

Document 5 Environmental Implications and Recommended Mitigation Measures

1.1 Corridor Drainage and Stormwater Management Approach

A detailed corridor drainage and stormwater management plan shall be developed during the detailed design phase of the project. A high-level analysis during the EA process was conducted to confirm right-of-way (ROW) requirements. During the detailed design stage, opportunities for employing Low Impact Design (LID) and Best Management Practices (BMP) of the day for stormwater management will be utilized. The objectives would be to manage stormwater within the ROW infrastructure as much as possible. Potential low impact design measures to consider may include:

- enhanced bioswales
- open-bottom pipes; and/or
- bioswales.

Depending on the measures used and their effectiveness given the localized subsurface conditions, the need for and size of the proposed stormwater management facility can be confirmed at detailed design.

All future stormwater management systems should provide an 'enhanced' level of stormwater quality protection as defined by the MECP in the *Stormwater Management Planning and Design Manual (2003)* or current BMP's depending on the time lapse to implementation. A more detailed understanding of the soil conditions and groundwater table, to be undertaken at detailed design, will assist in informing this approach.

The Phase 1 (Albion to Bank) urban cross-section will include typical urban stormwater design including storm sewers and catch basins. Stormwater will be directed to existing Albion Road and Bank Street stormwater facilities. A dry pond will also be provided near the low spot within the corridor to attenuate runoff from the roadway and will include an oil/grit separator and treatment train approach prior to discharge. A dry pond is required in this area as it is located within the Ottawa Airport's secondary bird hazard zone. Stormwater facilities in this area are recommended to not retain water and be landscaped so as to deter birds and waterfowl. The drainage can be designed in collaboration with the detailed designs for the widening of Bank Street in this area. Phase I will also include a drainage solution for the recommended Kelly Farm Drive extension.

The extension of Kelly Farm Drive from the current Urban Area boundary to the extension of Earl Armstrong Road is proposed as an urban cross-section roadway within a 26m right-of-way. The right-of-way is more or less at a high point in the existing east-west drainage pattern, thus providing some flexibility in whether the drainage will be conveyed to the west (towards the stormwater facility proposed for Earl Armstrong Road) or east (towards Bank Street). The Recommended Plan assumes that drainage of this road can be accommodated through a combination of means. Choices include some combination of:

- Conveyance toward the Earl Armstrong Road drainage system;
- Conveyance northerly toward the drainage system of the subdivision along the north side of the Urban Area boundary;

- Drainage easements across abutting Rural Area lands; and/or
- Integrating the drainage into an overall drainage scheme for an expanded urban area (should that be the case in the future).

The corresponding drainage solution will be confirmed at either the detailed design stage of the extension of Kelly Farm Drive, or at the detailed design stage of a possible future urban area expansion, whichever comes first.

The Phase 2 (Bank to Hawthorne) rural cross-section consists of asphalt travel lanes, partially paved shoulder, gravel rounding, vegetated gently-sloping fore slope, vegetated drainage channel, and vegetated back slope, with stormwater primarily managed within the right-of-way and discharging to watercourses after in-corridor treatment. Of note, this cross-section has wide, flat-bottom rural ditches which can be designed to accommodate the volumes of flows that could be anticipated from the project. The end of ditch treatment will include a pond located on a triangular parcel of land west of Findlay Creek to provide additional quality control prior to discharge for a portion of the corridor. Based on topography, outlet to Bank Street and Hawthorne Road stormwater facilities will likely also be necessary. Rock check dams are also recommended within the vegetated channels to provide quantity and quality control.

Also of note, the study team is aware that Lot 22, Concession 5 currently receives overland drainage from the licensed quarry to the south, as per the approved Environmental Compliance Approval issued February 13, 2017. This drainage flows northerly towards Findlay Creek. The Recommended Plan takes this into account and its detailed design will include measures to capture and direct that flow under Earl Armstrong Road, if it is still required.

1.2 Corridor Landscaping Approach

Within the Recommended Plan, integration with the landscape and surrounding natural environment will be a key design consideration. Key characteristics of the recommended landscape strategy include:

- Plantings adjacent to natural areas are to include non-invasive species that are native to Ottawa and will emulate natural characteristics;
- Tree plantings within the boulevard area in urban sections; and
- Locating plantings in groupings at intersections and within Roundabout intersection designs to act as gateway and scenic features.

