

# Evaluation of Anticipated Impacts of the KVR Multi-use Trail in the Vaseux-Bighorn National Wildlife Area



Prepared by:

**Jared Hobbs, M.Sc. R. P. Bio**

Director: J Hobbs Ecological Consulting Ltd.

9809 Pender Island, BC, Canada | VON 2M3

250.889.2071

[www.jhobbsecological.com](http://www.jhobbsecological.com)

J Hobbs Ecological Consulting Ltd.  
Hobbs Ecological Consulting Ltd.

Prepared for:

**Vaseux Lake Stewardship Association**

Prepared: September 18, 2025

## Table of Contents

<b>Introduction .....</b>	<b>3</b>
<b>Project Area Description .....</b>	<b>4</b>
<b>Environmental Context.....</b>	<b>4</b>
<b>Management Goals within the VBNWA.....</b>	<b>5</b>
<b>Biogeoclimatic Characteristics .....</b>	<b>5</b>
<b>Species at Risk Values.....</b>	<b>5</b>
<b>Tenure Description.....</b>	<b>6</b>
<b>Privately Owned Lands .....</b>	<b>6</b>
<b>Federally Owned Lands .....</b>	<b>6</b>
<b>Provincial Owned Lands .....</b>	<b>7</b>
<b>Review of Assessment Reports .....</b>	<b>9</b>
<b>Relevant Legislation .....</b>	<b>12</b>
<b>Federal Legislation .....</b>	<b>12</b>
<b>Provincial Legislation.....</b>	<b>16</b>
<b>Environmental Assessment - Procedural Considerations .....</b>	<b>18</b>
<b>BC Environmental Assessment Act (SBC 2018, c 51) .....</b>	<b>18</b>
<b>Federal Impact Assessment Act (IAA) (S.C. 2019, c. 28, s. 1) .....</b>	<b>19</b>
<b>Environmental Impact Assessment - Procedural Requirements .....</b>	<b>20</b>
<b>Species-at-risk Considerations .....</b>	<b>22</b>
<b>Impacts on Mammals .....</b>	<b>25</b>
<b>Impacts on Avifauna.....</b>	<b>26</b>
<b>Impacts on Herptiles .....</b>	<b>27</b>
<b>Impacts on At-Risk Invertebrates .....</b>	<b>28</b>
<b>Management Recommendations.....</b>	<b>30</b>
<b>Considerations Governed by the Canada Wildlife Act .....</b>	<b>31</b>
<b>Considerations governed by the Species-at-Risk Act.....</b>	<b>31</b>
<b>Consideration Governed by the BC Environmental Assessment Act.....</b>	<b>32</b>
<b>Position Summary.....</b>	<b>33</b>
<b>Closure .....</b>	<b>34</b>
<b>References.....</b>	<b>35</b>

## Introduction

The [Recreation Sites and Trails department](#) is a division within the new British Columbia (BC) Ministry of Sports, Recreation, Arts and Culture that provides opportunities for public recreation by developing, and maintaining recreational trails in BC. This department was formerly within the now defunct BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) and, under MFLNRORD, the [Regional District of the Okanagan-Similkameen](#) (RDOS) proposed the development of a bike path, with enhancements to upgrade infrastructure (surface and associated structures) along an existing Right-of-Way (ROW) established previously for the Kettle Valley Railroad (KVR). Hereafter this initiative may be referred to as “the Project” - this report focuses on a section of the proposed trail referred to as the [South Spur Trail](#).

The BC Ministry of Forests is no longer relevant to considerations regarding the proposed development – this authority is now most appropriately assigned to the new Ministry of Tourism, Arts, Culture and Sport. This initiative would need to be adopted by this new ministry in advance of any further promotion of the South Spur trail by RDOS. Notwithstanding these jurisdictional changes, the Project is apparently still being promoted by the RDOS with expressed interest in the development of a multi-user recreational bike path collocated along the former KVR ROW along the western shoreline of Vaseux Lake (G. Temple, pers. com.). In its initial proposal the RDOS rationalized this Project siting based on stated considerations for (human) health and safety, environmental impacts, and the aesthetic considerations of potential routes along Highway 97 (EBB 2018). In that context, considerations regarding environmental context, existing legislation and best-available science are notably lacking. This initiative is now almost a decade old, and the provincial ministry that initially advanced this proposal (MFLNRORD) is now defunct (due to government restructuring in 2022) and is no longer relevant to this process<sup>1</sup>.

Multiple dated reviews by EBB Environmental Consulting Inc. (2018 and 2019), and a brief independent review by Dr. D. Bright (2023) raised significant concerns for potentially detrimental impacts to a multitude of environmental values; specifically for the section of the KVR that passes through the Vaseux-Bighorn National Wildlife Area (VBNWA). In June 2025, Environment and Climate Change Canada (ECCC), working with the Vaseux Lake Stewardship Association (VLSA) contracted an independent review of this initiative to provide a more fulsome and current perspective for this now very dated proposal. As stated above, the scope of this report is restricted to a small highly contentious section of the KVR trail development and is intended to

### **The Kettle Valley Railroad: An Historical Context**

The KVR was in full operation, as a subsidiary of the Canadian Pacific Railway (CPR) between 1915-1961, whereafter service was abandoned in portions with the last operational portion in Penticton closing in 1989. Today most of the ROW has been converted to a multi-use recreational trail that extends the Trans-Canada Trail through southern BC from Midway, through Penticton, south to Princeton and west to Hope). More recently upgrades have been proposed, by MFLNRORD (2017), to further establish and encourage use of the KVR multi-use trail along sections of the KVR, between Penticton and Osoyoos.

<sup>1</sup> For this report the original proponent (MFLNRORD) is still referenced as it is the actions of this previous Ministry that are being examined in the context of the Project.

encourage focused consideration of environmental concerns to the South Spur Trail – a relatively short section that passes through the Westside Unit of the VBNWA. This report was commissioned by Environment and Climate Change Canada (ECCC) in June 2025, with partial funding provided by both ECCC and the Vaseux Lake Stewardship Association (VLSA).

This report considers all available relevant previous reports (as provided by the VLSA), relevant federal and provincial legislation, relevant Species at Risk recovery documents; and federally mapped critical habitat (both proposed and approved). These considerations are reviewed herein to consider both direct and indirect impacts to terrestrial vertebrate species listed on Schedule 1 under the federal *Species at Risk Act* (SARA). As appropriate, considerations may also extend to provincially listed species known, or with potential, to occur within the VBNWA.

## Project Area Description

### Environmental Context

The Canada Wildlife Act (CWA) (1985) created authority for ECCC to create National Wildlife Areas (NWAs). The VBNWA was established in 1979, primarily to protect winter range for California Bighorn Sheep (*Ovis canadensis californiana*) and is one of only six NWAs in BC. The area was subsequently also classified as a Category IV area by the International Union for Conservation of Nature (IUCN) in recognition of its inherent value for conservation of wildlife habitat. The area is also soon to be recognized as a Key Biodiversity Area (KBA) by the Wildlife Conservation Society in recognition of its species richness (I. Adams pers.com.) The area lies within the US-Canada transboundary traditional territory of the Syilx Nation. There are six distinct management units within the VBNWA including:

- 1) Irrigation Creek Unit,
- 2) Southeast Uplands Unit,
- 3) Northeast Uplands Unit,
- 4) **Northwest Marsh Unit,**
- 5) **Westside Unit;** and,
- 6) North Wetlands Unit.

The focus of this report is on the Westside Unit and the Northwest Marsh Unit as the now-dated MFLNRORD proposal bisects that unit and, logically, has significant potential to compromise wildlife and conservation values within the NWA. Of importance, the primary objective of all NWAs is to protect and conserve significant habitat to benefit conservation of migratory birds and other wildlife (*Government of Canada 1985*).

## Management Goals within the VBNWA

ECCC has developed a management plan for the VBNWA, recognizing five goals (see below) to enable effective management of habitat for migratory birds, species at risk and other wildlife (Environment Canada 2011). Any proposed developments along the ROW that bisect the VBNWA should, logically, be fully consistent with the VBNWA management goals (Bright 2023). Accordingly, it is important to identify activities on or adjacent to the NWA (including the KVR ROW under provincial authority) as activities on adjacent jurisdictions may (likely) have a negative impact on wildlife and wildlife habitat within the NWA.

- ✓ Goal 1: Restoration and management of important habitats and ecosystems, particularly for species at risk, migratory birds and other priority species.
- ✓ Goal 2: Control of invasive species.
- ✓ Goal 3: Control of unauthorized activities in the protected area. This is to prevent alteration of sensitive habitats and direct (e.g., mortality) and indirect (e.g., disturbance) to wildlife.
- ✓ Goal 4: Reduce the risk of catastrophic fires in the area to ensure persistence of endangered species; and,
- ✓ Goal 5: To limit anthropogenic impacts on water quality in the protected area.

All five goals are very likely to be compromised by the proposed development of recreational (cycling) activities along the ROW within the VBNWA.

## Biogeoclimatic Characteristics

The VBNWA is situated in the south Okanagan valley and occurs within the bunch grass (BG) and ponderosa pine (PP) biogeoclimatic zone (BGC), within the coast and Purcell Mountain rain shadow. This creates a dry climate with hot summers and short winters. Increased warming trends are predicted under current climate change scenarios with hot days over 30°C expected to double by 2050 (RDOS 2022). Precipitation patterns are also expected to change with an increase in spring and fall precipitation and a 14% decrease in summer precipitation (RDOS 2022). These predicted changes are anticipated to increase likelihood of wildfire; any increased accidental wildfire risk (as would likely occur as a direct result of increased recreational human visitation) warrant careful consideration during land use planning processes.

## Species at Risk Values

There is mapped critical habitat for 12 species that occur within (either partially or fully overlap) the VBNWA. Mapped critical habitat polygons are available within the published recovery strategies for each species and, in the interest of efficiency, are not reproduced in this report. It is noted that the precise boundaries for Desert Night Snake, Great Basin Gopher Snake, Olive Clubtail and Western Rattlesnake are not illustrated in the publicly available recovery strategy documents for these four species as they are deemed confidential by ECCC, but overlap was investigated and confirmed for this report. In addition, CH mapping is currently underway for North American Racer as the species has been recently uplisted from special concern to threatened; inevitably CH will be mapped for this species within the VBNWA (work underway by ECCC and currently being supported by J. Hobbs).

Additional detail regarding conservation concerns pertinent to recovery of species-at-risk in BC, with specific concerns related to the proposed South Spur trail development proposal, are provided in a subsequent section (see **Species-at-Risk Considerations** section).

## Tenure Description

### Privately Owned Lands

Adjacent Privately Owned lands are listed below (from North to South) along the South Spur trail proposed route. Habitat for several federally and provincially listed species-at-risk is found on these parcels (based on consideration of key biophysical attributes). These sensitive habitats, on each of these parcels, would experience indirect effects if the Project were to proceed.

