



**Draft Environmental Impact
Assessment:**

**Hollywood Road North
Extension**

Kelowna, BC

April 2026

Submitted to: City of Kelowna
Prepared by McElhanney Engineering Services Ltd.

Contact

Gina Le Bel, RP Bio., QEP
glebel@mcelhanney.com

Our file: 2125-40144-00



**Your Challenge.
Our Passion.**

Contents

1.	INTRODUCTION.....	5
1.1.	Project Context.....	5
2.	ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY	8
2.1.	Assessment Objectives.....	8
2.2.	Assessment Scope	8
2.3.	Assessment Methods.....	8
2.4.	Desktop Review	8
2.5.	Field Review.....	9
3.	PROPOSED WORKS	10
3.1.	Schedule	10
4.	EXISTING ENVIRONMENT.....	10
4.1.	Land Use.....	10
4.2.	Aquatic Resources	10
4.3.	Terrestrial Resources.....	14
4.4.	Wildlife.....	19
5.	APPLICABLE ENVIRONMENTAL LEGISLATION	31
5.1.	Municipal	31
5.2.	Provincial.....	33
5.3.	Federal	34
6.	ENVIRONMENTALLY SENSITIVE AREA DESIGNATIONS	35
7.	IMPACT ASSESSMENT.....	38
7.1.	Impacts to Aquatic Systems.....	38
7.2.	Impacts to Terrestrial Vegetation Systems	39
7.3.	Impacts to Wildlife and Wildlife Habitats	41
8.	ENVIRONMENTAL MITIGATIONS AND BEST MANAGEMENT PRACTICES	42
8.1.	Avoidance through Project Design.....	43
8.2.	Minimize through Environmental Mitigation Measures	43
8.3.	Restoration and Offsetting	44
8.4.	Construction Environmental Management Plan	46
8.5.	Timing Windows.....	46
8.6.	Vegetation and Stream Management	46
8.7.	Wildlife.....	48
8.8.	Contractual Implementation of Environmental Protections.....	54
8.9.	Erosion and Sediment Control	54
8.10.	Water Quality	54
8.11.	Material Storage and Handling	55
8.12.	Spill Management	55
8.13.	Air Quality and Dust Control	56
8.14.	Noise Management.....	56
8.15.	Environmental Monitoring and QEP Requirements	57
8.16.	Post-construction Monitoring	57
9.	CLOSURE AND PROFESSIONAL STATEMENT	58
10.	REFERENCES.....	59



Figures

Figure 1. Site Overview.....	7
Figure 2. Species and ecosystems at risk in and around the Project alignment.	18
Figure 3. Critical Habitat in and around the Project alignment.	28
Figure 4. Natural Environment Development Permit Areas along the proposed alignment.....	32
Figure 5. Environmentally Sensitive Areas	37
Figure 6. Impacts to ESAs	40
Figure 7. Nesting calendar for the A2 Nesting Zone (ECCC 2025).....	42
Figure 8. Compensation Planting Plan	45
Figure 9. Feasible locations of wildlife crossings.....	53
Figure 10. Spill Reporting Notification Chart.....	56

Tables

Table 1. Project Data Sources	9
Table 2. Follow-up Field Assessments & Surveys.....	9
Table 3. Vegetation Species within 30 m of Project footprint (LAA)*	15
Table 4. Species Observed within the project footprint.	20
Table 5. Incidental at-risk species observation.....	24
Table 6. List of at-risk wildlife species with documented occurrence within the EAA.....	25
Table 7. Habitat features for Great Basin gophersnake (Canada, 2017).	29
Table 8. Select at-risk species based on habitat requirements and nearby occurrence data.	30
Table 9. Project Area ESA Rankings	36
Table 10. Potential environmental impacts of Project components and activities including preparation, construction, operation and maintenance phases (x indicates measurable impacts).....	38
Table 11. Mitigation measures for each phase of construction.	43
Table 12. Summary of timing windows and environmental restrictions on construction	46

Appendices

Appendix A. Statement of Limitations
Appendix B. Engineer Design
Appendix C. Storm Water Management Plan
Appendix D. Ecosystem Explorer Query Results for Animals, Plants, and Ecosystems At-risk
Appendix E. Protected and Rare Plant Survey Report
Appendix F. Annually Protected Nest Survey Report
Appendix G. Bat Roost Habitat Survey Report
Appendix H. Tree Management Report
Appendix I. Snake Den Assessment
Appendix J. Wildlife Crossing Technical Memo



1. INTRODUCTION

McElhanney Engineering Services Ltd. (McElhanney) has been retained by the City of Kelowna (the City) to conduct an Environmental Impact Assessment (EIA) for the proposed extension of Hollywood Road (the Project) from Sexsmith Road to the John Hindle Drive roundabout at the University of British Columbia Okanagan (UBCO) (*Figure 1*).

This EIA is the result of the gap assessment from the Environmental Overview Assessment (EOA) (McElhanney 2025) and is intended to identify environmental constraints, environmental impacts from the proposed design, and to propose compensation measures and strategies to mitigate environmental effects. This report was prepared to be in alignment with the City's Terms of Reference (ToR) for Environmental Assessments (CoK N.D.).

1.1. PROJECT CONTEXT

The Project is located in the northern portion of the City of Kelowna, British Columbia (BC) at 4690 Highway 97 North (PID: 007-399-871) and is zoned as Agricultural Land Reserve. The City's Subdivision Development Application S24-0007 to accommodate the future BC Transit Regional Transit Operations & Maintenance (O&M) Facility was approved on October 25, 2024. The property was granted an exemption for development by the Agricultural Land Commission in 2022 (AE, 2023).

The proposed road alignment is approximately 2 km long, spanning from Sexsmith Road to John Hindle Drive. The southern half of the alignment is extensively developed, however the northern half of the alignment is generally undeveloped and natural. As a part of this Project a future transit hub is proposed to connect to the new section of Hollywood Road; considerations for this proposed hub are included in the EIA. The City Official Community Plan (OCP) identifies the future transit hub areas as an industrial zone.

The primary Project alignment is located approximately 80 m west of Carney Pond (watershed code 310-808200-37989), 300 m west of an unnamed wetland, 290 m west of Mill Creek and east of a forested area with rocky outcrops. Carney Pond, the unnamed wetland, Mill Creek and the forested area have both been identified as Environmentally Sensitive Areas (ESAs) and will require a Natural Environment Development Permit from the City.

Photos 1 through 5 show site conditions during the initial field review on November 14, 2024.



Photo 1. Conditions along existing Hollywood Road, viewing north



Photo 2. North view along the trail near the northern extent of the existing Hollywood Road



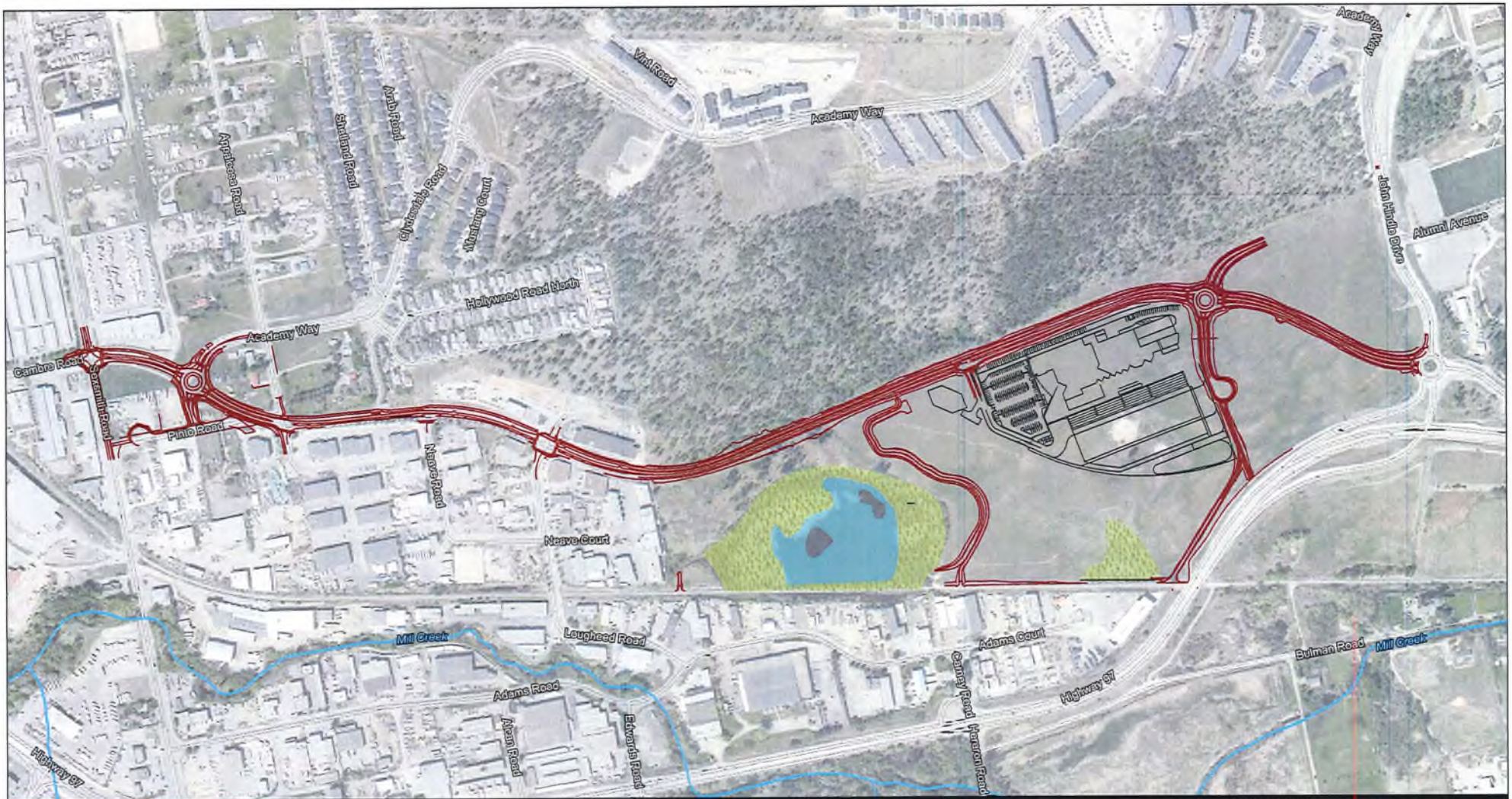
Photo 3. View north at the grass field



Photo 4. The roundabout at the north extent of the alignment



Photo 5. View north towards Carney Pond from the trail



 McElhanney		Hollywood Road Site Overview		LEGEND - Project Alignment - Future Transit Center - Stream* - Waterbody* - Wetland*	INSET MAP 
		1:5,500 0 75 150 300 Metres			
Project No. 2125-40144-00 NAD 1983 UTM Zone 11N	Figure 1 Date: 2025-04-29	Ortho Photo provided by the City of Kelowna *Data sourced from BC Data Catalogue			

2. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

2.1. ASSESSMENT OBJECTIVES

The primary objective of this assessment is to meet the requirements outlined in the following resources:

- *User's Guide for Changes In and About a Stream in British Columbia* (WLAP, 2022)
- *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (BC 2014a)
- *The City of Kelowna's Environmental Assessment Report Terms of Reference (ToR)* (CoK, N.D.)

These resources were referenced to meet the following key objectives:

1. Establish the existing environmental baseline conditions, specifically ESAs, within the boundaries of the Project in compliance with the City's Natural Environment Development Permit Areas (DPAs) and regulatory requirements;
2. Evaluate the potential for effects to baseline conditions, both qualitatively and quantitatively, based on field observations, available detailed engineering design, and most probable methods of construction;
3. Avoid effects through design considerations;
4. Identify or describe proposed compensation, mitigation measures, or Best Management Practices (BMPs) to offset potential effects to environmental baseline conditions or ESAs; and
5. Evaluate any residual effects.

The guidance documents were used to develop the methods described in the remainder of this document for evaluating overall impacts to fish and wildlife and their habitats, and ultimately how to avoid, mitigate, or offset those impacts.

2.2. ASSESSMENT SCOPE

Spatial assessment areas for this Project were characterized as follows:

- Project footprint (area of active construction)
- Local Assessment Area (LAA): areas within 30 m of the Project footprint.
- Extended Assessment Area (EAA): areas within 1 km of the Project footprint.
- Regional Assessment Area (RAA): areas within 3 km of the Project footprint of the site for broad-based reviews of biogeographical databases.

2.3. ASSESSMENT METHODS

Data was collected through desktop review of federal, provincial, and regional databases to identify any known environmentally sensitive elements in the area. A literature review was conducted, and relevant background information was assessed. To achieve the stated Project objectives, this EIA was completed in general accordance with guidance and principles provided in *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (BC, 2014a).

2.4. DESKTOP REVIEW

Data was collected through desktop review of federal, provincial and regional databases to identify documented ESAs in the area (*Table 1*).



Table 1. Project Data Sources

Source	Data	Scale of Review
BC Species & Ecosystems Explorer (BC, 2024d)	Rare and endangered species occurrences Rare and endangered plant community occurrences	RAA
iMapBC (BC, 2024a)	Sensitive Ecosystem Inventory (SEI) Polygons Rare and endangered species occurrences Rare and endangered plant community occurrences	RAA
Habitat Wizard (BC, 2024b)	Fish presence in adjacent streams Critical habitat for Species at Risk	RAA
Okanagan Habitat Atlas (CMN, 2024)	Biodiversity: Based on areas of greatest ecological and biodiversity significance, considering characteristics such as conservation rankings, wetlands, antelope brush, riparian habitat, and distance to roads Habitat Connectivity: Based on the degree to which ecosystems are linked to one another to form an interconnected network for wildlife movement, considering characteristics such as elevation, slope, terrain ruggedness, accessibility to water, urban areas, and agricultural areas	LAA
Fish Inventories Data Queries (BC, 2024c)	Fish and habitat data about a watershed or an individual lake or stream.	EAA
Great Blue Heron Atlas (CMN, 2025)	Documented and historical great blue heron nest colonies	RAA
Important Bird Areas Canada (IBA Canada, 2024)	Documented sites that support threatened birds, large groups of birds, and birds restricted by range or by habitat	EAA
EBird (eBird, 2024)	Documented hotspots, species maps, and recent sightings	RAA
InvasivesBC (BC, 2025)	Invasive plant species occurrences	EAA

2.5. FIELD REVIEW

A baseline field assessment was conducted on November 14, 2024, by a Qualified Environmental Professional (QEP), Gina Le Bel, RPBio, and Rachel Hodgson, BIT, of McElhanney. The purpose of the assessment was to collect baseline data and provide a general description of the environmental setting, with a focus on confirming and locating sensitive environmental features, including aquatic and terrestrial wildlife habitat. Additional field assessments and surveys completed by Gina Le Bel RPBio, Jill Bisaro RPBio, Nav Sandhu P.Eng., Robin Ong IS Certified Arborist, Courtney Lahue RPBio, Mike Dunn RPBio, and Caitey Gilchrist biology technician are summarized in *Table 2* and described in more detail in the following sections.

Table 2. Follow-up Field Assessments & Surveys

Assessment Type	Dates	Background	Impacts	Mitigations
Tree Inventory & Impact Assessment	November 13 to 16, 2024	Section 4.3.2 Appendix H	Section 7.2	Section 8.5.1
Snake Den Assessment	May 06 & 07, 2025	Section 4.4.3 Appendix I	Section 7.3.2	Section 8.6.2
Protected and Rare Plant Survey	June 05 & 23 2025	Sections 4.3.2 Appendix E	Section 7.2.1	Section 8.5.1
At-Risk Ecosystems Survey	June 27, 2025	Section 4.3.2	Section 7.2.2	Section 8.5.1
At-Risk Wildlife Species Survey	June 27, 2025	Sections 4.4.6, 4.4.7 & 4.4.8	Section 7.3.4	Section 8.6.4
Annually Protected Nest Survey	June 27, 2025	Section 4.4.5.1 Appendix F	Section 7.3.1	Section 8.6.1
Bat Roost Habitat Survey	July 04, 2025 August 05, 2025	Section 4.4.4 Appendix H	Section 7.3.3	Section 8.6.3.1
Water Sustainability Act Works Investigation	March 25, 2026	Section 4.3.2	Sections 7.1, 7.2	Sections 8.4, 8.5



3. PROPOSED WORKS

The City is proposing to complete upgrades and extending Hollywood Road North from Sexsmith Road to the John Hindle Drive roundabout. The most significant environmental works include the new section of road being installed to the west of Carney Pond which will connect to the future transit center. A stormwater channel is being installed on the north side of Carney Pond and will drain into Carney Pond. Similarly a stormwater outfall is also being installed on the north side of the Unnamed Wetland. A ditch from the unnamed wetland is being connected to Carney Pond to drain 1 in 100 year flows from the unnamed wetland. An overflow from Carney Pond is being installed and will drain the 1 in 100 year flows into a new stormwater outfall into Mill Creek from Loughheed Road. In addition to the new outfall, an old and broken outfall will be decommissioned upstream (north) of the new outfall. The old outfall pipe will be decommissioned and the bank repaired with native plantings. Wildlife crossings are proposed to maintain connection for herptiles and small mammals from Carney Pond (east of road alignment) to the upland forested area (west of road alignment). Compensation planting and tree replacements to compensate for environmental impacts are proposed and detailed in this report.

Works which have the greatest direct environmental impact as they relate to the roadworks themselves include clearing and grubbing of natural areas, stormwater outfalls, overflow drainages from the wetlands and works along the banks of Mill Creek. Mitigative measures include the provision of stormwater filtering devices and integrated wildlife crossings are described in further detail in later sections.

Further information on the design are included in the Issued for Tender Engineer Designs Drawings provided in *Appendix B*.

3.1. SCHEDULE

The Project will likely begin in the summer of 2026. The construction schedule should adhere to the reduced risk windows for focal species in the Okanagan Region, detailed in *Section 8*. The ideal season for restoration works including hydroseeding and replanting is in May/June, and September to November when rain is more common, and temperatures are lower.

4. EXISTING ENVIRONMENT

4.1. LAND USE

The Project is located in an urban setting, bordered by UBCO to the north, Highway 97 to the east, Sexsmith Road to the south, and a steep hillside with mature trees and rocky outcrops to the west (*Figure 1*). The Project area is a mix of land uses including residential and industrial buildings, the university, and natural areas. The natural areas have been disturbed by agricultural use and trails (*Figure 4*).

4.2. AQUATIC RESOURCES

No watercourses cross the Project alignment; however, Carney Pond (watershed code 310-808200-37989) (*Photo 6*), Mill Creek (watershed code 310-808200), and an unnamed wetland (no watershed code) north of the pond bordering the rail trail are located within the EAA and have minor works associated with them (BC, 2024a). Carney Pond is the closest to the Project footprint, and is located to the east and downslope of the footprint. Carney Pond is non-fish-bearing and although provincial mapping shows it connecting to Mill Creek, no surface water connection was observed during the site visit (BC, 2024a) (*Figure 2*).



Additionally, hydrotechnical investigations outlined in McElhanney's Stormwater Management Plan (SWMP) show only subsurface connection between Mill Creek, Carney Pond and the unnamed wetland (*Appendix C*). Mill Creek located approximately 500 m east of the Project footprint, flows southwest into Okanagan Lake (watershed code 310) and is classified as fish-bearing.

