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December 19, 2022
File: 2022-8287-000

Kirk Densmore
Environmental Services Coordinator
Ministry of Transportation & Infastructure
447 Columbia St.
Kamloops, BC V2C 2T3

Re: ENVIRONMENTAL ASSESSMENT FOR MCINTYRE BRIDGE UPGRADE, HIGHWAY 97

Dear Mr. Densmore:

Associated Environmental Consultants Inc. (Associated) completed this environmental assessment (EA) on behalf of the BC Ministry of Transportation and Infrastructure. The Ministry plans to upgrade McIntyre Bridge on Highway 97, located 8 km north of the Town of Oliver, BC (Figure 1). Stantec was retained to complete a conceptual design, while McElhanney was retained to complete the functional and detailed design for the bridge upgrade, which includes re-decking, widening, and repairs to the underside of the bridge (the Project).

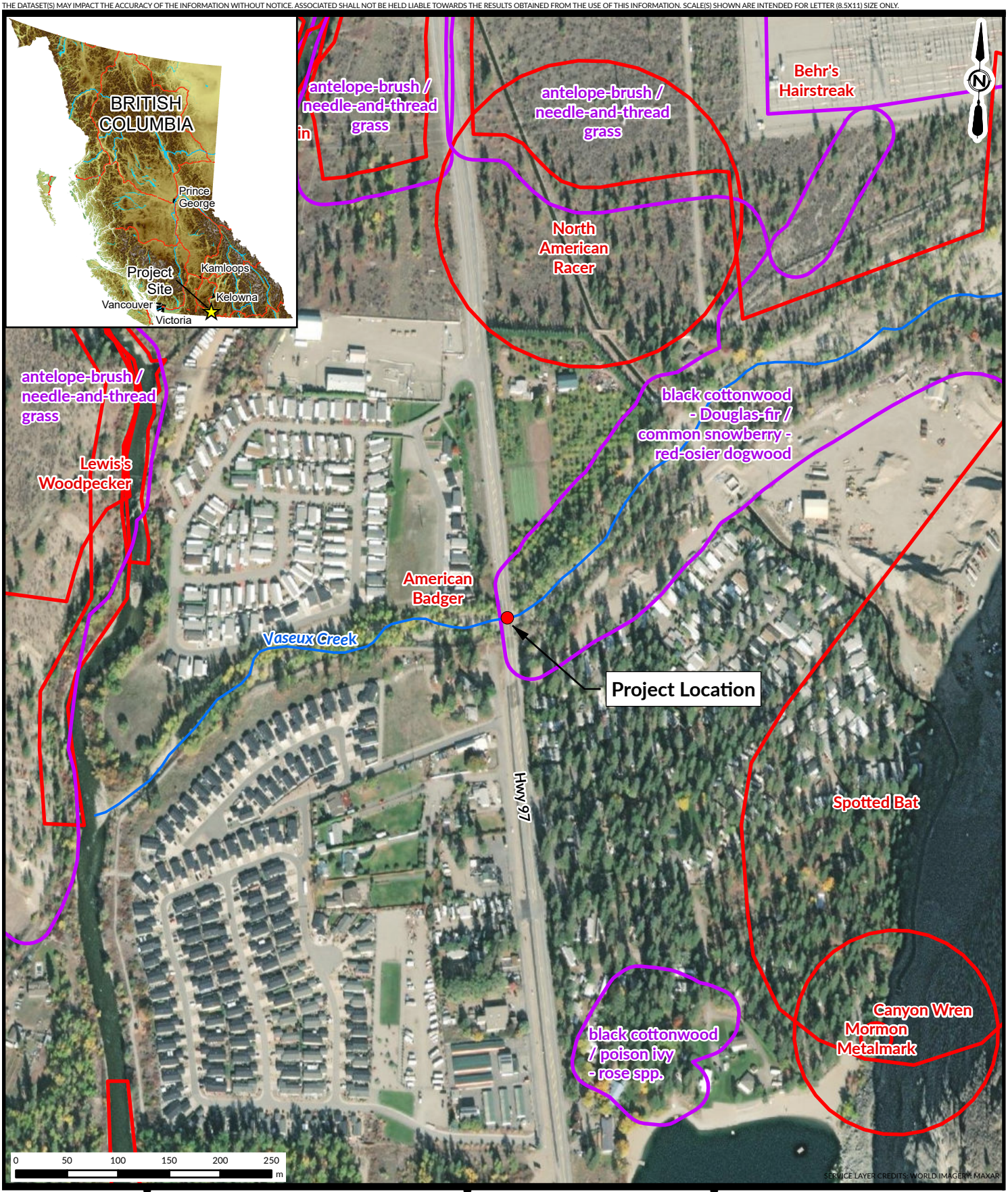
This report describes the existing aquatic and terrestrial environment, based on a background review and field assessment. Project effects are evaluated and mitigation measures related to Project construction are recommended to minimize Project-related effects.

This EA has been prepared in conjunction with the Project's conceptual design and is used to support and guide Project planning.

1 PROJECT DESCRIPTION

McIntyre Bridge is a two-lane, three-span bridge constructed in 1954, located over Vaseux Creek on Highway 97. The bridge is approximately 30.75 m long, with a 7.92 m clear roadway width.[1] In 2008 a 2.3 m clear steel grate sidewalk was constructed on the west side of the bridge. The existing bridge deck must be replaced to comply with the Canadian Highway Bridge Design Code (CAN/CSA S6-19) and the Ministry of Transportation and Infrastructure's supplement to CAN/CSA S6-19, as outlined in Stantec 2022.[1]

[1] Stantec. 2022. McIntyre Creek Bridge No. 255 – Deck Replacement Conceptual Design Memo – Draft.



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LEGEND

- McIntyre Bridge
- Vaseux Creek

Species & Ecological Communities at Risk

- Wildlife
- Ecological Community

AE PROJECT NO.	2022-8287
SCALE	1:5,000
COORD. SYSTEM	NAD 1983 UTM ZONE 11N
DATE	2022-11-29
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FIGURE 1: PROJECT LOCATION & SPECIES & ECOLOGICAL COMMUNITIES AT RISK

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

MCINTYRE BRIDGE UPGRADE, ENVIRONMENTAL ASSESSMENT

The Project includes the following upgrades:

1. Replace the existing single-lane concrete bridge deck and steel grate sidewalk (11.28 m wide) with a new, two-lane, cast-in-place composite concrete deck slab (10.68 m wide); and
2. Recoat the existing lead paint on the girders with lead-free paint.

The Project will not include any geotechnical or subsurface work. All works will take place above the creek, and there will be no instream works. Effort will be made to maintain single alternating traffic during construction.

1.1 Assessment Scope and Objectives

The scope of this EA focuses on the proposed McIntyre Bridge upgrades on Highway 97 and includes lands within 200 m of the Project centreline (Project Area). This EA focuses on the environmental impacts of the Project only.

The objectives of this EA are to assess the potential environmental impacts of the Project and to develop strategies to avoid, minimize, or restore potential impacts. Specific objectives are outlined below.

- Describe the baseline ecological environment in the Project Area.
- Identify the potential environmental effects of the Project.
- Determine mitigation strategies and procedures to avoid, minimize, or restore any identified effects.

