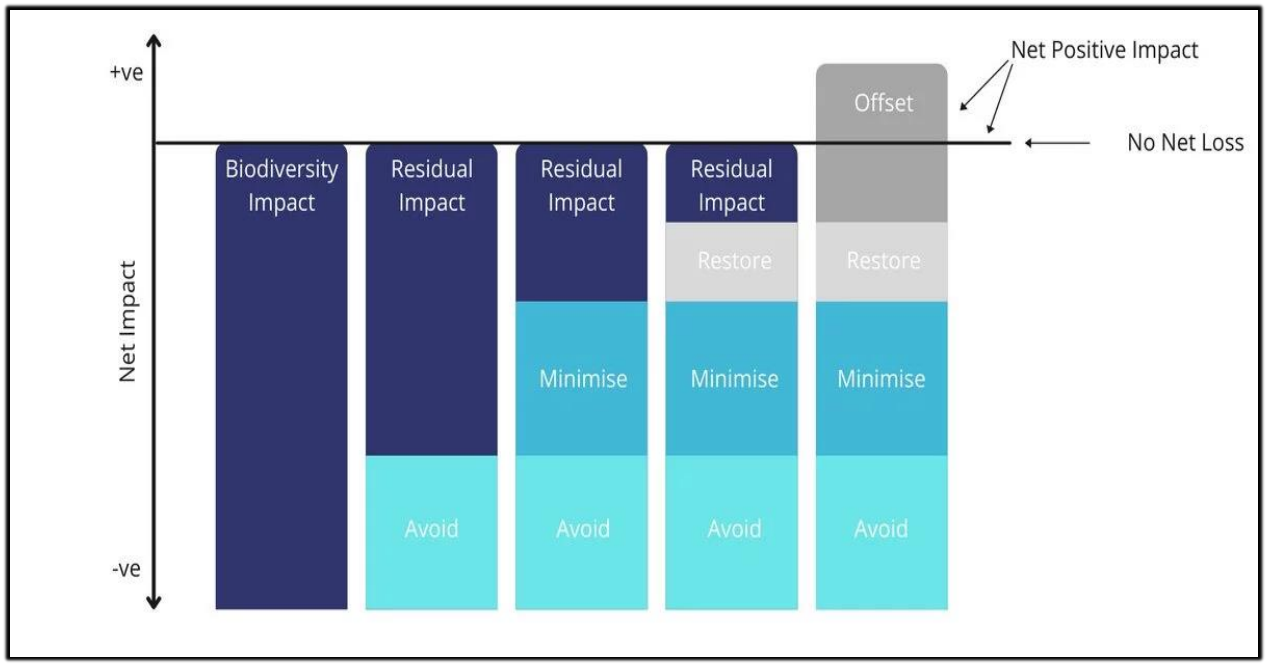


Figure 2:The Figure describes the mitigation hierarchy and the compensation steps for no net loss or Possible net gain.

4.2 Indigenous Consultation

The Municipality of Port Hope recognizes the constitutionally guaranteed rights of Indigenous peoples, and the obligation to consult and, where reasonable, accommodate Indigenous interests where potentially adverse effects could be realized upon the enjoyment of Aboriginal and treaty rights by the initiation of a project.

Ecological compensation projects, and, specifically, projects touching on natural heritage systems, wetlands, traditional territories, or other culturally relevant environment must be does in a fashion demonstrating earlier, meaningful, and continuing engagement with the potentially impacted Indigenous people. The involvement should start with the initial planning of the development application or planning and stop with the completion of the entire ecological assessment and compensatory plans.

The goal of consultation efforts must be to include both Indigenous knowledge and current science in environmental impact assessments to design and conduct mitigation measures and select and put into practice compensation projects. Where reasonably possible, the Indigenous communities might be offered to jointly plan or co-deliver the ecological compensation measures in land that is of interests or value to the community.

The advocates should show how the issues of Indigenous were heard and addressed in the Environmental Impact Study (EIS) and the final Ecological Offsetting and Compensation plan. The City could demand reports on engagement activities, summations of the issues brought out and action plans of tackling the concerns. In those areas where concerns are not resolved, the city will consult with the proponent and the involved Indigenous governments in good faith to find a resolution.