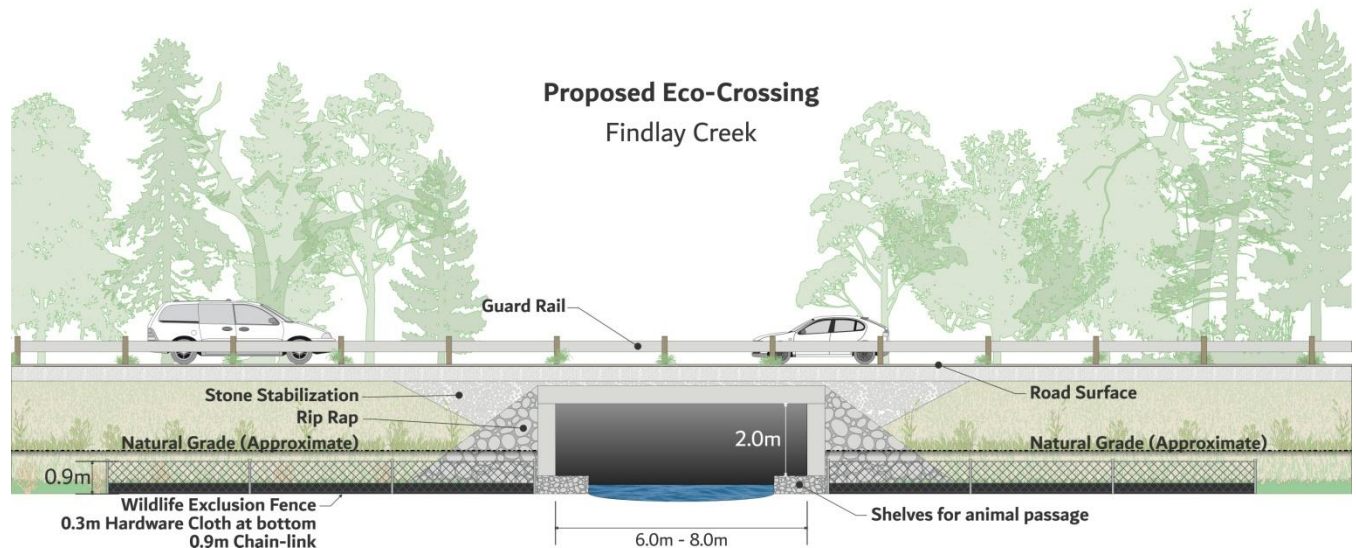
The special treatment in the vicinity of the Leitrim Provincially Significant Wetland (PSW) will need careful consideration to ensure plantings are consistent with the existing native wetland plants characteristic of the PSW and in consultation with South Nation Conservation Authority.

A *Forest Edge Management Plan* as described in section 1.8.9.1 will also assist in the development of a landscaping approach specific to the surrounding context.

1.3 Eco-Crossings Approach

Eco-crossings are recommended as part of the project at watercourses that cross the corridor. Considering the context of the Earl Armstrong Road Extension within the rural area, adjacency to the natural heritage system, Leitrim PSW and Significant Woodlands, three eco-crossings are proposed. This includes a crossing at Findlay Creek that will enable the flow of water and passage of terrestrial animals and aquatic species. A concept plan for the crossing at Findlay Creek is illustrated in Figure 1-1.

Figure 1-1 Concept Plan for Findlay Creek Eco-Crossing



Two other potential eco-crossing locations have been identified in the vicinity of the Provincially Significant Wetland (PSW) at the west end of the road extension: one as an aquatic species eco-crossing in the form of a culvert which will also provide hydrologic connection of the existing tributary where the roadway will cross; another further east where another tributary crosses the roadway. The purpose of this eco-crossing is to maintain and enhance the connectivity between the linkage features and the PSW (City of Ottawa Official Plan Schedule L, OPA 150, under appeal).

Eco-crossings can reduce the number of wildlife-vehicle interactions and enable wildlife to access habitat that may otherwise be inaccessible. Exclusion fencing is an important component to help guide terrestrial wildlife movements to the eco-crossings and have been included in the Recommended Plan.