1.2 Regulatory Context

Under Section 2 of the *Physical Activities Regulations*, SOR/2019-285, of the *Impact Assessment Act*, SC 2019, c. 28, this bridge upgrade Project is not considered a "designated project" and thus does not trigger an assessment under the *Impact Assessment Act*. However, the Project is governed by several federal and provincial laws and regulations. Below is a summary of the key acts and regulations applicable to the Project and to the EA process.

Table 1 Legislation Applicable to the Project

Legislation	How it applies
	Municipal
Sensitive Ecosystem	The Project is in the Regional District of Okanagan-Similkameen. The Project footprint is not located in an environmentally sensitive development permit area. The Project is entirely located within the Ministry of Transportation and Infrastructure's highway right-of-way.
	Federal
Species at Risk Act	The purpose of the *Species at Risk Act* (SARA), SC 2002, c. 29, is to prevent indigenous Canadian species, subspecies, and distinct populations of wildlife from becoming extirpated or extinct. Several species listed on Schedule 1 of SARA are known to occur in the general area of the Project. Mitigation measures are proposed to avoid impacts on species at risk. A permit under SARA is not expected to be required.
Migratory Birds Convention Act, 1994	The federal *Migratory Birds Convention Act*, SC 1994, c. 22, protects migratory birds and nests from indiscriminate harvesting and destruction. The *Migratory Birds Regulations* 2022 protect the nests of 18 migratory birds listed on Schedule 1 of the Regulations (including pileated woodpecker and great blue heron). Mitigation measures are proposed to avoid impacts on migratory birds.
	Provincial
Wildlife Act and *Wildlife Amendment Act*	The *Wildlife Act*, RSBC 1996, c. 488, protects vertebrate animals from direct harm, except as allowed by regulation (e.g., hunting or trapping). In 2004 the *Wildlife Amendment Act* (Bill 51 – 2004) was passed to protect and recover certain species at risk identified by Cabinet, making it an offence to kill, harm, harass, or capture an animal considered at risk. Mitigation measures are proposed to avoid impacts on wildlife.
Water Sustainability Act	The *Water Sustainability Act* (WSA), SBC 2014, c. 15, was brought into force on February 29, 2016 to ensure a sustainable supply of fresh, clean water that meets the needs of BC residents today and in the future. The WSA is the principal law for managing the diversion and use of water resources.

Legislation	How it applies
	Section 11 Notification under the WSA is required for works in and about a stream. The Notification should be submitted for this Project a minimum of 45 days before construction is commenced.
Weed Control Act	The *Weed Control Act*, RSBC 1996, c. 487, designates provincially and regionally noxious weeds (Schedule A) and the associated regulations. The Act provides guidelines for the prevention and management of noxious weeds. Under Schedule B of the Act, if noxious weeds are found in an area, a notice to the occupier to control weeds can be issued. If the weeds are not controlled, action will be taken to control the weeds at a cost to the occupant. Mitigation measures are proposed to minimize the introduction of weeds to the property and the spread of weeds off the property, and to manage existing weeds.

2 ASSESSMENT METHODS

Baseline environmental conditions were compiled by reviewing existing reports relevant to the Project and the immediate surrounding areas, and by conducting online provincial and federal database searches, including but not limited to:

- Aerial photos and maps of the Project Area;
- Ecosystems of British Columbia[2] for biogeoclimatic zone and subzone information;
- A Field Guide to Ecosystem Classification and Identification for Southern British Columbia – Volume 1: The Southern Thompson-Okanagan (Interim version);[3]
- BC Species and Ecosystems Explorer database[4] search for species and ecological communities at risk;

[2] Hope, G.D., W.R. Mitchell, D.A. Lloyd, W.R. Erikson, W.L. Harper, and B.M. Wilkeem. 1991. Chapter 10: Interior. Douglas-fir Zone. In D. Meidinger and J. Pojar (Eds.), Ecosystems of British Columbia (pp. 154-166). B.C. Ministry of Forests, Victoria.

[3] Ryan, M., D. Lloyd, and K. Iverson. 2021. A Field Guide to Ecosystem Classification and Identification for Southern British Columbia – Volume 1: The Southern Thompson-Okanagan. Prov. B.C. Victoria, BC. Land Manag. Handb. 76 (Interim version).

[4] Conservation Data Centre (CDC). 2022. BC Species and Ecosystems Explorer. Ministry of Sustainable Resource. Management. Victoria, BC. Available at: http://a100.gov.bc.ca/pub/eswp/ Accessed November 2022.

- iMapBC online database[5] for masked and unmasked occurrences, fish, aquifer, and well information; and
- Fish Inventories Data Queries.[6]
- Sensitive Ecosystem Inventory Okanagan Valley, Vernon to Osoyoos, 2000-2007.[7]

Associated's Stephanie Murphy, M.Sc., R.P.Bio., conducted a field assessment on August 26, 2022. Data collected during the field assessment included site condition (disturbance, invasive species), vegetation and ecosystems present, and wildlife habitat suitability. All wildlife signs, features (e.g., stick nests, wildlife trees), and sightings were recorded. See Appendix A for site photographs.

Data compiled during the field surveys were used to determine potential environmental effects and develop mitigation measures. Specific measures are provided in this letter to avoid, minimize, restore on site, or offset the environmental effects of the Project.

3 EXISTING ENVIRONMENT

3.1 Aquatic Resources

The McIntyre Bridge spans Vaseux Creek, which originates in the Okanagan Highlands to the east and generally flows west and southwest through Vaseux Protected Area. Shortly after passing under Highway 97, Vaseux Creek joins Okanagan River. The Okanagan River flows south into Osoyoos Lake just north of Osoyoos, BC. The Vaseux Creek watershed is approximately 296 km^2 [8] and has one main tributary, Solco Creek.[9] The lower portion of Vaseux Creek was straightened and diked for flood control purposes in the 1950s.[10]

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[5] DataBC. 2022. iMapBC. Available at: http://maps.gov.bc.ca/ess/sv/imapbc/ Accessed November 2022.

[6] Fish Inventory Data Query. 2022. Available at Fisheries Inventory Data Queries (FIDQ) - Province of British Columbia (gov.bc.ca) Accessed September 14, 2022.

[7] Iverson, K., D. Curran, T. Fleming and A. Haney. 2008. Sensitive Ecosystems Inventory – Okanagan Valley: Vernon to Osoyoos, 2000 – 2007. Methods, Ecological Descriptions, Results and Conservation Tools. Technical Report Series No. 495, Canadian Wildlife Service, Pacific and Yukon Region, British Columbia.

[8] Okanagan Basin Monitoring and Evaluation Program (OBMEP). 2019. Okanogan Basin Monitoring and Evaluation Program, 2018 Annual Progress Report. Colville Confederated Tribes Fish and Wildlife Department, Nespelem, WA. Report submitted to the Bonneville Power Administration, Project No. 2003-022-00.

[9] Associated Environmental Consultants Inc. (Associated). 2016. Collaborative Development of Methods to Set Environmental Flow Needs in Okanagan Streams. Working Document Version 1. Prepared for Okanagan Basin Water Board. Available at OBWB_EFN_May2016_mainreport.pdf

[10] Okanagan Nation Alliance (ONA). 2020. Environmental Flow Needs Assessment in the Okanagan Basin. Prepared for Okanagan Basin Water Board. Available at Phase 2 Report – Okanagan Basin Water Board (obwb.ca).