The City acknowledges the importance of respectful relationships, knowledge sharing and reconciliation within the context of its processes of planning and approvals of environmental development. This also incorporates taking into consideration offsetting or stewardship efforts that are Indigenous led as potential compensation provider when aligned to the objectives of ecology.

(London, 2021)

4.3 Environmental Impact Study (EIS)

Before approval of any development application proposing compensation for the loss or alteration of natural heritage features or functions, the following conditions must be met through a comprehensive natural heritage assessment. This may include, but is not limited to, an Environmental Impact Study (EIS), Natural Heritage Evaluation (NHE),

a) Demonstrate that the full Mitigation Hierarchy has been applied: Avoidance, Minimization, and Mitigation and that ecological compensation remains the only environmentally responsible option.

b) Demonstrate conformity with applicable in-force provincial, regional, and local planning and environmental policies, including but not limited to:

- The Provincial Planning Statement (PPS), 2024,
- The Lake Ontario Shoreline Management Plan,
- The Municipality of Port Hope Official Plan, and
- The Municipality of Northumberland Official plan
- Relevant guidelines or regulations of the Ganaraska Region Conservation Authority (GRCA).

c) Confirm and document consistency with the "no negative impact" test under Section 4.1.5 of the PPS, ensuring that proposed compensation will not result in negative impacts on the natural features or their ecological functions.

d) Determine the direct and indirect effects on natural heritage features/areas such as, but not restricted to woodlands, wetlands, large wildlife habitat, fish habitat, individual trees, watercourses as well as their respective vegetation protection zone and ecological buffer, where they exist.

e) Ensure compliance with all municipal environmental technical standards, including the Municipality of Port Hope's Tree Protection By-laws (or equivalent standards adopted by Council or referenced by the Planning Department),

4.4 Guideline Principles for Ecological Compensation

Objectives of Ecological Replacement and Compensation:

- Restore, replace, and, where possible, enhance the ecological structure and function of the affected Natural Heritage System (NHS), aiming for no net loss, and ideally achieving a net environmental gain.
- Implement compensation within the same sub watershed, and preferably in close proximity to the original impacted feature.
- Locate compensation projects within or adjacent to the NHS to ensure ecological connectivity is maintained or improved.
- Complete compensation projects promptly, ideally before ecological losses occur, or as soon as possible thereafter.
- Ensure transparency and accountability at every stage: planning, implementation, monitoring, and evaluation of compensation efforts.
- Integrate adaptive management and climate resiliency into compensation strategies, using evidence from scientific literature and effectiveness monitoring.

- Base all compensation work on:
    - Current knowledge of local ecosystem structure and function.
    - Applicable watershed and sub watershed studies.
    - Supporting technical studies (e.g., hydrogeological, hydrological, and geotechnical).
    - Guidance and input from the Ganaraska Region Conservation Authority.

(Toronto region conservation authority, 2023)

5. Determining appropriate measures

The success in re-establishing the converted ecological structure and functions is partially defined by nature heritage features and specifically what type of vegetation community is being restored. Certain types of vegetation community may be easily recreated within a fairly short time (e.g., the meadows), others (e.g., the young woodlands) require a longer time and still others (e.g. the treed swamps, the bogs) are quite impossible, or all but impossible, with present knowledge and methods to faithfully reproduce.

For example, the functions of some vegetation community such as cultural meadows and some marshes can be established relatively quickly (e.g., within five years) as they are dominated by perennial grasses and forbs which can reach maturity over the course of a single season and with the right soils and hydrology can support habitats for a range of species within a few years (Solymar, 2005; TRCA, 2018).The functions of other features such as woodlands take much longer to re-establish due to their long developmental periods (McLachlan and Bazely, 2003; MNRF, 2017a). As such, there can be a substantial time-lag between the removal of an established wooded feature and the time required for the compensated area to fully replace the ecological function and services provided by original feature (e.g., 5 to 20 years).

Feature compensation considerations should consider but not be limited to:

- Topography and drainage of the existing and proposed features.
- Community type (based on ELC).
- Wildlife habitat types and structures to be replicated or added as enhancements.
- Soil type, structure and quality of the existing and proposed feature composition and processes.
- Surface water contributions and hydroperiod and,
- Groundwater processes and interaction.