During the next phases of the project, the detailed design and exact location of eco-crossings should be confirmed and based on BMPs at the time. The City may also investigate the opportunity to conduct wildlife mortality surveys within the Study Area to inform future designs. The City should also consider lessons learned from other City projects where eco-crossings have been constructed and target animals are similar such as the Kanata South Link and Terry Fox Drive Extension projects.

The location of eco-crossings will be studied at the detailed design stage. It is possible that additional eco-crossings may be recommended at that time, and/or that the recommended locations may change, based on new information that may be available and having regard for funding and approval requirements and limitations.

1.4 Description of Project Activities

1.4.1 Preconstruction Phase

A key requirement of the pre-construction phase will be the acquisition by the City of the required right-of-way within the project limits. The City will employ its established process of contacting landowners and working with them towards acquisition, using the real property policies and procedures that are available to the City.

This phase includes the completion of preliminary and detailed engineering and landscape designs and preparation of contract drawings and specifications. The phase also involves obtaining all necessary permits as well as approvals from regulatory agencies. Issues to be confirmed during the design phase include:

- Confirming existing conditions through detailed survey;
- Confirmation of roadway geometry and accessibility design standards and features;
- Determination of intersection designs;
- Stormwater management design;
- Landscape materials and tree planting details;
- Confirming locations and design(s) of eco-crossings;
- Location/width of multi-use pathway;
- Street lighting design, frequency and location;
- Traffic plant design;
- Bus stop amenities;
- Strategy for management of impacted materials (if applicable);
- Obtaining approvals for construction access and working areas;
- Identification of all existing utilities in the area and preparing utility reconstruction/relocations;
- Detailed construction staging and phasing plans;
- Coordination with other projects in the vicinity of the corridor; and
- Development of all mitigation plans and strategies.

1.4.2 Construction Phase

This phase involves all activities related to construction. Physical construction activities for the road cross-section and intersections will include:

- Clearing and grubbing of trees or any vegetation within the grading limits for construction of the project;
- Stripping of topsoil within the grading limits;

- Excavation of road surface;
- Management of impacted materials (if applicable);
- Removal of existing asphalt, re-use where possible, and disposing at an approved facility;
- Preparing road bed including cutting and filling (potentially salvaging existing granular for re-use);
- Installation of storm catch basins and storm sewers as well as ditch drainage and other stormwater management features;
- Installing eco-crossings and exclusion fencing;
- Pouring concrete curbs;
- Laying granular and application of hot mix asphalt;
- Installing lighting and traffic signals; and
- Installing landscaping features.

1.4.3 Operational Phase

This phase begins with the first day of corridor operation and covers the general operational activities such as maintenance and monitoring, on an as-required basis. Once construction is complete, monitoring of the project, as it will be completed in phases, will be initiated as part of the normal City practice of operating a road. In addition, warranty reviews (such as landscape health) will be completed.

Corridor maintenance activities in accordance with current City standards will include:

- Spring sweeping of the roads and pathways;
- Ditch cleanouts;
- Snow and ice removal in winter;
- Landscaping maintenance including grass cutting, tree pruning (optimally in Fall or Winter); and
- Replacement of any landscape materials.

1.5 Project Phasing and Prioritization

The extension of Earl Armstrong Road is identified in the TMP for implementation post 2031. The project is not part of the City's affordable network. Notwithstanding, there may be opportunities to build sections of the project in two different phases. Potential priority sections can be described as follows:

Priority 1: Recommended for construction first given the more critical travel demand based on growth in the Leitrim community:

- Albion Road to Bank Street including the roundabout connection at Bank Street.

Priority 2: Based on future demand and area's growth and development needs:

- Bank Street to Hawthorne Road.

Although these potential phasing priorities are offered by this study, the actual priorities will be determined by the City as part of its ongoing TMP updates and infrastructure planning practices.

1.6 Project Staging

The Recommended Plan identifies a new road with tie-in to existing north-south major roads. Staging will not be as critical for this reason however, any efforts that can be made to limit disruption to the existing road network should be considered.

1.7 Built-in Mitigation Measures

For this project, “built-in mitigation” is defined as actions and design features incorporated in the pre-construction, construction, and operational phases, which have the specific objective of lessening the significance or severity of environmental effects which may be caused by the project. They include standard construction practices and BMPs.