1. Parcel ID 2311119, private lot with two properties above the gate, 9.4 ha. Situated at the northern extent of the Project Area.
2. Parcel ID 2311135, 9.5 ha lot situated at the base of the road that descends to the access gate along the KVR, immediately adjacent to high value riparian habitat.
3. Parcel ID 7899203, 52.4 ha private lot above the access gate along the KVR.
4. Vaseux Lake Westside Nature Trust (TNT) property adjacent to project area, CID Parcel 08-012-034, PID 26903733. Conservation Area #430, 108.35 ha. Fee Simple land. A winter hibernacula for Northern Pacific Rattlesnake (*Crotalus oreganus oreganus*), North American Racer (*Coluber constrictor*) and Great Basin Gopher Snake (*Pituophis catenifer deserticola*), named Rock Shelter Den, is located near the west edge of this parcel.
5. Vaseux Lake Salter Lease property adjacent to project area within TNT property / conservation area 430 (see #1), CID Parcel 015-020-520, 61.75 ha., 108.35 ha. Privately owned land that is leased to the Crown to conserve and manage fish and wildlife habitat.

### Federally Owned Lands

Adjacent Federally Owned lands are listed below (from North to South) along the South Spur trail proposed route. Habitat for several federally and provincially listed species-at-risk is found on these parcels (based on consideration of key biophysical attributes). These sensitive habitats, on each of these parcels, would experience indirect effects if the Project were to proceed.

1. Parcel ID 4742125, 43.8 ha, along oxbow restoration area
2. Parcel ID 14743124, 6.4 ha, along oxbow restoration area
3. Parcel ID 14776928, 9.2 ha, along oxbow restoration area
4. Parcel ID 14623323, 21.8 ha between NT property and lake. This parcel is immediately East of a large winter snake hibernacula (Rock Shelter den) and another nearby new snake den, detected in April 2025 (J. Hobbs and G. Temple pers. obs.) is situated within this parcel. There is also a suspected Spotted Bat (*Euderma maculatum*) roost and a confirmed winter hibernaculum for the highly endangered Pallid Bat (*Antrozous pallidus*). Finally, this parcel also includes a Bald Eagle (*Haliaeetus leucocephalus*) nest (confirmed active in 2025 and repeatedly used in many previous years (G. Temple pers. com.).
5. Parcel ID 14623251, 145.5 ha south of Rock Shelter Den and north of the lagoon parcel, also includes a peninsula of high value yellow-breasted chat (*Icteria virens*) and Western Screech-Owl (*Megascops kennicottii macfarlanei*) habitat.
6. Parcel ID 14623285, 57.5 ha immediately north of, and adjacent to, the lagoon.
7. Parcel ID 14623242, 61.1 ha near the south end adjacent to the bridge and includes the Lagoon Bench snake den (first reported by J. Hobbs 2004).

### Provincial Owned Lands

Adjacent Provincially Owned lands are listed below (from North to South) along the South Spur trail proposed route. Habitat for several federally and provincially listed species-at-risk is found on these parcels (based on consideration of key biophysical attributes). These sensitive habitats, on each of these parcels, would experience direct effects if the Project were to proceed.

1. Parcel ID 44263138, 5.6 ha in the lot at the base of the road that descends to the gate with immediately adjacent riparian habitat used by yellow-breasted chat and potentially by Western Screech-Owl.
6. Parcel ID 4263219, includes the section at the gate, 1.9 ha. There is a Great Basin Gopher Snake den in rail cut in this parcel (G. Temple pers. com.).
2. Parcel ID 4263308, private lot at the gate, 11.6 ha. This ROW is the largest lot along the ROW and contains most of the project footprint area for the trail. It would be most impacted by direct effects.

Of significance, the VBNWA also abuts the White Lake Grasslands protected area (3,744 hectares (ha)). The adjacency of the VBNWA with this large park significantly increases the conservation value for both properties (**Figure 1** - the proposed South Spur trail route is shown in **Red** along the west side of Vaseux Lake).

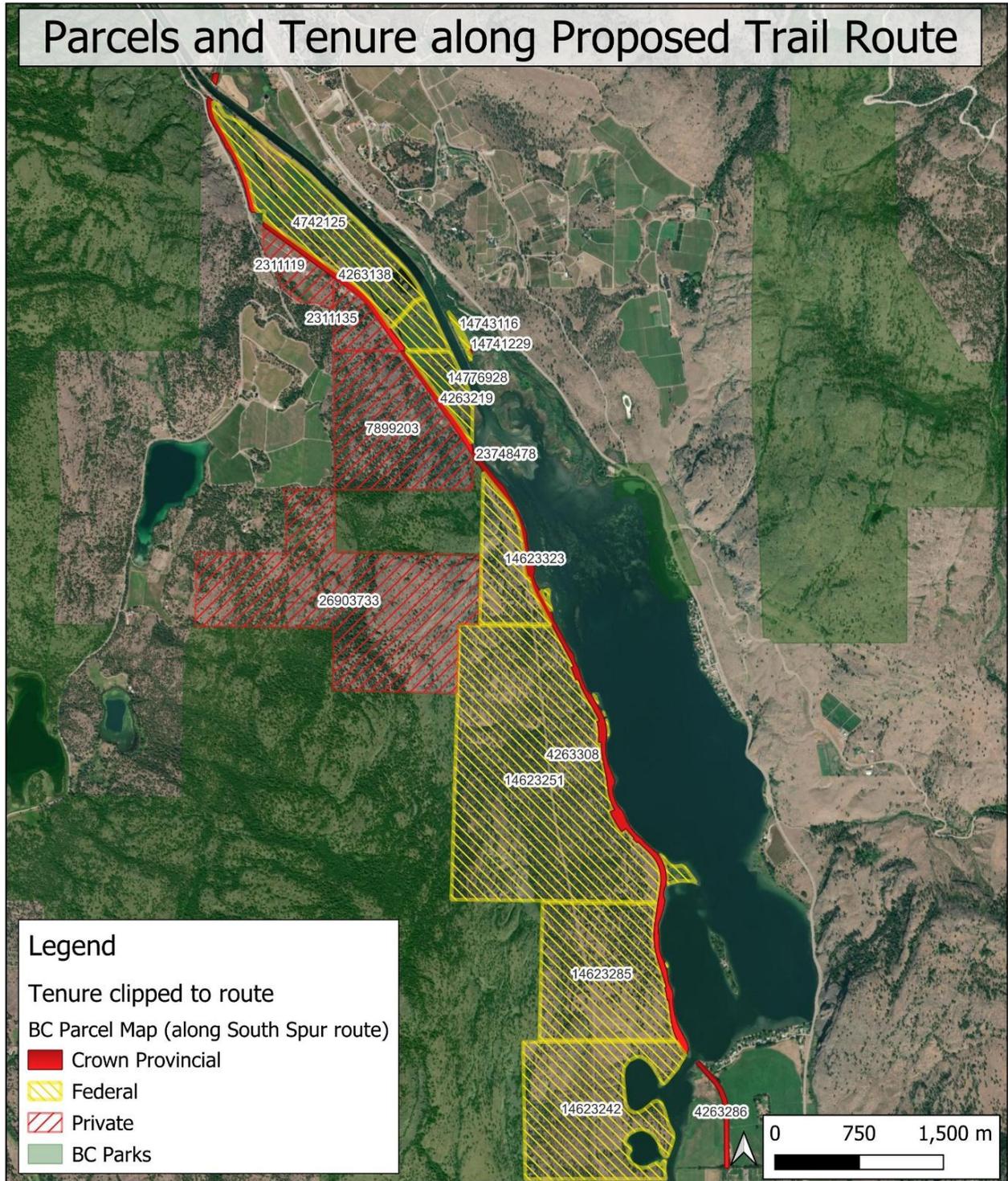


Figure 1: Depiction of land tenure and authorities (see legend) with jurisdiction for each land tenure.

## Review of Assessment Reports

Two reports were prepared by EBB Environmental Consulting Inc., as commissioned by the Recreation Sites and Trails BC Division within the now defunct MFLNRORD, in direct consideration of the proposed South Spur bike trail development. An additional report, completed by Dawe (2004), is also relevant and was also considered for preparation of the 2025 report by JHEC (i.e., this document). These reports were comprehensively reviewed during desktop study for this report; however, in the interest of efficiency these reports are only briefly summarised herein. All three reports are readily available to the VLSA.

A brief synopsis of the most relevant reports is provided in descending chronological order:

- 1) Desktop Assessment of Species at Risk Occurrence at the Vaseux-Bighorn National Wildlife Area, British Columbia. *Gebauer, M., November 2020. (32 pp).*

This report represents the most recent (desktop) assessment of species-at-risk occurrence within the VBNWA. The report identifies 30 SARA Schedule 1 species within a biologically diverse region characterized by unique habitats. This report was based on review of existing literature including management plans, recovery strategies and status reports. The BC CDC biotics database was also used to support this work. A total of 174 species were ‘screened’ to identify potential occurrence; from that process 83 species were identified as likely or known to occur. Federally mapped critical habitat was also noted for several species. The report also noted colocation of sensitive habitats for many more species listed as special concern. Additional field survey was emphasized as necessary.

Of relevance the management plan highlighted the need for habitat preservation to support species at risk within the VBNWA and underscores the ecological significance of the area for bird conservation. The authors identified additional conservation efforts as “essential” to maintain the biodiversity of the area and to support migratory bird populations within (and beyond) the South Okanagan.

- 2) Vaseux Lake West, Reconnaissance-Level Assessment Environmental Feasibility Study Kettle Valley Railway, South Spur Trail. *EBB Environmental Consulting Inc. (G. Smart & O. Busby), June 2019. (9 pp).*

This environmental feasibility study assessed local conditions and considerations in the interest of developing the South Spur bike trail. The report was commissioned by MFLNRORD to identify environmental considerations and provide recommendations for potential development. Notably, the field assessment was completed between April 3<sup>rd</sup> and April 6<sup>th</sup>, 2019; which predates annual returns of most migratory bird species, and predated emergence of most herptile species from their overwintering hibernacula. The lack of any species-at-risk observations is not surprising given the inappropriate timing of this work. Accordingly, this timing greatly restricts the relevance and applicability of this work for any and all considerations relating to conservation of species-at-risk within the VBNWA.

Of concern the authors appeared supportive of the proposed trail development noting a lack of observations of provincially or federally listed species without noting any caveat regarding the timing and short duration of the work as implemented by the authors. The report was also vague regarding legal requirements under SARA, with no mention of extremely high potential for violation of at least 11 clauses of the Canada Wildlife Act despite their pertinence to the VBNWA.

Proposed mitigations included recommendations for maintaining a narrow trail width, and constructing elevated boardwalks over sensitive areas, whilst taking measures to prevent unauthorized off-trail access (fencing and signage) despite the fact that these measures are clearly insufficient based on current observed use of the KVR ROW despite existing fencing and signage (Hobbs, pers. obs.).