(London, 2021)

5.1 Woodlands

For woodland compensation, the goal is to provide as ecological function as the system provided within 10 years of implementation. *Basal area*, a commonly accepted forestry metric, is a key parameter in the Ecological Land Classification system for Southern Ontario. It serves as a standardized and practical method for assessing forest structure and can be accurately measured using readily available and simple field equipment.

Stand basal area refers to the total cross-sectional area of all trees stems in an ecosystem, measured at breast height (1.3 metres), and is expressed per unit of land area (m^2/ha). Generally, older, and more ecologically functional treed ecosystems exhibit higher basal areas. This measurement also serves as a proxy for above-ground biomass, which is linked to various ecosystem functions. As such, restoring a comparable basal area in a newly re-established treed ecosystem supports the goal of maintaining similar levels of ecological function as those provided by the original feature.

Based on the survival and growth rates of previous projects from TRCA restoration, it is typical to achieve a *basal area* of five m2/ha at the 10-year mark. Based on these growth rates Table (below) will be used to determine the compensation ratios for various *basal area* categories.

Basal area range (m^2/ha)	Average basal area (m^2/ha)	Lag time factor – Basal area of 10-year-old restoration site (m^2/ha)	Compensation Ratio (ha: ha)
0 – 5	5	5	1:1
5.1 – 10	10	5	2:1
10.1 – 15	15	5	3:1
15.1 –20	20	5	4:1
20.1 – 25+	25	5	5:1

Figure. 3 Compensation Based on the Basal area.

(Toronto region conservation authority, 2023)

5.2 Wetlands

All wetlands eligible for compensation must be identified according to provincial standards such as the Ontario Wetland Evaluation System (OWES) or Ecological Land Classification (ELC). Ecological offsetting may be considered for the loss of wetland provided that the wetland is not a bog, fen or rare vegetation community as defined by the Natural Heritage Reference Manual (MNRF, 2010).

- In general, any authorized encroachment into wetland communities must be offset at a minimum ratio of 1:2, meaning that for every unit area of wetland impacted, two units must be restored or created. This standard reflects the industry-accepted principle of net ecological gain, which aims to provide a measurable improvement to the natural system in return for the loss of an existing feature. The net gain approach accounts for the inherent complexities, risks, and time delays associated with ecological restoration and the uncertainty of replicating all functions of the original wetland in a new location. To further address this uncertainty, creating a surplus area of wetland provides a form of built-in contingency helping to ensure that, even if portions of the restored wetland underperform, the overall ecological function is still achieved. In some cases, lower replacement ratios may be considered, particularly when the impacted wetland is dominated by invasive or exotic species such as *Phragmites australis ssp. australis*. Any adjustment to the standard ratio should be determined through consultation with regulatory authorities and Indigenous communities, based on site-specific conditions and broader conservation objectives.
- In general, any permitted encroachment into naturally occurring upland vegetation communities located within 30 metres of a wetland feature shall be offset at a minimum ratio of 1:1, whereby one unit of equivalent habitat is restored or enhanced for every unit lost. This requirement recognizes the ecological significance of adjacent upland habitats in supporting wetland functions, including hydrological buffering, wildlife habitat connectivity, and protection from edge effects. In certain cases, areas classified as cultural or anthropogenically influenced settings within the 30-metre setback may also be subject to compensation requirements. The application of offsetting in these areas will be determined through site-specific review and consultation with regulatory authorities and other stakeholders, including Indigenous communities, based on the functional value of the vegetation present and its contribution to the broader ecological system.

(Nottawasaga valley Conservation authority, 2021)

5.3 Other Features

In the cases where the Municipality has given the approval, natural features in the Municipality jurisdiction which are not part of Wetlands or (Significant) Woodlands may be considered case by case to replace and compensate ecologically. The compensation will be offered at a minimum of 1:1 ratio according to land area of the land or at a larger ratio according to a tested Environmental Impact Study (EIS) in terms of ecology, sensitivity, and purpose of the feature to be removed.