The extension of Earl Armstrong Road will be designed and implemented with the benefit of contemporary planning, engineering, and environmental management practices. Regard shall be had for the legislation, policies, regulations, guidelines, and best practices of the day. Where possible, mitigation measures will be prescribed in the construction contracts and specifications. Examples of practices that should be employed, based on current standards, are described below. These measures can be considered “built into” the preferred design for the roadway. They will be updated and refined during the pre-construction, construction, and operation phases of the project, as early as possible.

1.7.1 Erosion and Sediment Control Plan

A detailed plan will be prepared by the Contractor to manage and mitigate the flow of sediment into storm sewers and watercourses resulting from project construction including excavation. The plan will be based on BMPs.

1.7.2 Environmental Protection Plan

It will be the responsibility of the contractor to ensure that no contamination, waste or other substances which may be detrimental to aquatic life or water quality, will enter a watercourse as either a direct or indirect result of construction. In this regard, any floating debris resulting from construction which accumulates on watercourse banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any work which will cause or be the cause of discharge to watercourses is to be prohibited. At all times, construction activities are to be controlled in a manner that will prevent entry of deleterious materials to watercourses. In particular, construction material, excess material, construction debris and empty containers are to be stored away from watercourses and the banks of watercourses.

Construction areas should be demarcated and avoid encroachment of the PSW and the adjacent 50m protected area (buffer). Any required staging areas should avoid sensitive areas such as the PSW, or significant woodlands to the extent possible and located as far away as possible.

1.7.3 Air Quality, Noise and Vibration

Varied construction activities along the extension of Earl Armstrong Road are expected to create isolated and short-term noise, air quality and vibration impacts on the environment. The construction manager will be required to develop a strategy for mitigating the effects according to BMPs intended to satisfy, as feasible, the fugitive dust limits specified in O.Reg. 419, the noise limits specified in MOE NPC-115 and NPC-118 and City of Ottawa By-laws for Noise; and MOE NPC -119 and NPC-207 for ground vibrations or the regulating standards of the time. A list of common mitigation strategies adapted to the current project includes, but is not limited to, the following:

Air emissions BMPs:

- Monitor wind conditions, and plan operations to take advantage of calm wind periods;
- Minimize site storage of granular material in height and extent;
- Locate storage piles in sheltered areas that can be covered;
- Provide movable wind breaks;
- Use water spray and suppression techniques to control fugitive dust; and
- Cover haul trucks and keep access routes to the construction site clean of debris.

Noise and vibration BMPs:

- Limit speeds of heavy vehicles within and approaching the site;
- Provide compacted smooth surfaces, avoiding abrupt steps and ditches;
- Install movable noise barriers or temporary enclosures, around blast sites for instance;
- Keep equipment properly maintained and functioning as intended by the manufacturer; and
- If required, implement a blast design program prepared by a blast design engineer.

1.7.4 Emergency Response Plan

The preparation of an Emergency Response Plan to be used by the contractor is included to allow full emergency service access at all times during the construction period, such that there is a method to access all residential, commercial and other land uses in the event of an emergency. Additionally, the Emergency Response Plan should include provisions for providing temporary services to end users in the event of a construction related service outage or other service disruption.

1.7.5 Spills Response and Reporting Plan

A Spills Response and Reporting Plan will be prepared and adhered to by the contractor. Spills or discharge of pollutants or contaminants will be reported immediately to the Spills Action Centre at 1-800-268-6060. Clean up shall be initiated quickly to ensure protection of the environment.

1.7.6 Management of Contaminated Materials

Studies will be completed to confirm the potential for the project to interact with contaminated soil or groundwater, where existing conditions are not known. Where the potential has been confirmed, a plan to remediate the environment to the applicable standards will be prepared. The MECP and Construction Project Manager would be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated material or contaminated groundwater is encountered within the construction limits, these are to be removed and disposed of in accordance with all applicable Acts and Regulations. Treatment and discharge of contaminated groundwater are to also be in accordance with applicable legislation and regulations.

1.7.7 Lighting Treatment Plan

A Lighting Plan in accordance with City of Ottawa standards (City of Ottawa, 2016) will be prepared as part of the detailed design. The Lighting Plan will include lighting fixtures and illumination along the corridor.