3) Environmental Feasibility Study -Kettle Valley Railway, South Spur Trail. EBB Environmental Consulting Inc. (G. Smart & O. Busby), March 2018. (160 pp).

This feasibility study assessed environmental values and potential impacts associated with development of a recreational bike trail along the KVR and considered four potential routes, including the South Spur route that bisects the VBNWA. Key objectives included assessing environmental values and impacts related to trail development via identification of sensitive ecosystems ecological communities at risk and species at risk (see **Figure 7-22** and **7-23** in the EBB report for a partial identification of species-at-risk occurrence records in the Westside Unit). The report also purports to assess potential impacts of the development on environmental values for primary and alternative routes. Cumulative effects were also considered, and recommendations were provided for mitigation for each of several proposed routes were presented.

The study identified environmental impacts to include habitat loss, loss of critical habitat, introduction and spread of invasive plants, wildlife mortality and injury (i.e., direct effects), and disturbance that may deleteriously influence behaviour and promote habitat alienation (i.e., indirect effects), and changes in stream base flow and fish habitat quality.

The report recommended a combination of segments of the KVR South Spur (and alternative routes) and purports to incorporate existing developed trails to minimize environmental impact and to balance recreational use with environmental conservation; however, the merit of these findings warrants closer scrutiny. The report purports to have incorporated feedback from stakeholders through an engagement process - this component also warrants scrutiny.

The authors also asserted that relevant federal and provincial legislation governing land and environmental resources were considered, and identified key acts that were considered to include the *Forest and Range Practices Act*, the *Water Sustainability Act*, the *BC Wildlife Act*, the federal *Species at Risk Act* and the highly pertinent *Canada Wildlife Act* that sets forth prohibitions on activities that may affect National Wildlife Areas (i.e., the proposed South Spur trail development that bisects the VBNWA). The report stipulates that goals set for the VBNWA must be integrated into the trail development plan.

The EBB report also discussed Critical Habitat (CH) for species-at-risk (Note: the report identified occurrence of CH for short-rayed alkali aster but in actuality there is no mapped CH for this species in the Westside Unit of the VBNWA, and this species is not known to occur within the proposed South Spur Project footprint). In contrast the report failed to mention overlap of existing mapped CH for seven of 12 federally listed species with mapped CH and pending CH (mapping underway) for one more species (North American Racer (*Coluber constrictor*). This aspect of the report also warrants scrutiny.

Mitigation measures were also presented and included pre-construction surveys, identification of sensitive areas and development of management plans. During construction best management practices were recommended to avoid sensitive areas and active bird nests within no mention of avoidance for snake hibernacula despite colocation with a new den detected by

G. Temple in parcel ID 4263219. Timing restrictions for ongoing maintenance were also noted to protect breeding birds, but the window provided (April 1 to July 31) was too narrow and fails to consider existing guidance from ECCC regarding timing of activities with potential to affect nesting birds (refer to ECCC Breeding Bird Calendar for the area).

- 4) Some aspects of the ecology of Vaseux-Bighorn National Wildlife Area with emphasis on species at risk. Unpublished. Canadian Wildlife Service, Pacific and Yukon Region, British Columbia. *Dawe, N.K., R. Buechert, A.C. Stewart, J. Penny, K.A. Brock, and F. Russell. 2004. (93 pp).* This now dated report summarizes an inventory program conducted within the VBNWA by a multidisciplinary team of scientists engaged (by ECCC) to document species at risk (as listed at the time of the work) with a disclosed focus on vascular plants and vertebrates, including birds. The authors documented 260 plant species, 30 invertebrate species, 5 fish species, 2 amphibian species, 8 reptile species and 132 avian species as well as 17 species of mammal.

It was noted by Bright (2023) that the number and identity of potentially relevant federally listed at-risk species is discrepant between Gebauer (2020) and EBB (2018). This is based in part on the different geographic scopes of both reports<sup>2</sup>, and in part in consideration of changes to species listings made in the intervening time between these reports. Similarly, there are inconsistencies in the number of species noted in Dawe (2004) as this report is now 21 years dated. Regardless, the accuracy of the number of species-at-risk that may actually occur within the West side unit is not particularly pertinent - what is pertinent is that species-at-risk do occur and that management is required under both federal and provincial legislation.

Of relevance, both reports by EBB failed to adequately address prohibitions, through prudent and effective mitigation strategies, under the CWA within the VBNWA along the proposed South Spur route, including the logical and precautionary necessity of adhering to the goals of the VBNWA (see **Project Area Description section**). Similarly, both reports by EBB did not explicitly identify existing policy, under the [Canada-British Columbia Agreement on Species-at-risk](#), that commits the provincial government to achieving parity with SARA on all activities and lands within its jurisdiction (e.g., the KVR ROW) (Hobbs 2022).

Any trail development along the KVR ROW (i.e., Provincial Crown Land) and the adjacent federal land that would be immediately affected (i.e., VBNWA), via both direct and indirect effects, need to be adequately mitigated if the South Spur route is further advanced by the RDOS.

---

<sup>2</sup> Gebauer (2020) provided a desktop assessment for the Vaseux-Bighorn NWA (83 relevant species) while the EBB (2018) study was focussed on the South Spur route only, including its extension south to Osoyoos Lake, beyond the southern extent of the Westside unit of the VBNWA.

## Relevant Legislation

Responsibility for the conservation of wildlife in Canada is shared among the federal, municipal, First Nation and provincial governments in Canada. It is required that these government agencies work cooperatively to pursue the establishment of complementary legislation and programs for the protection and recovery of species at risk in Canada. This agreement is set forth in the federal *Species at Risk Act* (SARA), in the Accord for the Protection of Species-at-risk in Canada and again in the Canada-British Columbia Agreement on Species-at-risk (hereafter may be referred to as the Bilateral Agreement). The intent of both the accord and the bilateral agreement are to ensure a coordinated and focused approach to the delivery of species-at-risk protection and recovery through legislation, policies, and operational procedures in BC.

Environment and Climate Change Canada (ECCC) (under the Canada Wildlife Act (CWA)) recognize that National Wildlife Areas, including VBNWA, must be protected and managed in accordance with the Wildlife Area Regulations of the CWA. Of importance, the primary purpose of all National Wildlife Areas is to **protect and conserve wildlife and wildlife habitat**. As such, all activities in an NWA that could interfere with the conservation of wildlife can/should be prohibited. Accordingly, most National Wildlife Areas are not accessible to the public and activities in these NWAs are strictly regulated<sup>3</sup>.

Although the proposed bike path follows the KVR right-of-way (ROW) and this provincial ROW does not overlap the geographic boundaries of the VBNWA, it is reasonable to anticipate that any activity in the right-of-way should be fully consistent with the management plan goals for the NWA. The following synopses summarize environmental legislation pertinent to the South Spur proposed trail development. If approved, the proposal has potential to exacerbate conditions that may violate prohibitions in each of the following acts summarized in this section

### Federal Legislation

Responsibility for the conservation of wildlife in Canada is shared among the federal, municipal, First Nation and provincial governments. It is required that each government agency works cooperatively to pursue the establishment of complementary legislation and programs for the protection and recovery of species at risk in Canada. This agreement is set forth in the federal *Species at Risk Act* (SARA), in the Accord for the Protection of Species-at-risk in Canada and again in the Canada-British Columbia Agreement on Species-at-risk (hereafter may be referred to as the Bilateral Agreement).

The intent of both the accord and the bilateral agreement are to ensure a coordinated and focused approach to the delivery of species-at-risk protection and recovery through legislation, policies, and operational procedures in British Columbia. Federal legislation pertinent to management for species-at-risk in British Columbia (BC) is summarized below.

#### **Species at Risk Act (S.C. 2002, c. 29)**

The federal *Species at Risk Act* (SARA) provides protection to endangered or threatened organisms and habitats critical to their survival. SARA Schedule 1 is the official list of wildlife species at risk including species that are classified as being either extirpated, endangered, threatened or of special concern. This legislation applies to all federal land, to all migratory birds and to all aquatic species as defined in the

---

<sup>3</sup> Some activities may be authorized through Schedule I.1 of the Wildlife Area Regulations, or by the issuance of (limited duration) permits as long as they are consistent with the management plan goals for the NWA

Fisheries Act. SARA has also been espoused by the BC provincial government and should, by policy agreement, apply to provincial lands (both publicly owned and privately owned lands) but the province has yet to develop effective legal protection to ensure parity with SARA despite several commitments to do so (Hobbs 2022). In contrast, SARA prohibitions are automatically imposed on federal lands including First Nations lands, and through policy agreement the intent of SARA also applies to provincial crown and private lands.

In advance of listing under Schedule 1 of SARA, conservation ranks by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2006), which recognize the population abundance (size), geographic distribution (in Canada), the number of extant occurrences, population trends (range wide) and threats (e.g., human persecution, wildfire risk, disturbance, habitat loss or alteration) are used to promote listing under SARA.

All species known to occur within the VBNWA, and listed on SARA Schedule 1 as Endangered, Threatened or of Special Concern (SC) (see definitions below) are afforded automatic protection, to both direct and indirect effects, where they occur on federal land<sup>4</sup> (effective 2002). In addition, the BC provincial government develops and maintains their own lists of species at risk within the BC Conservation Data Centre (CDC). Provincial species-at-risk lists are independent of Schedule 1 of SARA. By way of an order, the SARA general prohibitions can be used to protect wildlife species designated as endangered, threatened or special concern by a provincial or territorial government if it is not already listed under Schedule 1 of SARA. After consultation this order would apply where the species that was added occurs on federal lands (e.g., VBNWA). Once listed under this process SARA prohibitions would also apply to the added species, residences and habitats listed, as well as the lands or sections of lands designated in the order (e.g., VBNWA).

**Endangered:** Species facing imminent extirpation or extinction.

**Threatened:** Species likely to become endangered if steps are not taken to reverse factors leading to their extirpation or extinction.

**Special concern:** Species that may become threatened or endangered in consideration of any combination of biological characteristics and identified threats.

Threats to the species or its CH are prohibited on federal land (including the VBNWA). The proposed development (bike path) would likely have negative adverse direct and indirect effects upon several SARA listed species, and their residences, within the VBNWA (see **Environmental Issues** section). This is in direct contravention to SARA.

#### **Migratory Birds Convention Act (S.C. 1994, c. 22)**

Environment and Climate Change Canada (ECCC), through the Migratory Birds Regulations (MBR), provides for the protection of migratory birds in Canada. All migratory birds, and several non-migratory species (e.g., Pileated Woodpecker (*Dryocopus pileatus*)) are each protected by the MBR (see call-out box below). The updated (2022) regulations details prohibitions that apply anywhere in Canada, including federal lands, provincial lands, First Nations reserve lands and private lands.