Regardless of these, the conceptual replacement and compensation proposal, that best suits the guiding principles, policies, and objectives of this framework, must be submitted to the municipality at an informal stage before the formulation of comprehensive site designs or engineering plans. Through this early engagement, the consistency and transparency with the Municipality ecological planning objectives will be kept and it will be possible to design the projects into a single entity.

An Ecological Replacement and Compensation Plan (ERCP) will act as the structuring document to all the further stages such as, site preparation, construction or feature creation and post construction maintenance and monitoring. The ERCP should encompass simple performance indicators and schedules with adaptive management so that the long-term position would show ecological functioning or improved functional levels.

(London, 2021)

6. Incorporation into official plan

The policies stated below can be incorporated into Municipality of Port hope Official plan under section C 5.2.2 Policies to direct or guide the compensation.

- Council shall protect the key natural features that lies in the municipal boundaries and the oak ridges moraine area. Avoidance, minimization, and mitigation must be the first considered before applying for the ecosystem compensation approval from the council.
- The compensation shall be considered and approved on case-to-case basis based on the complexity, functionality and biomechanism of the ecosystem.
- The ecosystem should be determined based on case-to-case basis on the type of ecosystem.
    - For wooded areas, the Ecological Replacement and Compensation Plan depends upon the basal area of the impacted or demolished woodlands and the compensation strategies should be applied according to the basal area strategy provided in the ecological offsetting guideline (this document)
    - For wetlands, the PSW shall be protected from the all the developments activities. The development on the unevaluated wetlands can be considered but appropriate compensation measures should be provided for affected wetland area. (refer to the compensation guideline).
    - For Watercourses, no development should be allowed as it serves as key habitat for many species across the municipal boundary and protected by the Fisheries act.
- Ecological Replacement and Compensation Plan should be presented before the council and approved before the beginning of the construction process.
- Monitoring for the compensated site should be for at least 10 years or until equilibrium is achieved and work shall be done consistently on the improvement areas based upon the monitoring survey results to attain the success of the compensation.
- If the proponent wishes to provide a cash in lieu value to the municipality or the Port Hope or the Conservation authority to compensate for the development, detailed Ecological Replacement and Compensation Plan should be shared by the municipality or Conservation authority with the developer to maintain transparency between all the parties.

7. Implementation

It is important to outline a clear implementation plan for each feature to be compensated for to maximize the likelihood of replacement or enhancement of ecological structure, function, and services within the Municipality of Port Hope NHS.

7.1 Site selection

Appropriate site selection for ecological replacement and compensation will increase the likelihood of achieving no net loss or, where possible, a net environmental benefit (or net positive effect), specifically when considering landscape-scale conservation goals and improving ecological system connectivity (Koh et al., 2014).

(London, 2021)

- The Municipality of Port Hope may identify potential naturalization and restoration sites through future ecological assessments or planning studies. These areas should be prioritized for restoration, enhancement, or expansion of the local natural heritage system (NHS).
- Not all potential sites may be pre-identified or mapped. Proponents must consult with the Municipality of Port Hope when proposing ecological compensation locations outside of recognized features.
- Site suitability must be evaluated in consultation with qualified professionals, such as:

    - Ecologists
    - Hydrogeologists
    - Environmental engineers

- All proposed compensation sites must be assessed based on ecological function, connectivity, and landscape context.
- Successful ecological restoration is typically achieved when projects are designed to match the prevailing biophysical site conditions, including:

    - Local climate and microclimate
    - Slope and topography.
    - Surface and subsurface drainage/hydrology
    - Soil composition and stability

7.2 Agreements

Agreements will differ from situation to situation, dependent on the compensation approach applied and on which party will undertake the implementation. Examples of agreements may be within the conditions of draft plan approval for a subdivision, a site plan agreement, or the commitments of an Environmental Assessment. Alternatively, there may be a stand-alone agreement for the Ecological Replacement and Compensation Plan signed by all the parties (proponent, landowner(s), approval authority(ies), as applicable). The parties involved in compensation decisions will ultimately determine the terms and conditions of any subsequent legal agreements. The following are factors to be considered when contemplating agreements:

- Agreements of conditional approval should cite that current costs to restore and current land values (at the time of receipt of the funds) should be used in calculating the compensation funds.
- Compensation funds transferred to a public agency must be applied to installation of the agreed upon ecosystem type, including land acquisition (when applicable), helping to ensure the funds are directed to the replacement of lost *ecosystem function*s and *services*.
- Funds (when being transferred to a public agency) should be received prior to removal of features.
- A timeline for implementation may be determined to ensure the ecosystem is replaced as soon as possible and ideally before the *impact* occurs.
- If the proponent implements compensation actions, a security should be held until the warranty's expiration. Warranty periods will vary but should be consistent with the determined monitoring period. Security amounts will also vary depending on perceived *risks* and complexity of restoration actions. Phased release of securities may be negotiated depending on the nature of the project to ensure development applicants undertake the required compensation work.
- If upon review by senior leadership at Municipality of Port Hope or GRCA, it is found that an agreement is not being followed, the proponent will be advised in writing and Municipality of Port Hope or GRCA (on behalf of Municipality) staff may cash the security and use the funds to undertake the necessary work. This ensures that the appropriate funding is available should the applicant fail to undertake or complete the agreed upon compensation.

In addition to the considerations listed above, there may be circumstances that warrant additional measures to help reduce *risk* to an acceptable level. The following provide some possible actions:

- Requiring greater financial securities to support possible mitigation measures and contingencies.
- Requiring financial securities to be held for longer periods of time to ensure establishment of newly restored ecosystems.

Increasing the size of the ecosystem required to be restored.

(Toronto region conservation authority, 2023)

7.3 Composition of project

The Proponent must present before the council a detailed Composition report for the compensation of the feature removed so that the transparency must be maintained throughout the project between all parties.

An Ecological Offsetting Project (EOP) report should include the following information:

- Description and location of feature being impacted.
- Description and location for where feature replacement is proposed.
- Cash-in-lieu calculation.
- Detailed design drawings for feature replacement and any enhancements.
- Implementation durations and project completion.
- Monitoring plan and schedule to demonstrate that features are functioning as anticipated.

8. Cash-in-Lieu

When it is not feasible to compensate on-site or off-site ecological compensation, the Municipality of Port Hope may accept cash-in-lieu payments as an alternative method to deliver equivalent ecological benefits within the municipal area.

Applicability Conditions

- On-site restoration is not feasible due to site constraints, limited space, or logistical barriers.
- Suitable compensation lands cannot be secured within a reasonable timeframe.
- Off-site locations could deliver greater ecological benefit or improve connectivity compared to the impacted site.

Requirements and Valuation

- A justification report prepared by a qualified environmental professional (e.g., ecologist or hydrologist) is required to support cash-in-lieu proposals.
- Compensation amounts will be based on:
    - the area and ecological function of the lost feature.
    - estimated costs for restoration, long-term maintenance, and monitoring.
    - the value of lost ecosystem services.
- At a minimum, the compensation amount should reflect the equivalent land-area value, with higher ratios (e.g. 2:1 or 3:1) applied depending on the habitat's ecological sensitivity and function.

Fund Administration

- Collected funds will be placed in a dedicated Natural Heritage Compensation Reserve Fund.
- These funds will support projects such as:
    - ecological restoration.
    - habitat enhancement.
    - connectivity corridor development.
    - long-term stewardship and monitoring.
    - acquisition of lands to expand the NHS.

Oversight and Transparency

- The Municipality will maintain transparent accounting and annual reporting on the collection and allocation of cash-in-lieu funds.
- Reports will be publicly available and include details on funded projects and ecological outcomes achieved.

9. Environmental Monitoring

Ecological replacement and compensation monitoring is needed to determine whether compensation has achieved no net loss (of area and ecological functions) or net environmental benefit (i.e., enhancements as compared to original conditions) of the replicated feature and ecological function(s). For example, if a wetland has a core function of providing amphibian breeding habitat for at least two species, monitoring should assess amphibian breeding in the replicated / compensated feature to ensure no net loss (i.e., at least two species of amphibians still breeding), or net environmental benefit (more than two species of amphibians still breeding).

As outlined in Section 4.1 of this policy framework, Ecological compensation may be permitted in the Municipality of Port Hope where it is not possible to avoid, minimize, or mitigate potential negative impacts resulting from development or infrastructure projects. The purpose of compensation monitoring is to assess whether the ecological compensation has achieved no net loss, or preferably a net environmental gain, in relation to the natural heritage features or functions being replaced or enhanced.