4.2.1. Site Hydrology

The diverse landscape surrounding the Project include industrial lands, undeveloped agricultural areas, and sensitive wetlands such as Carney Pond present unique challenges for stormwater management, requiring a balance between engineered conveyance systems and natural hydrologic connectivity. The SWMP provides an integrated approach to managing drainage and stormwater for the combined area, including the proposed roadway, surrounding developments, and receiving wetlands (*Appendix C*). The SWMP establishes a coordinated stormwater servicing strategy that maintains existing flow connectivity, protects downstream systems such as Carney Pond and Mill Creek, and supports future development within the watershed.

4.2.1.1. Existing Conditions

The Project RAA encompasses three distinct catchments:

- Industrial lands (south): Storm sewers discharge to Mill Creek. Infrastructure is generally adequate but undersized in some locations.
- Carney Pond catchment (central): Semi-forested and grassland areas drain westward via sheet flow and ephemeral channels. Carney Pond has no surface outlet and is ecologically sensitive.
- Northern lands: Drain toward a low point near the Rail Trail, with uncertain outlet connectivity.

While this summary provides a high-level overview of drainage conditions within the Project footprint, McElhanney also completed a standalone hydrotechnical evaluation in support of the proposed roadway. That assessment considers both existing conditions and anticipated future development at a conceptual level, and provides corresponding recommendations related to stormwater management. Key findings from the hydrotechnical analysis have been incorporated here; refer to *Appendix C* for full technical details.

4.2.2. Fish and Fish Habitat

Documented fish species in Mill Creek include brook trout (*Salvelinus fontinalis*), burbot (*Lota lota*), carp (*Cyprinus carpio*), dace (*Rhinichthys spp.*), kokanee (*Oncorhynchus nerka*), largescale sucker (*Catostomus macrocheilus*), longnose sucker (*Catostomus catostomus*), mountain whitefish (*Prosopium williamsoni*), northern pikeminnow (*Ptychocheilus oregonensis*), peamouth chub (*Mylocheilus caurinus*), prickly sculpin (*Cottus asper*), rainbow trout (*Oncorhynchus mykiss*), reidside shiner (*Richardsonius balteatus*), and various sculpins (*Cottus spp.*) and suckers (*Catostomus spp.*) (BC, 2024b).

Carney Pond is considered marsh/shallow open water wetland with a high wetland rating (Urban Systems, 1998). There are no recorded observations of fish in Carney Pond, however the potential for fish presence cannot be excluded (BC, 2024b). Further sampling would be required to determine if fish are present in Carney Pond. The unnamed and unmapped wetland is disconnected, ephemeral and is unlikely have the requisite conditions to support fish.

As Carney Pond and the unnamed wetland provide limited fish habitat or potential habitat direct impacts to fish and fish habitat are not anticipated from Project works. Works within and adjacent to Mill Creek have the potential to impact fish habitat as bank stabilization could impact habitat along the bank.





Photo 6. East overhead view of Carney Pond (29 November 2024)



Photo 7. View of unnamed wetland looking southwest from the rail trail (25 March 2026)



Photo 8. View of Existing Mill Creek outfall to be decommissioned (25 March 2026)



Photo 9. Site of new Mill Creek outfall (29 April 2026)

4.3. TERRESTRIAL RESOURCES

4.3.1. Biogeoclimatic Zone

The Project is located in the Ponderosa Pine Okanagan Very Dry Hot (PPxh1) biogeoclimatic (BEC) zone (MoF, 2024). The PP BEC zones occur in low elevations along the very dry valleys of the Southern Interior Plateau and is the driest, and in summer, warmest forested zone in British Columbia. These hot and dry summers result in moisture deficits during the growing season. The winters are cool and typically only have a light snow cover. The forests in PPxh1 BEC zone are dominated by Ponderosa pine (*Pinus ponderosa*), and forested areas are open and parklike with understory dominated by bluebunch wheatgrass (*Agropyron spicatum*). Fire and human activities have disturbed many areas of the PPxh1 subzone. In open stands the shrub layer is typically poorly developed with low cover of common snowberry (*Symphoricarpos albus*) and saskatoon (*Amelanchier alnifolia*). The herb layer typically well established but is easily dominated by invasive species.

In wetter areas within the PP BEC zone, Douglas-fir (*Pseudotsuga menziesii*) is the most common tree species in the canopy. Trembling aspen (*Populus tremuloides*) is a dominant component of the dense stands that occur on riparian or seepage sites throughout the zone, in addition to water birch (*Betula occidentalis*), black cottonwood (*Populus trichocarpa*), and paper birch (*Betula papyrifera*). Grasslands are also common in the PP BEC zone with big sagebrush (*Artemisia tridentata*), fescues (*Festuca* spp.), rabbit-brush (*Chrysothamnus nauseosus*), saskatoon (*Amelanchier alnifolia*), and arrow leaved balsamroot (*Balsamorhiza sagittata*) commonly observed (Hope *et al.*, 1991).

4.3.2. Vegetation

A variety of species were observed in and around the LAA of the Project area during the field assessments. Vegetation was documented within 30 m of the project footprint, Carney Pond, unnamed wetland and Mill Creek outfall sites. Vegetation observed during assessments in November and June of 2025 and March of 2026 are summarized in (Table 3) (Photos 9 through 11). Ponderosa pine was the dominant tree species with an understory of snowberry (*Symphoricarpos albus*), black hawthorn (*Crataegus douglasii*), tall Oregon-grape (*Mahonia aquifolium*), bluebunch wheatgrass, and saskatoon. The riparian habitat surrounding Carney Pond had Ponderosa pine and trembling aspen with an understory of snowberry, black hawthorn, and rose (*Rosa* spp.). Closer to the pond, cattails (*Typha* spp.) and sedges (*Carex* spp.) were observed. The existing outfall site of Mill Creek to be decommissioned is dominated by grasses with some presence of sparse riparian vegetation including red-osier dogwood, willow, and alder. The new proposed outfall site is dominated by roses, and snowberry, with some taller riparian vegetation including willow. The banks along Mill Creek are surrounded by industrial development and much of the area is dominated by invasive species.

Refer to *Appendix H* for a comprehensive tree inventory and *Appendix E* for a comprehensive catalogue of plant species observed at the Project site.

Table 3. Vegetation Species within 30 m of Project footprint (LAA)*

Common Names	Scientific Name	Common Names	Scientific Name
Ponderosa Pine	<i>Pinus ponderosa</i>	Common Snowberry	<i>Symphoricarpos albus</i>
Douglas Fir	<i>Pseudotsuga menziesii</i>	Tall Oregon-grape	<i>Mahonia aquifolium</i>
Spruce	<i>Picea spp.</i>	Bluebunch wheatgrass	<i>Pseudoregneria spicata</i>
Blue Spruce	<i>Picea pungens</i>	Rose	<i>Rosa spp.</i>
Black Cottonwood	<i>Populus trichocarpa</i>	Black Hawthorn	<i>Crataegus douglasii</i>
Magnolia	<i>Magnolia spp.</i>	Common Barberry	<i>Berberis vulgaris</i>
Maple	<i>Acer spp.</i>	Saskatoon	<i>Amelanchier alnifolia</i>
Bigleaf Maple	<i>Acer macrophyllum</i>	Common Strawberry	<i>Fragaria virginiana</i>
Norway Maple	<i>Acer platanoides</i>	Common Juniper	<i>Juniperus communis</i>
Western Redcedar	<i>Thuja plicata</i>	Common Mint	<i>Mentha spicata</i>
Elm	<i>Ulmus spp.</i>	Common Cattail	<i>Typha latifolia</i>
Mountain Pine	<i>Pinus mugo</i>	Bulrush	<i>Schoenoplectus spp.</i>
Common Yarrow	<i>Achillea millefolium</i>	Sedge	<i>Carex spp.</i>
Choke cherry	<i>Prunus virginiana</i>	Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>
Trembling Aspen	<i>Populus tremuloides</i>	Red-osier Dogwood	<i>Cornus sericea</i>
Alder	<i>Alnus spp.</i>	Common Rabbitbrush	<i>Ericameria nauseosa</i>

*Note: this list should not be considered exhaustive.



Photo 79. View northwest towards John Hindle Drive (14 Nov 2024).

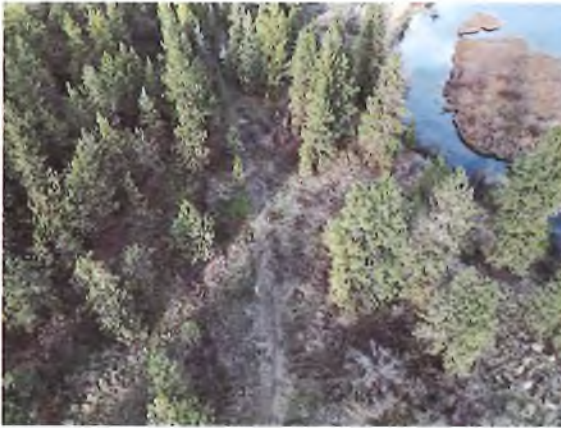


Photo 10 North overhead view of trail (29 Nov 2024).



Photo 811. West overhead view of forest (29 Nov 2024).

4.3.1. Invasive Species

The InvasivesBC application was reviewed for the presence of invasive plant species (BC, 2025). Within the EAA, the following invasive sites were recorded:

- Rush skeletonweed (*Chondrilla juncea*)
- Fuller's Teasel (*Dipsacus fullonum*)
- Heart-podded hoarycress (*Lepidium / Cardaria draba*)
- Common bugloss (*Anchusa officinalis*)
- Jewelweed / Spotted touch-me-not (*Impatiens capensis*)
- Black henbane (*Hyoscyamus niger*)

The BC Invasive Alien Plant Program (IAPP) invasive site records within the EAA, included (BC, 2025):

- Russian olive (*Elaeagnus angustifolia*)
- Rush skeletonweed (*Chondrilla juncea*)
- Common bugloss (*Anchusa officinalis*)
- Spotted knapweed (*Centaurea stoebe / biebersteinii*)
- Fuller's teasel (*Dipsacus fullonum*)
- Heart-podded hoarycress (*Lepidium / Cardaria draba*).

During the field assessments in November 2024, June of 2025 and March 2026, the following invasive species were observed within and surrounding the Project alignment: sulphur cinquefoil (*Potentilla recta*), curly dock (*Rumex crispus* L.), hoary cress (*Cardaria draba*), great mullein (*Verbascum Thapsus*), Hound's tongue (*Cynoglossum officinale*), bladder campion (*Silene vulgaris*), common burdock (*Arctium minus*), Russian knapweed (*Rhaponticum repens*), spotted knapweed (*Centaurea stoebe*), cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron cristatum*), reed canarygrass (*Phalaris arundinacea*), scotch thistle (*Onopordum acanthium*), prickly lettuce (*Lactuca serriola*), needle-and-thread grass (*Hesperostipa comata*) and common dead-nettle (*Lamium amplexicaule* L.). Schedule A of the Weed Control Regulation includes sulphur cinquefoil, spotted knapweed, common burdock and hoary cress as regionally noxious to the Okanagan, while hound's tongue is included as provincially noxious.

Refer to *Appendix E* for a comprehensive catalogue of invasive species observed at the Project site on June 05 and 23 of 2025.



4.3.2. Plant Species and Ecological Communities at Risk (BC List)

A search of the provincial CDC database resulted in the following publicly available occurrences within the EAA (BC, 2024a) (Figure 2):

- Three red-listed¹ communities
 - Black Cottonwood / Common Snowberry – Roses (*Populus trichocarpa* / *Symphoricarpos albus* - *Rosa* spp.);
 - Black cottonwood - Douglas fir / Douglas maple - common snowberry (*Populus trichocarpa* - *Pseudotsuga menziesii* / *Acer glabrum* - *Symphoricarpos albus*); and
 - Nuttall's alkaligrass - foxtail barley (*Puccinellia nuttalliana* - *Hordeum jubatum*)
- Two blue-listed² communities
 - Common Cattail Marsh (*Typha latifolia* Marsh); and
 - Hard-stemmed Bulrush Deep Marsh (*Schoenoplectus acutus* Deep Marsh).

¹ Red-listed: Native species or subspecies considered extirpated, endangered, or threatened in BC

² Blue-Listed: Native species considered vulnerable in BC





McElhanney

Project No. 2125-40144-00

Figure 2

NAD 1983 UTM Zone 11N

Date: 2026-04-28

Hollywood Road

Species and Ecosystems at Risk

1:5,500

0 75 150 300 Metres

Ortho Photo provided by the City of Kelowna
*Data sourced from BC Data Catalogue

LEGEND

- Bat Roost
- Turtle Nesting Location
- Project Alignment
- Future Transit Center
- Stream*

Species and Ecosystems at Risk*

- Black Cottonwood / Common Snowberry - Roses
- Common Cattail Marsh
- American Badger
- Hard-Stemmed Bulrush Deep Marsh
- Western Bumble Bee
- Painted Turtle - Intermountain - Rocky Mountain Population
- Ungulate Winter Range*
- Waterbody*
- Wetland*



4.3.2.1. Black Cottonwood / Common Snowberry – Roses (CDC 2010)

The Black Cottonwood / Common Snowberry – Roses ecological community is found in warm, dry climates of the central interior, on gravelly floodplains near rivers, streams, and lakes. Spring floods are infrequent and short. Black cottonwood dominates the open deciduous canopy, with a diverse shrub layer including snowberry, dogwood, rose, and younger cottonwoods. Other shrubs may include Douglas maple, saskatoon, and chokecherry (*Prunus virginiana*). The herb layer varies but often includes species like star-flowered false Solomon's seal (*Maianthemum racemosum*), and showy aster (*Eurybia spectabilis*), with Kentucky bluegrass (*Poa pratensis*) in grazed areas. This ecosystem is mapped at the north end of Carney Pond (BC, 2024a).

4.3.2.2. Black Cottonwood - Douglas Fir / Douglas Maple - Common Snowberry

The Black cottonwood - Douglas fir / Douglas maple - common snowberry ecosystem is relatively uncommon within its large range. Limited information on ideal conditions is available at the time of this report however, it is a riparian ecosystem given the presence of black cottonwood which require adequate moisture to flourish. The closest recorded occurrence is at Scotty Creek (BC, 2024a).

4.3.2.3. Nuttall's Alkaligrass - Foxtail Barley (CDC, 2009)

The Nuttall's alkaligrass - foxtail barley ecosystem experiences brief flooding in the spring, followed by drying that causes salt buildup. It is found on plateaus and valleys in the dry central and southern interior of BC, below 1200 m in elevation. It occurs in moist areas such as potholes, depressions, and around alkaline ponds. The vegetation is mainly salt-tolerant grasses, with few or no mosses. The plant cover can vary depending on annual rainfall. Grazing and soil disturbance may lead to an increase in foxtail barley and common silverweed (*Potentilla anserina*). The closest recorded occurrence is at Robert Lake 800 m northwest of the Project footprint (BC, 2024a).

4.3.2.4. Common Cattail Marsh (CDC, 2020)

The Common Cattail Marsh ecological community is found at low elevations in warmer areas of British Columbia (the Coast and the Interior). This community occurs in protected lake embankments and potholes with soils saturated for most of the growing season. The community is threatened by climate change, livestock use, and land alterations that can lead to direct losses and disrupt the hydrology of surrounding areas. This ecosystem is recorded at Carney Pond (BC, 2024a) and was observed with the presence of emergent cattail during the site assessment.

4.3.2.5. Hard-stemmed Bulrush Deep Marsh (MacKenzie and Moran, 2004).

The Hard-stemmed Bulrush Deep March ecological community is common in areas with warm, dry summers, typically found on exposed lake embankments and grassland potholes with occasional substrate exposure. Plant diversity in this ecological community is low, with bulrush being the dominant species. These marshes are usually located next to open water in wetland mosaics, with typical spring floodwaters up to 1.5 meters deep. This ecosystem is mapped at Carney Pond (BC, 2024a) and was observed during the field assessments.

4.4. WILDLIFE

The PPxh1 BEC zone provides a wide variety of habitat for wildlife. Combinations of grasslands and dry forests, with interspersed wetlands and dry shrub steppe habitat, are common. There is also an abundance of rugged cliffs with broken rock. The short and relatively snow-free winters attract many animals during the winter months, including mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*).



Flocks of passerine birds migrate from higher elevations to winter in the PP BEC zones. Amphibians and reptiles in this zone that utilize riparian and stream areas include Great Basin gophersnake (*Pituophis catenifer deserticola*), common garter snake (*Thamnophis sirtalis*), western toad (*Anaxyrus boreas*), and long-toed salamander (*Ambystoma macrodactylum*).

Biodiversity mapping shows that the Carney Pond, unnamed wetland and Mill Creek areas have 'high' to 'very high' biodiversity, while the western treed area is rated as 'low' to 'moderate,' and the agricultural field in the northeastern part of the alignment is rated as 'low' (CMN, 2024). Habitat connectivity is mapped as 'high' across most of the Project area, but residential areas to the north and south are identified as a 'connectivity barrier' for wildlife movement (CMN, 2024).

Since the Project is located in a relatively urban area with surrounding agriculture and suburbs, wildlife species capable of tolerating human disturbance are expected such as coyote (*Canis latrans*), black bear (*Ursus americanus*), northern pocket gopher (*Thomomys talpoides*), and meadow vole (*Microtus pennsylvanicus*) (Hope *et al.* 1991). The western forested area, riparian area along Carney Pond and the unnamed wetland, agricultural fields east of the alignment, and emergent vegetation in the pond provide nesting and foraging opportunities for a variety of birds. Carney Pond provides habitat for various species, including amphibians, birds, mammals, and along the banks is a historical nesting for the listed painted turtle Intermountain - Rocky Mountain Population (*Chrysemys picta* pop. 2; Photo 10). The rocky outcrops observed during the field assessment provide suitable basking, and potential overwintering, habitat for snakes and other reptiles (Photo 11, 12 & 13). Additionally, bats may potentially use rocky outcrops as roost sites. Signs of mammals observed during the field assessment includes deer scat, bear scat, bones, and burrows. The small mammal, likely rodent, burrows also provide potential refuge, or overwintering opportunities for reptiles.

Wildlife and wildlife sign identified during the field assessments in November 2024 and June and July of 2025 are summarized in Table 4. Bird species were identified auditorily and visually.

Table 4. Species Observed within the project footprint.