1.7.8 Construction Waste Management Plan

During construction there will be some excess materials that will require disposal off the project site. These could include concrete rubble, asphalt, waste steel/metal structural components, earth, and road right-of-way appurtenances such as signs, lighting and utility poles. During the detailed design stage, a Construction Waste Management Plan will be developed to ensure that surplus material is recycled wherever practical and to describe the methods to be used by the Contractor for disposal of all other surplus material in accordance with provincial or local municipal practices and guidelines. MECP's guideline *Management of Excess Soil – A Guide for Best Management Practices* (MOECC, 2014) should be referenced once this management plan is being prepared.

1.7.9 Unexpected Discovery of Archaeological Resources

If during the course of construction archaeological resources are discovered, the site should be protected from further disturbance until a licensed archaeologist has completed the assessment and any necessary mitigation has been completed.

1.8 Site Specific Mitigation Measures

Once potential effects were predicted as part of this EA study, mitigation measures were identified. Often these mitigation measures were sufficient to reduce potential negative effects to an insignificant or negligible status. Mitigation included environment rehabilitation and replacement. Localized site-specific mitigation measures are summarized below for the transportation, natural and social environments.

1.8.1 Property Impact Assessment

Costs associated with acquiring property and property rights on which to build or provide construction easements for the construction of the project will need to be estimated. These will include, in addition to actual property value, the cost of right-of-way preparation, legal and appraisal services and land survey.

1.8.2 Public Communications Plan

The requirement for a Public Communications Plan stems from the need to keep the public informed about the work in progress and the end result of the construction activities. Businesses, institutions, residents and other stakeholders including emergency service vehicle providers must be aware of scheduled road closings and other disruptions to normal service ahead of time in order that their activities can be planned with minimum disruption. The Public Communications Plan will follow the standard set by the City including detail on how to communicate the information to the public, what information should be disseminated, and at what project stage the communication should take place.

1.8.3 Archaeological Assessment

Areas within and adjacent to the corridor identified as having archaeological potential will be subject to subsequent (Stage 2/3/4) Archaeological Assessment prior to construction should these lands be required to be disturbed through implementation of the Recommended Plan. As part of the Stage 2 Archaeological Assessment, a cemetery limits investigation should be planned for on lands adjacent to the cemetery to confirm the cemetery boundaries. Subsequent stages of archaeological assessment should be completed as early as possible in the detailed design phase as the results may impact design details and schedules. Indigenous communities will be involved as required based on best practices and governing municipal and provincial legislation and policies.

1.8.4 Cultural Heritage Impact Statement

Identified CHRs adjacent to or within the corridor will need to have a Cultural Heritage Impact Statement (CHIS) completed as per the City of Ottawa's Guide to Preparing CHIS', by a qualified person. During this review, the City's updated Heritage Reference List will be consulted to determine if new potential resources should be evaluated as part of additional studies during detailed design. Any new CHERs or CHIS will be provided to MTCS. Any CHR's not designated under Part IV or V of the *Ontario Heritage Act* will be evaluated following the City of Ottawa's

CHIS Guidelines. Consultation with Indigenous Communities to assist in identifying potential CHRs shall be a component of this work.

1.8.5 Construction and Traffic Management Plan

A Construction and Traffic Management Plan will be developed to manage the transportation function for all travel modes including equipment and material deliveries at various times during the construction period. The objective will be to maintain clear walking routes and to maintain as much functionality for traffic as possible. The plan will also outline the road signage program.

1.8.6 Corridor Drainage and Stormwater Management Plan

The purpose of developing and implementing stormwater management strategies is to provide adequate systems for the Recommended Plan. The purpose of the Corridor Drainage and Stormwater Management Plan is twofold; it identifies the rate and volume of anticipated stormwater runoff and the means to accommodate it, and also identifies the means of achieving Ministry guidelines for water quality of stormwater runoff.

This includes the identification, in the detailed design phase, of the overall stormwater management system requirements, methods of retention, detention and infiltration, and any control mechanisms necessary to achieve runoff quantity and quality targets, while continuing to provide the required flows to downstream areas. Drainage systems and their components are sized and designed in conjunction with the overall project, and retention or detention systems are then incorporated into the design to achieve Ministry guidelines for runoff quantity and quality control. When prepared during the detailed design phase, this plan will consider the opportunity to treat stormwater runoff within the identified right-of-way prior to further off-site (i.e., outside the right-of-way) treatment following those measures outlined in the Corridor Drainage and Stormwater Management Approach outlined in section 1.1.