Any compensation measures that are to be implemented shall be followed up and endorsed by the Municipality through a proposed compensation monitoring plan. The monitoring process

should start just after the end of the compensation activity, e.g. planting or habitat restoration, so that correct baseline information is gathered.

It is natural to assume that watched ecological compensation shall persist until restoration objectives are attained as anticipated and when the circumstances established by the Environmental Impact Study process including those granted in the Ecological Replacement and Compensation Plan are fulfilled. Mostly, a five-year monitoring period can be expected, even though it might take longer depending on the result by site, or the amount of compensation.

Termination of the monitoring activities will have to be discussed with the Municipality. Monitoring responsibilities can be transferred by way of an approved agreement that sets out the terms of such transfer in a case where it is determined that compensation lands will be transferred to the Municipality of Port Hope.

Although compensation monitoring plan details will vary on a case-by-case basis, the following are some general recommendations:

- Compensation monitoring should capture the baseline conditions and re-evaluate the efficacy of the compensation project at the 1, 3, and 5-year milestones. Should the compensation project not meet the goal of no net loss or, preferably net environmental benefit (or net positive effect) at the 5-year milestone, compensation monitoring will be required at 5-year intervals until no net loss at minimum is achieved. This timeline may span pre-, during, and post-construction as it is recommended that compensation projects be initiated as early as possible to minimize lag time of replacing natural features and their function(s).
- Survivorship thresholds expectations should be set, with a 70% success rate being recommended as a baseline.
- Monitoring data should be transferred to the Municipality of Port Hope for storage and to inform future compensation strategies (e.g., lessons learned).
- Reporting should occur at each milestone to outline the succession and survivorship within the replaced or enhanced feature to assess the project's trajectory towards no net loss or, preferably net environmental benefit (or net positive effect). Where projects are not functioning as designed and approved (e.g. expected outcomes not observed, low survivorship of plantings), as defined through the Ecological Replacement and Compensation Plan, and with consideration for the most up-to-date research, interventions and modifications to the project will be required to ensure that the project achieves, at minimum, no net loss and,

The Municipality of Port hope will provide direction on the success of the implementation of the EIS recommendations resulting in one of three outcomes; 1) do nothing, 2) remedial works identified, or, 3) policy changes identified.

(London, 2021)