Vaseux Creek is an important fish-bearing creek, providing salmonid rearing (feeding or resting) and spawning habitat. There are records of rainbow trout both up and downstream of the bridge crossing.[5] Table 2 lists the fish species known to occur in Vaseux Creek. The creek is also available to chinook, kokanee, and coho salmon populations downstream in Okanagan River.[5] A natural barrier to fish migration is located approximately 5 km from the mouth, marking the extent of available habitat to anadromous salmon populations.[4]

Table 2
Fish Species Known to Occur in Vaseux Creek[6]

Common Name	Scientific Name
Bridgelip sucker	*Catostomus columbianus*
Longnose dace	*Rhinichthys cataractae*
Mountain whitefish	*Prosopium williamsoni*
Prickly sculpin	*Cottus asper*
Rainbow trout	*Oncorhynchus mykiss*
Sockeye salmon	*Oncorhynchus nerka*

The lowest reach of Vaseux Creek (from McIntyre Bridge down to the mouth) has been subjected to intense urban encroachment, significant modification, and riparian function impairment. This reach of the stream has been straightened with corresponding diking and complete bank armouring. Such modifications limit the creek's ability to regularly interact with riparian areas, thus riparian vegetation has been reduced to light tree cover, and large woody debris is lacking. During freshet flows, Vaseux Creek frequently floods side channel areas, but in summer, flow is reduced to a very localized thalweg profile. Low summer flows are exacerbated by significant water withdrawals, and Vaseux Creek frequently runs dry upstream of McIntyre Bridge.[5]

At the time of the field assessment, the wetted width of Vaseux Creek was between approximately 8 and 10 m, and the channel width was approximately 14 m. The gradient at the bridge crossing is low, and the stream substrate is predominantly large cobbles. Some instream vegetation is present, along with shallow pools, but only trace amounts of boulders and woody debris. Two riffle and two glide transects were previously installed in the lowest 1 km reach of Vaseux Creek between Highway 97 and its confluence with Okanagan River.[5] As the Project will not require instream works, impacts on water quality, fish, and fish habitat are likely to be minor.

3.2 Vegetation and Ecosystems

The Project is in the Okanagan Very Dry Hot Bunchgrass (BGxh1) biogeoclimatic zone. The BGxh1 is limited in extent, covering only the Okanagan Valley floor from the south end of Vaseux Lake to the US border at Osoyoos. It also occurs along the Similkameen Valley from Keremeos south to the US border. The BGxh1 occurs from valley bottom (260–400 m) to approximately 375 to 475 m on cool and neutral aspects and 400 to 500 m on warm aspects. It is one of the driest and hottest geographic areas in Canada. Extreme drought during much of the growing season is responsible for the shrub steppe and grassland vegetation.[3]

The sensitive ecosystem inventory polygons label the Project footprint as RZ – Road Surface. The habitat upstream of the Project footprint is labelled as 60% riparian riverbed, 20% coniferous woodlands, and 20% riparian creek bench; the structural stage includes 1 (riverbed) and 5 (coniferous forest). The habitat downstream of the Project footprint is labelled as 70% riparian riverbed and 30% riparian creek bench; the structural stage includes 1 (riverbed) and 6 (creek bench).

In general, the width of the riparian vegetation in the Project Area is thin and mostly consists of black cottonwood (*Populus trichocarpa*), ponderosa pine (*Pinus ponderosa*), trembling aspen (*Populus tremuloides*), red alder (*Alnus rubra*), and mountain-ash (*Sorbus aucuparia*). The shrub layer is composed of smooth sumac (*Rhus glabra*), wild sarsaparilla (*Aralia nudicaulis*), common rabbit-brush (*Ericameria nauseosa* var. *speciosa*), and tall Oregon grape (*Mahonia aquifolium*). The forb/herb layer is heavily dominated by invasive species such as cheatgrass (*Bromus tectorum*) and other agronomic grasses, baby's breath (*Gypsophila paniculate*), and oceanspray (*Holodiscus discolor* var. *discolor*). Native forbs include yarrow (*Achillea millefolium*) and needle-and-thread grass (*Hesperostipa comata*). The site series at the Project location was determined to be 110 – Py – Sumac – Mock-orange but is highly disturbed. Site series 110 has a typical soil moisture regime of 4 to 5 and is a forested site that occurs in gullies, on gentle lower slope fans, and on toe slopes and level areas where soils have a high coarse fragment content, with intermittent subirrigation associated with small streams.[3]

3.2.1 Plant Species and Ecological Communities at Risk

Six plant species at risk have the potential to occur in the Project Area, based on habitat types in the Project Area and on geographical search criteria.[4] Three of these are provincially Red-listed, three are Blue-listed, and three are listed on Schedule 1 of *Species at Risk Act* (SARA), SC 2002, c. 29 (Table B1 in Appendix B). Seven plant species at risk have been previously recorded within 5 km of the Project Area[5] (Table B2). All plant species at risk have either low or moderate potential to occur in the Project Area, based on habitat suitability and level of existing disturbance. No rare plants were identified during the field assessment within the Project Area, although a dedicated rare plant assessment was not conducted. Given the lack of instream works and the existing level of roadside disturbance, no rare plants are expected to be affected by the Project.

Thirteen ecological communities at risk have potential to occur in the Project Area, based on habitat types in the Project Area and on geographical search criteria[4] (Table B3). Ten of these are provincially Red-listed, and three are Blue-listed. There are 12 ecological communities at risk previously recorded within 5 km of the Project;[5] however, only five of these are associated with riparian ecosystems (Table B4). One of these ecological communities, terrestrial ecosystem mapping identified Black cottonwood - Douglas-fir / common snowberry - red-osier dogwood (*Populus trichocarpa - Pseudotsuga menziesii / Symphoricarpos albus - Cornus sericea*) as occurring immediately upstream of the bridge[5] (Figure 1). This ecosystem was not observed during the field assessment and given the level of disturbance present and the restricted work area (roadside shoulders), the Project is unlikely to affect any ecosystems as risk.

3.3 Wildlife and Wildlife Habitat

The south Okanagan supports some of the most at-risk wildlife species in Canada and is one of the most important areas for wildlife conservation in BC. The warm climate, extensive grassland and riparian ecosystems, and low-relief landscape have allowed wildlife from more southern latitudes to colonize this area.[3]

The Project has the potential to affect birds and bats that prefer to nest/roost under bridges, such as America dipper (*Cinclus mexicanus*) and Californian myotis (*Myotis californicus*), as well as other semi-aquatic species such as river otter (*Lontra canadensis*) and wildfowl. Herptile species such as common garter snake (*Thamnophis sirtalis*) and long-toed salamander (*Ambystoma macrodactylum*) may be encountered under the bridge deck, along the creek bank, or in stream. Vaseux Creek acts as a wildlife corridor for medium- and large-ranging mammals, providing valuable habitat connectivity in an area highly affected by human disturbance.

Deer tracks were observed under the bridge during the field assessment, along with scat that is likely from a mustelid such as American mink (*Neovison vison*), long-tailed weasel (*Mustela frenata*), or otter. A structure was found under the bridge that looked to be a bed-down area for a small mammal, appearing to be an otter “couch” (Appendix A). It was a slightly raised area composed of sand, mud, and bark. There was no evidence of birds or bats roosting under the bridge; however, this should be confirmed again immediately before construction. There is an old cottonwood snag (dead standing tree) on the northwest side of the bridge, which likely provides habitat for wildlife.