Of note, this plan will also address the implications of the project being within the drainage area of the Findlay Creek Municipal Drain, and it will address overland flow associated with the licensed quarry to the south. The objective of this subsequent study will be to study the flow capability of Findlay Creek, to mitigate the risk of property flooding that might possibly be associated with the extension of Earl Armstrong Road, and to ensure that the road corridor itself is drained appropriately. That study will have regard for a concern expressed by downstream property owners that the project could possibly result in changes to the performance of the Findlay Creek Municipal Drain. The City acknowledges the request from these property owners to not be responsible for any costs associated with any required improvements to the municipal drain resulting from this road project.

1.8.7 Geotechnical Investigations

A more detailed geotechnical and hydrogeological program should be completed during detailed design to advise on groundwater and subsurface conditions and potential impacts that will need to be considered in the detailed design of the project. Subsequent investigations should consider hydrological impacts, if any, to the Provincially Significant Wetland. Additional

geotechnical studies should be completed to advise on the design for the crossing of Findlay Creek.

1.8.8 Phase II Environmental Site Assessment

A Phase I ESA was completed to assist with the evaluation of alternatives and potential impacts that will need to be further considered in the detailed design of this project. The Phase I ESA identified several areas that have some level of risk for contamination, specifically in the vicinity of Bank Street. Additional ESA work (e.g. Phase II ESA) may be required to assess the soil and groundwater quality associated with these areas and to assist in the planning and scoping of the construction phase of the project with regard to the cost and approach to the management of materials (soil and/or groundwater during construction).

1.8.9 Landscape Plan

A detailed Landscape Plan will be prepared to guide the species selection, location and planting details for all proposed plantings and other streetscape elements within the corridor. The plan will be prepared by a professional landscape architect in consultation with the South Nation Conservation (SNC) for planting in the vicinity of the PSW and adjacent to the significant woodlands. The Landscape Plan will generally be in-keeping with the Corridor Landscape Approach outlined in **Section 1.2** of this ESR.

1.8.9.1 FOREST EDGE MANAGEMENT PLAN

The Recommended Plan was selected based on the evaluation of natural, social, and economic environment criteria. Within that analysis however, it was acknowledged that portions of the recommended corridor pass through or along landscapes with identified natural values. Although the Recommended Plan has been designed to be as compact as possible, with a ROW of 37.5m, it will include the total removal of all vegetation within that ROW to enable the new infrastructure construction and tie-ins to natural grade. The valued environmental areas that are affected vary in the segments east and west of Bank Street.

West of Bank Street, the alignment passes through the adjacent lands of the Casino Wetland. The landscape is primarily a deciduous forest environment with mixed meadow areas. The Recommended Plan will result in:

- 1.67 ha of lands adjacent to the Casino PSW being displaced; and
- 0.696 km of new edge conditions.

East of Bank Street, the alignment passes through lands identified as existing or proposed Significant Woodlands. The landscape is also primarily a deciduous forest environment and includes species such as Sugar Maple (*Acer saccharum*), Green Ash (*Fraxinus pennsylvanica*), ironwood (*Ostrya virginiana*), Black Ash (*Fraxinus nigra*) and Basswood (*Tilia americana*). In this section, the Recommended Plan will result in:

- 4.82 ha of existing or proposed Significant Woodlands being displaced; and
- 2.3 km of new edge conditions, not including the sections where the southern edge of the ROW abuts lands zoned for Rural Commercial/Industrial and Mineral Aggregate land uses.

Given that the project will result in substantial lengths of new forest edges being created and the existing forest exposed, it is important to understand and assess the potential impacts and the opportunities to mitigate. Some of the direct and indirect impacts as a result of newly exposed edges include:

- soil compaction from construction equipment;
- destabilization of landforms composed of unconsolidated material;
- cutting within the ROW of the roots of trees that are located on adjacent lands;
- exposure of the retained edge vegetation to the effect of increased light, wind and sun which may result in decreased soil moisture;
- reduced establishment of shade tolerant plant species;
- reduction in the size and shape of forest interior habitats;
- overall reduction in species richness and abundance, particularly forest interior species;
- increase invasion/spread of non-native plant species;
- wildlife (including birds) exposure to edge predators;
- exposure of “edge” trees to windthrow;
- changes to hydrology; and,
- increased noise during construction and operation.