Type	Common Name	Scientific Name	BC List	SARA Schedule 1	Observation Type
Reptile	Great Basin Gophersnake	<i>Pituophis catenifer deserticola</i>	Blue	Threatened	Visual
Reptile	Painted Turtle Intermountain - Rocky Mountain Population	<i>Chrysemys picta</i> pop. 2	Blue	Special Concern	Visual
Reptile	Common Gartersnake	<i>Thamnophis sirtalis</i>	Yellow	-	Visual
Bird	American Goldfinch	<i>Spinus tristis</i>	Yellow	-	Auditory
Bird	American Robin	<i>Turdus migratorius</i>	Yellow	-	Auditory and visual
Bird	Black-billed Magpie	<i>Pica hudsonia</i>	Yellow	-	Auditory and visual
Bird	Black-capped Chickadee	<i>Poecile atricapillus</i>	Yellow	-	Auditory
Bird	Bullock's Oriole	<i>Icterus bullockii</i>	Yellow	-	Auditory and visual
Bird	California Quail	<i>Callipepla californica</i>	Exotic	-	Auditory and visual
Bird	Canada Goose	<i>Branta canadensis</i>	Yellow	-	Auditory and visual
Bird	Cedar Waxwing	<i>Bombycilla cedrorum</i>	Yellow	-	Auditory and visual
Bird	Common Raven	<i>Corvus corax</i>	Yellow	-	Visual
Bird	Common Yellowthroat	<i>Geothlypis trichas</i>	Yellow	-	Auditory
Bird	Dark-eyed Junco	<i>Junco hyemalis</i>	Yellow	-	Auditory



Type	Common Name	Scientific Name	BC List	SARA Schedule 1	Observation Type
Bird	Downy Woodpecker	<i>Dryobates pubescens</i>	Yellow	-	Auditory
Bird	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Exotic	-	Auditory and visual
Bird	House Finch	<i>Haemorhous mexicanus</i>	Yellow	-	Auditory and visual
Bird	House Sparrow	<i>Passer domesticus</i>	Exotic	-	
Bird	Mallard	<i>Anas platyrhynchos</i>	Yellow	-	Auditory and visual
Bird	Mourning Dove	<i>Zenaida macroura</i>	Yellow	-	Auditory and visual
Bird	Northern Flicker	<i>Colaptes auratus</i>	Yellow	-	Auditory and visual
Bird	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Yellow	-	Visual
Bird	Pygmy Nuthatch	<i>Sitta pygmaea</i>	Yellow	-	Auditory
Bird	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Yellow	-	Auditory and Visual
Bird	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Yellow	-	Auditory and visual
Bird	Spotted Towhee	<i>Pipilo maculatus</i>	Yellow	-	Auditory
Bird	Turkey Vulture	<i>Cathartes aura</i>	Yellow	-	Visual
Bird	Tree Swallow	<i>Tachycineta bicolor</i>	Yellow	-	Visual
Bird	Trumpeter Swan	<i>Cygnus buccinator</i>	Yellow	-	Auditory and visual
Bird	Violet-green Swallow	<i>Tachycineta thalassina</i>	Yellow	-	Visual
Bird	Western Kingbird	<i>Tyrannus verticalis</i>	Yellow	-	Auditory and visual
Bird	Western Wood Pewee	<i>Contopus sordidulus</i>	Yellow	-	Auditory
Bird	Wilson's Snipe	<i>Gallinago delicata</i>	Yellow	-	Visual
Bird	Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	Yellow	-	Visual
Mammal	Mule Deer	<i>Odocoileus hemionus</i>	Yellow	-	Visual





Photo 912 Painted turtle basking on logs at Carney Pond



Photo 1114. Rocky outcrop within the Project footprint.



Photo 1013. Gophersnake on the trail within the Project footprint.

4.4.1. Ungulate Winter Range

Ungulate winter range (UWR) are areas that have been identified to contain habitat necessary to meet the winter habitat requirements of an ungulate species. These features may include areas of suitable vegetation, water sources, and shelter for the animal during colder months. The Project alignment has potential to provide these necessary aspects of UWR. In addition, UWR (U-8-001) for mule deer overlaps the entire RAA (BC, 2024a) (see *Figure 2*). The Project has potential to deter mule deer from utilizing the area or could cause human wildlife conflict with deer crossing the new alignment between the western forested area and the Carney Pond area.

4.4.2. Amphibian Occurrences

The Project footprint provides potential amphibian habitat due to the presence of Carney Pond, Mill Creek, the unnamed wetland and the open forested area with downed logs. A variety of native species have potential to utilize the Project footprint and surrounding areas including long toed salamander (*Ambystoma macrodactylum*), Columbia spotted frog (*Rana lueiventris*), and western toad (*Anaxyrus boreas*). The Great Basin spadefoot (*Spea intermontana*) has not been observed in and around the Project footprint, however multiple occurrences are documented at Robert Lake (BC, 2024a) which is northwest of the Project footprint. Future dispersal of this species to Carney Pond or the unnamed wetland is possible, if this species is not already present in and around the Project alignment. No targeted surveys were completed for the great

basin spadefoot or any other amphibian and therefore, their presence cannot be discounted, despite a lack of documented occurrences. Carney Pond and the surrounding area has potential to support this species along the less steep shores where smaller temporary pools may develop.

4.4.3. Reptile Occurrences

The project footprint provides potential reptile habitat due to the presence of rocky outcrops, talus slopes, prey species, and connectivity to open grassland areas. A snake den assessment was conducted by a local snake specialist on May 06, 2025, with a follow up survey on May 07, 2025. Snakes were observed in and around the Project area, but no hibernacula were identified within 100 m of the Project alignment. Rocky outcrops within 100 m of the Project alignment were investigated as apart of the snake survey and deemed to not provide the necessary conditions for overwintering. It is likely these areas are used by snakes during their active period. More details and survey results are provided in *Appendix I*.

4.4.4. Bat Occurrences

Bats often forage near water and roost in trees and rocky outcrops; therefore, Carney Pond presents potential foraging, and the adjacent forested habitat and rocky outcrops provide opportunity for roosting. Fifteen species of bat have the potential to inhabit the Okanagan area including seven species of myotis (BC Bats, 2025). A bat tree-roost habitat survey was conducted on July 04, 2025, resulting in the identification of four potential roost sites. Follow up acoustic surveys were also completed and confirmed roosting trees within 100 m of the Project alignment. Additional details and survey results are provided in *Appendix H*.

4.4.5. Avian Occurrences

A review of eBird found Carney Pond to be a hotspot with 158 species identified by citizen scientists through eBird reporting (eBird, 2024). Reported species included raptors, owls, herons, songbirds, and waterfowl (eBird, 2024). A few examples of species observed in 2025 include downy woodpecker (*Dryobates pubescens*), red-tailed hawk (*Buteo jamaicensis*), bald eagle (*Haliaeetus leucocephalus*), great blue heron (*Ardea Herodias*), and trumpeter swan (*Cygnus buccinator*) (eBird, 2025). These species have the potential to be in and around the Project area given the Project alignment's proximity to Carney Pond.

4.4.5.1. Annually Protected Nests

The project footprint provides potential avian nesting habitat due to the presence of Carney Pond and associated riparian vegetation. Under the *Migratory Birds Convention Act, 1994 (MBCA)*, certain nests, such as great blue herons and pileated woodpeckers, are protected year-round. Additionally, Section 34(b) of the provincial *Wildlife Act* provides year-round protection for the nests of several bird species which have potential to occur within the Project footprint, including bald eagle and great blue heron. Section 34(c) protects bird nests when they are occupied by a bird or egg, this also applies to all species listed under the MBCA.

A survey for annually protected nests was conducted on June 27, 2025, with no nests being identified. Survey results are provided in *Appendix F*.

4.4.6. Incidental At-risk Wildlife Observations

Four incidental at-risk wildlife observations are documented within RAA (BC, 2024a). These include: two painted turtles Intermountain - Rocky Mountain Population (*Chrysemys picta bellii*), one at Carney Pond and the other along Highway 97; one Great Basin gophersnake; and one western yellow-bellied Racer



(*Coluber constrictor Mormon*) near the south end of the Project area, where Hollywood North Road meets the trail near the large rocky outcrops. More information on each of these species is included in *Table 5*.

Table 5. Incidental at-risk species observation.

Species	Description	Habitat Preferences	Conservation Status
Painted Turtle Intermountain - Rocky Mountain Population (<i>Chrysemys picta</i> pop. 2) (Canada, 2018b)	This species is olive green to blackish in colour with contrasting yellow stripes on the legs and neck and a bright red to faded pink/orange plastron (belly surface) with a dark mark in the middle. Red and yellow markings are also often visible along the margin of the shell (carapace). New hatchlings are approximately 3 cm in length with adults up to 25 cm. Females are often larger than males.	This species utilizes aquatic pond and wetland habitats with floating logs, emergent rocks and foreshore haul out sites. Overwintering habitat includes aquatic areas with muddy or silty bottoms for overwintering. Nesting habitat includes well-drained soils (8-14 cm deep), sparse native vegetation, and gently sloping southward to maximize solar exposure, located within 150-200 m of a water source (Canada, 2018b).	BC List: Blue Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Special Concern SARA Schedule 1: Special Concern
Great Basin gophersnake (<i>Pituophis catenifer deserticola</i>) (COSEWIC, 2013)	This species is the largest snake to BC, measuring up to 2.5 m as an adult. They are grey, cream, or yellow coloured with a white underside. Their back and sides have regularly spaced brown or black rectangular markings that become stripes on the tail. They have a bullet-shaped head with dark bands between the eyes and extending from the eye to the upper jaw margin.	This species is found within warm, dry grassland valleys in BC. They require foraging, hibernating, and egg-laying habitat that are optimally within 500 m. They forage in a variety of open habitats. They shelter in underground burrows, at the base of shrubs, or under rocks, logs or other cover objects. Females lay eggs in burrows on warm grassy slopes or in fine talus. They hibernate during winter in dens in bedrock crevices, in deep burrows, or in interstitial spaces between rocks and talus slopes.	BC List: Blue COSEWIC: Threatened SARA Schedule 1: Threatened
Western yellow- bellied racer (<i>Coluber constrictor Mormon</i>) (COSEWIC, 2015)	This species is a long, slender and incredibly speedy snake. They range in length from 50 cm to 2 m and are green, olive-green, yellowish-brown with cream to bright yellow undersides. They have a rounded snout with large eyes and round pupils.	This species is restricted to the arid south-central interior of BC. They overwinter in communal rock dens on south-facing slopes of steep river valleys or may use rodent burrows or other refuges and hibernate singly. This species forages in ponderosa pine and bunchgrass areas in riparian and valley bottom habitats. Nesting habitat includes sparsely vegetated or talus slopes, though they have also been observed nesting in abandoned rodent burrows on sandy, vegetated hills (COSEWIC 2015).	BC List: Blue COSEWIC: Threatened SARA Schedule 1: Threatened

4.4.7. Wildlife Species at Risk (BC List)

A query of the CDC Species and Ecosystems Explorer summary of at-risk animal data was completed to generate a list of rare and endangered species at risk with the potential to occur within the Project area based on biogeoclimatic zone and habitat type (BC, 2024d) (*Appendix D*). Searches resulted in the identification of one masked occurrence of an at-risk species within the RAA (BC, 2024a). On December



4, 2024, the CDC concluded that details regarding the masked occurrence were not relevant to the proposed development (per. comm. S. Mustafa, 2024). A proximity search of the provincial CDC database within the EAA resulted in the following occurrences (BC, 2024a) (Table 6):

Table 6. List of at-risk wildlife species with documented occurrence within the EAA.

Common Name	Scientific Name	Type	BC List	SARA ¹	COSEWIC ²	Distance to Project Alignment
American Badger	<i>Taxidea taxus</i>	Mammal	Red	1-E	E	200 m
Painted Turtle - Intermountain - Rocky Mountain Population	<i>Chrysemys picta</i> pop. 2	Reptile	Blue	1-SC	SC	50-300 m
Monarch	<i>Danaus plexippus</i>	Invertebrate	Red	1-E	E	50-300 m
Western Bumble Bee	<i>Bombus occidentalis</i>	Invertebrate	Yellow	1-T	T	~350 m

¹1-E – Endangered, 1-SC – Special Concern, 1-T- Threatened

²E- Endangered, SC – Special Concern, T - Threatened

Surveys for evidence of American badger (*Taxidea taxus*) presence, painted turtle nesting sites, and the monarch's (*Danaus plexippus*) food source, milkweed (*Asclepias* sp.), were completed in June 2025. Results of these surveys and descriptions of the species listed above are discussed below.

4.4.7.1. American Badger

The American badger is a small to medium sized carnivorous mammal; it is short and sturdy but long, as shown in *Image 1*. They are a solitary species with relatively large home ranges, living in burrows, largely below grassy fields, with elaborate underground tunnel networks (Nature Canada, 2019). Badgers prefer grasslands with friable soil and healthy prey populations: preferred habitat can include parkland, farms, and treeless areas. Badger burrows are holes dug in the ground usually to a depth of 3 meters and usually many burrows are present in the area where an individual is living (Animalia, 2022a).

The alignment and surrounding areas present potential badger habitat. Suitable conditions include open ponderosa pine forest and open grasslands. However, badgers typically prefer sites with greater connectivity to expansive green spaces, which are lacking within the project footprint. No evidence of badger was observed during the site visits, or badger burrow survey; however, incidental observations reported to the CDC in 1999 and 1998 have badger sited in the grass field near the Project area (eastern portion), and in the south extent of the Project area. A potential badger burrow was documented along Carney Pond in iNaturalist on 17 May 2023, approximated 50 m from the proposed project alignment.

On June 27, 2025, a survey was conducted for badger burrows and the presence of key prey species, the Columbian ground squirrel (*Urocitellus columbianus*). The survey was undertaken during a suitable time of year for detecting burrows (MoE, 2007). Small mammal burrows were observed; however, it could not be confirmed if they belonged to Columbia ground squirrel exclusively. Although evidence of badger was not observed during this survey, badgers may still move into or utilize the habitat.

4.4.7.2. Western Painted Turtle - Intermountain - Rocky Mountain Population (ECCC, 2018)

The western painted turtle is the only native turtle in BC, found in the Cariboo, Thompson-Okanagan, and Kootenays. The Intermountain-Rocky Mountain Population is restricted to lower elevations and valley bottoms in southeastern BC. Adults range in length from 10 to 25 cm and have a green to blackish body



with yellow stripes on its legs and neck, and a bright red belly (*Image 2*). The painted turtle is slow to mature, has low reproductive rates, and faces high egg and hatchling mortality. It depends on both aquatic habitat for foraging and mating, and terrestrial habitat for nesting and migration. Major threats to western painted turtle populations include road mortality as adults travel to nesting sites, and habitat loss/fragmentation.

Carney Pond, the unnamed wetland and surrounding area provide ideal conditions for painted turtle. In addition to the CDC occurrence polygon (BC, 2024a), turtle nesting sites were identified along the banks of Carney Pond (AE 2023). This species is confirmed present adjacent to the alignment and may cross the Project alignment.

On June 27, 2025, a survey for western painted turtle nesting activity was conducted with a focus on the sandy slopes close to Carney Pond where historic occurrences of nests were identified. Diggable soils as well as small burrows were observed in this area, which have the potential for turtle nesting sites. The survey in 2025 did not confirm the presence of nests but confirmed the presence of suitable nesting conditions for turtles.

4.4.7.3. Monarch (COSEWIC, 2010)

The monarch butterfly, characterized by its orange and black wings with a span of 93–105 mm (*Image 3*), is widely distributed across Canada, having been recorded in every province and the Northwest Territories. In BC, the western population is confined to southern regions, with breeding sites in the Okanagan Valley and along the Fraser River Valley. Monarchs rely on diverse habitats, including overwintering areas along the California coast, breeding sites on native milkweeds, and nectaring and staging areas in parks and ecological reserves. Their survival is threatened by forest degradation in overwintering locations and the extensive use of herbicides and pesticides in agriculture. Showy milkweed (*Asclepias speciosa*) is the only milkweed species native to BC and occurs in the dry areas of the southern interior. It is mapped within the Carney Pond area (BC, 2024a), along with a monarch butterfly observation (iNaturalist, 2024). Given the proximity to potential breeding habitat, monarch butterflies may be present in the Project area.

On June 05 and 24 of 2025, a protected and rare plant survey was conducted. Observations for showy milkweed were recorded throughout the Project area during the survey indicating suitable habitat to support monarchs. Survey results are provided in *Appendix E*.

4.4.7.4. Western Bumble Bee (COSEWIC, 2014)

The western bumble bee is a medium sized (1 to 2 cm) bumble bee with a short head and yellow hair in front of the wings (*Image 4*). They are distributed throughout most of western North America. The *subspecies occidentalis* occurs in western Canada from southern BC through southern Alberta and Saskatchewan. They live in a diverse range of habitats, including mixed woodlands, farmlands, urban areas, montane meadows, and prairie grasslands. They require habitat with abundant floral resources, suitable nesting sites, and protected overwintering sites. They typically nest underground in abandoned rodent burrows or within hollows in decaying wood. There is a recorded observation of this species south of the University of British Columbia-Okanagan (west of highway 97) and east of Highway 97/north of McCurdy Road (BC, 2024a). Targeted surveys for this species were not conducted for this EIA.





Image 1. American Badger (Source: Nature Canada, 2019)



Image 2. Painted Turtle (Source: ECCC, 2018)



Image 3. Monarch (Source: iNaturalist, 2024b)



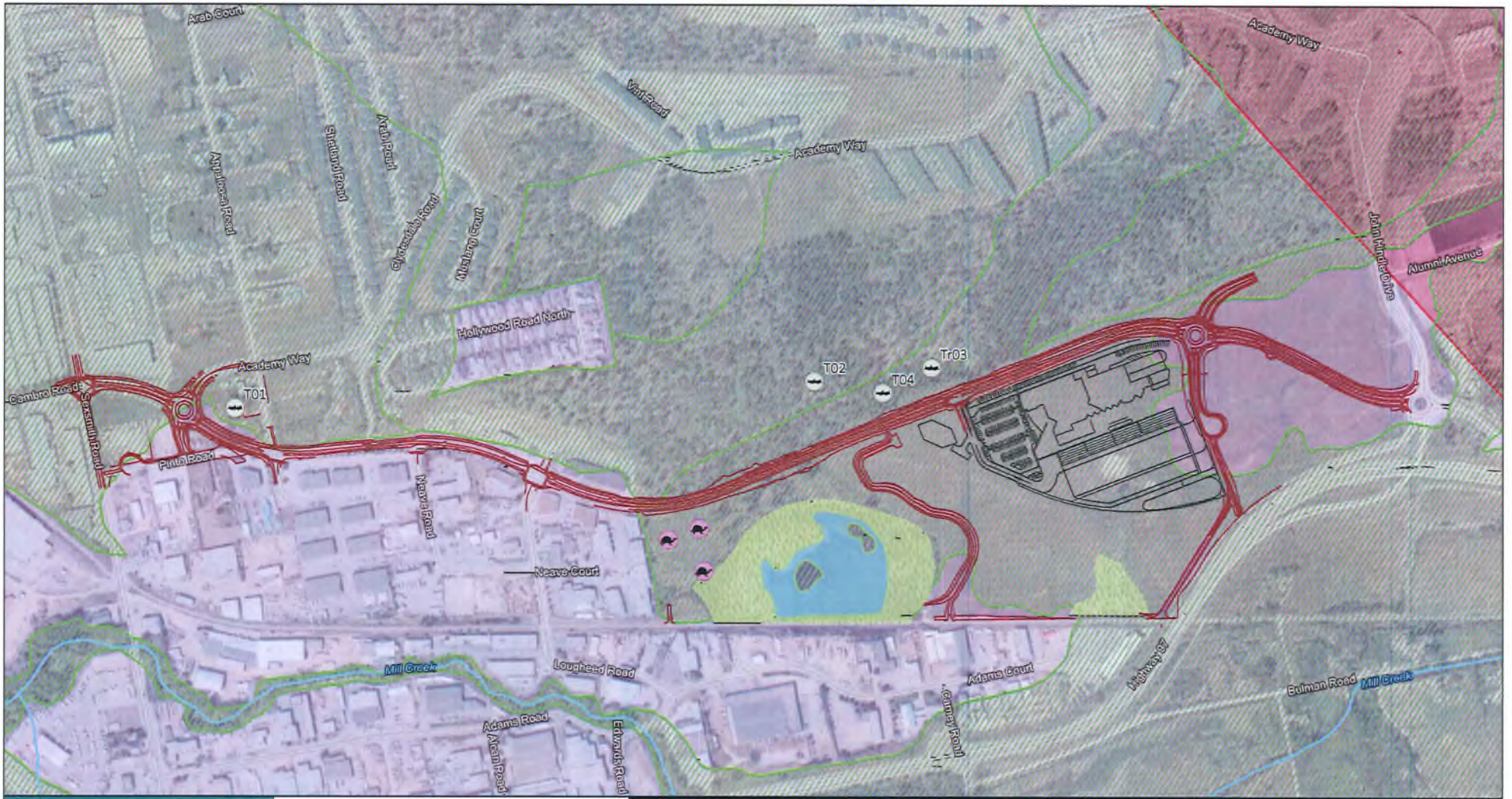
Image 4. Western Bumble Bee (Source: COSEWIC, 2014)

4.4.8. Critical Habitat for Federal Species at Risk

The federal government identifies species that are extirpated, endangered, threatened, or of special concern in Canada (COSEWIC, 2011). These species and their Critical Habitat are protected under the *Species at Risk Act* (Canada, 2002).