The area under the bridge appears to be occasionally used by humans, as there was trash such as beer cans, cigarette butts, and tires present.

3.3.1 Wildlife Species at Risk

Black cottonwood and trembling aspen floodplain forests are important habitats for many at-risk bat species, including the fringed myotis (*Myotis thysanodes*) and western small-footed myotis (*Myotis ciliolabrum)*, which hunt insects over riparian areas and adjacent grassland and shrub steppe areas. Other at-risk species include secondary-cavity nesters, such as the western screech-owl (*Megascops kennicottii macfarlanei)* and Lewis's woodpecker (*Melanerpes lewis*).[3] The dry grasslands and rocky outcrops of the south Okanagan are home to several at-risk snake species. North American racer (*Coluber constrictor*) is known to occur north of the Project footprint (Figure 1).

There are 59 wildlife species at risk with the potential to occur in the Project Area, based on habitat types in the Project Area and on geographical search criteria.[4] Seventeen of these are provincially Red-listed, 38 are Blue-listed, and 25 are listed on Schedule 1 of SARA (Table B5). Twenty-four wildlife species at risk have been previously recorded within 5 km of the Project Area[5] (Table B6). Several of these may use the Project Area for foraging, such as the spotted bat (*Euderma maculatum)*, canyon wren (*Catherpes mexicanus*), and Lewis's woodpecker (*Melanerpes lewis*). Most, however, are not expected to nest or roost or breed in the immediate area due to specific habitat requirements that are not found in the Project Area. For example, spotted bat and canyon wren may occur in a variety of habitats but only roost and nest in caves and cliffs. Nesting trees of Lewis's woodpecker are strongly associated with fire-maintained, old-growth ponderosa pine, which occur in the general area (west of the Okanagan River and around McIntyre Bluff) but will not be affected by the Project.

Western tiger salamander (*Ambystoma mavortium)* is provincially Red-listed and ranked as Endangered on Schedule 1 of SARA. It can occur throughout the southern Okanagan within 650 m of suitable aquatic breeding sites. Incidental sightings and roadkill have been found along Highway 97 near Oliver.[4] Although they mostly breed in lakes, reservoirs, and ponds, they may also breed in stream pools. Temporary pools along Vaseux Creek may provide suitable breeding habitat in low-water years.

Mitigation measures are provided in Section 5 to protect wildlife should any be encountered during Project work.

4 POTENTIAL PROJECT EFFECTS

Potential effects of the Project are confined to the construction phase, and no additional effects during bridge operation are anticipated after the Project is complete. Potential effects of the Project on aquatic resources include:

- degradation of water quality as a result of erosion, sedimentation, and/or spills; and
- degradation of riparian habitat value for fish because of channel bank disturbance or removal of riparian vegetation.

Potential effects of the Project on vegetation and ecosystems include:

- disturbance of riparian vegetation;
- disturbance of ecosystems at risk; and
- habitat degradation though the spread or introduction of invasive plant species.

Potential effects of the Project on wildlife and wildlife habitat include:

- wildlife mortality through incidental take or disturbance during breeding season;
- disturbance of wildlife habitat through tree removal or ground disturbance;
- indirect disturbance and/or displacement of wildlife during construction; and
- wildlife habitat degradation though the spread or introduction of invasive plant species.

5 MITIGATION MEASURES

The following mitigation measures are recommended to avoid, reduce, or offset Project effects on aquatic resources, vegetation and ecosystems, and wildlife and wildlife habitat.

5.1 GENERAL MITIGATION

- Follow the 2020 Standard Specifications for Highway Construction, Section 165: Protection of the Environment[11] and Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development.[12]
- Retain an adequately qualified professional (AQP)[13] who has the authority to stop construction activity that contravenes mitigation recommendations or has the potential to harm the natural environment. The contractor will be responsible for implementing these protection measures, while the AQP will oversee and document their implementation.
- Identify an appropriate laydown/staging area for machinery, fuelling, and servicing before works are commenced, in consultation with the AQP. Choose a laydown/staging area that is at least 30 m from the stream and that avoids natural grasslands, riparian habitat, and ecological communities at risk.

[11] BC Ministry of Transportation and Infrastructure. 2020. Available at 2020 Standard Specifications For Highway Construction Volume 1 Of 2 (Gov.Bc.Ca)

[12] Government of British Columbia. 2014. Available at Develop with Care 2014 - Province of British Columbia (gov.bc.ca)

[13] Appropriately Qualified Professional (AQP) is a designated professional registered in British Columbia, acting under that association's Code of Ethics and subject to disciplinary action, with demonstrated education, skills and experience, and may be reasonably relied on to provide advice within their area of expertise.

5.2 AQUATIC RESOURCES

- Submit a Section 11 Notification under the *Water Sustainability Act* a minimum of 45 days before construction is commenced. This letter EA may be used as supporting documentation, along with Project design drawings. If Project detailed designs change significantly from the conceptual design (e.g., increased Project footprint or instream works), this EA should be updated accordingly.
- Avoid instream works. Should instream works be required, confine works to the least-risk work window for fish, July 15 to August 31.[14]
- Place tarps and/or plywood under the bridge girders to protect the creek when recoating the girders. Prohibit lead paint from entering Vaseux Creek.
- Follow the environmental best management practices for fuel storage and spill response, provided in Section 5.2.1, below.
- Install silt fencing before any earth works or deck removal works that may result in erosion and/or sediment introduction to the stream.
- Stockpile any excavated material, bridge debris, and vegetation debris separately and at least 30 m from Vaseux Creek. Cover stockpiles before precipitation and high winds to avoid erosion.
- Minimize disturbance to riparian vegetation and the stream bank as much as possible.
- Pour all concrete and allow it to cure in the absence of surface water and precipitation so to avoid runoff into aquatic environments. Install or maintain silt fencing between the work site and Vaseux Creek if there is a risk of contaminants entering the stream.
- Schedule site activities to coincide with favourable weather conditions, when possible.

5.2.1 Environmental Best Management Practices for Fuel Storage and Spill Response

- Store fuel and hydrocarbons within approved fuel containers or tidy tanks in vehicles and remove the containers from the site daily.
- Ensure a fully stocked, approved spill kit is located at McIntyre Bridge for the duration of the works, and that all personnel are trained in spill response and in using the spill kits provided.
- Refuel and service machinery at least 30 m away from the top of bank of Vaseux Creek.
- Ensure fuel tanks have connections that shut off automatically when the container is full.
- Collect condensation siphoned from fuel tanks in a separate tank for disposal in a licensed facility.

[14] Government of BC. Okanagan, Similkameen & Upper Shuswap Fisheries Timing Windows. Slide 1 (gov.bc.ca)

- Store all deleterious substances (or equipment containing deleterious substances) in secondary containment (e.g., generators placed in overflow basins). All deleterious materials should be kept within secondary containment of at least 110% of the volume being stored.
- Ensure that all equipment used on site is in sound mechanical condition. Do not use equipment with fuel leaks or deteriorated hydraulic hoses. Other precautions to be followed are:
    - Inspect equipment daily and keep it clean and free of oil, grease, coolant, or other contaminants;
    - Equip stationary equipment with drip trays to contain leakage of fuel, lubricant, or any other fluid;
    - Use biodegradable hydraulic fluids when possible; and
    - Ensure that all machinery complies with applicable BC and federal regulations for operations and exhaust emissions and ensure that exhaust systems work well enough to control noise to normal operating levels.