On this basis, mitigation is warranted, with the objective being to reduce the impacts associated with the construction and operation of the Recommended Plan. This can be accomplished through the completion of a *Forest Edge Management Plan* at the detailed design stage of the project. This plan can implement contemporary best practices and draw on existing reference documents including the Toronto Region Conservation Authority’s *Forest Management Plan Guidelines* (2004). As part of the *Forest Edge Management Plan*, mitigation measures will include, but not be limited to the following:

- Additional natural environment surveys to document the environmental conditions at the time of detailed design, which is planned for some time in the future (coinciding with Ecological Site Assessment);
- Grading within areas where the edge will be newly created and will be designed to meet existing grades a minimum of 3m away from the tree drip-line;
- Delineation of the “limit of site alteration” and marking in the field, using visual means so that construction teams can clearly see the limit of site alteration and not stray from it during the clearing and grubbing processes;
- Identification of a planting list of appropriate native trees, shrubs and ground flora that are appropriate to the context and that will create a fast-growing and protective buffer. Plant species used within the buffer will be in-keeping or complimentary to the remaining existing forest and be non-invasive in nature;
- Consideration of a potential salvage of unique, rare or easily transplantable wetland vegetation species in the direct road extension to contribute to areas planned for replanting;
- Installation of new edge plantings as soon as possible following the site alteration processes to both protect the exposed forest and to mitigate the spread/invasion of aggressive plant species;

- Compaction of soils on lands immediately adjacent to the newly exposed forest edge will be minimized to the extent possible. Construction activities can result in cut roots, and soil compaction due to re-grading and fill placement;
- Decompaction efforts and methodology will be site-specific. Where decompaction is required, it will extend to a minimum depth of approximately 25cm;
- Drainage patterns adjacent to newly created edges will be maintained to avoid changes in soil moisture this is especially important around wetland areas and forest communities with substrates that maintain increased moisture capacity; and
- A monitoring plan will be developed to ensure that the newly planted material survives and fulfils the intended function and to ensure that the inadvertent spread of aggressive or non-native plant species is appropriately managed.

The *Forest Edge Management Plan* will be prepared by qualified professionals as part of a multi-disciplinary team. The disciplines will include terrestrial biologists, landscape architects, arborists, and those with construction engineering experience. This plan will also address opportunities for compensation. The plan should involve and receive endorsement from SNC prior to implementation. Such opportunities may include some combination of:

- Improvement to other publicly-owned forests along the project limits or elsewhere in the municipality;
- Designation in the Official Plan of natural heritage resource lands in the vicinity with the objective of minimizing loss of forest cover; and
- Communicating the available incentives to landowners to maintain or enhance forest values on private lands.

It is important to note that this mitigation can only be planned and designed at the time of the detailed design of the Recommended Plan. This is because the detailed grading analyses would need to be completed, and an up-to-date inventory of forest edge conditions would be necessary. It is also important to note that the landscape mitigation would be completed on lands adjacent to the proposed right-of-way and would require the consent of the landowner. If, at the time of planning and design, there was probability that the forest edge lands in question would be subject to a land development proposal and associated removal of the forest landscape, the City would re-evaluate the need for a *Forest Edge Management Plan* in that location.

1.8.10 Ecological Site Assessment

Various potential Natural Heritage Features were identified in the general study area under present day conditions. An Ecological Site Assessment should be carried out to more thoroughly determine the presence and extent of natural heritage features including: Significant Wildlife Habitat, Species At Risk (SAR), and habitat suitable for SAR located along the preferred corridor during detailed design and prior to construction to confirm habitats and species presence. Protection afforded to any identified species shall be in accordance with appropriate provincial and federal jurisdiction.

The Ontario *Endangered Species Act* (ESA, 2007) is updated periodically to add newly listed species or revise species status. Prior to construction, the ESA, 2007 should be reviewed and an update of the potential species present and their associated habitat should be completed. A SAR determination should be included in an Ecological Site Assessment for any affected areas. If a SAR is observed during the works within the construction zone, the MECP is to be immediately contacted and operations modified to avoid any negative impacts to the species or their habitat until they leave the area, or until further direction is provided by the MECP. If necessary, permits will be obtained under the ESA.