---

<sup>4</sup> Prior to listing on SARA Schedule 1 a species is first assessed and assigned a conservation rating (Endangered, Threatened or Special Concern, by COSEWIC. Species listed by COSEWIC are routinely reviewed and considered by the Governor in Council (GIC) and, if assented, are subsequently listed on Schedule 1 of the federal SARA.

Specifically, migratory bird species are protected in Canada, under the MBR, at all times. The MBR ensures all migratory bird nests are protected when they contain a live bird or viable egg but, in addition, regulations introduced under the MBCA in 2022 now afford year-round protection to the nests of an additional 18 species (including Pileated Woodpecker) as listed in Schedule 1 of the MBR (2022). Pileated Woodpecker is anticipated to also occur within the VBNWA.

The Pileated Woodpecker is a keystone species, playing an important role in forested ecosystems by excavating large nesting, roosting and foraging cavities that are subsequently used by many other species for shelter and nesting. Although not considered migratory (i.e., it is a year-round resident maintaining a monogamous relationship on territories year-after-year) or listed as ‘at-risk’ its nests have recently been afforded special protection under the MBR to recognize documented use of Pileated Woodpecker cavities by at least 38 other avian species (Bull and Jackson 2020).



All species protected under the MBR of the MBCA within the VBNWA would inarguably be negatively impacted, both directly and indirectly, by the proposed bike path development.

#### **Canada Wildlife Act (RSC, 1985, c. W-9)**

The Canada Wildlife Act (CWA) “allows for the creation, management and protection of wildlife areas for wildlife research activities, or for conservation or interpretation of wildlife. The purpose of wildlife areas is to preserve habitats that are critical to migratory birds and other wildlife species, particularly those that are at risk. The Wildlife Area Regulations prohibits all activities that could be harmful to species and to their habitat...these wildlife areas are known as National Wildlife Areas.”

Within the NWA the Wildlife Area Regulations (WAR) govern activities. Specifically, subsections 3.1(1) to (3) and sections 3.6 and 3.7 describe that “no person shall do any of the following in any wildlife area except in accordance with a permit issued under section 4 or section 8.1”. Subsection 3.1(1) prohibits many activities that may reasonably be anticipated within the VBNWA. Many of these activities are already occurring (see images below). It is reasonable to anticipate an increase in violations of Subsection 3.1(1) if the proposed bike path development is approved.

Several violations of the CWA were witnessed during a single visit on April 22, 2025, including 3.1(1)K (light or maintain a fire: see images of non-permitted cycling and a non-permitted fire pit below). It is anticipated that these activities, as observed on the ROW (provincial authority) and also observed in the NWA would increase if the RDOS proposal is advanced **Figure 2** and **Figure 3**).



**Figure 2: Cyclists using the existing path in the ROW. Several cyclists were also observed biking along the pipeline route within the VBNWA.**



**Figure 3: Firepit within the ROW. Another firepit was also observed near the lagoon within the VBNWA during a subsequent visit on April 24.**

Of relevance, a dead snake (*Thamnophis elegans*) was found along the bike path (G. Temple, pers. obs. – photo provided). This is likely a common incident from interaction with trail users (cyclists) and exemplifies unintentional consequence to wildlife as a result of non-permitted use of the existing path along the ROW through the VBNWA. Although the ROW is publicly accessible there are inarguably impacts to wildlife that occur in the immediately adjacent VBNWA as a direct result of increased use of the area by the public.

Other potential infractions are also anticipated should the Project be approved, including violations under subsection 3.1(1) including clauses:

- ❖ 3.1(1) (a) introduce any living organism whose presence is likely to result in harm to any wildlife or the degradation of any wildlife residence or wildlife habitat (e.g., seeds of invasive plants from soil clinging to bike tires or parts).
- ❖ 3.1(1) (c): have in their possession any equipment that could be used for hunting, fishing or trapping (e.g., users that leave the ROW carrying fishing equipment into the VBNWA).
- ❖ 3.1(1) (h): allow any domestic animal to run at large or keep any domestic animal on a leash that is longer than three metres (e.g., users riding with dogs that are typically off-leash, and may roam freely into the VBNWA and/or pursue (harass, threaten or kill) wildlife within the immediately adjacent VBNWA);
- ❖ 3.1(1) (i): carry on any recreational activities, including swimming, camping, hiking, wildlife viewing, snow shoeing, cross-country skiing and skating. (logically cycling should be considered under this subsection).
- ❖ 3.1(1) (j): participate in a group meal or group event involving 15 or more people (e.g., group rides along the proposed bike path).
- ❖ 3.1(1) (k): light or maintain a fire.
- ❖ 3.1(1) (l): Operate a conveyance (e.g., bike) - including a conveyance without a driver on board (other than an aircraft).
- ❖ 3.1(1) (m): conduct take-off or landing of an aircraft, including a remotely piloted aircraft (e.g., drone).

- ❖ 3.1(1) (u): Carry out any other activity that is likely to disturb, damage, destroy or remove from the wildlife area any wildlife — whether alive or dead — wildlife residence or wildlife habitat (e.g., wildlife disturbance from increased human use).
- ❖ 3.1(1) (s): Deposit (human) waste material that would degrade or alter the quality of the environment (e.g., unsanitary disposal of human excrement).
- ❖ 3.1(1) (t): remove, damage or destroy any artifact or natural object (e.g., firewood gathering)

It is reasonable to assume that each of the aforementioned violations are likely to increase in direct proportion with increased human use of the immediately adjacent ROW that bisects the VBNWA.

### **Fisheries Act (RSC, 1985, c. F-14)**

The *Fisheries Act* provides a framework to manage and control Canada’s fisheries, as well as to conserve and protect fish and fish habitat, including pollution prevention. Under the Act, activities other than fishing that result in the death of fish and/or activities that may result in the harmful alteration, disruption or destruction of fish habitat are prohibited.

Projects with the potential to adversely impact fish and/or fish habitat and with a project scope that is not covered under the standards and codes of practice should be reviewed by Fisheries and Oceans Canada (DFO) through the Request for Review process. This applies to work in or near water bodies that are frequented by fish and any other areas which fish depend on directly or indirectly to carry out their life processes, including spawning grounds, nursery, rearing, food supply and migration areas, including any waterbody that is connected to fish-bearing waters at any time of the year. The review will determine if the project requires an authorization under the *Fisheries Act*. Although fish are outside the bailiwick of the author’s expertise it is noted that any potential negative impacts from the proposed project should be vetted against the *Fisheries Act*, and DFO’s advice should be solicited in this process, to ensure potential direct and indirect effects are duly considered.

### **Provincial Legislation**

#### **BC Wildlife Act [RSBC 1996]**

Native wildlife, including fish, herptiles (amphibians and reptiles), birds and mammals, are protected or managed under the BC *Wildlife Act* (BCWA). Under this Act it is an offence to intentionally kill, harm, collect, transport, or trade in native wildlife species. The nests of seven species of birds are afforded additional year-round protection including: Osprey, Eagle (Bald and Golden), Great Blue Heron, Gyrfalcon, Burrowing Owl, and Peregrine Falcon. The risk of threat, as prohibited under the BCWA, to all species that occur within the VBNWA would inarguably be exacerbated, both directly and indirectly, by the proposed bike path development (see **Environmental Issues** section).

It warrants mention that there is a long-standing repeatedly active Bald Eagle nest (last active 2025) immediately adjacent to the KVR ROW at the north end of the South Spur proposed trail development (as reported by G. Temple – photos provided). It is reasonable to presume that any increase in disturbance, due to increased human activity as a direct result of the proposed South Spur trail development, would likely negatively impact this protected nest feature.

#### **BC Water Sustainability Act [SBC 2014]**

Affords protection of surface and groundwater resources by regulating water use, rights management and protection of the resource through the water sustainability regulations.

**Weed Control Act [RSBC 1996]**

Established to protect the provinces economy, natural resources and society from negative impacts associated with introduction of foreign weeds. Private property owners and government agencies are required to control species that occur on their property or jurisdiction through the weed control regulations.

Several invasive plant species occur in the vicinity of the proposed South Spur trail development including:

- Hoary alyssum (*Berteroa incana*)
- Diffuse knapweed (*Centaurea diffusa*)
- Greater knapweed (*Centaurea scabiosa*)
- Canada thistle (*Cirsium arvense*)
- Yellow devil hawkweed (*Hieracium glomeratum*)
- St. John's wort (*Hypericum perforatum*)
- Oxeye daisy (*Leucanthemum vulgare*)
- Dalmatian toadflax (*Linaria dalmatica*)
- Sulphur cinquefoil (*Potentilla recta*)

Increased recreational use is anticipated to have a concomitant and proportional increase of vectors known to spread invasive plants, reducing wildlife forage (for deer and bighorn sheep) and negatively impacting the broader ecosystem.

Invasive plants are typically introduced through human activities. From an independent trail development application the BC Ministry of Water, Land and Resource Stewardship (MWLRS) objected to the proposal as “*invasive plants generally lack natural predators and pathogens that would otherwise keep their populations under control they often establish themselves in soils disturbed from development of roads, utility lines, trails, commercial recreation sites, agriculture, etc. Once established, invasive plants have a tremendous capacity to invade adjacent, undisturbed natural plant communities displace wildlife and disrupt natural ecosystem functions*” (MWLRS Referral Number: 170879349-007; Reference Number: 805958). The same concepts apply to the RDOS application for development of the South Spur trail along the provincial ROW.

**Forest and Range Practices Act**

The provincial *Forest and Range Practices Act* (FRPA) govern forest and range activities on public lands during forest planning, road building, timber harvesting, reforestation, and livestock grazing. FRPA applies to all public forest and range lands and to anyone who holds an agreement under FRPA. FRPA also establishes authority for designation of Wildlife Habitat Areas (WHAs) where SARA listed species occur on publicly accessible (i.e., Crown) lands, and designation of Ungulate Winter Range areas (UWRs) to conserve key biophysical attributes for winter range areas for ungulate species listed under FRPA (e.g., Mule Deer) (e.g., UWR 8-001 completely overlaps the KVR ROW within the VBNWA).

## Environmental Assessment - Procedural Considerations

In the context of the concerns listed below, under the BC *Environmental Assessment Act* (BC EAA) and the federal *Impact Assessment Act* (IAA), both environmental assessment acts have relevance. The concerns noted for each of the federally listed species with mapped CH within both the ROW and the VBNWA suggest that if the province elects to continue to advance the proposal for the South Spur trail development the Project warrants review under the BC EAA, and potentially under the federal IAA.

Although it is recognised that this project does not exceed set thresholds that would trigger the requirement for a certificate under the BC EAA or the federal IAA the BC Environmental Assessment Office (BC EAO) has authority, under section 11 of the *Act*, to impose the requirement for the proponent (i.e., the RDOS) to be required to follow a more fulsome environmental assessment process. Direct and indirect effects to SARA listed species, both within the ROW and in the immediately adjacent VBNWA, would likely exceed any reasonable definition of negligible. The requirements for a fulsome environmental assessment process are briefly summarized in this section.