The Project area was evaluated for Critical Habitat for listed species at risk (BC, 2024a). Critical habitat for three species was identified within the EAA (BC, 2024a; *Figure 3*):

- American badger (described in *Section 4.4.7.1*)
- Great Basin spadefoot
- Great Basin gophersnake



		Hollywood Road Critical Habitat for Federally-Listed Species at Risk		LEGEND		INSET MAP			
Project No. 2125-40144-00 NAD 1983 UTM Zone 11N		Figure 3 Date: 2026-04-28		1:5,500 0 75 150 300 Metres North Arrow Ortho Photo provided by the City of Kelowna *Data sourced from BC Data Catalogue		 Bat Roost  Turtle Nesting Location  Project Alignment  Future Transit Center  Stream* Critical Habitat for Federally-Listed Species at Risk*  Great Basin Gophersnake  American Badger jeffersonii subspecies  Great Basin Spadefoot  Waterbody*  Wetland*			

4.4.8.1. Great Basin Spadefoot (COSEWIC, 2019)

The Great Basin spadefoot is found in the arid southern interior of BC, where it inhabits semi-arid grasslands, shrub-steppe, and open woodlands. Spadefoot toad eggs and tadpoles are found in aquatic habitats before they transition to terrestrial juveniles and adults. Breeding occurs in temporary waterbodies, and the species requires terrestrial habitat with loose, friable soils for refuge from freezing and drought. Adults are small to medium-sized and have squat bodies and short legs (*Image 5*). Threats to Great Basin spadefoot toad populations include road mortality, pollution of breeding sites, and wetland loss.

The spadefoot toad has not been observed or recorded in and immediately adjacent to the Project alignment; however, multiple occurrences are documented at Robert Lake which is northwest of the Project footprint. Future dispersal of this species to Carney Pond or the unnamed wetland is possible, if this species is not already present in and around the Project alignment. This species is nocturnal and utilizes burrows making identification much more challenging. Spadefoot may be present but have not been identified to date. Carney Pond and the surrounding area has potential to support this species along the less steep shores where smaller temporary pools may develop.

4.4.8.2. Great Basin Gophersnake (COSEWIC, 2013)

As an adult, the Great Basin gophersnake measures up to 2.4 m in length, is grey, cream, or yellowish with a white underside, and has a dark band between its eyes, as shown in *Image 6* (COSEWIC, 2013). They require foraging, hibernating, and egg-laying habitats within close proximity (optimally within 500 m) to complete their life cycle. Biophysical attributes that make up Critical Habitat for these snakes is summarized in *Table 7*.

Based on the habitat preferences of gophersnake, it is possible that the site may be used for overwintering due to the absence of rocky outcrops and foraging due to availability of prey and retreat structures within the Project alignment. One gophersnake was observed during the field assessments.

Table 7. Habitat features for Great Basin gophersnake (Canada, 2017).

Life Stage	Function	Biophysical features	Attributes	Time of year used
All life stages	Overwintering (denning/hibernation)	Cliff, talus, rock outcrop, or earth covered rock outcrop	Rock with cracks or fissures that provides access below frost line	September through March
All life stages	Overwintering (denning/hibernation)	Grassland or open shrub-steppe	Soils deep enough for earthen dens or rodent burrows	October through March
All life stages	Foraging, mating, shedding, refuge, basking	Grassland, shrub-steppe, rock outcrop, cliff, talus	Availability of retreat structures: rock outcrops, rock piles, large rocks, talus, bluffs, shrubs, grass and forbs, live and dead trees. Availability of principal prey items such as small mammals, birds, other snakes, lizards and their eggs	March through October
Adults	Egg-laying	Grassland or open shrub-steppe	Presence of rodent burrows, talus slopes, rock fissures, and/ or decaying wood	June to September



Image 5. Great Basin spadefoot (COSEWIC, 2019)



Image 6. Great Basin gopher snake (Source: COSEWIC, 2013)

4.4.9. Potential Occurrence for At-risk Species

The full list of publicly available occurrences of wildlife at risk based on their association with PPxh1 and the Northern Okanagan Basin is attached in *Appendix D* (BC, 2024d). A select list of at-risk species with Moderate to High potential for occurrence along the Project alignment are presented in *Table 8*. Species were selected based on nearby occurrence data and their potential use of available habitat.

Probability of occurrence within the footprint was ranked based on the following criteria:

- **High Probability:** species record within the project footprint and suitable habitat is present within the EAA.
- **Moderate-High:** no species record within the project footprint, but suitable habitat is present within the EAA.
- **Moderate-Low:** species record within the project footprint, but suitable habitat is not present within the EAA.
- **Low:** no species record within the project footprint and no suitable habitat is present within the EAA.

Table 8. Select at-risk species based on habitat requirements and nearby occurrence data.

English Name	Scientific Name	Type	BC List	SARA ¹	COSEWIC ²	Occurrence Probability
Monarch	<i>Danaus plexippus</i>	Invertebrate	Red	1-E	E	High
Painted Turtle - Intermountain - Rocky Mountain Population	<i>Chrysemys picta pop. 2</i>	Reptile	Blue	1-SC	SC	High
American Badger	<i>Taxidea taxus</i>	Mammal	Red	1-E	E	High
Great Basin Gophersnake	<i>Pituophis catenifer deserticola</i>	Reptile	Blue	1-T	T	High
Western Yellow-bellied Racer	<i>Coluber constrictor Mormon</i>	Reptile	Blue	1-T	T	High
Western Rattlesnake	<i>Crotalus oreganus</i>	Reptile	Blue	1-T	T	Moderate-High
Desert Nightsnake	<i>Hypsiglena chlorophaea</i>	Reptile	Red	1-E	E	Moderate-Low
Western Skink	<i>Plestiodon skiltonianus</i>	Reptile	Blue	1- SC	SC	Moderate-High
Great Basin Spadefoot	<i>Spea intermontana</i>	Amphibian	Blue	1-T	T	Moderate

English Name	Scientific Name	Type	BC List	SARA ¹	COSEWIC ²	Occurrence Probability
Western Bumble Bee	<i>Bombus occidentalis</i>	Invertebrate	Yellow	1-T	T	High
Fringed Myotis	<i>Myotis thysanodes</i>	Mammal	Blue	N/A	DD	Moderate-High
Hoary Bat	<i>Lasiurus cinereus</i>	Mammal	Blue	N/A	E	Moderate-High
Yuma myotis	<i>Myotis yumanensis</i>	Mammal	Blue	N/A	N/A	Moderate-High
Pallid Bat	<i>Antrozous pallidus</i>	Mammal	Red	1-T	T	Moderate-High

¹ 1-E – Endangered, 1- SC – Special Concern, 1-T- Threatened

² E- Endangered, SC – Special Concern, T – Threatened, DD- data deficient

5. APPLICABLE ENVIRONMENTAL LEGISLATION

The BMPs presented in this EIA are intended to meet the requirements of applicable legislation administered by several legal authorities and their regulatory agencies.

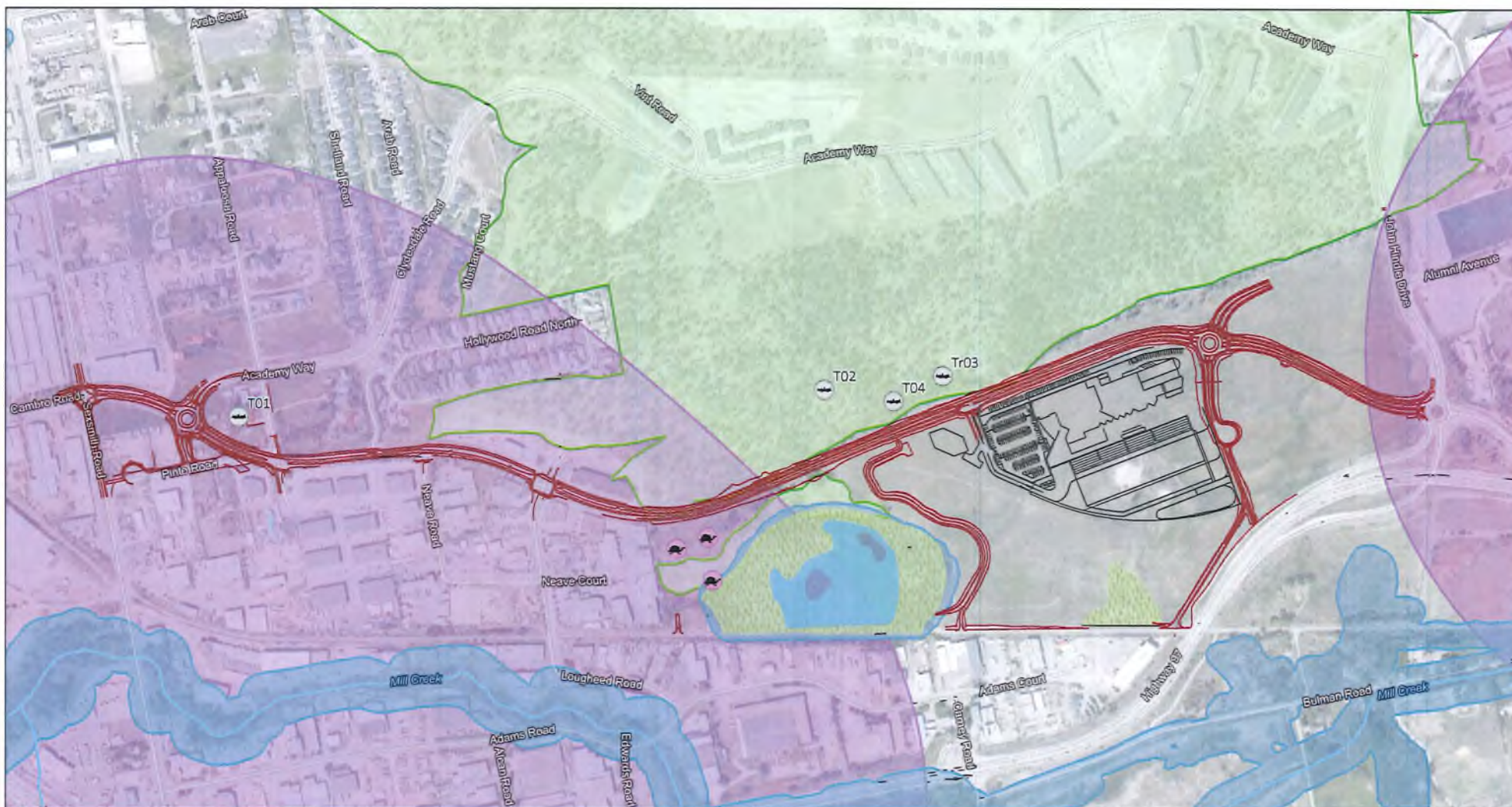
Applicable environmental legislation was reviewed to determine potential permitting requirements to facilitate the work. All work must comply with the conditions of regulatory agency approvals and permits obtained to proceed with construction activities.

A permit matrix showing all relevant permits including, but not limited to, environmental permits is included in *Appendix C*.

5.1. MUNICIPAL

The City has designated Environmental DPAs within the municipal boundaries to delineate areas with increased environmental values – these areas require oversight in accordance with established DPA Guidelines. The Project includes areas which cross and are adjacent to Natural Environment DPAs, including the following categories: Vulnerable Groundwater Aquifers, Watercourses, and Sensitive Ecosystems (*Figure 4*). The DPAs limit development and require reporting to the City. A ToR for Report Preparation for Environmental Assessment Reports has been provided by the City (CoK, N.D.).

A report addressing the Natural Environment DPAs is required for the Project. This requirement is fulfilled through this EIA and previously completed EOA report. The City may also require a Farm Protection DP for the area within the Project, as it was previously designated as protected under the Agricultural Land Commission. The ALC has granted an exemption for development to the City as of 2022.



 McElhanney Project No. 2125-40144-00 Figure 4 NAD 1983 UTM Zone 11N Date: 2026-04-28		Hollywood Road Development Permit Areas 1:5,500 0 75 150 300 Metres Ortho Photo provided by the City of Kelowna *Data sourced from BC Data Catalogue †Data sourced from City of Kelowna		LEGEND <table border="0"> <tr> <td> Bat Roost</td> <td>Kelowna 2040 OCP Environment DPast</td> <td> Waterbody*</td> </tr> <tr> <td> Turtle Nesting Location</td> <td> Sensitive Ecosystems</td> <td> Wetland*</td> </tr> <tr> <td> Project Alignment</td> <td> Vulnerable Groundwater Aquifers</td> <td></td> </tr> <tr> <td> Future Transit Center</td> <td> Water Courses</td> <td></td> </tr> <tr> <td> Stream*</td> <td></td> <td></td> </tr> </table>		Bat Roost	Kelowna 2040 OCP Environment DPast	Waterbody*	Turtle Nesting Location	Sensitive Ecosystems	Wetland*	Project Alignment	Vulnerable Groundwater Aquifers		Future Transit Center	Water Courses		Stream*			INSET MAP 
Bat Roost	Kelowna 2040 OCP Environment DPast	Waterbody*																			
Turtle Nesting Location	Sensitive Ecosystems	Wetland*																			
Project Alignment	Vulnerable Groundwater Aquifers																				
Future Transit Center	Water Courses																				
Stream*																					

5.2. PROVINCIAL

5.2.1. British Columbia *Wildlife Act*

The provincial *Wildlife Act* (BC, 1996a) protects vertebrate animals from direct harm, except as allowed by regulation (e.g., hunting or trapping). Under this legislation, protected wildlife may be handled for salvage or inventory purposes as long as the appropriate permits are obtained.

Sections specifically applicable to this project include:

- Section 29 – stipulates that it is an offence to capture wildlife without a permit under this Act.
- Section 34 – protects all birds and their eggs, Section 34(b) protects select species nests year round, and Section 34(c) protects the nests of other species while they are occupied by a bird or egg.
- Angling and Scientific Collection Regulation (B.C Reg 125/90) - requires permitting for sampling, salvaging or collecting fish for scientific purposes (ie. Scientific Fish Collection Permit).

Wildlife “sweeps” and establishment of work zone isolations are recommended based on available habitat and Project complexity. As Project works may require handling of wildlife on an incidental basis, a General Wildlife Permit is recommended to be obtained prior to the commencement of construction to prevent Project delays. Salvage works may be required along the Project alignment and adjacent to Carney Pond, unnamed wetland and Mill Creek.

As vegetation removal is required, consideration of bird nesting protected nests is essential. A QEP is required to complete bird nest surveys and proactive buffers may need to be established to reduce disturbance of identified nests.

A Scientific Fish Collection Permit is recommended to be obtained prior to the commencement of work within Mill Creek. Proposed bank stabilization and work within the area of the Mill Creek outfall may require instream works and therefore, the salvage of fish. A QEP is required to complete any salvage of fish during this work.

5.2.2. British Columbia *Weed Control Act*

The BC *Weed Control Act* (BC, 1996b) regulates control of designated noxious plants and imposes a duty on all landowners to control designated noxious plants. In accordance with the regulations, an occupier must control noxious weeds growing or located on land and premises, and on any other property located on land and premises occupied by that person.

Mitigations measures must be applied to avoid the introduction, spread, and establishment of weeds during Project works. Measures should be included in an Environmental Protection Plan (EPP) and Contractors Environmental Management Plan (EMP)

5.2.3. British Columbia *Water Sustainability Act*

The *Water Sustainability Act* (WSA) provides protection for waterbodies and a framework for use in BC (BC, 2014b). All changes in and about a stream, or where use of groundwater is proposed, require provincial permitting. Under the WSA, authorized changes including the construction of engineered culvert crossings and the construction of storm water outlets require a WSA Notification to the Water Officer, and a minimum 45 day waiting period prior to start of construction. A WSA Approval may also be required for projects with



more significant works that may permanently alter the bank of a stream. Additionally, under Section 10 of the WSA, alterations and withdrawals of groundwater require approval by the Province.

A WSA Approval application will need to be submitted for all works associated with the Project. The WSA approval is anticipated to include details on the stormwater outfalls in Mill Creek, Carney Pond and the Unnamed Wetland, overflow structures from Carney Pond and the Unnamed Wetland, and bank repairs at the old outfall at Mill Creek and any new structures developed at the new outfall site.

5.2.4. Riparian Areas Protection Regulation

The Riparian Areas Protection Regulation (RAPR), enacted under the *Riparian Areas Protection Act*, is designed to safeguard riparian zones while supporting urban development and promoting environmental stewardship.

Notwithstanding RAPR applicability, the City is submitting this Project through the DP process, and under that process riparian area setbacks exceed those under the minimum RAPR, therefore achieving compliance with the provincial statute.

5.2.5. Agricultural Lands Commission Act

The *Agricultural Lands Commission Act* provides protection to designated agricultural lands within the province in order to preserve agricultural land.

The Project was previously granted an exemption for development from the Agricultural Lands Commission in order to remove the designation as Agricultural Land Reserve.

5.2.6. Heritage Conservation Act

The *Heritage Conservation Act* (BC, 1996c) encourages and facilitates the protection and conservation of cultural heritage in BC. It also authorizes inspections and regulates alterations to heritage sites, including activities such as development, construction, and excavation that may impact identified heritage resources.

The Project should have procedures in place to manage archaeological chance finds, including measures to mitigate impacts on heritage resources, such as the discovery of stone artifacts, shell deposits, rock paintings, and old pit or building structures. The *Heritage Conservation Act* is mentioned here for due diligence however considerations under this Act are outside of the scope of this assessment.

5.3. FEDERAL

5.3.1. *Migratory Birds Convention Act, 1994*

Most bird species in Canada are protected under the MBCA, with some exemptions for specific groups like raptors, waterfowl, and corvids. The MBCA aims to conserve migratory bird populations, protect nests during breeding seasons, and prevent overhunting. Certain nests, like those of herons and pileated woodpeckers, have year-round protection under the Migratory Birds Regulations (Canda, 2022).