5.2.2 Spill Response

Ensure all personnel are adequately trained in spill response and are familiar with the spill kits provided. In the event of a spill, the following steps apply:

1) Ensure Safety

- Ensure personal, public, and environmental safety.
- Wear appropriate protective gear.
- Determine what product was spilled before clean-up.
- Warn people in the vicinity.
- Ensure no ignition sources are present if the spill is flammable.

2) Stop the Flow

- Stop the flow at its source.
- Act quickly to reduce the risk to the environment.
- Close any valves and shut off pumps or plug the leaks.

3) Secure the Area

- Restrict access to the area to only the personnel required to assist in the spill or maintain safe operations.
- Prevent unauthorized entry onto the site.

4) Contain the Spill

- Prevent the spill from entering any drainage structures or watercourses.

- Use spill-absorbent material to contain the spill.
- Minimize environmental contamination.

5) Notify/Report Spills

- Report spills of any size to the contractor site supervisor and the AQP.

Spills of any size must be orally reported immediately to the site supervisor and the ADQ, and clean-up efforts must be documented. The Project supervisor is responsible for designating qualified personnel to document all spills that occur on site and for preparing an incident report for the ADQ. Photographs, measurements, notes, etc., must be collected and be made available to the Ministry of Environment and Climate Change Strategy and other agencies, if required. A file containing all incident reports must be located on site at all times.

An environmental incident report must be filled out for all environmental incidents. The incident report shall include:

- Name and telephone number of the person who reported the spill;
- Name and telephone number of the person who caused the spill;
- Spill location, cause, and a description of the surrounding area;
- Type (including safety data sheet number) and quantity of the spilled material;
- Details of the spill response, including location of disposal site;
- Names of all people on the scene, including agency representatives;
- Names of people and agencies notified after the spill;
- Sequence of events, including notifications and timing; and
- Comments on the handling of the incident.

The *Spill Reporting Regulation*, BC Reg. 221/2017, requires all persons who manage hazardous materials to report significant spills to:

BC Spill Response line 1-800-663-3456

The following materials are those likely to be present at the Project site, but other materials may also be present. If a spill occurs at or above the amount indicated for each material, the provincial emergency program (PEP) must be advised immediately.

- Fuels, engine oils, and hydraulic oils: 100 L;
- Petroleum oils and emulsions: 100 L;
- Antifreeze: 5 L; and

- Propane: 10 kg.

Under the *Environmental Management Act*, SBC 2003, c. 53, the person who had possession, charge, or control of the substance immediately before its spill must immediately report the spill to the PEP. A report to the PEP must include the following information, where applicable:

- Name and telephone number of the person who reported the spill;
- Name and telephone number of the person who caused the spill;
- Location and time of the spill;
- Type and quantity of the substance spilled;
- Cause and effect of the spill;
- Details of action taken or proposed;
- Description of spill location and area surrounding the spill;
- Details of further action contemplated or required;
- Names of the agencies on the scene; and
- Names of other persons or agencies advised concerning the spill.

5.3 VEGETATION AND ECOSYSTEMS

- Conduct a site reconnaissance before construction to identify any ecosystems at risk in the laydown/staging area. The ADQ will be responsible for this reconnaissance. Avoid disturbance of ecosystems at risk within or close to the work area.
- Minimize tree and shrub removal. Perform tree thinning strategically to conserve snags, standing dead trees, and potential wildlife recruitment trees, where possible.
- Reduce the spread or introduction of weeds by ensuring that vehicles, tools, and clothing of personnel accessing the site are clean and free of weeds or any associated plant material before entering and leaving the worksite. This is of particular importance when leaving the site, as the roadside near the bridge is infested with weeds.
- Do not move soil from the Project Area to another location, as it will have a large seed bed that includes invasive species. If excavated soil needs to be removed from the site, deposit it at a licensed landfill.
- Record the number and species of trees and shrubs lost and replant with the same number, to result in no net loss.

5.4 WILDLIFE AND WILDLIFE HABITAT

- Obtain a general wildlife permit under the *Wildlife Act* in advance of works, which will allow an AQP to salvage and relocate wildlife, such as reptiles and amphibians, if any are encountered during construction.
- Retain an AQP to undertake a wildlife sweep for stick nests, nest cavities, wildlife dens, and bat roosts before construction. Any nests of great blue heron or pileated woodpecker, or wildlife dens, will be protected from disturbance and removal until they are deemed abandoned in accordance with the legislation, as determined by the AQP.
- Conduct all vegetation clearing and grubbing between **August 15 and March 25.**[15] If unavoidable, clearing should be preceded by a nest survey by an AQP to ensure active nests are not affected. A vegetation buffer will be established and maintained around any active nest sites (size and duration will be species dependent).
- Avoid removal of the dead standing snag located to the northeast of McIntyre Bridge (49°14'44.67"N, 119°31'31.93"W), if possible.
- Ensure an AQP is on site during bridge deck removal to salvage and relocate wildlife if any are encountered. The AQP will have the authority to stop works until such time as wildlife are relocated outside the Project footprint.

5.5 POST-CONSTRUCTION SITE REMEDIATION

- Restore disturbed stream banks post-construction to minimize the risk of erosion and/or sedimentation in the future.
- Re-seed all disturbed areas with a certified weed-free seed mix appropriate for the southern interior immediately after construction.
- Replace any trees and shrubs lost to the Project in a like-for-like fashion.
- Complete (done by the AQP) a post-construction completion report documenting the construction, mitigation, incidences, and remediation that took place.

6 CLOSURE

If the mitigation measures outlined in this EA are followed, it is not expected that the Project will negatively affect aquatic resources, vegetation and ecosystems, or wildlife and wildlife habitat. Please contact the undersigned at 250-545-3672 if you have and questions or concerns.

[15] Government of Canada. Accessed November 16, 2022. Available at Nesting periods - Canada.ca

Yours truly,

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Senior Biologist

Reviewed by,

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BS
Appendices:
A – Site Photographs
B – Tables

APPENDIX A: Site Photographs

Photo 1: McIntyre Bridge, looking north

Photo 2: Vaseux Creek at McIntyre Bridge

Photo 3: Stream bank southwest of bridge

Photo 4: Stream bank southeast of bridge

Photo 5: Stream bank northwest of bridge

Photo 6: Stream bank northwest of bridge

Photo 7: Vaseux Creek upstream of bridge

Photo 8: Vaseux Creek downstream of bridge

Photo 9: Wildlife tree located northwest of bridge

Photo 10: No evidence of birds or bats under bridge deck

Photo 11: Scat located under bridge deck

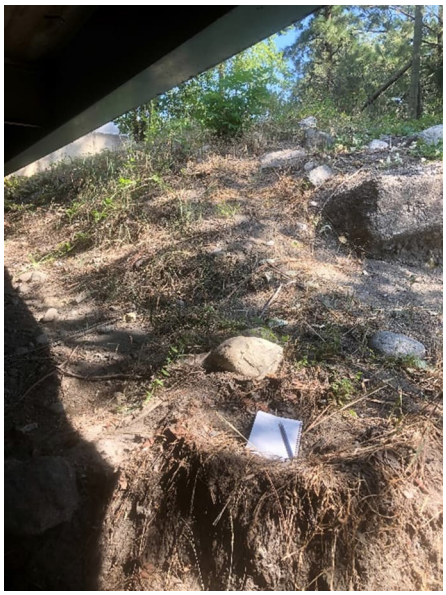

Photo 12: Suspected “otter couch” under bridge

Photo 13: Weed-infested road sides by bridge

Photo 14: Weed-infested road sides by bridge

APPENDIX B: Tables

Table B1 Plant Species at Risk with the Potential to Occur in the Project Area (CDC 2022)

