Restoration Plan

PURPOSE:

This document provides guidance for the completion of a Restoration Plan, which may be required for the submission of an application under the *Planning Act*. All Restoration Plans shall follow the requirements referenced in this document.

A Restoration Plan provides information required for a Planning Application where the City may request the preparation of a Restoration Plan whenever new development or site alteration is proposed that would result in disturbance to natural areas or vegetation removal, or that is associated with existing habitat degradation in natural areas. A restoration plan may also be required for the Vegetation Protection Zone surrounding the Natural Heritage System, or in association with the establishment or enhancement of Linkages.

Development, as defined in the City's Official Plans, means "the creation of a new lot, change in land use, or the construction of buildings or structures, requiring approval under the *Planning Act*." This includes:

- Official Plan Amendments;
- Zoning By-law Amendments;
- Draft Plans of Subdivision;
- Site Plan Control;
- Consents to Sever;
- Minor Variances; and,
- Niagara Escarpment Plan amendments or development permits.

Site alteration means "activities, such as grading, excavation, and the placement of fill that would change the landform and natural vegetative characteristics of a site".

If the subject property is being assessed via an Environmental Impact Statement or similar site-specific natural heritage evaluation, then some of the components of the Restoration Plan (e.g., site characterization) may be incorporated into that study.

Restoration is the human intervention in the recovery of an ecosystem to recreate, initiate, or accelerate the recovery after disturbance. A Restoration Plan is a strategy for enhancing ecological features and/or functions to a pre-determined target condition. Restoration Plans can be developed in response to an immediate disturbance or impact, either in situ or at an approved off-site location, or as part of larger long-term goals for the improvement of ecological systems. Restoration goals, objectives, and targets should be tailored to the problem at hand, the existing conditions of the site, and the condition or status of the adjacent lands.

This document specifically discusses Restoration Plans addressing the restoration of natural habitats and native vegetation. It does not include guidance for urban landscaping, streetscaping, or similar planting plans that are not geared towards the restoration of natural systems.

PREPARED BY:

A Restoration Plan is to be developed by a professional Landscape Architect (LA) who is a member in good standing with the Ontario Association of Landscape Architects (OALA), with input from a qualified expert (e.g., ecologist, environmental consultant, certified ecosystem restoration professional) who can provide technical knowledge regarding the desired target communities, recommended plant species, appropriate habitat enhancements, etc.

CONTENTS:

A Restoration Plan shall contain the following:

1.1 Identification of Goals, Objectives, and Targets

The first step towards preparing a successful Restoration Plan is to establish the specific goal(s) and objectives for restoration. Restoration goals describe the desired future condition of the site and are typically long-term. Restoration objectives represent the specific and measurable short-term steps that allow progress towards the overall

goal's completion. Objectives should be practical and realistic for the site and the scope of the project, and should include quantifiable, time-based targets.

For example, a Restoration Plan addressing a minor disturbance (e.g., culvert repair or replacement requiring some grading and vegetation disturbance on adjacent natural lands) may have a goal of simply returning the site to an equivalent condition as its pre-existing state once construction is complete. The objectives for the plan would include restoring pre-existing grade and soil conditions, and planting or seeding native vegetation in keeping with the quantities and species that were on site prior to construction.

For more complex projects, such as a streambank restoration project in a degraded urban system, the overall restoration goal may be to re-establish a stable stream channel within a natural valley setting that matches historical conditions or the conditions described for an approved reference site. The objectives associated with that goal could include the removal of hard structures (e.g., gabion baskets, dykes), regrading to provide particular slope or sinuosity characteristics, creation of specified habitat features (e.g., standing snags, coarse woody debris), planting of native vegetation in specified quantities, and removing non-native invasive species below a certain threshold.

The City of Hamilton has developed Natural Heritage System (NHS) goals in its Official Plans (OPs) which include a goal to "restore and enhance connections, quality and amount of natural habitat" (C.2.1.5). The OPs further state that "it is a City objective to expand and reinforce the existing natural heritage system in the long term by encouraging and undertaking ecological restoration towards locally established targets" (F.3.4.4.5 of the Urban OP and F.3.4.1.4 of the Rural OP), with City-wide habitat restoration targets being provided in Table F.3.4.1 of the Urban Hamilton Official Plan and F.2 of the Rural Hamilton Official Plan (**Table 1**). The applicant should bear in mind the NHS goals and policies of the City while navigating the Restoration Plan process.