Under section 11 the VLSA has the right to solicit a section 11 consideration from the BC EAO. It is recommended that the VLSA and ECCC, as affected stakeholders, co-submit a petition to the BC EAO to this effect (see **Position Summary** section). The federal and provincial acts that govern and regulate environmental impacts associated with proposed projects are briefly summarized in the next section.

### BC Environmental Assessment Act (SBC 2018, c 51)

The *BC Environmental Assessment Act* (BC EAA) provides a safeguard to ensure due consideration when assessing the impact of major projects upon the environmental, economic, social and health aspects for major projects in BC. The act intends to promote sustainability by ensuring that all projects meet consistent environmental standards to ensure concerns from public, indigenous nations and government agencies are fully addressed. Compliance with the BC EAA requires a formal and structured assessment process that includes public consultation and the involvement of indigenous nations to ensure their rights and interests are recognized. The BC EAO is responsible for facilitating public engagement with various stakeholders throughout the assessment process.

The *Reviewable Projects Regulation* sets the [criteria and thresholds](#) for a project to be considered reviewable<sup>5</sup>. The intent of the regulation is for large projects that could have significant negative impacts (e.g., mines, pipelines, resorts and infrastructure projects that exceed specific threshold) to undergo comprehensive formal review. It is recognized that the proposed bike path does not exceed the threshold to trigger review under the BC EAA; however, in some situations, the proponent of a sub-threshold project can be directed to follow procedures under the BC EAA (see **Management Recommendations** section).

---

<sup>5</sup> Projects that do not meet the thresholds in the regulation, do not require an environmental assessment, but still require all other relevant permits and authorizations to be approved by other regulatory agencies.

### Federal Impact Assessment Act (IAA) (S.C. 2019, c. 28, s. 1)

The federal *Impact Assessment Act* (IAA) outlines a process for assessing the impacts of major projects and projects carried out on federal lands. The Impact Assessment Agency of Canada is responsible for conducting impact assessments under the IAA. The IAA applies to designated projects as described in the *Physical Activities Regulations* and to non-designated projects on federal lands. **Projects on federal lands require federal environmental assessment even if they are not designated projects.** Sections 81 to 91 of the IAA set out requirements in relation to a “project” on federal lands. **Although the proposed South Spur trail route is not on federal land (as the project footprint is anticipated to be restricted to the provincial ROW for the KVR) given proximity and bisection with the VBNWA the proponent should arguably be held accountable to requirements under the IAA.**

Section 81 indicates that the obligation to determine the necessity of imposing the IAA process applies to a “project”, which is defined as:

- ❖ “a physical activity that is carried out on federal lands or outside Canada in relation to a physical work and that is not a designated project or a physical activity designated by regulations made under paragraphed 112(1)(a.2)”; and
- ❖ “a physical activity that is designated under section 87 or that is part of a class of physical activities that is designated under that section.”

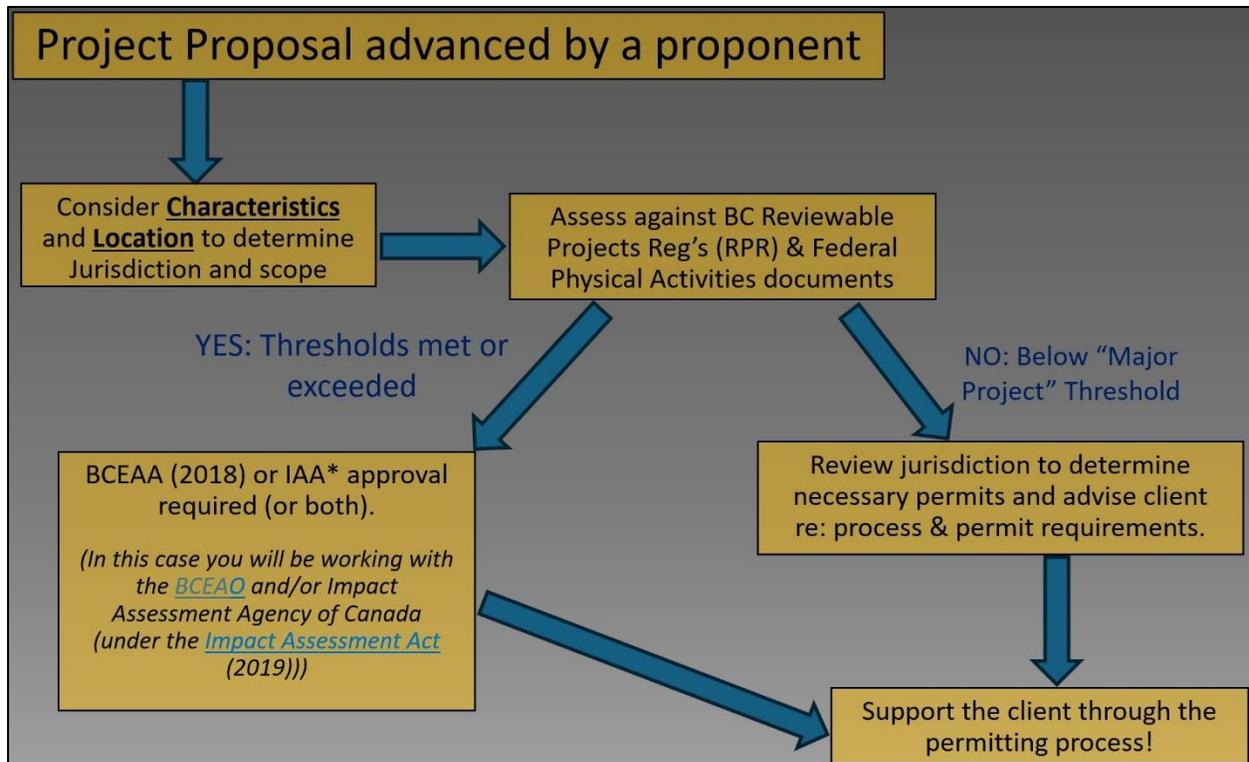
Section 87 allows the Minister to expand the definition of project by identifying “physical activities” that are not “in relation to physical works.” If an Order were made under s. 87, any authority responsible for such project would be required to make an environmental effect determination.

Specifically, as stated in Section 82, a project must not be carried out on federal lands unless:

- ❖ 82 (a): the authority determines that the carrying out of the project is not likely to cause significant adverse environmental effects; or
- ❖ 82 (b): the authority determines that the carrying out of the project is likely to cause significant adverse environmental effects and the Governor in Council decides, under subsection 90(3), that those effects are justified in the circumstances.”

## Environmental Impact Assessment - Procedural Requirements

The BC EAO describes environmental assessment as “A decision-making process to help identify and evaluate the effects associated with the construction, operation, and decommissioning of a proposed project”. An effective environmental assessment should accurately inform stakeholders, and agencies with jurisdiction over all applicable tenures, to ensure appropriate consideration by decision makers regarding the Project. The first step in the regulatory pathway (as shown in **Figure 4**) requires an understanding of the legal requirements that the RDOS would need to address to ensure they satisfy all professional and legal requirements.



**Figure 4: Overview of steps required to determine the appropriate regulatory pathway for a project.**

Depending on the Project characteristics and location, the Project will follow one of two regulatory pathways. If it is deemed a ‘major project’ by the Reviewable Projects Regulations (RPR) or by the Federal Physical Activities document, it will follow a strictly defined process. This process is governed by the BC Environmental Assessment Office, or the Impact Assessment Agency of Canada, or, in some cases, by both.

- ❖ The Impact Assessment Agency of Canada (IAAC) leads federal impact assessments and manages the process to ensure that all information needed to understand potential impacts of proposed project is collected and presented.
- ❖ The Environmental Assessment Office is a neutral regulatory agency within the provincial government that works with Project proponents (and their Prime consultant) to ensure that any potential economic, social, cultural, and environmental effects that may occur during the lifetime of a major project are thoroughly assessed.

The RDOS proposal for trail development along the ROW as it bisects the VBNWA does not meet or exceed the thresholds under the RPR or the Federal Physical Activities documents (i.e., the Physical Activities Regulation). As such, the proponent is not (currently) required to comply with the federal or provincial EA process for the project, but under Section 11 of the BC EAA the BC EAO can examine this outcome and request compliance with the BC EAA (See **Position Summary** section).

If directed by the BC EAO the RDOS will be required to follow a standard series of steps in preparing an EA for application for a certificate, from the BC EAO, to proceed, as follows:

- 1) Describe the Project and discuss Project alternatives,
- 2) Determine Authorities having Jurisdiction,
- 3) Scope issues,
- 4) Identify Valued Components,
- 5) Identify Project-related Effects,
- 6) Determine the Area of Influence (for both direct and indirect effects),
- 7) Identify risk pathways,
- 8) Develop effective and efficient mitigation,
- 9) Determine Significance of Residual Effects; and, finally,
- 10) Understand and quantify potential cumulative effects.

This process places a significant financial burden upon the proponent and will require support from a company qualified in this practice area and will take at least a year to complete. In this process the proponent's representative will need to identify and describe direct and indirect effects.

**Direct Effects:** Interactions that are experienced as an immediate impact of one event or variable on another. For example, Project activities related to construction or operation may lead to direct mortality or injury to an individual of a species. A common example is clearing of vegetation during the breeding bird window that would have a direct effect to eggs and nestlings; hence the standard timing delay or scrubbing/sweeping requirement.

**Indirect Effects:** These are characterized by situations where the effect to the VC is mediated by one or more other variables. For example, often temporal or spatial separation (an example of two variables) from Project-related activities will 'buffer' direct impacts to the VC but indirect effects from, for example, loss of habitat or habitat features, may still occur and have an effect upon the local population of a given species.

Each SARA Recovery Strategy includes a list of activities likely to affect (or destroy) habitat for a species (i.e., an indirect effect) that will inform consideration for Species-at-Risk.

## Species-at-risk Considerations

Each of the twelve<sup>6</sup> species with federally mapped CH are presented in **Table 1**. Focus was applied to only those species with mapped CH as those species are currently afforded legal protection on federal land by SARA. Species without mapped CH, including species listed on Schedule 1 as Special Concern<sup>7</sup>, are not considered however this does not indicate a lesser degree of conservation merit as all species that occur within the VBNWA are designated for protection under the Canada Wildlife Act, and protection from both direct and indirect effects is the assigned responsibility of the federal government land manager for the VBNWA.

**Table 1** also notes, for each species with mapped CH that partially or fully overlaps the VBNWA, if there are activities that may be promoted or exacerbated as a direct result of the proposed South Spur trail development. These annotations were made with direct consideration to the recovery strategy for each species, specifically, the section of the recovery strategy that describes activities detrimental to the species' recovery.