The Ecological Site Assessment will also inform or provide guidance on the location, type and size of engineered eco-crossings as well as the location of associated exclusionary fencing.

1.8.11 Tree Conservation Report

The purpose of the Tree Conservation Report is to retain as much natural vegetation as possible, including mature trees, stands of trees, and hedgerows. The Tree Conservation Report will identify and describe the vegetative cover on the site prior to construction and will provide a professional opinion as to the priority that should be given to the conservation of the treed areas that are beyond the grading limit. This report will also provide an assessment of trees identified for removal.

Together with the Landscape Plan, the Tree Conservation Report will help ensure that trees will be retained where feasible, and that new trees will be planted to contribute to the City's forest cover target and to address net tree loss of a project site. The Tree Conservation Report will be prepared in accordance with the City of Ottawa Guidelines.

1.8.12 Construction Timing Considerations

All activities related to the construction should avoid certain timing windows dependent on the wildlife that is present. Following SAR review and more in-depth surveys conducted prior to detailed design, there may be additional timing restrictions in addition to those listed below to protect sensitive species and/or habitats. Below presents an outline of timing windows that will be avoided.

1.8.12.1 BREEDING BIRDS (MIGRATORY BIRDS CONVENTION ACT)

In order to remain in compliance with the *Migratory Bird Convention Act*, 1994 and *Fish and Wildlife Conservation Act*, 1997 it is recommended that any vegetation removal that may be required take place outside of the breeding bird season for this region (April 1st to August 31st).

In most cases nest searches during the nesting season (April 1st to August 31st) are not recommended within complex habitats, as the ability to detect nests is largely low while the risk of disturbance to active nests is high. Disturbance increases the risk of nest predation and abandonment by adults. Therefore, nest searches are not recommended unless nests are known to be easy to locate without disturbing them. Nests searches may be completed during the nesting period (April 1st to August 31st) by a qualified biologist within 'simple habitats'

(Canadian Wildlife Service, 2014). Simple habitats refer to habitats that contain few likely nesting spots or a small community of migratory birds.

Examples of simple habitats include the following:

- an urban park consisting mostly of lawns with a few isolated trees;
- a vacant lot with few possible nest sites;
- a previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil, for instance); or
- a structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawks, gulls and others)” (Canadian Wildlife Service, 2014)

Similarly, nest searches can also be considered when investigating the following:

- “conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts);
- cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or
- colonial-breeding species that can often be located from a distance (such as a colony of terns or gulls)” (CWS 2014).

1.8.12.2 IN-WATER WORKS AND FISH RELOCATION (*FISHERIES ACT*)

Should there be in-water works such as that associated with culvert extensions for watercourses, confirmation of in-water construction timing windows with MNRF is necessary prior to any construction works. For potential fish relocation work, a License to Collect Fish for Scientific Purposes is required from the MNRF as well. To protect fish spawning activity, there are specific in-water works timing window restrictions. Consultation with MNRF should be continued ongoing to provide updated information on the timing restrictions at the time of design.

1.8.12.3 TURTLES

Turtles are actively nesting in June and early July and may be attracted to existing road shoulders or to construction zones with areas of exposed soils or stockpiles of fill. Caution should be taken during the active season (April 1 – October 30) of any given year by thoroughly sweeping the area before works begin to help encourage any turtles within the area to move away. Exclusion fencing will be installed to prevent turtle access to the work area where appropriate (eg., near water or wetlands). Additional consultation with the MNRF may also provide species-specific mitigation, if required.

1.8.12.4 FISHERIES SELF-ASSESSMENTS

As a result of changes to the Department of Fisheries and Oceans Canada (DFO) “Fisheries Act” in 2013, the “Fisheries Act” is now proponent based and any in-water works will require self-assessment. From the self-assessment process, the proposed in-water works are weighed against criteria set out by the DFO (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>). By

using this criterion, it can be determined if works can avoid serious harm to fish. If works cannot avoid serious harm to fish and/or works are not included in the criteria listed on the DFO's website, a "Request for Review" will be submitted to DFO. DFO will make a determination regarding serious harm to fish and will outline, if required, approval/authorizations to be obtained from the DFO. Opportunities for habitat enhancements to watercourses should be considered.