Table 1: City of Hamilton's Natural Cover Targets (Table F.3.4.1 of the Urban Hamilton Official Plan)

Natural Cover Type	Existing Percentage Cover	City-Wide Target Percentage
Forest Cover	17.7%	30%
Interior Forest Cover (100 m inside from the edge)	4.2%	10%
Interior Forest Cover (200 m inside from edge)	1.4%	5%
Riparian Vegetation greater than 30 m wide	34.7%	75% of stream length should be naturally vegetated.
Wetland Cover	8.3%	10%

Table 2: City of Hamilton's Habitat Restoration Targets of the Rural Hamilton Official Plan (Table F.2 of the Rural Hamilton Official Plan)

(Natural Cover Type	Existing Percentage Cover	City-Wide Target Percentage
Forest Cover	17.7%	30%
Interior Forest Cover (100 m inside from the edge)	4.2%	10%
Interior Forest Cover (200 m inside from edge)	1.4%	5%
Riparian Vegetation greater than 30 m wide	34.7%	75% of stream length should be naturally vegetated.
Wetland Cover	8.3%	10%

The four Conservation Authorities (CAs) that have jurisdiction over areas within the City (Conservation Halton, Grand River Conservation Authority, Hamilton Region Conservation Authority, and Niagara Peninsula Conservation Authority) may also have

specific objectives and requirements for the contents or presentation of a Restoration Plan. For projects where the proposed works include site grading in regulated areas, alteration of shorelines or watercourses, or interference with a wetland, it may be required to obtain approval and a permit from the CA prior to beginning work.

1.2 Site Characterization

It is important for the applicant to understand the existing conditions of the project site, to make informed decisions for the selection of species, techniques to be used, required site preparation, and any requirements for remediation. Understanding baseline conditions prior to identifying a target condition (e.g., one or more vegetation communities that are a desired endpoint following restoration) is important to guide the creation of a successful Restoration Plan.

Characterization of the site's existing vegetation and biophysical conditions may be carried out as part of the completion of an Environmental Impact Statement or similar study, or independently, and may make use of existing background information (though field confirmation is recommended to ensure that the most accurate and up-to-date information is used). For heavily disturbed sites (i.e., sites affected by extensive vegetation removal, regrading, erosion, etc., where the current condition is not representative of the natural, historic condition), it may be necessary to utilize only historical information and/or to select a reference site from a nearby area with similar biophysical conditions (e.g., topography, moisture regime, weather conditions, soil texture) to set the target endpoint for restoration.

Site characterization should include a description of existing conditions and constraints within the area to be restored. Specific to restoration, the characterization should consider factors including (but not necessarily limited to) the following:

- Existing vegetation communities within and directly adjacent to the restoration area – allows an understanding of the plant species and vegetation community types that occur naturally on the site and may therefore be well-suited for the site's biophysical conditions; for heavily degraded sites, a reference site from

another similar location[1] may be required. The City's Environmental Impact Statement (EIS) Guideline (2015) include accepted methodologies for ecological surveys. Reference should also be made to the Natural Areas Inventory Project 3rd Edition (2014) Species Checklist;

- Presence and location of significant species, including Species at Risk (SAR) - identifies specimens or locations that should be protected from disturbance during construction, and/or identifies species which may be a priority to include in planting plans or habitat creation strategies. The City's guidelines for EIS and Species Habitat Assessment include accepted methodologies for ecological surveys; and,
- Presence and location of features which may require special consideration in the Restoration Plan, e.g.:
    - Seeps - wet pockets that will require a different species list than the surrounding area and may require additional erosion protection;
    - Erosion-prone areas - may require stabilization prior to or as part of planting;
    - Scour or ice-prone areas adjacent to watercourses - may not support the establishment of woody vegetation;
    - Steep slopes - may require more aggressive erosion controls until vegetation is established;
    - Thin, poor, or compacted soils - may require amendments prior to planting;
    - Invasive species - requires short- and/or long-term management to promote success of planted native species; and/or,
    - Evidence of excessive animal activity such beaver or deer browse - may require more aggressive protection measures for planted trees and shrubs.