Vegetation clearing is recommended to occur outside of the migratory bird breeding season. If any remaining vegetation clearing for the Project is required it is recommended to have nest surveys completed by an QEP prior to the onset of activities if planned during the bird breeding season (i.e., March 31 to August 15). Project works may disturb vegetation used by migratory birds for stopover, breeding, and foraging. The recommended vegetation removal window is August 16 to March 30. In

addition, a protected nest survey prior to any vegetation clearing year-round is recommended to be completed by a QEP.

5.3.2. *Species at Risk Act*

The *Species at Risk Act* (SARA) protects species at risk from becoming extinct or lost from the wild (Canada, 2002). It covers all wildlife species listed under Schedule 1 as being at risk nationally (and their Critical Habitats). Critical Habitat is the habitat necessary for the survival or recovery of a listed endangered, threatened or extirpated species (if a recovery strategy has recommended the reintroduction of that extirpated species). The purposes of the SARA are to prevent wildlife species in Canada from disappearing; to provide for the recovery of wildlife species that are extirpated (no longer exist in the wild in Canada), endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from becoming endangered or threatened (Canada, 2002).

An investigation of potential habitat for SARA protected species in and around the project footprint has been completed. Additional surveys in advance of Project activities that may impact at-risk species may be required. Protection measures for species at risk may be required as indicated in **Section 8.6.4**. No formal permitting under SARA is required as the Project does not occur on federal land and impacts to aquatic and migratory bird species protected under supporting legislation (e.g., *Fisheries Act*, *MBCA*) shall be managed if and as needed under the respective legislation.

5.3.3. *Fisheries Act*

The *Fisheries Act* (Canada, 1985) aims to protect fish populations and their habitats, ensuring the sustainability of aquatic ecosystems. Key provisions include the prohibition of activities that cause the harmful alteration, disruption, or destruction of fish habitats (Section 35) and the prevention of the release of harmful substances into waters frequented by fish (Section 36). The Act emphasizes responsible management practices to balance environmental protection with sustainable development, fostering stewardship of aquatic resources. A Request for Review from Fisheries and Oceans Canada (DFO) is required when there is potential for a project to cause the death or fish or harmful alteration, disruption or destruction (HADD) to fish habitat.

Project works are not expected to permanently alter Carney Pond or the unnamed wetland including any potential loss or degradation of these features. Stormwater channel work will occur adjacent to these features, with limited impact. Bank stabilization work around the outfall at Mill Creek will occur and alter a portion of the bank (this work will be permitted under the *Water Sustainability Act*). A request for review is anticipated for these Project works. QEPs will work with design engineers to ensure that all designs and construction techniques conform to the BMPs for *Fisheries Act* compliance.

6. ENVIRONMENTALLY SENSITIVE AREA DESIGNATIONS

The City identifies a variety of natural ecosystems as having intrinsic value. These areas are identified in the Natural Environment DPAs and are for protecting riparian management areas, terrestrial sensitive ecosystems, the Okanagan Ecosystem Connectivity Corridor, and other sensitive areas. The purpose is to use these polygons to determine how to minimize impacts to sensitive areas and ensure appropriate precautions are put in place during design and construction. Within the ToR document, the City provides

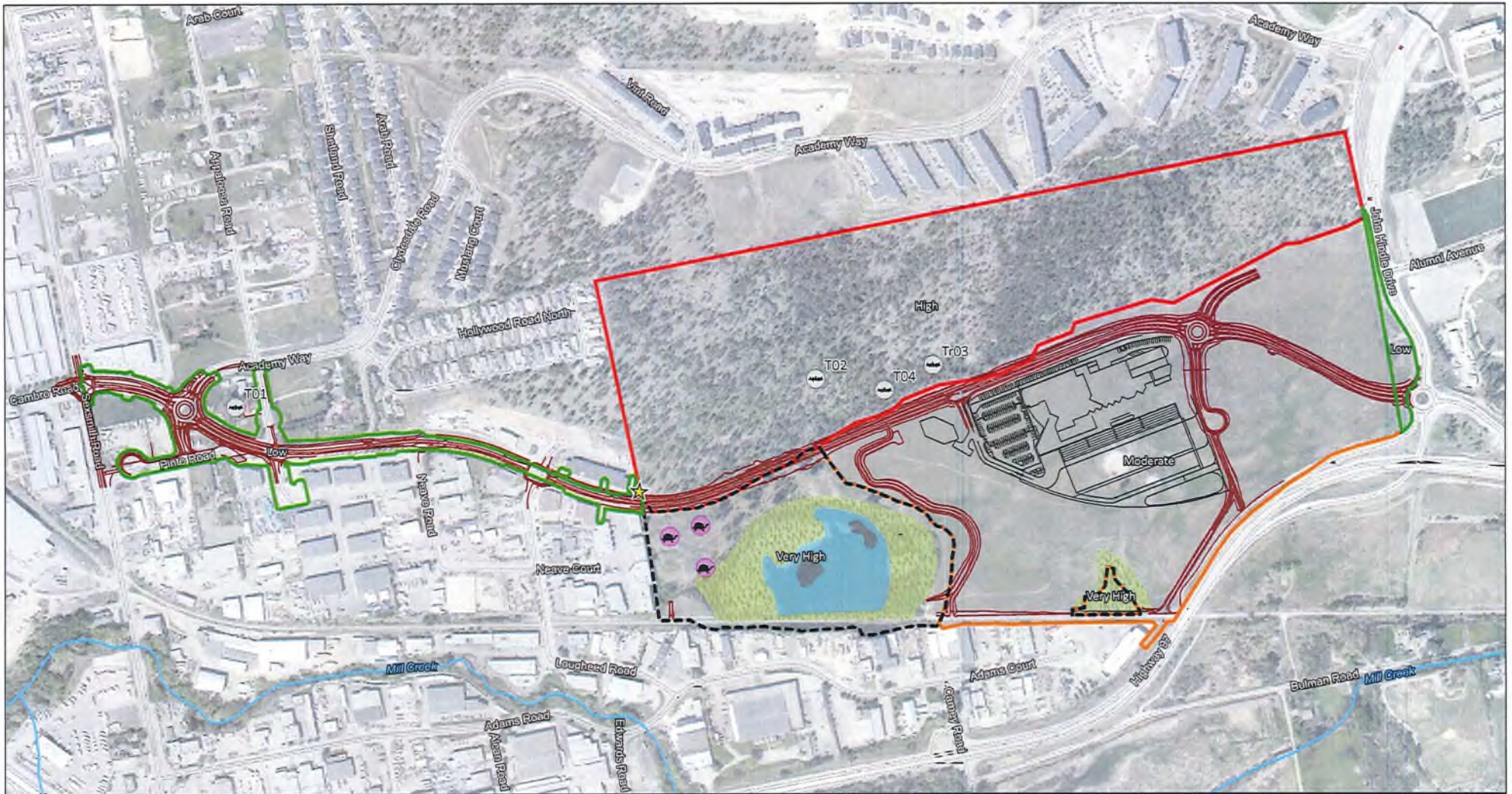
classifications for ESA ranging from 1, indicating a very high value site, to 4, indicating a low value site (City of Kelowna, ND).

Following the field assessment on November 14, 2024 and March 25, 2026, McElhanney utilized the definitions to assign ESA areas within the Project area, which can be seen in *Figure 5* and are explained in *Table 9*. Impacts to ESA 1 and 2 areas will require compensation (*Section 8.14.1*).

Table 9. Project Area ESA Rankings

ESA Ranking	Area	Value
ESA 1 (Very High)	Carney Pond & surrounding riparian area	The Carney Pond and surrounding riparian area supports a diverse range of vegetation, wildlife, and wildlife habitat. This area is relatively natural and historically utilized for turtle nesting. In addition, two mapped ecological communities at risk are mapped in Carney Pond.
ESA 1 (Very High)	Unnamed Wetland & Mill Creek	The unnamed wetland and Mill Creek support a diversity of vegetation, wildlife and wildlife habitat. The area is relatively natural and provides cover, food and other habitat features not present in surrounding areas.
ESA 2 (High)	Unnamed Wetland & Mill Creek riparian area	(Unnamed wetland is a 15 m and Mill Creek a 30 m riparian setback according to natural environment DPA). The surrounding riparian area of the unnamed wetland and Mill Creek provide relatively natural areas with combinations of vegetation and habitat features for birds, amphibians and other wildlife. These areas should be avoided when at all possible and relevant BMPs should be implemented to reduce impacts to these zones.
ESA 2 (High)	Ponderosa pine treed ecosystem	This area of mature and native vegetation including mature ponderosa pine is a habitat island for birds and small to large mammals. Evidence of wildlife trails, and scat confirm wildlife usage. It should be avoided when at all possible and BMPs and restoration are likely needed for impacts in these areas as a variety of protected features are present including bat roosts, wildlife trees, and rocky outcrops.
ESA 3 (Moderate)	Open grass field	The open grass field has been historically disturbed and appears potentially to be mowed on a semi-regular basis. Although this area does not appear to support native bunchgrass species it still provides open space for wildlife to move and may suit the needs of some wildlife species. Usage by birds and reptiles was observed during the site visits.
ESA 4 (Low)	Urban area and existing roadways	Particularly in the south half of the alignment the Project and surrounding area is dominated by existing roadways and urban mixed use. These areas provide little to no habitat values due to a lack of wildlife habitat features.





		Hollywood Road Environmentally Sensitive Areas		LEGEND Bat Roost Rocky Outcrop Turtle Nesting Location Project Alignment Future Transit Center Stream* Very High ESA High ESA Moderate ESA Low ESA Waterbody* Wetland*	INSET MAP
Project No. 2125-40144-00 NAD 1983 UTM Zone 11N	Figure 5 Date: 2026-04-28	Scale: 1:5,500 0 75 150 300 Metres 	Ortho Photo provided by the City of Kelowna *Data sourced from BC Data Catalogue		

7. IMPACT ASSESSMENT

The Project activities and phases will interact with biophysical components in the receiving environment on a multitude of levels. *Table 10* summarizes the progressive phases of the Project and lists Project activities that are anticipated to interact with biological systems, physical systems, and atmospheric conditions. The summary table lays the foundation of understanding how certain activities can interact with a variety of systems, so that appropriate mitigation measures can be selected.

Table 10. Potential environmental impacts of Project components and activities including preparation, construction, operation and maintenance phases (x indicates measurable impacts).

PROJECT PHASES / COMPONENTS	Biological Systems					Physical		Atmospheric	
	Aquatic Systems	Terrestrial Vegetation	Wildlife and Wildlife Habitat	Wildlife Species at Risk	Invasive Species	Surface Water Quality	Surface Water Quantity	Air Quality (dust)	Acoustic Environment (noise)
Site Preparation									
Clearing and Grubbing	x	x	x	x	x	x		x	x
Stripping	x	x	x		x	x		x	x
Staging Areas		x	x		x	x		x	
Construction									
Excavation	x	x	x	x	x	x		x	x
Grading	x	x	x	x		x		x	x
Cuts and Fills	x	x	x	x	x	x		x	x
Berm			x	x	x			x	x
Paving	x	x	x	x		x		x	x
Riprap Placement	x	x	x	x	x			x	x
Maintenance									
Invasive Plant Management		x	x		x	x			x
Drainage Maintenance	x					x			
Restoration									
Hydroseeding disturbed areas		x	x	x	x				
Replanting of impacted areas	x	x	x			x			

7.1. IMPACTS TO AQUATIC SYSTEMS

Localized impacts to Carney Pond and the unnamed wetland are anticipated as a result of the stormwater outfalls, and overflow outlets from both wetlands. Works involve impacts to the wetland edges, and riparian vegetation for the installation of the infrastructure. Permanent impacts are compensated, and temporary impact areas will be restored. Removal of the failing outfall, bank stabilization, and installation of a new



outfall at Mill Creek will alter the existing conditions. The stormwater outfall will be below the highwater mark and relevant mitigation measures will be identified during the WSA review process. The outfall decommissioning and bank repairs will involve planting and restoration and should improve the overall condition of the bank and riparian area.

7.2. IMPACTS TO TERRESTRIAL VEGETATION SYSTEMS

Direct loss of terrestrial vegetation is expected to occur from Project clearing and grubbing activities. Construction activities may also result in soil compaction or erosion, which may also affect the quality of vegetation or ecosystems. Soil compaction can limit the ability for native species to grow, and erosion can result in the loss of fertile soils for vegetation to germinate. Construction equipment has potential to spread invasive plants or their seeds to new areas, including native ecosystems located adjacent to the LAA, resulting in potential reductions to ecosystem quality.

7.2.1. Impacts to ESAs & Offsetting

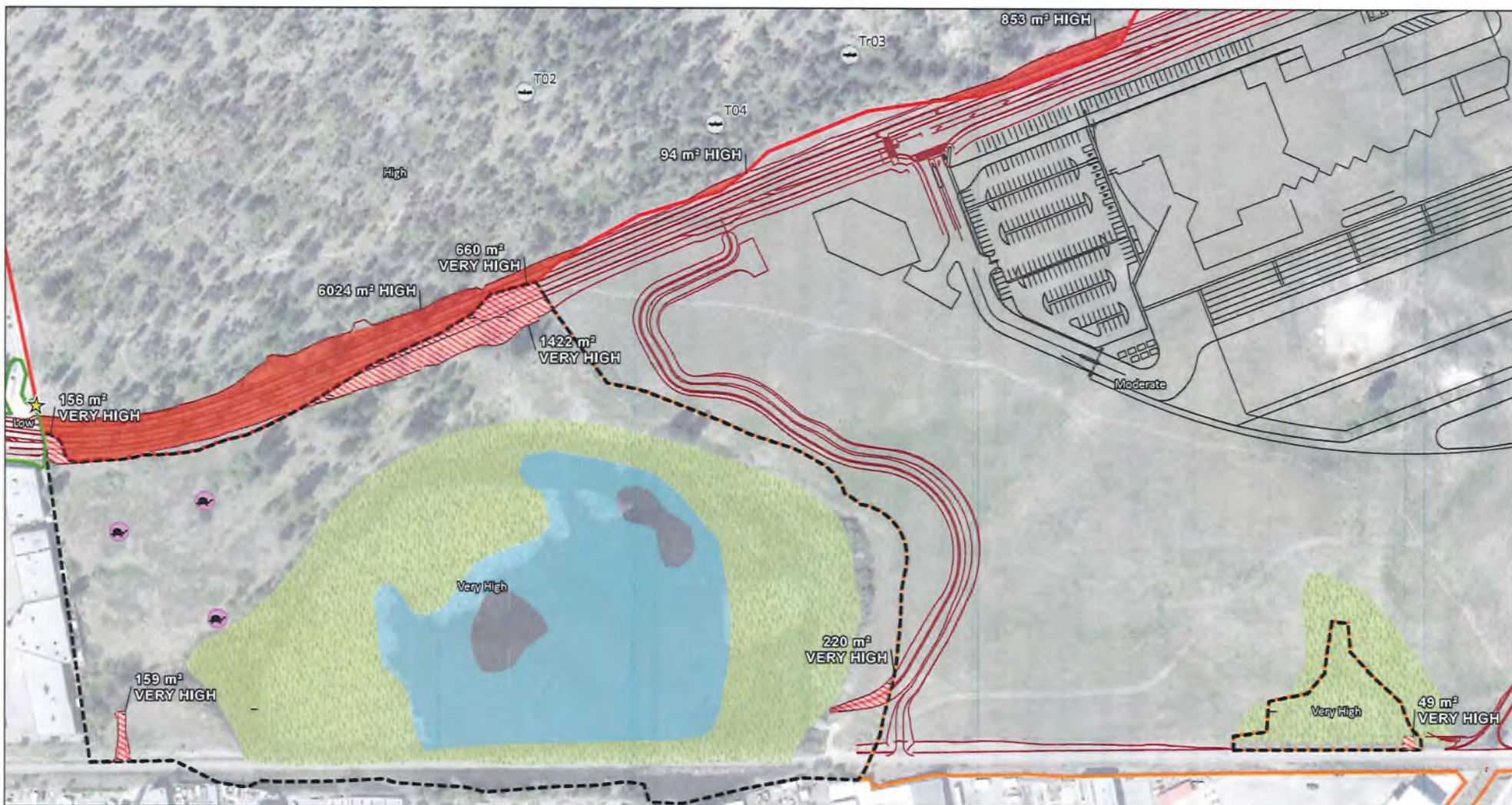
Permanent impacts to ESAs as a result of the Project have been calculated as 2,670 m² to Very High Value ESAs and 6,973 m² to High Value ESAs. The impacts are along the riparian area of Carney Pond, the unnamed wetland, and to the forested area to the west of Carney Pond (*Figure 6*).

The impacts in the Very High value ESAs are proposed to be compensated for through riparian area restoration. Compensation is proposed through a ratio-based scheme, based on relative sensitivity of the impacted ESA. For this project (City of Kelowna, N.D.). The following compensation ratios were applied:

- 3:1 enhancement to impact ratio for 1,247 m² of ESA's ranked "Very High"
- 1:1 ratio for one area of "Very High" ESA measuring 1,422 m² that can be restored in place following temporary disturbance;
- 1:1 ratio for areas measuring 6,973 m² with a "High" ESA ranking.

This results in a total compensation area of 12,136 m². Details on the compensation are included in *Figure 6* and *Section 8.3*.





McElhanney

Hollywood Road
Environmentally Sensitive Area Impacts

1:2,000

0 25 50 100 Metres

Ortho Photo provided by the City of Kelowna
*Data sourced from BC Data Catalogue

Project No. 2125-40144-00

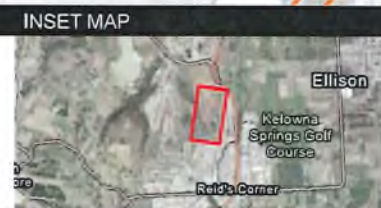
Figure 6

NAD 1983 UTM Zone 11N

Date: 2026-04-29

LEGEND

- Bat Roost
- Rocky Outcrop
- Turtle Nesting Location
- Project Alignment
- Future Transit Center
- Stream*
- Waterbody*
- Wetland*
- Very High ESA
- High ESA
- Moderate ESA
- Low ESA
- ESA Impacts
- High
- Very High



7.2.2. Impacts to At-risk Plants

A variety of herb and shrub species were observed within the Project area. Of these showy milkweed provides important egg-laying habitat for listed monarch butterflies. Additionally, the blue-listed slender hawksbeard (*Crepis atriobarba*) was identified on site. These native plant species provide important habitat values for at-risk species that could be using the project footprint and surrounding area. Ensuring they are managed and maintained throughout the life of the project will ensure they continue to provide this value to insects and increase the biodiversity of the areas they grow. The remaining species were introduced or invasive (*Appendix E*). As a result, mitigations will be required to prevent impacts to showy milkweed and slender hawksbeard. Mitigation measures are outlined in *Section 8.5.2*.

7.2.3. Impacts to At-risk Ecosystems

The listed ecosystem common cattail marsh and hard-stemmed bulrush deep marsh was observed along Carney Pond during field assessments. It is not anticipated that Project works will result in loss or alteration of this habitat through vegetation clearing, however stormwater work is proposed adjacent to these riparian ecosystems and BMPs should be put in place to ensure that the impacts from construction are limited.. Removal of this listed ecosystem should be avoided for this Project whenever possible. Mitigation measures are outlined in *Section 8.5.2*.