**Table 1: . Activities likely to result in destruction of Critical Habitat as noted in the most recent recovery strategy documents for each of 12 species with mapped CH within the ROW and the VBNWA (some text describing effects is taken directly from the relevant recovery strategy).**

Species	Direct Effect	Indirect Effect
<b>Mammals (n=2)</b>		
<b>American Badger (see ECCC 2021)</b>	-None. No mortality expected from increased use of the ROW; however, increased human traffic may negatively influence behaviour.	-Creation of barriers to movement from increased human use. Behavioral effect resulting in reduced function of CH in the VBNWA.
<b>Pallid Bat (see ECCC 2017)</b>	None anticipated.	None anticipated.
<b>Avifauna (n=2)</b>		
<b>Lewis' woodpecker (see ECCC 2017)</b>	Low level threat. No mortality expected from increased use of the ROW however increased human traffic may negatively influence breeding behaviour.	Removal of any known nest tree (e.g., wildlife trees removed to accommodate human safety) or modification of these trees (e.g., through topping or limbing) such that nesting cavities are no longer accessible. This will result in direct loss of potential nesting habitat. -Significant removal of 'potential nest trees' and standing mature trees within 400 m of a known or potential nest tree.

<sup>6</sup> Soon to be 13 if including North American Racer.

<sup>7</sup> CH mapping is not a requirement for species listed on SARA Schedule 1 as Special Concern. Instead management plans provide guidance for their recovery wherever they (may) occur.

Species	Direct Effect	Indirect Effect
<b>Yellow-breasted Chat (see ECCC 2016)</b>	-Construction of roads and access trails through shrub thickets may result in injury to nestlings.	-Construction of roads and access trails through shrub thickets may promote disturbance, affect territory acquisition and alienate limited areas of nesting habitat (Bötsch, Y. et al., 2018).
<b>Herptiles (n=5 (and 1 more pending))</b>		
<b>Desert Nightsnake (see ECCC 2017)</b>	-Areas of high-use recreational activity, e.g., off-road vehicle tracks, mountain biking and/or hiking trails, rock climbing routes; and/or alteration of natural habitats for recreational purposes. -Mortality associated with human-bike interaction, and increased exposure to intentional persecution by trail users. -Fire suppression and/or human-caused high-intensity fire resulting in destruction to biophysical features and attributes of critical habitat	-Recreation activities may cause direct impacts to biophysical attributes (i.e., collapsing of earthen burrows (PICA), damaging retreat locations), and/or may indirectly cause habitat features to be unsuitable owing to the recreation disturbance (i.e., snakes will not use these areas for foraging and/or basking; disturbance may influence availability of local prey items). -Vegetation changes can alter important habitat features such as thermal properties, availability of earthen denning and/or foraging, and prey type and abundance. Conversely, fuel build up can lead to hot-burning and catastrophic wildfires.
<b>Great Basin Gopher Snake (see ECCC 2017)</b>		
<b>Northern Pacific Rattlesnake (see ECCC 2017)</b>		
<b>Great Basin Spadefoot (see ECCC 2017)</b>	-Development and/or maintenance or modification of transportation and service corridor infrastructure, including road building, expansion, upgrading, or installation of other types of barriers to movement. Increased human use of the ROW could impact mortality rates. -Activities related to the control of invertebrate pests or invasive plant species (as may be required due to increased levels of human transport of invasive plants).	-Concomitant indirect effects due increased levels of human disturbance. -Damaging recreational use (e.g., off-road vehicle use) in core critical habitat can compact soils, making them unsuitable for burrowing.

Species	Direct Effect	Indirect Effect
<b>Western Tiger Salamander (see ECCC 2017)</b>	-Mortality associated with human-bike interaction, and increased exposure to intentional persecution by trail users.	Development and/or maintenance or modification of existing structures, road building, expansion, upgrading, or installation of other types of barriers to salamander movement.
<b>Invertebrates (n=3)</b>		
<b>Behr’s Hairstreak (see ECCC 2016)</b>	-Increased probability of human-caused fire resulting in mortality in local populations.	-Conversion of natural landscape. -Increased probability of human-caused fire resulting in destruction to existing biophysical attributes of critical habitat. -Any recreational activities occurring outside of existing roads or trails, at any time and in all seasons; (e.g., foot traffic, mountain biking, and horse-back riding) to the extent that larval host plants are damaged or destroyed. -Introduction of alien invasive species. -Activities related to the control of invertebrate pests and/or invasive plant species.(mechanical or chemical) that are not in accordance with provincial best management practices, where available
<b>Nuttall’s Sheep Moth (see ECCC 2023) (VBNWA is one of only four metapopulations in BC and the only remaining extant population).</b>	Unlikely to experience direct threats except during construction if Antelope Brush plants are removed or destroyed.	A human-caused fire in 2003, appears to have eradicated one of the two sites in the VBNWA. This threat would be exacerbated by the South Spur Trail development proposal.
<b>Olive Clubtail (see ECCC 2022)</b>	Restricted to littoral zones within VBNWA – no impact anticipated.	Restricted to littoral zones within VBNWA – no impact anticipated.

## Impacts on Mammals

Although federally mapped CH has (currently) only been mapped for two species of mammals in the Westside unit of the VBNWA (i.e., Pallid Bat and American badger) there are many more species of mammals that are known to occur in the area. Dawe et. al. (2004) cites 17 species of mammals, but that list is certainly higher given more recent additions to SARA Schedule 1 and species-at-risk additions by the BC CDC that could be added, by petition, to allow consideration under SARA. A query of the iNaturalist database, the Wildlife Species Inventory Database, data maintained by the author, data compiled by O. Dyer (previous govt species-at-risk biologist) and other sources contain hundreds of observation records for mammals (and other clades). The list of at-risk mammal species does not warrant repetition or updating here, but a few notable at-risk species include the California Bighorn Sheep that motivated the establishment of VBNWA in 1979. It would also include other federally listed species such as the Little Brown Myotis (*Myotis lucifugus*) (pers. obs.), Fringed Myotis (*Myotis thysanodes*, SARA Schedule 3), Western Harvest Mouse (*Reithrodontomys megalotis*) (SARA SC) and Nuttall's Cottontail (*Sylvilagus nuttallii*) (SARA SC).

Deleterious effects to Pallid Bat and American Badger are noted in **Table 1** as relatively insignificant; however, disturbance is still likely and in opposition to the CWA and the objectives of the VBNWA. In response to a proposal for trail development (elsewhere) within American Badger Critical Habitat MWLRS asserted that “...high trail density removes secure habitat for wildlife species. To demonstrate zone of influence disturbance for American badger, a 500m buffer (should be) applied to the proposed trail” to accurately characterize potential deleterious impacts to habitat function (cited to Proctor et al. 2020 in MWLRS Referral Number: 170879349-007; Reference Number: 805958).



Figure 5: American Badger



Figure 6: Pallid Bat

The RDOS South Spur trail proposal also overlaps with Ungulate Winter Range Order U-8-001 for Mule Deer (*Odocoileus hemionus*). The proposal must also consider all applicable General Wildlife Measures (GWMs) outlined in this Order under FRPA. This area is occupied by migratory Mule Deer from October to mid-May and recreational use should be minimized and preferably avoided during this time. In other similar (trail development) applications MWLRS has recommended a seasonal closure during this period (October – mid-May) to reduce impacts on migratory Mule Deer. This MWLRS recommendation further renders this application to be non-conforming with existing legal designations for this area.

## Impacts on Avifauna

The purpose of federal NWA is clearly acknowledged by ECCC and iterated and underscored by the Canada Wildlife Act; simply stated, a focal objective of the VBNWA is to preserve habitats critical to migratory birds and other wildlife species, particularly those that are at risk. Despite recognition that the proposed South Spur trail development occurs within a provincial ROW, given the proximity and bisection of the ROW within the VBNWA, it is reasonable to assume there will be indirect effects to both breeding and migratory habitat for birds. Although public use of the ROW is currently permitted additional development of recreational opportunities along this portion of the KVR will logically and inevitably increase human use (both frequency and number of visitors) within adjacent highly sensitive habitats within the VBNWA. The habitat in this area has been in a state of recovery following industrial use as a commercial railroad, by CPR, which (fortunately) ended almost 65 years ago and is currently viewed as an important remnant of mature ponderosa pine forest in the Okanagan Valley. Evidence from even low intensity surveys in the area since 2000 (see **Review of Assessment Reports** section) have documented repeated use by many species at risk that depend on habitats within the VBNWA during both the (avian) migration and breeding periods.



### Supporting Evidence of Increased Indirect Effects to Avifauna.

*“Outdoor recreational activities are increasing worldwide... Forests are a natural environment often used for such activities as jogging, hiking, dog walking, mountain biking, or horse riding. The mere presence of people in forests can disturb wildlife, which may perceive humans as potential predators. Many of these activities rely on trails, which intersect an otherwise contiguous habitat and hence impact wildlife habitat. The aim of this study was to separate the effect of the change in vegetation and habitat structure through trails, from the effect of human presence using these trails, on forest bird communities.”* From Böttsch, Y. et al., 2018. (Figure 7 & Figure 8).

**Figure 7: Yellow-breasted Chat.**

The authors (i.e., Böttsch, Y. et al., 2018) compared the effects of recreational trails on birds in forests frequently used by recreationists with bird breeding use in two rarely visited forests. This study confirmed that in the disturbed (i.e., high-recreation-level forests) avian density and species richness were both reduced in proportional proximity to trails when compared to forests isolated from human disturbance associated with trail use (Böttsch, Y. et al., 2018). The authors concluded that *“the mere presence of humans can negatively affect the forest bird community along trails”* (Böttsch, Y. et al., 2018). Furthermore, the authors advised that prevention of trail construction in undeveloped natural habitats is the most efficient mitigation to reduce human access, and thus disturbance to avifauna (Böttsch, Y. et al., 2018).



**Figure 8: Lewis's Woodpecker**

Alienation of habitat from increased human disturbance is not unique to, or solely felt by, avifauna. The focus of the study by Bötsch, Y. et al. (2018) was indeed on avifauna however these findings are very reasonably extrapolated to all species of wildlife. Human disturbance is widely recognized in published literature to be deleterious to most species of wildlife, with human caused disturbance frequently resulting in abandonment of otherwise suitable habitats, reduced productivity and fecundity, and localized deleterious effects to wildlife populations. Given the explicitly stated objective of the VBNWA (“to protect and conserve significant habitat to benefit conservation of migratory birds and other wildlife” (Government of Canada 1985)) the proposed RDOS Project (South Spur Trail proposal) is in direct opposition to the objectives and regulations of the Canada Wildlife Act.