[1] Reference sites are typically established based on proximity (i.e., geographically close so as to have similar climate conditions), similar biophysical conditions (e.g., soil texture, slope, moisture regime, sun exposure), similar vegetation communities or dominant plant species (if known), and a lack of or lower level of disturbance. The reference site would act as a template upon which the target condition for the restoration site would be modelled.

Information on the above may be acquired from an Environmental Impact Statement or other technical studies (e.g., slope stability, fluvial geomorphic assessment) completed for the site, where these are required.

Understanding the conditions and limitations of the site in advance will assist in developing a more successful plan and limit the amount of replanting or amendment needed later on. The proponent of the Restoration Plan must demonstrate that they have investigated their project site and understand and have addressed the conditions and limitations accordingly.

1.3 Site Design and Construction Considerations

1.3.1 Target Community and Species Selection

The identification of a target community or target condition for the project site, post-restoration, is to be guided by the overall restoration goal(s) and the site characterization, as described above. Once those factors are established, the applicant may begin designing the Restoration Plan around the desired end state.

Ecological Land Classification (ELC; Lee et al., 1998) is the system by which vegetation communities are typically characterized in southern Ontario. The ELC manual provides an accounting of vegetation communities that are naturally occurring in Ontario (complete with notes on dominant and associate species, canopy cover, appropriate moisture regime, etc.) and may be a valuable resource for the development of a target community for restoration, particularly for sites that are heavily disturbed or degraded and cannot be guided by the pre-construction condition. The target community should be consistent with or complimentary to communities found within the adjacent lands and/or subwatershed, and with the site's biophysical conditions such as topography and hydrology.

Species selected for restoration of natural areas shall be native, non-invasive, and suited to the specific site conditions of the planting location (including soil texture, pH, and organic matter content). Native plant species are adapted to the local site conditions, have evolved along with local wildlife, and most of the time offer much

higher benefits for wildlife habitat and food sources. Planting material (saplings and seeds) should be from a local seed source (i.e., hardiness zone 6a and Seed Zone 37). Similarly, the inclusion of Species at Risk (SAR) or other significant (e.g., locally/regionally rare) plant species in a Restoration Plan may be of value for species preservation, particularly on projects geared entirely towards natural restoration and the preservation of land or completed as compensation for SAR impacts elsewhere. But these should only be considered in consultation with the appropriate agencies and would best occur in locations that will not be subject to ongoing or recurring disturbance or stress, to maximize the success of the plantings.

Plant species selection emphasizing wildlife habitat enhancement may include general measures for wildlife food and shelter, such as providing trees and shrubs producing nuts or berries, seeding in a high proportion of native wildflowers for pollinating insects, or including some coniferous trees for winter shelter of birds and small mammals. Species-specific considerations may also apply; for example, the Tri-colored Bat (*Perimyotis subflavus*) is generally thought to prefer large oaks and maples for the establishment of its maternity roosts, so projects seeking to support this species might emphasize the selection of those tree species. Creation of varied microtopography along with brush piles, hibernacula, perching trees, and other artificial habitat structures may be considered based on project goals.

Species selection must adhere to the 10-20-30 rule; which states that no one species should account for more than 10% of all plantings, no one genus should account for 20% of all plantings, and no one family should account for 30% of all plantings. This rule should be applied separately for shrubs and trees. There must be a minimum of five species per targeted plant type (e.g., tree, shrub, forb, graminoid, aquatic, etc.) with at least one submergent or floating plant and one emergent species if applicable aquatic systems are included in the plan.

Herbaceous seed mixes including proposed percentages for each species in the mix should be provided as part of the plan documentation. A cover crop or nurse crop for erosion protection and weed suppression should be applied in conjunction with the perennial mix; application rates and should follow the guidance of agencies and/or

suppliers as appropriate. The proponent shall ensure that only native varieties of selected species are included, with no cultivars or horticultural varieties as these may be less vigorous over time than the native varieties.

1.3.2 Soil Condition

Soils remediation may be required to address deficiencies (e.g., compaction, nutrient depletion, erosion or stripping of topsoil) or contamination. Anthropogenic disturbance can cause dramatic changes to the soil structure and nutrient availability. Soils may be highly compacted or alkaline if transitioning from hardscaping or urban land use. Presence of certain species with allelopathic effects such as European Buckthorn (*Rhamnus cathartica*) and Black Walnut (*Juglans nigra*) can also alter the soil chemistry. Soils may also be lacking in organic materials. Disturbed areas should have a minimum of 20 cm of topsoil with approximately 5-15% organic matter applied prior to planting.