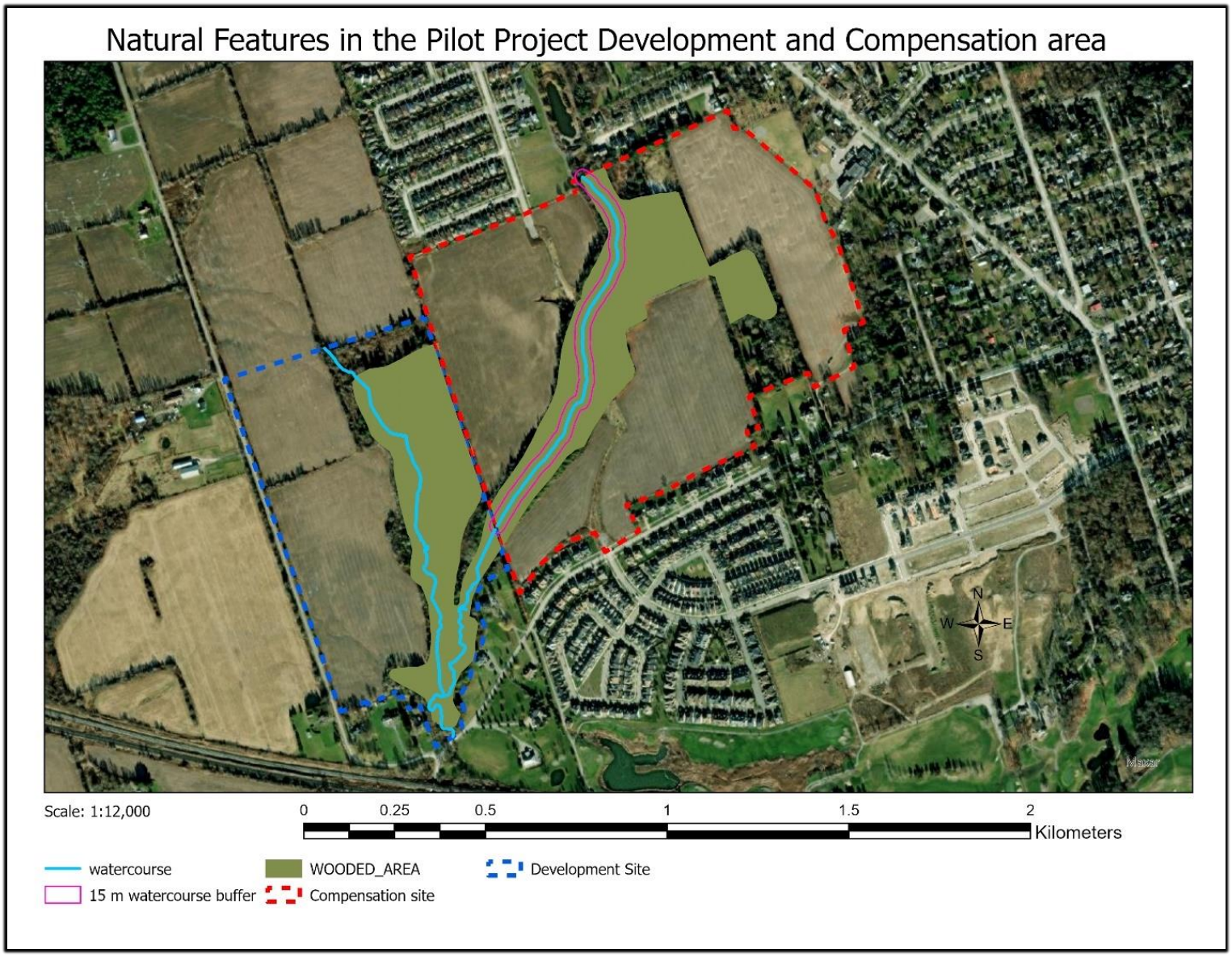
10. Pilot project

10.1 Development Site:

Lot 10 and Lot 11, Concession 1, Municipality of Port Hope is the project location. The location is close to the urban boundary with an easy access to the Lakeshore Road to the south. It is flanked by residential acquisition to the north and the south. The area consists of approximately 10.71 ha forested area and a stream that flows to the northeastern boundary running upstream moving from the southwest to the northeast side of the site. The proposed development of the site is a residential subdivision in the site selected area of development.

10.2 Compensation site

The compensation area, following the principles of ecological compensation is to be the Lot 12, Concession 1, Hope, which is located directly on the west of the area of development. The chosen location already hosts a forest, and two brooks, rendering it an ecologically comparable location to the place that will be impacted. Such similarity will increase the pace of the ecological balance and make it easier to restore the functions that are lost.



Map 4: Development in the Pilot project.

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT COMMENTS
1058493	SPECIES	Upland Sandpiper	Bartramia longicauda	S2B			17QJ1569
1058493	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPEC	RESTRICTED SPEC	RESTRICTED SPEC	17QJ1569
1058493	SPECIES	Red-headed Woodpecker	Melanerpes erythrocephalus	S3	END	END	17QJ1569
1058493	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17QJ1569
1058493	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17QJ1569
1058483	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPEC	RESTRICTED SPEC	RESTRICTED SPEC	17QJ1469
1058483	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17QJ1469
1058483	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17QJ1469
1058584	SPECIES	Upland Sandpiper	Bartramia longicauda	S2B			17QJ1570
1058584	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPEC	RESTRICTED SPEC	RESTRICTED SPEC	17QJ1570
1058584	SPECIES	Red-headed Woodpecker	Melanerpes erythrocephalus	S3	END	END	17QJ1570
1058584	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17QJ1570
1058584	SPECIES	Wood Thrush	Hylocichla mustelina	S4B	SC	THR	17QJ1570
1058584	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17QJ1570
1058574	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPEC	RESTRICTED SPEC	RESTRICTED SPEC	17QJ1470
1058574	SPECIES	Eastern Meadowlark	Sturnella magna	S4B,S3N	THR	THR	17QJ1470
1058574	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	17QJ1470

Image 1: COSEWIC SAR species obtained from NHIC: make a map.