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat	Likelihood of Occurring near the Project
Cut-leaved water-parsnip	*Berula incisa*	Blue			Riparian	Moderate
River bulrush	*Bolboschoenus fluviatilis*	Blue			Riparian	Low
Bent spike-rush	*Eleocharis geniculata*	Red	E	1-E (2011)	Riparian	Moderate
Small-flowered lipocarpha	*Lipocarpha micrantha*	Red	E	1-E (2005)	Riparian	Moderate
Toothcup	*Rotala ramosior*	Red	E	1-E (2003)	Riparian	Moderate
Peach-leaf willow	*Salix amygdaloides*	Blue			Riparian	Moderate

Search criteria: Regional District of Okanagan-Similkameen; Habitat types anthropogenic, riparian, stream/river; Biogeoclimatic zone BGxh.
Notes: COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARA – *Species at Risk Act*, SC 2002, c. 29

Table B2 Plant Species at Risk Previously Recorded Within 5 km of the Project (DataBC 2022)

English Name	Scientific Name	BC List	SARA Schedule	Record Location (last observation date)	Habitat[1]	Likelihood of Occurring near the Project
Pale evening-primrose	*Oenothera pallida* ssp. *pallida*	Red		North of Oliver (2013)	Grassland /Herbaceous	Low
Cut-leaved water-parsnip	*Berula incisa*	Blue		4 km southwest of White Lake (2019)	Grassland /Herbaceous, Roadside, Creek, Saline, Herbaceous Wetland	Moderate
Short-rayed aster	*Symphyotrichum frondosum*	Red	1 – E (2006)	East side of Vaseux Lake (2013)	Beach	Moderate
Western centaury	*Zeltnera exaltata*	Red		South of Willowbrook (2017)	Bog/Fen, Saline, Herbaceous Wetland	Low
Annual paintbrush	*Castilleja minor* var. *exilis*	Red		Mount Keogan (2021)	Grassland /Herbaceous, Saline	Low
Thurber's needlegrass	*Eriocoma thurberiana*	Blue		300 m north of Park Rill Creek (2008)	-	Low
Idaho blue-eyed grass	*Sisyrinchium idahoense* var. *occidentale*	Red		South of Willowbrook (2017)	Herbaceous Wetland, Saline	Low

Notes: [1] Source: BC CDC 2022. COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARA – *Species at Risk Act*, SC 2002, c. 29

Table B3 Ecological Communities at Risk with the Potential to Occur in the Project Area (CDC 2022)

English Name	Scientific Name	BC List	Likelihood of Occurring near the Project
Water birch / roses	*Betula occidentalis / Rosa* spp.	Red	Low
Rough fescue - (bluebunch wheatgrass) - yarrow - clad lichens	*Festuca campestris - (Pseudoroegneria spicata) - Achillea borealis - Cladonia* spp.	Red	Low
Idaho fescue - bluebunch wheatgrass - silky lupine - junegrass	*Festuca idahoensis - Pseudoroegneria spicata - Lupinus sericeus - Koeleria macrantha*	Red	Low
Ponderosa pine / red three-awn	*Pinus ponderosa / Aristida purpurea* var. *longiseta*	Blue	Low
Ponderosa pine - black cottonwood / poison ivy	*Pinus ponderosa - Populus trichocarpa / Toxicodendron rydbergii*	Red	Low
Ponderosa pine / smooth sumac	*Pinus ponderosa / Rhus glabra*	Red	Low
Black cottonwood - Douglas-fir / Douglas maple - common snowberry	*Populus trichocarpa - Pseudotsuga menziesii / Acer glabrum - Symphoricarpos albus*	Red	Low
Black cottonwood / common snowberry - roses	*Populus trichocarpa / Symphoricarpos albus - Rosa* spp.	Red	Low
Black cottonwood / poison ivy - rose spp.	*Populus trichocarpa / Toxicodendron rydbergii - Rosa* spp.	Red	Low
Bluebunch wheatgrass - junegrass	*Pseudoroegneria spicata - Koeleria macrantha*	Blue	Low
Nuttall's alkaligrass - foxtail barley	*Puccinellia nuttalliana - Hordeum jubatum*	Red	Low
Antelope-brush / needle-and-thread grass	*Purshia tridentata / Hesperostipa comata*	Red	Low
Common snowberry - prairie rose	*Symphoricarpos albus - Rosa woodsii*	Blue	Low

Search criteria: Regional District of Okanagan-Similkameen; Habitat types anthropogenic, riparian, stream/river; Biogeoclimatic zone BGxh.
Notes: COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARA – *Species at Risk Act*, SC 2002, c. 29

Table B4 Ecological Communities at Risk Previously Recorded Within 5 km of the Project Area (DataBC 2022)

English Name	Scientific Name	BC List	Likelihood of Occurring near the Project
Black cottonwood – Douglas-fir / Douglas maple – common snowberry	*Populus trichocarpa - Pseudotsuga menziesii / Acer glabrum - Symphoricarpos albus*	Red	Moderate
Black cottonwood - Douglas-fir / common snowberry - red-osier dogwood	***Populus trichocarpa - Pseudotsuga menziesii / Symphoricarpos albus - Cornus sericea***	**Red**	**High**
Black cottonwood / poison ivy - rose spp.	*Populus trichocarpa / Toxicodendron rydbergii - Rosa* spp.	Red	Moderate
Trembling aspen / common snowberry / Kentucky bluegrass	*Populus tremuloides / Symphoricarpos albus / Poa pratensis*	Red	Moderate
Water birch / roses	*Betula occidentalis / Rosa* spp.	Red	Moderate

Bold – Identified in sensitive ecosystems inventory data as occurring immediately upstream of the Project

Table B5 Wildlife at Risk with the Potential to Occur in the Project Area (CDC 2022)

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
White-throated swift	*Aeronautes saxatalis*	Blue			Unknown: Cliff, sparsely vegetated rock, talus stream/river, lakes	Moderate for forage, low for breeding
Western toad	*Anaxyrus boreas*	Yellow	SC	1-SC (2018)	Frequent: riparian, forested, streams/river, lakes, wetland	Moderate
Pallid bat	*Antrozous pallidus*	Red	T	1-T (2003)	Obligate: grassland/shrub Frequent: sagebrush steppe, rock/cliff, talus, sparsely vegetated areas Occasional: industrial, dry conifer forest, lakes/pond	Moderate
Great blue heron, *herodias* subspecies	*Ardea herodias herodias*	Blue			Frequent: agriculture, moist/wet conifer forest, deciduous, mixedwood forest, meadows, lakes, riparian, stream/river Occasional: suburban, dry conifer forest, wetland	Moderate
Vivid dancer	*Argia vivida*	Blue	SC	1-SC (2019)	Obligate: springs and steam/river	Moderate
Upland sandpiper	*Bartramia longicauda*	Red			Frequent: agriculture, grassland, meadow Occasional: suburban	Moderate
American bittern	*Botaurus lentiginosus*	Blue			Obligate: wetland/marsh, Frequent: lakes, pond Occasional: agriculture, grassland	Low
Rough-legged hawk	*Buteo lagopus*	Blue	NAR		Frequent: wetland, grassland, meadow, sagebrush steppe Occasional: agriculture, suburban, riparian	Moderate
Swainson's hawk	*Buteo swainsoni*	Red			frequent: agriculture, brush steppe, deciduous forest	Moderate