7.3. IMPACTS TO WILDLIFE AND WILDLIFE HABITATS

The area surrounding the Project was found to provide habitat for reptiles, birds, small and medium-sized mammals, and habitat connectivity for larger mammals. Impacts to wildlife and wildlife habitat through Project-related activities may include:

- **Changes in habitat** – any changes to the area that do not necessarily render the habitat unusable or unsuitable but may decrease the quality of the habitat or result in a permanent or temporary change in use.
- **Changes to the quality of habitat** – may occur in areas within and adjacent to the footprint and may include habitat fragmentation, and increased susceptibility to invasive species distribution and abundance.
- **Habitat loss** – may result from the construction of access points and staging areas. This can be avoided by strategically placing access points and staging areas in areas where vegetation clearing is not required.
- **Changes in wildlife habitat use** – noise and vibration resulting from construction activities may cause habitat avoidance or movement deflections during seasons where movements are important to certain wildlife species. Wildlife may disperse temporarily or permanently from areas of disturbance.
- **Direct impacts to species physiology and/or behaviour** – an individual / species response to potential disturbance stimuli includes undetected metabolic changes, vocalizations, and dispersion away from the source of disturbance. Elevated noise levels (e.g., from machinery and people within close proximity), olfactory stimuli, visual stimuli and subsurface vibrations (e.g., from compacting) constitute various types of disturbance stimuli.
- **Direct mortality** – potential for injury / mortality to species, including collisions with construction machinery or other construction equipment.



7.3.1. Impacts to Birds

The Project has the potential to disturb nesting birds. Vegetation clearing during the bird breeding window (i.e., 31 March to 15 August) (*Figure 7*), or raptor nesting period (i.e., 01 January to 30 September) (BC, 2013), can displace nesting birds and result in incidental take if active nests are cleared. Breeding birds may respond to disturbance stimuli by vocalization, undetected metabolic changes, and dispersion, which may lead to nest abandonment and/or nest predation.

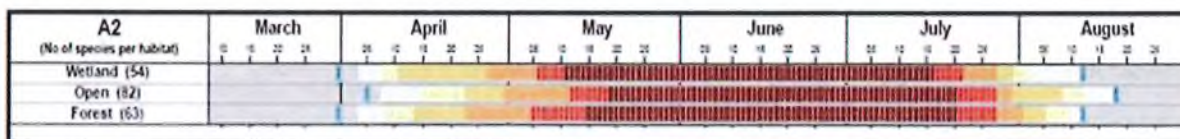


Figure 7. Nesting calendar for the A2 Nesting Zone (ECCC 2025).

7.3.2. Impacts to Reptiles and Amphibians

Amphibians and reptiles rely on migration between aquatic habitats (such as wetlands, ponds, and riparian areas) and terrestrial habitats (such as rocky outcrops and caves) for breeding purposes (FLNR, 2014). Construction activities along road shoulders, trees, rocks, and shrubs can disrupt these species, with road mortality being a particular concern (FLNR, 2014). Development too close to a hibernacula or overwintering location causes disturbance and reptile abandonment of their overwintering location (see *Appendix I*).

7.3.3. Impacts to Mammals

The Project has the potential to disturb other mammals through direct mortality as a possible result of collisions with heavy equipment and site vehicles, and there is potential for mammals to get trapped in open excavations. Loss of habitat and insect availability may occur through vegetation removal.

7.3.4. Impacts to Wildlife Species at Risk

Wildlife species at risk mapped and documented within the area have potential to be impacted by Project works (see *Section 4.4.9*). Impacts can come in a variety of forms including from direct mortality, noise, destruction of habitat, and reduction of space and resources. Works completed during sensitive life stages, such as the breeding season, have a higher potential to impact these species and thus should be avoided where possible. Mitigation Measures are outlined in *Section 8.6.4*.

8. ENVIRONMENTAL MITIGATIONS AND BEST MANAGEMENT PRACTICES

The provincial mitigation hierarchy for environmental values is described in four levels (British Columbia, 2014):

1. Avoid.
2. Minimize.
3. Restore onsite.
4. Off-set (offsite or onsite).

Measures to avoid and minimize Project impacts start early in design when the environmental features are identified, and the design is modified to avoid those features. As this Project involves the installation of a set road alignment, there are limitations to what can be moved to avoid impacts. BMPs will be applied during construction to mitigate impacts, where possible.



8.1. AVOIDANCE THROUGH PROJECT DESIGN

As indicated throughout this report, the design team has implemented a mitigation hierarchy of measures for the conservation and protection of the environment, with the ultimate goal to avoid or minimize residual effects. Measures to avoid and minimize Project impacts start early in design when the environmental features are identified, and the design is modified to avoid those features. Measures implemented throughout the project design include the design of wildlife crossings, protection of High Value ESA areas including Carney Pond and the unnamed wetland, and protection of at-risk species and ecosystems. In addition, works will be completed within the least risk windows which are outlined in *Section 8.4*.

8.2. MINIMIZE THROUGH ENVIRONMENTAL MITIGATION MEASURES

Impacts are minimized during the Project design, construction, operation, and restoration phases through the implementation of BMPs. The following guidelines and BMPs were used to develop appropriate avoidance and mitigation measures:

- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BC, 2014a)
- Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (MFLNRO, 2013)
- Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia (MFLNRO, 2014)
- Best Management Practices for Amphibian and Reptile Salvages in British Columbia (MFLNRO, 2016)
- DFO Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act (DFO, 2019)
- DFO Measures to Protect (DFO, 2019) and Standards and Codes of Practice (DFO, 2021)
- Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia (WLAP, 2022)

A variety of environmental protection and mitigation measures for the Project are proposed to minimize harmful effects to environmental receptors. The expected required measures employed per Project phase are summarized in *Table 11* and in the subsections below.

Table 11. Mitigation measures for each phase of construction.

Environmental Mitigation Measures	Phase			
	Design	Construction	Operation	Restoration
EPP	✓	✓	✓	✓
Environmental Monitoring		✓	✓	✓
Erosion and Sediment Control		✓	✓	✓
Spill Control and Emergency Response		✓		✓
Terrestrial Vegetation Management		✓		✓
Wildlife and Wildlife Habitat Protection		✓		✓
Wildlife Species at Risk Management	✓	✓		✓
Soil Management		✓		✓
Water Management		✓		
Hazardous Materials Management		✓		
Air Quality and Dust Control		✓		



Environmental Mitigation Measures	Phase			
	Design	Construction	Operation	Restoration
Noise Management		✓		
Waste Management		✓		✓
Restoration Plan				✓

Repairs to habitat may be necessary due to unforeseen events such as flooding, erosion, or drought conditions. As a contingency to mitigation measures, the contractor will also provide planned secondary strategies that can be implemented in the unlikely event that planned avoidance and mitigation measures do not meet their objectives.

8.3. RESTORATION AND OFFSETTING

Restoration and offsetting measures are being proposed. Restoration will occur anywhere construction impacts are temporary and compensation to offset impacts to ESAs will be completed. Where appropriate, disturbed areas will be revegetated to prevent surface erosion upon completion. Temporary surface protection may be warranted, as outlined in the subsequent section. All temporary controls (non-biodegradable) must be removed prior to demobilizing from the site. All temporary impact areas should be restored to an equal or better condition of the area prior to disturbance. Within an ESA are temporary disturbance will be 661 m². This area will be restored and the plan is shown in *Figure 8*.

Impacts to the Very High Value ESA areas require compensation of a 3:1 ratio, and impacts to the high value ESA requires compensation at 1:1 ratio (CoK ND). Based on this the required compensation area is 12,136 m² and proposed is 13,925 m². By including a slightly higher square meters or compensation than required it confirms the Project will meet compensation targets. Proposed compensation measures are targeted around Carney Pond, while avoiding the known painted turtle nesting area. The compensation area avoids areas that are currently functioning and targets areas of mowed grass and invasive species. Details on the proposed compensation planting are included in *Figure 8* and the engineer designs in *Appendix B*. The compensation planting will be subject to a 3-year maintenance period and will require an 80% survivorship of the plants in all three bed Types A, B and C.

The compensation plan has been prepared and prioritizes establishing higher value riparian areas around Carney Pond. The restoration planting areas are divided into three bed Types A, B and C, with vegetation mixes according to the location. All species proposed in and around Carney Pond are native species which have been observed onsite. Planting is recommended to be completed in the fall September to November when moisture levels are higher and temperature is lower. The planting timing must consider the seasonal weather conditions. Temporary irrigation measures are also required during the 3-year monitoring period to allow plants to establish.

REPLACEMENT TREE SCHEDULE

BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	BED TYPED	
				%	No.
Trees					
<i>Pinus ponderosa</i>	Ponderosa pine	Min 2m	3.0m spacing between trees. Maintain 1.5m setback from planted or existing shrubs and a 2.0m setback from other planted or existing trees.	78%	163
<i>Pseudotsuga menziesii</i>	Douglas-fir	height		22%	45
TREES TOTAL				100%	208

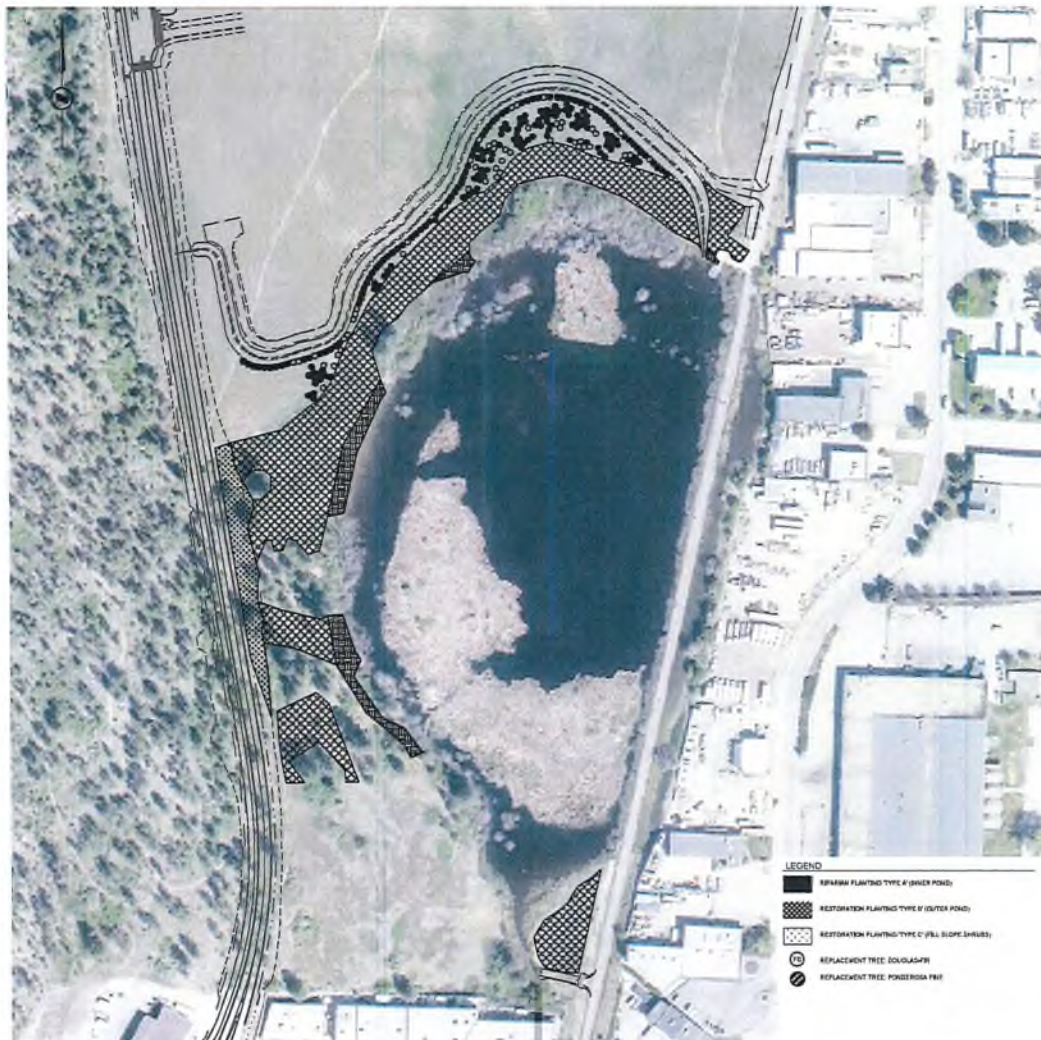
PLANT SCHEDULE

SPECIES & QUANTITY BY BED TYPE

SPECIES & QUANTITY BY BED TYPE			BED TYPE		A: Inner Pond		B: Outer Pond		C: F&S Slope Shrubs		Total Area	
			AREA (sq m)		1231		11250		1541		13025	
BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	A		B		C		Totals		
				%	No.	%	No.	%	No.			
Trees												
<i>Pseudotsuga menziesii</i>	Douglas-fir	#5 Post	1 per 6 sq m	5%	11	22%	413	0%	0	0	424	
<i>Pinus ponderosa</i>	Ponderosa pine	#5 Post	1 per 6 sq m	0%	0	75%	1463	0%	0	0	1463	
<i>Populus tremuloides</i>	trembling aspen	#5 Post	1 per 6 sq m	15%	32	2%	4	0%	0	0	36	
<i>Prunella montanensis</i>	black chokeberry	#5 Post	1 per 6 sq m	42%	89	0%	0	0%	0	0	89	
<i>Salix lasiolepis</i>	white birch	#5 Post	1 per 6 sq m	25%	53	0%	0	0%	0	0	53	
<i>Salix lucida</i>	Pacific willow	#5 Post	1 per 6 sq m	20%	44	0%	0	0%	0	0	44	
TREES TOTAL				100%	224	100%	1476	0%	0	0	2099	
Shrubs												
<i>Rosa rubra</i>	Knockout rose	#1 Post	Plant in same species clusters	42%	532	0%	0	0%	0	0	532	
<i>Malva alcea</i>	honey sucker	#1 Post	species clusters	52%	133	0%	0	29%	459	0	1163	
<i>Geum sp.</i>	pat. Geum sp.	#1 Post	of 4.5 plants wide	3%	57	15%	168	15%	207	0	429	
<i>Symphoricarpos alba</i>	common snowberry	#1 Post	approx. 0.5m	52%	133	32%	331	25%	335	0	304	
<i>Alnus glabrum</i>	Douglas maple	#1 Post	spacing: Maintain	0%	0	10%	1125	0%	0	0	1125	
<i>Pinus ponderosa</i>	knockout rose	#1 Post	1-1.5 m spacing	5%	67	15%	168	0%	0	0	235	
<i>Amelanchier alnifolia</i>	hackberry	#1 Post	between shrubs	5%	67	25%	263	22%	268	0	598	
<i>Cornus amomum</i>	red-leafed dogwood	#1 Post		25%	233	0%	0	0%	0	0	233	
SHRUBS TOTAL				100%	1231	100%	11250	100%	2673	0	13025	

Notes:

- Avoid entry into areas of retained native vegetation during all phases of work.
- Remove all invasive plant matter prior to receipt of new materials.
 - Complete invasive vegetation removal through manual or mechanical means, ensuring all roots and shrubs are removed. Manual removal required for critical root zone areas of retained trees.
 - Avoid impacts to retained native shrubs and trees during invasive removal works, including machine entry onto critical root areas.
- Once invasive removal is complete, aerate and loosen remaining soil surfaces.
- Install 300mm organic based over seeded surfaces. Towed to meet 2P specifications per Canadian Landscape Standard. Supply analysis certificate for review and approval prior to import.
- Target regular spacing of shrubs, arrange shrubs in groups of 5-6 of the same species and select suitable microsites for each species. Avoid grid pattern layout.
- Once plantings are complete, install feeding layers.
 - Bed Type A Inner Pond: 100mm compacted bark mulch. Ensure the installed plants are not buried, create wells if needed.
 - Bed Type B Outer Pond: Install a native seed mix at a rate of 15 kg per ha.
 - Bed Type C F&S Slope Shrubs: install hydroseed using native seed mix with mulch and fertilizer.
- Seed mix to be sourced per following minimum specifications:
 - All species must be 100% native to BC's Okanagan (south interior) region.
 - Mix to be maximum 30% flowering perennial species by seed count.
- Review protection fencing and stakes per Detail B, Drawing 304801H-C742 is required for all planted trees, both replacement and compensation planting. Follow Details for all planting installation methods including tree staking and staking. See Drawing 304801H-C743.
- Timing of planting must consider seasonal weather patterns such as frost, precipitation, drought, Fall (October) is recommended.
- The Contractor completing planting installation works is responsible for 100% survival of planted stock by the end of their warranty period. Temporary irrigation is required to be installed or otherwise provided.
- All additional areas disturbed during construction shall be restored using the prescriptions on this Drawing. Contractor to consult the Project Qualified Environmental Professional for instructions and applicable Bed Type.



LEGEND

- REPLACEMENT PLANTING TYPE A (INNER POND)
- REPLACEMENT PLANTING TYPE B (OUTER POND)
- REPLACEMENT PLANTING TYPE C (F&S SLOPE SHRUBS)
- REPLACEMENT TREE: DOUGLAS FIR
- REPLACEMENT TREE: PONDEROSA PINE

CONTRACTOR

STAMPS



NO.	DATE	ISSUE/REVISION	BY	APPROVED	CHECKED	REAL
0	2020-03-28	100% DETAIL	LJ	JR	EC	
1	2020-04-24	ISSUED FOR TENDER	LJ	JR	EC	

DRAWN

L. JANDW

DESIGN

A. BROWNLOW

SCALE

G 1:1 250 50

ENCL. CHECK

E. JORDAN

ENCL. OF RECORD

A. BROWNLOW

CITY OF KELOWNA

HOLLYWOOD 7 PROJECT
CARNEY POND
COMPENSATION PLAN

CITY DEPT.
INFRASTRUCTURE

CITY FILE NO.

PROJECT DRAWING NO.

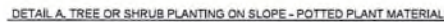
304801H-C741

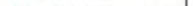
CITY RECORD NO.

SHEET NUMBER
1 OF 2

REV NO.

1



CONSULTANT 	STAMPS	NO. DATE 9 2026-03-28 100% DETAIL	BY AFFIRMED LJ JB EC	CHECKED EC	SEAL	DRAWN LJ JANG	ENCL. CHECK LJ JORDAN	CITY OF KELOWNA HOLLYWOOD 7 PROJECT CARNEY POND COMPENSATION PLAN DETAIL	CITY COPIES INFRASTRUCTURE	
		1 2026-04-24 BAILED FOR TENDER	LJ JB EC			DESIGN Δ BROWNLOW	ENCL. OF RECORD Δ BROWNLOW		CITY FILE NO.	
						SCALE			PROJECT DRAWING NO. 304801PL-C742	REV NO. 1
									CITY RECORD NO.	SHEET NUMBER 3 OF 2

8.4. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

The overall requirements for environmental protection required during the completion of the Project, are based on *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia*. This document provides a framework for the Construction Contractor, to develop an EPP to facilitate compliance to the applicable legislation. This document should be developed by a QEP, and an Environmental Monitor (EM) should be on site during sensitive construction phases and works within ESAs. The EM is also required to confirm that mitigation measures are appropriately installed or utilized and functioning as intended and to address other concerns should they arise. The Contractors EPP will need to be reviewed and accepted by the City to ensure it is sufficient for the Project works. General environmental BMPs applicable to the Project are included in the sections below as a starting point.