### Impacts on Herptiles

There will also be direct effects to other wildlife species, most notably to herptiles (including Northern Pacific Rattlesnake, North American Racer, Great Basin Gopher Snake, Desert Nightsnake, Western Tiger Salamander and Great Basin Spadefoot) (see **Figure 9-14** below). It is likely, based on observed existing threats and impacts to herptiles within the VBNWA, that effects from disturbance, including indirect effects to habitat and direct effects to individuals (i.e., mortality, both intentional and as a result of persecution) will be exacerbated by increased human use that will be encouraged as a direct result of the proposed trail development.

The Recovery Strategy for Great Basin Gopher Snake and Northern Pacific Rattlesnake identify mountain biking as an activity likely to result in destruction of critical habitat. There are several known hibernacula near the proposed Project area. Recent research in BC by E. Lomas (2013) confirmed walking trails result in high levels of disturbance to rattlesnakes inhabiting the area with disturbance resulting in lower body condition relative to snakes inhabiting less disturbed areas (Lomas, 2013).



**Figure 9: Northern Pacific Rattlesnake**



**Figure 10: North American Racer**



**Figure 11: Great Basin Gopher Snake**



**Figure 12: Desert Nightsnake**



**Figure 13: Great Basin Spadefoot**



**Figure 14: Western Tiger Salamander**

### Impacts on At-Risk Invertebrates

Increased human use along the ROW within the VBNWA will result in a concomitant increase to the risk of accidental human-caused wildfire (Pogue 2017, RDOWs 2022), and the risk of wildfire is particularly pronounced on more sessile species. Invertebrates such as Behr's Hairstreak, Olive Clubtail and Nuttall's Sheep Moth are very likely to be severely impacted in the event of another (human-caused) wildfire within the VBNWA.

Disconcertingly, this threat has already been significantly detrimental to the highly endangered Nuttall's Sheep Moth. The federal Recovery Strategy describes that one of the two previously known occurrences for this very rare invertebrate, in what is disconcertingly the only remaining extent population of this species in Canada, was recently destroyed as a direct result of human-caused wildfire in the VBNWA in 2003 (ECCC 2023).

#### **Nuttall's Sheep Moth Fire Impact**

*"Observations within the Vaseux Lake subpopulation are from two sites within 2 km of each other. There was a fire (human caused) in 2003, and Nuttall's Sheep Moth has not been recorded since then. These habitats contained numerous mature (>50 years old) Antelope-brush shrubs that were lost in the fire." (ECCC 2023).*

Given observation of recent evidence (e.g., fire pits) of illegal fires along the ROW in a single day of site assessment in April 2025 (Hobbs and Temple, pers. obs. – see **Figure 3**), and as supported by Pogue

(2017), the risk of human caused wildfires within the VBNWA is directly proportional to increased human use along the ROW and within the VBNWA. If the South Park trail development proposal proceeds there will unarguably be an increased risk of catastrophic stand-replacing fires associated with increased human use along the KVR. The direct effects of stand replacing fires are obviously most detrimental to more sessile species such as invertebrates, hence the treatment in this section, however the impact would also logically extend to avifauna, mammals and herptiles.

The Canada Wildlife Act governs use of the VBNWA. The RDOS Project proposal is in flagrant disregard of the Canada Wildlife Act and directly opposes the explicitly stated intent of NWAs in Canada. The 2018 review by EBB clearly states that stakeholder consultation was achieved as a component of this review, but the adequacy and comprehensive nature of this consultation process warrant revisitation. It seems implausible that a fulsome consultation process would achieve a similar level of support from a more informed public if anticipated increased risk of wildfire were to be fully disclosed during public consultation (**Figure 15**).



**Figure 15: This image appropriately illustrates the devastating effects of wildfires to wildlife (used with permission from the photographer: J. Findlay).**

## Management Recommendations

The original trail development proposal was advanced by the Recreation Sites and Trails division within MFLNRORD in, or prior to, 2018. In April 2022, the BC government divided the former MFLNRORD into several relevant ministries. These agencies, First Nations and ECCC also have authority, including:

- The BC Ministry of Water, Land and Resource Stewardship (MWLRS). Under the current regime the MWLRS is now fully responsible for water policy, land and resource planning, fish and wildlife, and developing relationships with indigenous peoples for co-management of resources. As such, MWLRS is recognized as a significant stakeholder for any development along the KVR ROW, and consultation is required with concessions made to accommodate multiple resource values, including conservation of Species-at-Risk.
- The BC Ministry of Forests is no longer relevant to considerations regarding the proposed development – that authority is now most appropriately assigned to the new Ministry of Tourism, Arts, Culture and Sport. This initiative would need to be adopted by this new ministry in advance of any further promotion of the South Spur trail by RDOS.
- In consideration of authorities having jurisdiction ECCC is also a significant authority that demands improved engagement and consultation. Consultation with ECCC is also required as the federal designate is responsible for conservation of species-at-risk values within the VBNWA.

In addition, interests and concerns should also be solicited from several other key groups, including First Nations, members of the general public and conservation groups such as the VLSA. As the original proponent of the trail development (i.e., MFLNRORD) is now defunct any renewed attempt to advance this proposal is discouraged and, if pursued, would arguably require early consultation with both federal and provincial agencies and local indigenous groups. Each of these entities arguably have superseding authority and jurisdiction over conservation of natural resources along and adjacent to the KVR ROW for the section that bisects the VBNWA.

A renewed focus on integrated land and resource management, advancing reconciliation with indigenous peoples, developing new water policies, managing species at risk, and implementing a cumulative effects regime should logically overshadow a poorly considered and now-dated proposal to advance additional recreational opportunities within a very dated ROW granted to Canadian Pacific Railway over 100 years ago. This is particularly salient as the proposed development bisects one of only six federal NWA in BC, with arguably negligent consideration of associated direct and indirect impacts to species-at-risk conservation.

Specific considerations under three very relevant *Acts* that govern conservation of species-at-risk are summarized in the following sections below.

### Considerations Governed by the Canada Wildlife Act

Violation of any of the conditions under S.3.1 of the CWA are legally prohibited within the VBNWA. There are at least 11 conditions that are likely to (continue to) be violated if the proposed development (of a bike path) were to proceed within the provincial ROW that bisects the VBNWA. The proponent (i.e., the provincial government acting as the proponent) could arguably be held liable for any harm that occurs to Species-at-Risk, including their CH, as a result of breach of the CWA.

Even current (relatively low) levels of use of the ROW by members of public warrant investigation. Clearly the provincial government needs to implement improved measures of compliance and enforcement to prevent continued violation of the CWA and SARA by members of the public that continue to use the existing KVR trail for access through the VBNWA. Furthermore, it is logical to assume that public use of the ROW would increase under any scenario if future development of recreational opportunities/use of this section of the KVR is promoted by the RDOS “Rails and Trails” initiative. Logically, the province should cease and desist any attempt to further develop recreational opportunities along the KVR ROW where it intersects with the VBNWA to avoid legal liability.

### Considerations governed by the Species-at-Risk Act

Under SARA, the definition of federal land includes, but is not limited to:

- Canada's oceans and waterways,
- National parks,
- Military training areas,
- National wildlife areas,
- Some migratory bird sanctuaries; and
- First Nations reserve lands.

SARA applies within these jurisdictions, and ECCC is recognized as the relevant authority having jurisdiction over the VBNWA, including protection of all CH from both direct and indirect effects within its boundaries. Protection under SARA is automatic; that is, there is no ‘safety net’ Section 61(1)(2) order required as prohibitions are automatically in full effect on federal lands) (see SARA s. 58(1)(2)(3)).

It is also understood that prohibitions under SARA also apply to Residences and individuals identified on Schedule 1. There are many SARA Schedule 1 listed species confirmed within the VBNWA, and CH has been mapped for 12 of them (with additional CH mapping underway for North American Racer). Responsibility is assigned to the federal land manager to take action to comply with SARA and, accordingly, to protect federally mapped CH within the VBNWA.

If these provisions are not met along the portion of the ROW that bisects the VBNWA for the section referred to as the South Spur trail development proposal the Governor in Council (GIC) can be solicited, by any member of the public, including the VLSA, to advance an order to prohibit destruction of critical habitat for any part of critical habitat located on non-federal lands (i.e., along the provincial ROW for the KVR). The Governor in Council (GIC) has authority to protect critical habitat on non-federal lands that is not otherwise protected.

### Consideration Governed by the BC Environmental Assessment Act

It has been recognized that the proposed development of a recreational trail along the KVR ROW does not meet the threshold to trigger a formal environmental assessment process (i.e., deemed non-reviewable) under the BC EAA; however (as noted previously), there are safeguards to trigger a formal assessment request from the BC EAO for non-reviewable projects.

A comprehensive review of existing documentation suggests that the existing assessment by EBB (2018), whilst thorough, does not adequately meet information requirements under the BC EAA for the South Spur trail proposal. Existing studies are summarized in more detail in the section **Review of Assessment Reports**, and briefly noted below for convenient reference:

- In 2004, ECCC conducted a team-supported field inventory within the VBNWA, with a focus on vascular plants and vertebrates (Dawe et al. 2004). This work recorded a total of five species of fungi, 260 species of plants, 30 species of invertebrates, five fish species, two amphibian species, eight reptile species, 132 bird species, and 17 mammal species but that work is dated (fieldwork completed May - August 2003). Since then there have been many species up-listed to Schedule 1 of SARA with CH now mapped for 12 species-at-risk within the VBNWA.
- Independent reviews completed by EBB (2018) and Gabauer (2020) were desktop-based studies suggesting additional supporting field surveys are still required.
- In recent years there has been only a single brief reconnaissance field study to assess feasibility of the proposed development, as described in EBB (2019).

**Under section 11 of the BC EAA the Minister of the Environmental Assessment Office (BC EAO) holds authority to designate a project as reviewable in response to a public appeal (BCEAO 2023). This appeal, if filed, would assert that the project does not meet the test of substantially started (i.e., construction has not started, project activities are not being carried out and the project is not in operation). If the South spur trail development project is subsequently determined to be eligible and is designated as reviewable under Section 11 of the BC EAA the project will require an environmental assessment certificate before it can proceed.**

To fully understand the extent of the RDOS proposal, and the resulting potential impact to federally listed species-at-risk (including habitat function and value) VLSA requests that the proponent hire a team of appropriately Qualified Environmental Professionals to survey the trail and surrounding area to produce a more comprehensive Environmental Assessment report that fully identifies existing wildlife and habitat values within a surrounding 500 m (minimum) buffer of the KVR ROW. This effort should have an extensive field component and should fully identify all potential impacts to wildlife values using expert-based consideration from a team of Subject Matter Experts (SMEs). In addition, as part of the proposal RDOS should attempt to develop and advance meaningful and effective mitigations, as a component of their proposal, to avoid any and all impacts, and these mitigations should be closely scrutinized by SMEs. If impacts cannot be eliminated the VLSA posits that the proposal should be rejected in consideration of the requirements of all relevant legislation, including both the *Canada Wildlife Act* and the federal *Species at Risk Act*.