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
					Occasional: industrial, suburban, conifer/mixedwood forest	
Green heron	*Butorides virescens*	Blue			Frequent: lakes, riparian, wetland Occasional: stream/river, suburban	Moderate
Northern rubber boa	*Charina bottae*	Yellow	SC	1-SC (2005)	Ffrequent: dry conifer forest, brush steppe, grassland, meadow, riparian, rock/talus Occasional: stream/river	Moderate
Common nighthawk	*Chordeiles minor*	Blue	SC	1-T (2010)	Frequent: all forest types and moistures, brush steppe, grassland, meadow, lakes, rock/cliff, talus, sparsely vegetated, wetland Occasional: agriculture, suburban, riparian, stream/river	Moderate
Painted turtle - intermountain - rocky mountain population	*Chrysemys picta* pop. 2	Blue	SC	1-SC (2007)	Obligate: lakes, riparian, wetland Frequent: industrial, suburban	Moderate
Evening grosbeak	*Coccothraustes vespertinus*	Yellow	SC	1-SC (2019)	Frequent: all forest types and moistures, suburban Occasional: riparian	Moderate
Yellow-billed cuckoo	*Coccyzus americanus*	Red			Frequent: shrub, riparian shrub Occasional: agriculture hedgerow, deciduous and mixedwood forest, riparian forest, wetland	Moderate
Townsend's big-eared bat	*Corynorhinus townsendii*	Blue			Obligate: caves Frequent: industrial, suburban, all forest types and moistures Occasional: grassland, shrub, riparian forest	Moderate

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
Western rattlesnake	*Crotalus oreganus*	Blue	T	1-T (2005)	Obligate: cliff, sparsely vegetated rock, talus, caves Frequent: dry conifer forest, brush steppe, grassland, meadow, riparian Occasional: mesic conifer forest	Moderate
Black swift	*Cypseloides niger*	Blue	E	1-E (2019)	Obligate: cliff Frequent: lakes, stream/river, wetland	Moderate
White-headed woodpecker	*Dryobates albolarvatus*	Red	E	1-E (2003)	Frequent: Dry conifer forest Occasional: mesic conifer forest, mixedwood forest, riparian forest	Moderate
Horned lark, *merrilli* subspecies	*Eremophila alpestris merrilli*	Red			Frequent: agriculture, suburban, grassland Occasional: meadow, salt flats	Moderate
Spotted bat	*Euderma maculatum*	Blue	SC	1-SC (2005)	Frequent: dry conifer forest, sagebrush steppe, cliff, sparsely vegetated rock, talus, wetland Occasional: agriculture, riparian shrub	Moderate
Rusty blackbird	*Euphagus carolinus*	Blue	SC	1-SC (2009)	Frequent: moist/wet conifer forest, lakes, wetland Occasional: industrial, suburban, mixedwood forest	Moderate
Peregrine falcon, *anatum* subspecies	*Falco peregrinus anatum*	Red	NAR	1-SC (2012)	Frequent: agriculture, shrub steppe, grassland, meadow, lakes, riparian herbaceous, cliff, sparsely vegetated rock, talus, wetland Occasional: suburban, shrub, salt flats, beach, gravel bar, stream/river	Moderate
Gyrfalcon	*Falco rusticolus*	Blue	NAR		Frequent: agriculture, tundra, meadow, shrub, lakes, ocean,	Moderate

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
					estuary, mudflats, cliff, wetland Occasional: grassland, stream/river	
Rocky Mountain ridged mussel	*Gonidea angulata*	Red	E	1-SC (2005)	Obligate: lakes, stream/river	Moderate
Barn swallow	*Hirundo rustica*	Yellow	SC	1-T (2017)	Frequent: agriculture, industrial, suburban, lakes, stream/river, wetland Occasional: forest all types and moistures, grassland, meadow, brush steppe, shrub, riparian	Moderate
Caspian tern	*Hydroprogne caspia*	Blue	NAR		Frequent: suburban, lakes, ocean, stream/river Occasional: riparian gravel bar, wetland	Low
Desert nightsnake	*Hypsiglena chlorophaea*	Red	E	1-E (2003)	Frequent: shrub steppe, grassland, meadow, sparsely vegetated rock	Moderate
Yellow-breasted chat	*Icteria virens*	Red	E	1-E (2003)	Frequent: shrub, riparian shrub Occasional: agriculture hedgerow, deciduous and mixedwood forest, riparian forest	Moderate
California gull	*Larus californicus*	Red			Obligate: lakes Frequent: agriculture, suburban, ocean, wetland Occasional: grassland, meadow, ocean features, salt flats, stream/river	Low
Hoary bat	*Lasiurus cinereus*	Blue			Frequent: lakes, riparian forest, stream/river, wetland Occasional: mixedwood forest, cliff	Moderate

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
Viceroy	*Limenitis archippus*	Red			Unknown: agriculture, suburban, deciduous, meadow, shrub, riparian, wetland (westward more riparian in arid regions)	Moderate
Short-billed dowitcher	*Limnodromus griseus*	Blue			Frequent: meadow, intertidal, estuary, wetland Occasional: agriculture, suburban, swamp	Low
Lilac-bordered copper	*Lycaena nivalis*	Blue			Frequent: dry conifer forest, shrub steppe, grassland, meadow Occasional: deciduous, mixedwood, riparian	Low
Western screech-owl, *macfarlanei* subspecies	*Megascops kennicottii macfarlanei*	Blue	T	1-T (2005)	Frequent: mesic-wet conifer forest, deciduous, mixedwood, and riparian forest Occasional: agriculture, suburban	High for forage, Moderate for breeding
Lewis's woodpecker	*Melanerpes lewis*	Blue	T	1-T (2012)	Frequent: dry conifer, deciduous, brush steppe, grassland, meadow, riparian forest Occasional: agriculture, suburban	High for forage, Moderate for breeding
Surf scoter	*Melanitta perspicillata*	Blue			Frequent: lakes, ocean, riparian forest Occasional: riparian herbaceous, riparian shrub	Low
Western small-footed myotis	*Myotis ciliolabrum*	Blue			Obligate: cliff, talus, sparsely vegetated rock Frequent: riparian, caves Occasional: dry conifer forest	Moderate
Little brown myotis	*Myotis lucifugus*	Blue	E	1-E (2014)	Obligate: caves Frequent: all forest types and moistures	Low