8.5. TIMING WINDOWS

Scheduling construction during the period of reduced risk to species present on site will aid in minimizing overall affects. *Table 12* outlines least risk windows for focal species in the Thompson-Okanagan Region.

Table 12. Summary of timing windows and environmental restrictions on construction

Focal Species	Reduced Risk Window	Constraints
Amphibians and Reptiles	Species dependent	Salvages should be scheduled for the time of year when the least number of species and life stages will be impacted (FLNR 2014). <i>Wildlife Act</i> Permits may not be issued for salvages scheduled to take place once amphibians and reptiles have begun to overwinter (FLNR 2014).
Migratory Birds	August 16 to March 30	Breeding bird surveys are a provincial requirement to precede any vegetation clearing works within the sensitive window for breeding birds (March 31 to August 15). Furthermore, surveys for Schedule 1 species with year-round nest protection is required ahead of any vegetation removal at any time of year.
Raptors (eagles, hawks, falcons and owls)	October 1 to December 31	Raptor nest surveys are recommended to precede works within the sensitive window for raptors (January 1 to September 30). Furthermore, surveys for species with year-round nest protection is required ahead of any vegetation removal at any time of year.

8.6. VEGETATION AND STREAM MANAGEMENT

We recommend the following measures to ensure vegetation is protected on site during construction:

- Protect and avoid Carney Pond and the unnamed wetland.
- Reduce impact to riparian areas surrounding Carney pond, the unnamed wetland and Mill Creek
- Create exclusion fencing for all areas that are not to be disturbed, to prevent accidental impacts to vegetation within the ESAs.
- Ensure an EM is on site during all works instream and bank stabilization and restoration work taking place at the Mill Creek outfall (old and new locations), even in dry conditions.
- Protect wildlife trees with exclusion fencing, as needed.

All necessary vegetation and tree clearing will be the responsibility of the Contractor and BMPs should be in place prior to and during this construction activity.

8.6.1. Tree and Vegetation Protection and Removal

When removing trees and vegetation the Contractor should implement the following BMPs:

- Only trees and areas that have been approved for construction will be cleared.



- Strategic scheduling of clearing activities to minimize areas of erodible soil surfaces at any given time while pursuing works to completion as quickly as possible once started.
- Limit the extent of vegetation clearing as much as possible.
- Ensure that equipment used for vegetation removal complies with best practices for deleterious substance control.
- Schedule vegetation removal within the window of least risk for breeding birds, wherever possible.

8.6.1.1. At-risk Plants and Ecosystems

For any areas disturbed along Carney Pond, the unnamed wetland and Mill Creek outfalls the listed ecosystem restoration planting should be completed at a 3:1 ratio. These ecosystems include black cottonwood / common snowberry – roses, common cattail marsh, hard-stemmed bulrush deep marsh.

In addition, the blue-listed slender hawksbeard should be retained in place where feasible. If their current locations are impacted by the Project, the plants should be relocated (transplanted) to areas outside and adjacent to the Project. Transplantation must be conducted by hand, by a qualified professional with relevant experience. Seasonal timing of transplantation is recommended for May, after the last frost. Further supportive measures can include seed collection, storage, and propagation (to be conducted by an experienced specialist and/or nursery), with planting as part of the restoration portion of this Project. A planting plan should be prepared be written in coordination with the Contractor to show the planting area, species, and densities for approval by the City prior to construction. Monitoring of transplanted plants will take place at later stages of the project (see *Appendix E*).

8.6.2. Noxious Weeds and Invasive Plant Handling

Due care should be taken to protect the Project alignment and surrounding area from the introduction of invasive plants during construction. Mitigation measures in the EPP should include at minimum:

- All equipment brought on site is thoroughly cleaned (e.g., remove dirt from other work sites that has accumulated on the tracks, undercarriage, tires) prior to arrival and departure.
- Keeping equipment and vehicles clean to prevent tracking of soil on or off site.
- Providing fill and topsoil clean of seeds of invasive species.
- Treatment of nearby infestations.
- Stabilize bare soils and prevent the establishment of invasive species in newly disturbed areas. If vegetative cover is used to stabilize bare soils, the use of only locally appropriate native species is recommended.
- Check clothing and footwear for seeds or plant matter and, if materials are detected, remove and segregate as to not infest the area.
- Use established roads/tracks to prevent access to potentially weed infested areas.
- Areas requiring clearing and grubbing should be screened for the presence of invasive plants. If invasive species are identified, they should be flagged, removed, segregated, and transferred under cover to a facility capable of accepting such material (i.e. transfer station).
- Know the origin of gravel or other fill used and that it is free of invasive plant species, invasive plant seeds, or rhizomatous plant parts. Avoid using fill from known sites of invasive plant infestation.
- Known locations of noxious weeds will be clearly marked to prevent unintentional disturbance.
- Noxious weeds and invasive plant species that are encountered and are to be removed prior to construction activities, including all roots and shoots, per best management practice. Above ground plants are to be bagged to prevent spread or disbursement and removed from site for incineration.



at an approved facility, and roots will require excavation for most noxious weed species as well. An invasive species management plan is recommended.

A full list of noxious and undesirable weeds and exotic / introduced plants and control measures are available from the BC Ministry of Agriculture as mandated by the provincial *BC Weed Control Act* (BC 1996a). The Contractor should include species specific management measures in their EPP. The development of long-term objectives and priorities is needed to address effective invasive species management.

8.6.3. Soil Management

We recommend the following measures be implemented:

- The contractor should avoid placement of excavated materials adjacent to any watercourse or storm drainage on the site.
- Erosion and sediment control measures should be implemented around stockpiles of excavated material in areas where natural drainage or storm water could erode the stockpile and thereby transport sediment to surface water.

8.6.4. Waste Management

We recommend the following mitigations for waste be implemented on site:

- Scrap materials should be temporarily stockpiled and removed to a licensed landfill or recycling depot.
- If materials that are believed to be contaminated or hazardous are located on site, the contractor should immediately cease work in that area and notify the QEP and the City.
- Containers or trucks carrying cement or fresh concrete should not be washed on the Project site, into any watercourse, or storm drain. Wash water should be disposed of at approved disposal sites.
- All food waste should be locked up and removed from site daily to prevent attracting wildlife.

8.7. WILDLIFE

8.7.1. Bird Protection

Vegetation clearing should be completed outside of the migratory bird breeding window, which occurs March 31 to August 15. Vegetation includes all types of cover, from tall grasses to shrubs and trees. If clearing is required within this window, a breeding bird nest survey must be conducted by a QEP with expertise in avian behaviour and biology, particularly regarding at-risk species that may occur in the area. Any active nests identified within or immediately adjacent to the Project area must be buffered with a "no-work" zone until the nest is confirmed to have fledged. Buffer distances will be determined based on the species identified.

A survey for nests with year-round protection must be completed prior to any vegetation clearing activities at any time of year. Raptor nests may be active during the raptor breeding season, which occurs from January 1 to September 30. During this period, additional "quiet" buffer zones may be required to prevent disturbance to nesting raptors.

8.7.2. Amphibian and Reptile Protection

BMPs for the protection of amphibians and reptiles to be implemented during and after construction include:

- **Timing Restrictions:** Avoid construction during key activity periods for amphibians and reptiles to reduce disturbance during hibernation, mating, and migration.



- **Wildlife Surveys and Exclusion Fencing:** Conduct pre-construction wildlife sweeps at least two weeks before ground disturbance. Install silt fencing around the work area to prevent ingress and reduce mortality from machinery and vehicles.
- **Habitat Protection:** Preserve riparian and emergent vegetation to buffer amphibians and reptiles from predators and extreme temperatures. Prevent the introduction of invasive species.
- **Permitting and Salvage:** Apply for a provincial General Wildlife Permit in advance to enable species salvage if required. Follow *Best Management Practices for Amphibian and Reptile Salvages in BC* (FLNRO, 2016) for any salvage work. The province does not typically issue permits for salvage during the overwintering period (i.e., October 31 to March 1).
- **Construction Response Protocol:** If amphibians or reptiles are encountered during construction, all activity must stop, and the QEP must be notified immediately.
- **Connectivity Measures:** Install wildlife crossing culverts, targeting herptiles and American badger, along the new Hollywood Road to maintain habitat connectivity and reduce road mortality.

8.7.3. Mammal Protection

Complete a wildlife sweep prior to construction to confirm no species at risk are present prior to construction. The need for a full salvage may be determined on site by the QEP depending on observed presence leading up to construction. A provincial General Wildlife Permit is required to handle small mammals and should be applied for proactively in case a salvage is needed.

To avoid attracting urban wildlife to the site, the Contractor should not feed animals encountered on the site and must ensure that food and edible materials are contained in appropriate bins and are removed from site at the end of each day. Any issues with nuisance wildlife should be recorded and reported to a Conservation Officer within 24 hours.

8.7.3.1. Bat Protection

Minimizing vegetation removal through the strategic placement of access/egress routes and by only removing vegetation necessary to complete works may reduce impacts to bats. General wildlife sweeps should be conducted ahead of construction for any incidental wildlife. The identified active roost sites (see *Appendix H*) will require mitigation during the roosting period from April 30th through September 1st. Sites should be re-surveyed to determine occupancy if work is planned during future roost periods (i.e., starting April 30, 2026). An additional potential roosting site was identified but was inaccessible at the time of the field investigations. Further investigation and acoustic monitoring are recommended prior to work occurring during the roosting period (April 30 – September 1) to explore this potential roost site and others.

8.7.3.2. American Badger Protection

If badgers are observed on site, they should not be harassed or bothered in any way. Work should cease and allow the individual to pass prior to recommencing construction. Limit the extent of damage to natural areas on the Project site to reduce impacts to habitat. Install exclusion fencing throughout the site to minimize risk of badger entry into the active construction area. A crossing targeting small- to medium-sized mammals, such as badger, should be installed to allow wildlife movement safely through the site (see Section 9.6.6).

8.7.4. Species at Risk Management

Wildlife species at risk with a high potential to be impacted by Project activities include monarch butterfly, painted turtle, Great Basin gophersnake, and western yellow-bellied racer. Wildlife sweeps shall be conducted prior to works to target these species.

8.7.4.1. Monarch Mitigation Measures

Milkweed plants should be retained where feasible. Where plants are impacted by the Project, transplantation should be carried out by a QEP. In addition, measures such as planting milkweed should be considered as part of site restoration efforts (*Appendix E*).

8.7.4.2. Western Painted Turtle

Impacts to western painted turtle populations may be mitigated through:

- **Habitat Avoidance:** Avoid disturbance to sandy clay soils that may serve as nesting habitat. No work is to occur within or adjacent to Carney Pond. If active nesting is identified during construction, the nest location shall be buffered by the QEP to prevent impacts to the nest.
- **Wildlife Passage:** Install one or more wildlife crossing culverts along the road alignment to facilitate turtle movement and reduce road mortality.
- **Pre-Construction Sweeps:** Conduct a targeted wildlife sweep prior to construction to locate and safely relocate any turtles from the work area.

8.7.4.3. Great Basin Gophersnake & Western Yellow-bellied Racer

Impacts to these species may be mitigated through (*see Appendix I*):

- Apply a minimum 15 m buffer around Carney Pond to restrict works directly adjacent to the pond. In addition, a 15 m buffer will also be applied to the unnamed wetland and a 30 m riparian buffer to Mill Creek. These buffers will likely be required under the City OCP as well so it is unlikely that works will be allowed to expand into this area.
- Install a temporary reptile restriction fence along the eastern edge of the worksite (ideally surrounding the worksite) to reduce the potential of reptile movement into the worksite. If this fence is restrictive to the Project, it may be substituted with an EM visually inspecting the site each day before works commence.
- Notify the EM immediately if a snake is found on site.
- Maintain a 100 m buffer around any potential den sites until a reptile specialist QEP is able to determine the presence of dens during spring emergence (April to mid-May). No hibernacula have been found within the Project area to date. If the QEP determines that the area is clear of hibernacula or overwintering sites, the 100 m buffer may be removed and works shall be allowed to continue.
- Install one to four wildlife crossings, targeting herptiles, beneath the road to maintain habitat connectivity.

Retention of high value structures such as the forested rocky areas containing less dense and more mature ponderosa pines should be prioritised for potential snake critical habitat. If required, restoration of shrubs and trees to this area will allow for some restoration to the ecosystem functionality at the Site.

Should a wildlife injury occur EQUAL Wildlife Rehabilitation (same operator; 250-488-7105) can be contacted directly after informing the conservation officer reporting service of the wildlife injury.



8.7.5. Wildlife Interactions

A zero-tolerance policy regarding the feeding of wildlife should be implemented to reduce interactions or conflicts. All domestic and food waste must be securely stored in an appropriate bin (to minimize odours and limit accessibility) until it is possible to safely dispose of it at an approved waste disposal site. The wildlife should not be harassed, including yelling, or trying to engage in order to get a photograph. Follow posted speed limits to avoid wildlife/vehicle collisions.

If necessary, steel plates will be placed over any excavations to be left open overnight. If any wildlife becomes trapped in an excavation despite the presence of the plates, work will be delayed until the wildlife can be captured and safely relocated to a suitable location outside the work site. Wildlife handling and removal will require a call to the Conservation Officers Service (Provincial) at 1-800-663-7867, or a local animal protection society (for dogs and other domesticated animals) or other qualified wildlife professional.

8.7.6. Wildlife Crossing and Fencing

Installation of wildlife crossing(s) and fencing is recommended to mitigate habitat fragmentation and reduce vehicle-wildlife collisions from the future road. Key design parameters for wildlife crossings include identifying target species, selecting an optimal site based on habitat use and movement patterns, and determining spacing between structures when multiple crossings are implemented. Appropriate wildlife crossing siting is essential for effective mitigation and to ensure structures are located to maintain wildlife habitat connectivity (Clevenger and Huijser 2011). Ideal crossing locations include areas along the highway with exclusion fencing, where site conditions support construction, and align with current and future wildlife movement patterns (Government of Alberta 2023a). Where feasible, incorporating multiple structures is recommended to maximize wildlife passage opportunities. Spacing between wildlife crossings may vary depending on target species, as well as the variability of landscape, terrain, and wildlife presence and habitat (Government of Alberta 2023a; Clevenger and Huijser 2011). Wildlife crossings are also most effective when integrated with exclusion fencing, which prevents wildlife from accessing roads and guides them toward designated crossing structures (Government of Alberta 2023b). Design of exclusion fencing may vary depending on the target species.

After identifying the target species and preferred crossing locations, the proposed designs were reviewed for engineering feasibility. Due to terrain and construction constraints, alternative crossing options were developed to support wildlife movement within the limits of site conditions.

8.7.6.1. Target Species

Wildlife to consider when installing a crossing includes amphibians, reptiles, and small and large mammals. For the Project, priority species to target include at-risk wildlife including herptiles such as Great Basin gophersnake, Great Basin spadefoot, and western painted turtle, as well as American badger. Another target species includes mule deer, which was documented during desktop-based research, observed during field surveys, and has winter range throughout the site.

8.7.6.2. Optimal Crossing Designs and Locations

Considering the target species, three design options are recommended for wildlife crossing and exclusion fencing, including:

- **Option 1 (Lowest Effort):** A single crossing targeting small- to medium-sized mammals, such as badger, modified to accommodate herptiles;
- **Option 2 (Medium Effort):** One to four crossings targeting herptiles, in addition to Option 1; or



- **Option 3 (Highest Effort):** One crossing targeting medium- to large-sized mammals, such as mule deer, combined with Option 1 and/or Option 2 crossings to accommodate herptiles.

Ideal crossing locations include areas along the roadway where site conditions support construction and align with current and future wildlife movement patterns (Government of Alberta 2023b). For more details on optimal crossing design specifications for each Option see *Appendix J*.

8.7.6.3. Feasible Crossings Selected

Due to elevation constraints and design requirements, two wildlife crossings were deemed feasible for the Project, including one targeting small- to medium-sized wildlife (i.e., Option 1) and one supplementary herptile crossing (i.e., Option 2) (*Figure 9*). Adjacent terrain slopes of 45–50% restrict the ability to construct additional crossings or install crossings with larger dimensions that may target large-sized wildlife, such as mule deer (i.e., Option 3). Furthermore, the extent of exposed bedrock near the southernmost section of the Project alignment limits the feasibility of additional herptile crossings.

Wildlife occurrence data indicate that the feasible crossing location is located near several species of interest. An American badger record is located roughly 65 m east of the proposed structure. For herptiles, the wildlife trail is situated approximately 100 m south, and common gartersnakes were observed during McElhanney field visits approximately 100 m east of the site. The feasible wildlife crossing is also situated near Carney Pond, supporting connectivity between the aquatic habitat and adjacent upland areas.

For more details on feasible crossing and fencing design specifications for each Option see *Appendix J*.

8.8. CONTRACTUAL IMPLEMENTATION OF ENVIRONMENTAL PROTECTIONS

The various BMPs provided throughout this report and in issued regulatory permits should be made available to bidders and included in the successful Tender such that environmental protection requirements are contractually enforceable. This includes identifying an EPP as a standard requirement for environmental conduct, to be implemented throughout the duration of the Project by the successful contractor.

8.9. EROSION AND SEDIMENT CONTROL

Clearing and grubbing increases the potential for erosion and sedimentation control (ESC) issues if exposed soils are left unabated. Construction staging, BMPs, and ESC measures are required for this Project.

The Contractor is to prepare a Site-specific ESC Plan outlining appropriate ESC measures and procedures for the work. The ESC plan must be implemented prior to engaging in any work in an area that may result in the discharge of sediment-laden water.

The project ESC plan should identify measures and BMPs to be implemented for the management of erosive soil surfaces and to prevent runoff of sediment laden water from the Project alignment. The Contractor will ensure that ESC measures are implemented prior to starting any construction related activity. The ESC Plans and implementation will be adjusted as needed to achieve regulatory compliance.

The Contractor will follow BMPs for ESC and will follow a specific multi-phase plan developed specifically for this Project. In general, ESC measures will employ BMPs in accordance with the Standards and Best Practices for Instream Works (WLAP 2022).

8.10. WATER QUALITY

The Federal *Fisheries Act* (Canada 1985) legislates that no deleterious substances may be released into fish-bearing waters. A substance is deleterious if it is harmful to fish or wildlife, if it limits the use of fish by humans, or if, by going through some process of degradation, it harms the soil or water quality (for example, oxygen-depleting wastes) (ECCC 2023a). A substance is also deleterious if it exceeds a level prescribed by regulation.

Surface water quality and construction water runoff must be discharged in compliance with all applicable legislation, regulations, standards, and guidelines for the protection of the aquatic environment.

Areas under federal jurisdiction are to achieve compliance with the standards outlined in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME 1999). Lands within provincial jurisdiction follow the standards for the protection of aquatic life outlined in the *BC Working Water Quality Guidelines* (MOECCS 2021b) and the *BC Approved Water Quality Guidelines* (MOECCS 2021a).