## Position Summary

The RDOS proposal for continued development of a multi-use recreational path along the KVR overlaps many important sensitive wildlife habitats, including many areas of federally mapped CH. These include CH and sensitive habitats documented to support many species at risk that are known to be deleteriously affected by human presence and trail development. The potential for increased recreational use along the KVR within these sensitive habitats raises substantive concerns regarding:

- 1) alienation of sensitive habitats from obligate species that occur in the VBNWA,
- 2) increased direct mortality risk to Species-at-Risk,
- 3) increased risk of wildlife-human conflict (e.g., humans interacting with the venomous Northern Pacific Rattlesnake),
- 4) significant increased risk of human-caused stand-replacing wildfire in the VBNWA; and,
- 5) increased risk from introduction of invasive plants in habitat adjacent to the trail.

The RDOS has not knowingly provided information to detail meaningful and effective mitigation for these impacts, particularly beyond the construction phase (see concerns regarding EBB 2018). The application does not include a fulsome Environmental Assessment, Trail Sustainability Assessment, Environmental Management Plan, Invasive Species Management Plan, Monitoring Plan, or Safety Plan. Each of these are key documents for the establishment and maintenance of a safe and sustainable trail system for both humans and wildlife (see MWLRS Referral Number: 170879349-007; Reference Number: 805958).

Furthermore, as the proposed South Spur trail is an expansion of an existing trail system (along the KVR), the VLSA requests additional background information regarding mitigative measures applied to the KVR recreational trail to date. Information regarding existing and anticipated level of visitor use along the existing sections of the KVR multi-user trail will also help inform considerations by ECCC and VLSA.

Given the currently proposed design and siting of the proposed South Spur trail development project (as depicted in EBB 2018), which wholly bisects the VBNWA, and given extensive ongoing concerns regarding conservation and recovery of many federally and provincially listed species on both federal and provincial lands, the VLSA will request more appropriate consideration. If this initiative is not formally and immediately cancelled the VLSA will suggest that the proposed Project undergo rigorous environmental assessment procedures for all Project components (including development, and ongoing operation). In response to recognized deficiencies during Project consideration by the provincial government (as outlined in the review of EBB 2018; as commissioned by the now defunct MFLNRORD), if the South Spur trail development proposal is advanced any further, the VLSA fully intends to submit a formal application to the provincial government to designate the South Spur trail development proposal as a reviewable project under the BC EAA. If this proposal is not cancelled the VLSA may also escalate by submitting a petition to the federal government to invoke S.80 (i.e., the “Emergency Order”) of the federal *Species at Risk Act*.

Given this position the VLSA respectfully request that formal written notification be provided by the RDOS to the VLSA stating that the RDOS-MFLNRORD initiative to advance the South Spur trail development proposal along the KVR ROW, through the VBNWA, will be appropriately and immediately rescinded.

## Closure

J Hobbs Ecological Consulting Ltd. (JHEC) is submitting this report to VLSA (the Client) for advance to ECCC (supporting funder).

This work was completed by J Hobbs Ecological Consulting Ltd. (“JHEC”) acting under contract to the Client, as a deliverable for project number JHEC-2025-21. This report was prepared by JHEC, based on review of information provided by the client, pertinent primary literature and consideration of site topography, terrain, and habitat (based on review of open-source satellite imagery, field assessment and field survey work). This work was completed by JHEC for sole benefit and use by VLSA to address and raise concerns regarding regulatory requirements relevant to the South Spur trail development proposal as advanced by RDOS.

In performing this work, JHEC has relied in good faith on information provided by others and has assumed that the information provided by those individuals is both complete and accurate. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions or recommendations herein.



---

**Authorized Signatory and QEP: J. Hobbs - Director**

## References

- B.A. Blackwell & Associates Ltd. & Ecologic Consulting. 2021. Terrestrial Ecosystem and Wildlife Habitat Mapping for the Vaseux Bighorn National Wildlife Area. Report Prepared for: Protected Areas, Pacific Region, Canadian Wildlife Service Environment and Climate Change Canada / Government of Canada.
- BCEAO. 2023. Designation application requirements. Section 11 - Ministers Power to Designate a Project as Reviewable. Version 1. 7 pp. [Designation Application Requirements](#)
- Bötsch, Y. et al., 2018. Effects of recreational trails on forest birds: Human presence matters. *Frontiers in Ecology and Evolution* 6:175. [doi: 10.3389/fevo.2018.00175](https://doi.org/10.3389/fevo.2018.00175)
- Bright, D. 2023. Letter to VLSA re: Proposed Trail Development Along the Former Kettle Valley Railway (KVR) Line Adjacent to Vaseux Lake and At-risk Species Evaluations. 7 pp.
- British Columbia Ministry of the Environment. 1998. Habitat Atlas for Wildlife at Risk Riparian & Wetland Ecosystems. [https://www.env.gov.bc.ca/okanagan/esd/atlas/riparian\\_wetland.html](https://www.env.gov.bc.ca/okanagan/esd/atlas/riparian_wetland.html)
- Dawe, N.K., R. Buechert, A.C. Stewart, J. Penny, K.A. Brock, and F. Russell. 2004. Some aspects of the ecology of Vaseux-Bighorn National Wildlife Area with emphasis on species at risk. Unpublished. Canadian Wildlife Service, Pacific and Yukon Region, British Columbia.
- Destination Osoyoos. Economic Impact and Value of Tourism in Osoyoos. <https://destinationosoyoos.com/wp-content/uploads/2023/06/Economic-Impact-and-Value-of-Tourism-in-Osoyoos-v3.pdf>
- EBB Environmental Consulting Inc. (G. Smart & O. Busby), March 2018. Environmental Feasibility Study - Kettle Valley Railway, South Spur Trail. Report prepared for BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 203 pp (165 pp. plus appendices).
- EBB Environmental Consulting Inc. (G. Smart & O. Busby), June 2019. Vaseux Lake West, Reconnaissance-Level Assessment Environmental Feasibility Study Kettle Valley Railway, South Spur Trail. Report prepared for BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 15 pp.
- Environment Canada, 2011. Vaseux-Bighorn National Wildlife Area Management Plan. [https://publications.gc.ca/collections/collection\\_2015/ec/CW66-292-2011-eng.pdf](https://publications.gc.ca/collections/collection_2015/ec/CW66-292-2011-eng.pdf) Government of Canada. 1985. *Canada Wildlife Act*. <https://laws-lois.justice.gc.ca/PDF/W-9.pdf>
- Environment and Climate Change Canada. 2016s. Recovery Strategy for the **Behr's Hairstreak** (*Satyrrium behrii*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 28 pp. + 16 pp.
- Environment and Climate Change Canada. 2016b. Recovery Strategy for the **Yellow-breasted Chat** *auricollis* subspecies (*Icteria virens auricollis*) (Southern Mountain population) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. v + 31 pp.

- Environment and Climate Change Canada. 2017a. Recovery Strategy for the **Pallid Bat** (*Antrozous pallidus*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 14 pp. + 46 pp.
- Environment and Climate Change Canada. 2017b. 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. 2017c. Recovery Strategy for the **Great Basin Spadefoot** (*Spea intermontana*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 31 pp. + 40 pp.
- Environment and Climate Change Canada. 2017d. Recovery Strategy for the **Lewis's Woodpecker** (*Melanerpes lewis*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 40 pp.
- Environment and Climate Change Canada. 2017e. Recovery Strategy for the **Tiger Salamander** (*Ambystoma tigrinum*) Southern Mountain population in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 19 pp. + 39 pp.
- Environment and Climate Change Canada. 2021. Recovery Strategy for the **American Badger** *jeffersonii* subspecies (*Taxidea taxus jeffersonii*) Western population and Eastern population in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 20 pp. + 36 pp.
- Environment and Climate Change Canada. 2022. Recovery Strategy for the **Olive Clubtail** (*Stylurus olivaceus*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. 2 parts, 19 pp. + 52 pp.
- Environment and Climate Change Canada. 2023. Recovery Strategy for the **Nuttall's Sheep Moth** (*Hemileuca nuttalli*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 35 pp.
- Gebauer, M., November 2020. Desktop Assessment of Species at Risk Occurrence at the Vaseux-Bighorn National Wildlife Area, British Columbia. Report prepared for Environment and Climate Change Canada, 80 pp.(40 pp plus appendices).
- Hagginbottom, K and Scott, N. 2004. Wildlife Tourism: a strategic destination analysis. Common Ground Publishing Pty Ltd. Altona, Victoria, Australia. Larose Research & Strategy. 2022.
- Hobbs, J. 2022. Species-at-risk Recovery in BC - An Audit of Federal and Provincial Actions. Prepared for Sierra Club BC and Western Canada Wilderness Committee. 59 pp.
- Lomas, E.V. (2013). Effects of disturbance on the northern pacific rattlesnake (*Crotalus oreganus oreganus*) in British Columbia. Master's thesis, University of British Columbia. Pogue, A.M., 2017. Humans, Climate and an Ignitions-Limited Fire Regime at Vaseux Lake. M.Sc. Thesis, University of British Columbia, 82 pp.

Proctor, M. F., McLellan, B. N., Stenhouse, G. B., Mowat, G., Lamb, C. T., & Boyce, M. S. (2020). Effects of roads and motorized human access on grizzly bear populations in British Columbia and Alberta, Canada. *Ursus*, 2019(30e2), 16-39.

RDOS. 2022. Climate Projections for the Okanagan Region. <https://www.rdos.bc.ca/development-services/planning/strategic-projects/climate-projs/>

MWLRS Referral Number: 170879349-007; Reference Number: 805958. RTSBC and Kettle River Cycling Association (KRCA), FRPA Section 57 application response.

### **Online References**

BC Environmental Assessment Act:

<https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/18051#section10>

Canada Wildlife Act. [About the Canada Wildlife Act - Canada.ca](https://www.canada.ca/en/nature/about-the-canada-wildlife-act)

Federal IAA : <https://laws.justice.gc.ca/eng/acts/i-2.75/page-7.html#h-1160814>

Government of Canada Vaseux-Bighorn National Wildlife Area website: [Vaseux-Bighorn National Wildlife Area - Canada.ca](https://www.canada.ca/en/nature/about-the-vaseux-bighorn-national-wildlife-area)

Physical Activities Regulations: <https://laws.justice.gc.ca/eng/regulations/SOR-2019-285/page-2.html#docCont>

What projects are reviewed: <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/environmental-assessments/environmental-assessment-process/what-projects-require-environmental-assessment#>

Wildlife Management Area Regulations:

<https://laws.justice.gc.ca/eng/regulations/C.R.C., c. 1609/page-1.html>

### **Personal Communication:**

Grant Temple – VLSA President

Ian Adams – WCS KBA biologist