10.3 Scope of Compensation Project

This compensation scheme deals with the destruction of woodland on proposed development in Lot 11 as indicated in the accompanying site map. To ensure ecological integrity and river degradation, a 15-metre of vegetative buffer will be developed along the watercourse. The compensation process will be accomplished via planting of native trees so that there will be avoidance of destruction of ecological functions in net-terms with the objectivity of unattainable net-gain in case of environmental benefits. The developer should put in place and observe the compensation measures. A thorough compensation scheme is supposed to be handed over to the municipal council to be reviewed and approved.

10.4 Expected Outcomes:

- Restoration of woodland habitat and hydrological function like the impacted site
- Stabilization of riparian zones through buffer planting
- Long-term improvement in habitat connectivity and ecological resilience

10.5 Processes

- The compensation and monitoring plan begins with design for compensation and the approval from the municipality.
- The 15 m buffer is marked as vegetation protection zone, and no development is to be done in this area.

- As stated in the proposed policy above in section 6, for woodlands, a basal area for the woodlands should be measured and the compensation ratio should be defined according to the section 5.1.
- After the compensation ratio is determined, the next step is site selection and should be near the demolished area. The most suitable location identified is Lot 12 concession 1 Hope which provides similar function as observed through aerial imagery.
- As the compensation is completed, the developer (if compensation is done by developer) or municipality or Conservation authority should setup a Monitoring plan for next 10 years or until equilibrium is achieved.

10.6 Project success

This part talks about the project success that is If the planted woodlands have achieved equilibrium and successful in providing similar ecological function as the development site. The surveyors must be contacted, and a report should be sent to Municipality to inform bout the project success.

11. Summary and conclusions

The report highlights the need for an Ecosystem compensation policy in the region of Port hope and delivers a policy framework that shall guide the developers to compensate for the natural features lost due to the development process. The growing urbanization puts a lot of stress on the enhancement and conservation of the natural heritage features, and no method of compensation is provided in the Official Plan of Municipality of Port Hope. The report first outlines the Policy conformity of this report and proposed policies that aligns with the Planning act, the Provincial Planning Statement and the Official plan of both upper and lower tier municipality that is Municipality of Northumberland and Municipality of Port Hope. The framework also talks about the background and the location of study area (Port Hope). The background highlights the natural heritage features around the municipal area and Oak Ridges moraine Conservation area followed by the definition and importance of Ecological compensation and why its is needed in the Port Hope municipal area. The Policy report then brings up the Mitigation Hierarchy scale that states before compensation avoidance, minimization and mitigation shall be adopted to minimize the impact of development and the compensation is often considered as the last resort. This framework use various techniques from different ecological reports like the Woodland compensation strategy is picked up from the Toronto region Conservation authority and the wetlands strategy has been developed with the help of compensation guidelines from Nottawasaga Conservation authority and the Credit Valley conservation authority. The Framework also highlights the need to incorporate these policies into the Official Plan of Municipality of Port Hope and policies have been developed and highlighted in this document. The approval authority and the council will review those policies and may integrate it into the official plan. The repost also talks about the transparency between the proponent, the Ganaraska

Region Conservation authority and the Municipal body will be valuable in achieving the compensation success. Agreements, Ecological Replacement and Compensation Plan and Site plans will be presented before the council and rational decision must be completed to achieve sustainable growth. The policy also picks up the Environmental monitoring plan to enhance the biodiversity and ensure the equilibrium of the compensation project that must provide similar functions as the original site.

Another section that demonstrates the policy context of the policies proposed by applying the policies to a Natural feature to understand the capabilities and implementation of the policies. The pilot project happens near the urban settlement and consists of woodlands and a watercourse that extends from SW corner of the development site to NE of the site. The applied policies states that the developer need to measure the basal area of the woodlands and the appropriate area is given to compensate based on the basal area.

The Document also talk about the strategies and the professional help got to develop this Policy framework and the risk and assumption related to developing the framework.

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Other Sources Used:

1. Ontario GeoHub for wetland, woodland, and Hydrology layers
2. ArcGIS Pro
3. NHIC: Make a map.