During instream work and bank stabilization work, an Environmental Monitor is required to be onsite full-time. Water quality monitoring will occur during this time. Measures to protect water quality for this Project will include:

- Accidental spill of deleterious substances such as uncured concrete, concrete wash water, fuel, oil, antifreeze / glycols, asphalt millings, or other spills from equipment working near storm sewer inlets.
- Runoff from erodible surfaces and stockpiles has the potential to enter storm sewer inlets potentially discharging 'deleterious' substances into the environment.



- Non-natural discharge of water, including surface water generated within Project limits, shall be compliant with the federal water quality guidelines for discharge into aquatic habitat.

8.11. MATERIAL STORAGE AND HANDLING

The Contractor must follow BMPs to allow for identification, labeling, safe handling, storage, transport and appropriate disposal of construction and hazardous materials utilized and wastes generated by the Project. The Contractor must manage all non-hazardous construction-related debris (e.g., metals, concrete, asphalt, stripped organic material, waste wood, organic material) appropriately. The EPP should outline BMPs for the storage, handling, and management of waste materials during Site preparation and construction activities. The potential laydown areas should also be indicated on a figure in the EPP.

8.12. SPILL MANAGEMENT

The Contractor shall implement measures to avoid or minimize potential contamination of the soil, groundwater, and surface water (overland flow) because of Project works and other operations including refueling of equipment. A detailed Spill Protection/Spill Response Plan will be developed by the Contractor and should include the following spill prevention measures:

- To the extent possible, use and/ or storage of paint, primers, fuels, rust solvents, degreasers, grout, poured concrete or other chemicals should be planned 30 m from a watercourse.
- When unavoidable activities near water use substances that are potentially deleterious, appropriate mitigation measures must be implemented so that these chemicals do not enter the water.
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keeps an emergency spill kit on site.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- Report any spills of sewage, oil, fuel, or other deleterious material whether near or directly into a water body
- Ensure clean-up measures are suitably applied so as not to result in further alteration of the shoreline.
- Clean up and appropriately dispose of the deleterious substances
- Maintain all machinery on site in a clean condition and free of fluid leaks to prevent any deleterious substances from entering the water.

The EPP should identify Project activities and locations where additional mitigations are required to protect water resources from leaks and spills. Storage and handling guidelines for controlled substances should also be addressed.

To assist the Contractor with the formulation of the Spill Response Plan, the following six steps for spill response have been provided as a guideline. Further technical assistance may be needed from a qualified professional.

Spill Response Steps

1. SAFETY FIRST
2. STOP THE FLOW (when possible)
3. SECURE THE AREA
4. CONTAIN THE SPILL
5. NOTIFY / REPORT (Emergency Management and Climate Readiness Program 1-800-663-3456)
6. CLEAN UP (Circumstances may dictate another sequence of events)



All environmental incidents or near-misses are reported to the City within 24 hours of the incident occurring. During an emergency spill event, personnel that are responsible for/or witnesses the spill (the Spill Observer) will be responsible for activating the spill notification procedures (Figure 10).

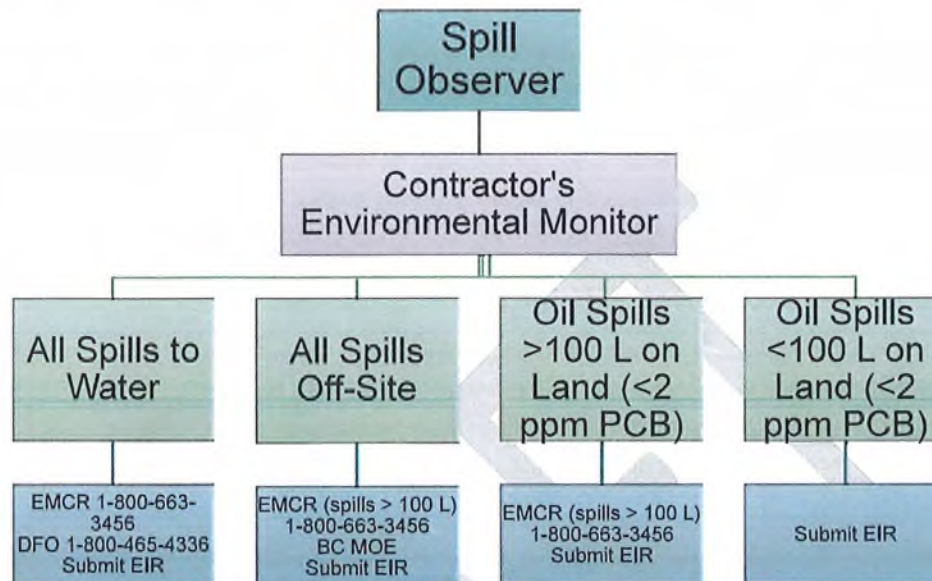


Figure 10. Spill Reporting Notification Chart

8.13. AIR QUALITY AND DUST CONTROL

The Contractor will conduct construction operations in as efficient a manner as possible to reduce double handling of materials thereby limiting the risk of dust production. Mechanical sweeping (with vacuum) will be used to keep dust and mud under control as per the approved ESC plans. Other potential air quality and dust control measures include:

- Minimizing equipment emissions by operating equipment at optimum-rated loads.
- Minimizing stockpile handling.
- Equipping haul trucks with a moveable fabric bed cover to be utilized to keep the wind off loads.
- Implementing erosion and sediment control BMPs to mitigate air contamination from windswept material.
- Utilizing block heaters rather than engine idling to prevent engine freeze.
- Prohibiting burning of refuse or other material related to the work site.

8.14. NOISE MANAGEMENT

Construction activities, including excavation and hauling of materials using heavy equipment can result in the production of noise which may disturb wildlife. The Contractor will ensure that no unnecessary noise is created during its work on the Project.

In addition, unnecessary noise can be mitigated through the implementation of BMPs. The following list contains several noise reduction BMPs that will be implemented by the contractor during all phases of construction:



- Maintain equipment in good working order
- Implement "Best Available Control Technologies" on equipment such as silencers and mufflers.
- Establish a speed limit to slow vehicles and mitigate noise generation.

8.15. ENVIRONMENTAL MONITORING AND QEP REQUIREMENTS

Requirements for Environmental Monitoring and QEP duties are included in the EPP; however, this critical role is included here for emphasis. The contractor's QEP will be responsible for environment compliance related to the contractor's work. This includes obtaining any required permits for wildlife sweeps or salvages and implementing other necessary BMP work, as required for environmental compliance. The contractor's QEP shall provide full-time environmental monitoring during works which are occurring in or around a Stream, as defined by the WSA, and daily monitoring during works within Very High value ESA areas.

8.16. POST-CONSTRUCTION MONITORING

Post-construction effectiveness monitoring of revegetated areas will be conducted following planting and will be completed annually for 3 years after. The applied monitoring requirements will include an annual survey by a QEP to evaluate vegetation establishment. Presence and extent of invasive species will also to be documented. Any species transplanted during the construction work will also be monitored at this time.

A post-construction monitoring summary report is to be prepared for each monitoring year. This will summarize the survivorship results of the compensation plan and restoration work. Reporting will include management recommendations as needed, to meet site habitat targets.

9. CLOSURE AND PROFESSIONAL STATEMENT

This EIA, supplemented by follow up field assessments and surveys identified by the EOA, has been prepared with information available at the time of writing. Due to the dynamic nature of wildlife habitat, the authors reserve the right to update the conclusions of the report at a later date, should conditions change, to evaluate potential impacts to environmental baseline conditions, ESAs, Critical Habitat, and species at risk.

We trust the information provided is sufficient to meet your needs at this time. Should there be any questions regarding the information within, please do not hesitate to contact the undersigned.

Yours truly,

McELHANNEY LTD.

Prepared by:

DRAFT

Rachel Hodgson, BIT
Junior Biologist
rhodgson@mcelhanney.com

DRAFT

Gina Le Bel, RPBio.
Biologist
glabel@mcelhanney.com

DRAFT

Amanda Hamilton, RPBio.
Biologist
ahamilton@mcelhanney.com

DRAFT

Jill Bisaro, RPBio
Biologist
jbisaro@mcelhanney.com

Reviewed by:

DRAFT

Courtney Lahue, RPBio.
Wildlife Biologist
clahue@mcelhanney.com

DRAFT

Thomas Fita, RPBio.
Senior Biologist
tfita@mcelhanney.com

DRAFT

Lisa DeSandoli
Senior Biologist
lsandoli@mcelhanney.com



10. REFERENCES

- Animalia. 2022a. American Badger. Retrieved from: [American Badger - Facts, Diet, Habitat & Pictures on Animalia.bio](#)
- Associated Environmental (AE). 2023. Environmental review memo to support re-zoning and subdivision. Available upon request.
- British Columbia Badger Recovery Team. 2008. Recovery plan for American Badger (*Taxidea taxus*) in British Columbia. Prepared for the B.C. Ministry of Environment, Victoria, B.C. 36 pp. Retrieved from: https://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/badger_jeffersonii_rcvry_strat18092008.pdf#:~:text=Species%20at%20risk%20recovery%20is%20the%20process%20by%20which%20the
- BC Conservation Data Centre (CDC). 2009. Ecological Community Summary: *Puccinellia nuttalliana* - *Hordeum jubatum*. B.C. Minist. of Environment. Available: <https://a100.gov.bc.ca/pub/eswp/>
- BC Conservation Data Centre (CDC). 2010. Ecological Community Summary: *Populus trichocarpa* / *Symphoricarpos albus* - *Rosa* spp. B.C. Minist. of Environment. Available: <https://a100.gov.bc.ca/pub/eswp/>
- British Columbia (BC). 2014. Procedures for Mitigating Impacts on Environmental Values. Version 1.0. Accessed from: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-policy-legislation/environmental-mitigation-policy/em_procedures_may27_2014.pdf
- British Columbia (BC). 2014. Develop with Care. Accessed from: <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/laws-policies-standards-guidance/best-management-practices/develop-with-care>
- BC Conservation Data Centre (CDC). 2020. Ecological Community Summary: *Typha latifolia* Marsh. B.C. Minist. of Environment. Available: <https://a100.gov.bc.ca/pub/eswp/>
- Government of Canada (Canada) 1985. *Fisheries Act* (RSC 1985, c. F-14). <https://laws-lois.justice.gc.ca/eng/acts/F-14/>
- Canada, Government of (Canada). 1994. *Migratory Birds Convention Act*. Retrieved from: <http://laws-lois.justice.gc.ca/PDF/M-7.01.pdf>
- Canada, Government of (Canada). 2002. *Species at Risk Act (SARA)*. Retrieved from: <https://laws.justice.gc.ca/eng/acts/S-15.3/>
- Clevenger A.P., and M.P. Huijser. 2011. Wildlife Crossing Structure Handbook Design and Evaluation in North America. U.S. Department of Transportation. Bozeman, MT. Accessed from: https://westerntransportationinstitute.org/wp-content/uploads/2016/08/425259_Final_Report_Updated.pdf
- Community Mapping Network (CMN). 2024. Okanagan Habitat Atlas. Retrieved from: <https://cmnmaps.ca/OKANAGAN/>
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2010. COSEWIC Annual Report on the Monarch *Danaus Plexippus* in Canada. Retrieved from: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Monarch_0810_e1.pdf
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2011. COSEWIC Annual Report 2011-2012. Retrieved from [COSEWIC Annual Report – 2011-2012 - Canada.ca](#)



- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2013. COSEWIC Annual Report on the Great Basin Gophersnake *Pituophis catenifer deserticola* in Canada. Retrieved from: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Monarch_0810_e1.pdf
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2014. COSEWIC assessment and status report on the Western Bumble Bee *Bombus occidentalis*, *occidentalis* subspecies (*Bombus occidentalis occidentalis*) and the mckayi subspecies (*Bombus occidentalis mckayi*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 52 pp. Accessed from: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Western%20Bumble%20Bee_2014_e.pdf
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015. COSEWIC assessment and status report on the Eastern Yellow-bellied Racer *Coluber constrictor flaviventris* and Western Yellow-bellied Racer *Coluber constrictor mormon* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvii + 64 pp. Retrieved from: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Eastern_%20and%20Western%20Yellow-Bellied%20Racers_2015_e.pdf
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2019. COSEWIC Annual Report on the Great Basin Spadefoot (*Spea intermontana*) in Canada 2019. Retrieved from: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/great-basin-spadefoot-2019.html>
- City of Kelowna (CoK). 2024. 2040 Official Community Plan. Retrieved from: <https://www.kelowna.ca/our-community/planning-projects/2040-official-community-plan>
- City of Kelowna. No Date. Terms of reference for report preparation: Environmental assessment. Retrieved from: [app_a_environmental_assessment_new.pdf](app_a_environmental_assessment_new.pdf) (kelowna.ca)
- eBird. 2024. Kelowna Carney Pond. eBird online mapping of species observations data. Cornell Lab of Ornithology, Cornell University. <https://ebird.org/hotspot/L1810768/bird-list>
- Environment and Climate Change Canada (ECCC). 2017. Recovery Strategy for the Western Rattlesnake (*Crotalus oreganus*), the Great Basin Gophersnake (*Pituophis catenifer deserticola*) and the Desert Nightsnake (*Hypsiglena chlorophaea*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. Part 1, 28 pp., Part 2, A. 37 pp., B. 36 pp., C. 28 pp.
- Environment and Climate Change Canada (ECCC). 2018. Management Plan for the Western Painted Turtle (*Chrysemys picta bellii*) Intermountain – Rocky Mountain population in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. 2 parts, 4 pp. + 31 pp.
- Google Earth. 2024. Aerial and Roadside Photograph Imagery for Hollywood Road, Kelowna, BC.
- Government of Alberta. 2023a. Guideline for planning wildlife crossing structures. Alberta Transportation and Economic Corridors. Accessed from: <https://open.alberta.ca/dataset/f2011dd9-e5fe-451c-b41c-9854fd5d7de6/resource/ea3c3cac-7d8d-4627-af58-e87f6f01215a/download/tec-guideline-planning-wildlife-crossing-structures.pdf>
- Government of Alberta. 2023b. Guideline for planning wildlife exclusion fencing. Alberta Transportation and Economic Corridors. Accessed from: <https://open.alberta.ca/dataset/342b0759-c427-43b5-bd8f-cdf0dcd87c2a/resource/c98d172c-6869-49d2-a51c-0e0a1e5a9845/download/tec-guideline-planning-wildlife-exclusion-fencing.pdf>
- Hope, G.D., W.R. Mitchell, D.A. Lloyd, W.R. Erickson, W.L. Harper, and B.M. Wikeem. 1991. Ponderosa Pine Zone. Ecosystems of British Columbia. B.C.Min. Victoria, B.C. Chapter 9, pp. 139-151. Accessed from: <https://www.for.gov.bc.ca/hfd/pubs/docs/Srs/Srs06/chap9.pdf>



Huijser, M.P., A.V. Kociolek, T.D.H. Allen, P. McGowen. 2015. Construction Guidelines for Wildlife Fencing and Associated Escape and Lateral Access Control Measures. Western Transportation Institute – Montana State University. Lakewood, CO. Accessed from: https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25%2884%29_FR.pdf

Important Bird Areas Canada (IBA Canada). 2024. Mapping. Retrieved from: [Canadian Important Bird Areas \(ibacanada.ca\)](https://ibacanada.ca)

iNaturalist. 2024. Milkweed Tracker of Central Okanagan. Accessed from: <https://inaturalist.ca/projects/milkweed-tracker-of-central-okanagan>

MacKenzie, W.H. and J.R. Moran. 2004. Wetlands of British Columbia: a guide to identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Handb. No. 52. Accessed from: <https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh52.htm>

McElhanney Engineering Services Ltd. (McElhanney). 2025. Progressive Design Build – Hollywood 2 and Hollywood 7 Environmental Overview Assessment: Hollywood Road Kelowna, BC

Ministry of Environment (MoE). 2025. Inventory Methods for Medium-sized Territorial Carnivores: Badger. Standards for Components of British Columbia's Biodiversity No. 25a. Accessed from: <https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/badger.pdf>

Ministry of Environment and Climate Change Strategy and Thompson Rivers University (MECCS & TRU). 2025. B.C. Reptiles and Amphibians. Accessed from: <https://bcreptilesandamphibians.ca/>

Ministry of Forests (MoF). 2024. Biogeoclimatic Maps. Retrieved from: BEC WEB (gov.bc.ca)

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia. Accessed from: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2014. Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia. Retrieved from: https://www.env.gov.bc.ca/wld/documents/bmp/HerptileBMP_complete.pdf

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2016. Best Management Practices for Amphibian and Reptile Salvages in British Columbia. Version 1.0., June 2, 2016. Accessed from: <https://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do;jsessionid=D6203B8626E4009E9C7ABD1ACFE17B84?subdocumentId=10351>

Ministry of Water, Land, and Resource Stewardship (MWLRS). 2025. Best Management Practices for Badgers in British Columbia. Accessed from:



https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/badgerculverts_bmp2025.pdf

Ministry of Water, Land and Air Protection (WLAP). 2022. Requirements and Best Management Practices for Making Changes In and About a Stream in British Columbia. Version 2022.01. Government of British Columbia. Accessed from: <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/wsa-cias-requirements-bmps.pdf>

Nature Canada. 2019. American Badger. Retrieved from: [American Badger - Nature Canada](#)

Personal Communications: Sirajul Mustafa, BC Conservation Data Centre

Province of British Columbia (BC). 1996a. Wildlife Act. Retrieved from [Wildlife Act \(gov.bc.ca\)](#)

Province of British Columbia (BC). 1996b. *Weed Control Act*. Retrieved from [Weed Control Act \(gov.bc.ca\)](#)

Province of British Columbia (BC). 2014. *Water Sustainability Act*. Retrieved from: [Water Sustainability Act \(gov.bc.ca\)](#)

Province of British Columbia (BC). Ministry of Environment. 2024a. iMapBC online mapping resource tool. Retrieved from: <https://maps.gov.bc.ca/ess/hm/imap4m/>

Province of British Columbia (BC). Ministry of Environment. 2024b. Habitat Wizard. Retrieved from: <https://maps.gov.bc.ca/ess/hm/habwiz/>

Province of British Columbia (BC). Ministry of Environment. 2024c. Fish Inventories Data Queries. Retrieved from: <https://a100.gov.bc.ca/pub/fidq/welcome.do>

Province of British Columbia (BC). Ministry of Environment. 2024d. BC species and ecosystems explorer. Retrieved from <https://a100.gov.bc.ca/pub/eswp/>

Province of British Columbia (BC), Ministry of Environment & Thompson Rivers University (MoE & TRU). No Date (N.D.a). BC Reptiles and Amphibians. Western yellow-bellied racer. Retrieved from <https://bcreptilesandamphibians.ca/western-yellow-bellied-racer/>

Province of British Columbia (BC), Ministry of Environment & Thompson Rivers University (MoE & TRU). No Date (N.D.b) BC Reptiles and Amphibians. Desert Nightsnake. Retrieved from <https://bcreptilesandamphibians.ca/desert-nightsnake/>

Province of British Columbia (BC). 2025. InvasivesBC. Accessed from: <https://invasivesbc.gov.bc.ca/Landing>

Urban Systems (1998). Wetland Habitat Management Strategy. Accessed from: https://www.kelowna.ca/sites/files/1/docs/community/wetland_habitat_management_strategy.pdf