1.3.3 Restoration Techniques

The specifics of a Restoration Plan should include techniques and materials to assist with the establishment of native vegetation, the control of undesirable plants (i.e., “weeds”), and the integration of the restored area into the surrounding natural environment. Ultimately, each Restoration Plan will be highly site-specific in response to the individual goals/objectives and site conditions for the project. The proponent of a Restoration Plan should, however, demonstrate that they have considered the inclusion of the following:

- Successional planting - nodal or banded plantings where shrubs and trees are planted in clumps to mimic natural community structure. Clumps should have the largest woody specimens in the centre with shrubs and smaller caliper trees extending out with strips of open meadow between. This planting method promotes the development of microclimates and niche habitats, therefore, encouraging greater species diversity;
- Bioengineering - hardscaping techniques (e.g., armor stone, rip-rap) may be unavoidable for small or highly restricted sites, but where possible the use of

such techniques should be limited in favour of bioengineering (e.g., fascines, live staking, brush mattresses) for slope or bank protection;

Invasive species controls - particularly where populations of invasive plants are known to occur on or adjacent to the site, measures for the elimination or management of those species should be incorporated into the Restoration Plan; long-term management or monitoring requirements may also be appropriate to incorporate, as may clean equipment protocols to ensure that invasive species are not spread off-site. The Ontario Invasive Plant Council has produced Best Management Practices and other resources to address invasive species, available on their website;

Erosion controls - Erosion and Sediment Control Plans are standard requirements for most projects; an emphasis on enhanced erosion protection may be appropriate for Restoration Plans, particularly in association with seed application on slopes or bottomlands where erosive forces may remove the applied seed before it establishes;

Habitat creation - constructed features or structures such as bird or bat boxes, basking logs and pull-outs, rock piles, brush piles, reptile hibernacula, standing deadwood, etc., may be included in keeping with the specific goals for the Restoration Plan;

Varied topography - a site that has been uniformly graded will support less species diversity and microhabitat development than one that is more variable; and,

Natural channel design - channel reconstruction that emulates the natural form of a watercourse so that it balances the natural processes such as erosion and deposition and provides a variety of habitats tailored to the species known to occur. Refer to Ontario’s Stream Rehabilitation Manual for more details.

1.3.4 Implementation

The implementation component of a Restoration Plan defines all of the activities necessary to execute the site design to effectively achieve the predetermined goals,

objectives, and targets. This step addresses practical details such as staging, phasing, maintenance, costing, etc.

Restoration timelines will depend on the reason for restoration or overarching goal. Projects where in-situ restoration is to occur following a disturbance event (e.g., remediation of a construction staging area), restoration will be completed once that event has concluded. When restoration is completed as a method of ecological compensation or offsetting, restoration efforts must be initiated prior to activities that will cause the proposed triggering impacts. Phasing of construction must also account for sensitive wildlife windows such as in-water work timing windows, Species at Risk (SAR) bat maternity roosting windows, and migratory birds nesting windows. Additional timing windows may apply depending on the sensitivities present. Construction sequencing should consider vegetation removal, in-stream works (if applicable), wildlife rescue plans, seasonal timing of landscaping and bioengineering, stockpiling operations, etc.

Planting timing must be considered and is dependent on plant size and type. The following rules must be followed:

- Trees and shrubs:
    - Bare root - Planting can occur no earlier than April and no later than November. No bare root planting shall occur in the driest months (July and August). Ideally to occur in April or May;
    - Container and ball and burlap - Planting can occur no earlier than April and no later than November. Ideally to occur in April, May, September, October, or November;
    - Seeds - Planting to occur in October and November; and,
    - Bioengineering – Planting can only occur in April, October, and November.
- Ground cover:
    - Nurse crops - Planting can occur no earlier than April and no later than November. Ideally to occur in April, May, September, or October. Ideally to occur in April, May, September, or October; and,

    - Dormant native seed (cold stratified for spring) - Planting can occur no earlier than March and no later than November. Ideally to occur between March and May or between September and November.
- Aquatic plants:
    - Plugs - Planting can occur no between May and June and September to November. Ideally to occur mid-May to late-June; and,
    - Shoots - Planting can occur no between April and June. Ideally to occur mid-April to mid-June.