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
					Occasional: industrial, suburban, grassland, meadow, shrub, riparian	
Fringed myotis	*Myotis thysanodes*	Blue	DD	3 (2005)	Frequent: all forest types and moistures, stream/river Occasional: shrub steppe, grassland, meadow Unknown: rock, subterranean	Moderate
Black-crowned night-heron	*Nycticorax nycticorax*	Red			Frequent: lakes, riparian shrub, wetland Occasional: agriculture, suburban, shrub, stream/river	Low
Jutta Arctic, *chermocki* subspecies	*Oeneis jutta chermocki*	Blue			Frequent: all forest types and moistures, meadow, riparian, wetland	Moderate
Sinuous snaketail	*Ophiogomphus occidentis*	Blue			Obligate: lakes, stream/river	Low
American white pelican	*Pelecanus erythrorhynchos*	Red	NAR		Obligate: lakes Occasional: ocean, beach, stream/river, wetland	Low
Pronghorn clubtail	*Phanogomphus graslinellus*	Blue			Frequent: lakes	Low
Common sootywing	*Pholisora catullus*	Blue			Frequent: agriculture, suburban (seldom in any kind of natural setting)	Moderate
Gophersnake, *deserticola* subspecies	*Pituophis catenifer deserticola*	Blue	T	1-T (2005)	Obligate: talus Frequent: brush steppe, grassland, meadow, sparsely vegetated rock Occasional: industrial, suburban, riparian	Moderate
Western skink	*Plestiodon skiltonianus*	Blue	SC	1-SC (2005)	Obligate: subterranean Frequent: dry-mesic conifer forest, shrub steppe, grassland, meadow, talus,	Moderate

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
					sparsely vegetated rock, stream/river Occasional: deciduous forest Unknown: riparian forest	
American golden-plover	*Pluvialis dominica*	Blue			Frequent: agriculture, tundra, grassland, meadow, salt flats, beach wetland Occasional: suburban, lakes, ocean	Low
Sonora skipper	*Polites sonora*	Blue	NAR		Obligate: meadow Occasional: mesic-moist/wet conifer forest, riparian forest	Low
Checkered skipper	*Pyrgus communis*	Blue			Frequent: industrial, suburban, dry conifer forest Occasional: agriculture, grassland, meadow	Moderate
Western harvest mouse	*Reithrodontomys megalotis*	Blue	E	1-SC (2009)	Frequent: agriculture, industrial, suburban, grassland, meadow, sagebrush steppe, riparian herbaceous, riparian shrub Occasional: dry conifer forest	Moderate
Preble's shrew	*Sorex preblei*	Red			Frequent: shrub steppe, grassland, riparian shrub, wetland	Moderate
Williamson's sapsucker	*Sphyrapicus thyroideus*	Blue	E	1-E (2006)	Frequent: dry-mesic conifer forest Occasional: deciduous, mixedwood, and riparian forest	Moderate
Abbreviate pondsnail	*Stagnicola apicina*	Blue			Obligate: lakes, stream/river	Moderate
Forster's tern	*Sterna forsteri*	Red	DD		Frequent: lakes, wetland Occasional: ocean, beach, estuary, stream/river	Low

English Name	Scientific Name	BC List	COSEWIC	SARA	Habitat [1]	Likelihood of Occurring near the Project
Olive clubtail	*Stylurus olivaceus*	Red	E	1-E (2017)	Obligate: stream/river Occasional: lakes. Breeds along warm streams and lakeshores with sandy or muddy edges	Low
Sharp-tailed grouse, *columbianus* subspecies	*Tympanuchus phasianellus columbianus*	Blue			Frequent: grassland, meadow Occasional: agriculture, dry conifer forest, deciduous, sagebrush steppe, riparian forest	Moderate
Barn owl	*Tyto alba*	Blue	T	1-T (2018)	Frequent: agriculture Occasional: suburban, mixedwood forest, shrub steppe, grassland, meadow, riparian, wetland	Moderate

Notes: [1] Source: BC CDC 2022. COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARA – *Species at Risk Act*, SC 2002, c. 29

Table B6 Wildlife at Risk Previously Recorded Within 5 km of the Project Area (DataBC 2022)

English Name	Scientific Name	COSEWIC Status	BC List	SARA Schedule	Survey Site	Likelihood of Occurring near the Project
			Amphibians			
Great Basin spadefoot	*Spea intermontana*	T (NOV 2019)	Blue	1	Okanagan River	Low, not ideal habitat
Western tiger salamander	*Ambystoma mavortium*	E (NOV 2012)	Red	1	Park Rill, north of Oliver	Moderate for breeding and living
			Birds			
Lewis's woodpecker	*Melanerpes lewis*	T (APR 2010)	Blue	1	Okanagan River	High for forage, moderate for breeding
Brewer's sparrow, *breweri* subspecies	*Spizella breweri breweri*		Blue		South of Mount Keogan	Low, preferred habitat not present
Canyon wren	*Catherpes mexicanus*	NAR (MAY 1992)	Blue		Gallagher Lake and 1.7 km upstream of Vaseux Creek	Moderate for forage, low for breeding
White-throated swift	*Aeronautes saxatalis*		Blue		Vaseux Creek	Moderate for forage, low for breeding
Bobolink	*Dolichonyx oryzivorus*	SC (MAY 2022)	Red	1	Inkaneep Park	Low
Western screech-owl, *macfarlanei* subspecies	*Megascops kennicottii macfarlanei*	T (MAY 2012)	Blue	1	Park Rill Creek, North of Oliver	High for forage, moderate for breeding

English Name	Scientific Name	COSEWIC Status	BC List	SARA Schedule	Survey Site	Likelihood of Occurring near the Project
Insects						
Okanagan hammertail	*Efferia okanagana*	E (NOV 2011)	Red	1	Vaseux Lake	Low
Olive clubtail	*Stylurus olivaceus*	E (MAY 2011)	Red	1	Okanagan River	Moderate
Mormon metalmark	*Apodemia mormo*	E (MAY 2014)	Red	1	Vaseux Creek near Vaseux Protected Area	Moderate
Sagebrush tiger beetle	*Cicindela pugetana*		Blue		McIntyre Bluff	Low
Behr's hairstreak	*Satyrium behrii*	E (MAY 2012)	Red	1	Vaseux Creek, McIntyre Bluff	Low, facultative plant not present
Mammals						
Western harvest mouse	*Reithrodontomys megalotis*	E (NOV 2019)	Blue	1	Mount Keogan and east side of Vaseux Lake	Moderate
Nuttall's cottontail	*Sylvilagus nuttallii*	SC (NOV 2016)	Blue	1	1 km north of Project	Low
Columbia Plateau pocket mouse	*Perognathus parvus*		Blue		East of Vaseux Lake Park	Low
American badger	*Taxidea taxus*	E (NOV 2012)	Red	1	Okanagan valley	Low
Spotted bat	*Euderma maculatum*	SC (NOV 2014)	Blue	1	300 m southwest of Project	High for forage, low for breeding

English Name	Scientific Name	COSEWIC Status	BC List	SARA Schedule	Survey Site	Likelihood of Occurring near the Project
			Reptiles			
Western Skink	*Plestiodon skiltonianus*	SC (NOV 2014)	Blue	1	Vaseux Lake	Moderate
North American racer	*Coluber constrictor*	T (NOV 2015)	Blue	1	Willowbrook, Dutton Creek, Inkaneep Park	Moderate
Desert nightsnake	*Hypsiglena chlorophaea*	E (MAY 2011)	Red	1	1.5 km upstream	Moderate

Notes: COSEWIC – Committee on the Status of Endangered Wildlife in Canada; SARA – *Species at Risk Act*, SC 2002, c. 29