Design details are to be provided for items including (but not necessarily limited to) the location of staging areas and access routes, location of grading activities, tree removals, tree protection zones and fencing details (See City of Hamilton's Tree Protection Guidelines 2010), erosion and sediment control requirements, boundary of disturbance and areas that are to be retained in their natural condition, drainage patterns (i.e., swales, run-off areas, ponds, streams, wetlands, planting details including plant supply information, and design specifications for any artificial structure including artificial habitats. Written verification is required that the plant materials supplied reflect the native species listed on the approved landscape plans; verification by a qualified botanist will ensure that all materials (including live stake material) are the listed species, and that seed mix content has been reviewed and approved prior to application. Revegetation should occur within seven days but no later than 14 days of completion of final grading either with the permanent plantings of temporary cover or nurse crop. Detailed design is also subject to the specific requirements stated by the applicable Conservation Authority.

1.4 Monitoring

A monitoring plan must be undertaken at the cost of the applicant and shall include appropriate tasks both during and post-construction. As part of this plan, the proponent may consider establishing a photographic record at set vantage points to allow for direct comparison of conditions over time. The intention of the monitoring plan is to determine the success of the project at meeting the stated restoration goals by confirming the achievement of objectives and targets and evaluating the endurance of restored

features and functions over time. The proponent should therefore develop a monitoring plan that is suited to the scope and complexity of the proposed project and addresses the specific project goals by using appropriate methodology (e.g., plots, presence/absence, abundance counts) over an appropriate timeline. Similar to the overall monitoring plan's goals, objectives, and targets, the monitoring component should provide defined goals and measurable targets for monitoring in keeping with the overall project goal.

1.5 Documentation

Required documentation for a Restoration Plan includes a planting plan drawing prepared by a Landscape Architect which provides locations, quantities, and details of planting on the site, plus supporting documentation which provides:

A description of project goals and objectives;

- The results of the site characterization investigations;
- The identification of the target condition and an explanation of the factors or rationale that were used to select that target condition;
- Discussion of any required permits;
- Implementation considerations to be followed, such as timing, phasing, etc.; and,
- Monitoring plan details.

One digital (PDF) copy of the Restoration Plan drawings and supporting documents should be submitted to the city as part of a complete application. For sites where an Environmental Impact Statement (EIS) is also being prepared, the supporting documentation can be included as part of the EIS report and need not be duplicated.

PROCEDURE

The process outlined below is designed to allow for timely and efficient review of development applications.

a) Identification of Study Need;
b) As outlined within Schedule H (Rural Hamilton Official Plan) and Schedule I (Urban Hamilton Official Plan), a Restoration Plan may be required;

c) Preparation of the Restoration Plan;
d) The completion of the Restoration Plan and preparation of the associated documentation should follow the procedures detailed in this guideline document;
e) Submission and Review of the Restoration Plan;
f) One digital (PDF) copy of the Restoration Plan drawing and supporting documentation should be submitted to the City as part of a complete application. For sites where an Environmental Impact Statement or other project documentation (e.g., design report) is also being prepared, the supporting documentation can be included as part of those documents;
g) The City's Natural Heritage Planning staff will be responsible for reviewing the Restoration Plan. There may be occasions where the City's Environmentally Significant Areas Impact Evaluation Group (ESAIEG) is also asked to review the Restoration Plan, particularly when it is submitted as part of a larger or more complex application;
h) Implementation and Monitoring; and,
i) The Restoration Plan will provide guidance to the applicant on how to design the development site layout to maintain or enhance the ecological functions of the Natural Heritage System. The development plan must then be updated to incorporate these recommendations.

REVIEWED AND APPROVED BY:

Natural Heritage, Planning and Economic Development Department

The Conservation Authority with regulatory authority over the subject lands, namely:

- Hamilton Conservation Authority
- Conservation Halton
- Niagara Peninsula Conservation Authority
- Grand River Conservation Authority

CONTACT:

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*Please note that the Ministry of Environment, Conservation and Parks is considering consolidating Ontario's 36 Conservation Authorities, creating nine Regional Conservation Authorities (RCAs), targeted to occur in early 2027. The RCAs which will cover Hamilton include the Western Lake Ontario RCA and the Eastern Lake Erie RCA. It is anticipated that CA contact information will change at this time.