

Deja View and Power Wagon Trails Environmental Screening Report

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Table of Contents

Part 1: Project Background	3
1.0 Introduction	3
1.2 Location.....	4
Part 2: Regulatory Overview	6
2.1 Wildlife Act.....	6
2.2 Migratory Birds Convention Act.....	6
2.3 Species At Risk Act	6
2.4 Weed Control Act.....	6
2.5 Heritage Conservation Act	7
2.6 Fisheries Act	7
2.7 Water Act	7
2.8 Riparian Areas Regulation.....	7
Part 3: Environmental Conditions.....	8
3.1 Summary (sensitive sites, natural values, impact risk and mitigation).....	8
3.2 Ecological Communities at risk	12
3.3 Plant Species at risk.....	12
3.4 Wildlife	13
3.6 Soil and water degradation.....	15
References and Web-based Information Sources	16
Appendix A: Species At Risk Potentially Occurring in the Deja View and Power Wagon Trails Area	17

Part 1: Project Background

1.0 Introduction

The Columbia Valley Greenways Trail Alliance (CVGTA) requested completion of an environmental screening report to help inform decisions related to trail development, upgrades, and closures in the Deja View and Power Wagon Trail network. This report is based on an environmental screening template that is currently being piloted by Recreation Sites and Trails BC to help stewardship groups coordinate information about the environmental values and features within a trail corridor. The environmental screening template draws from on-line provincial government databases as an initial desk-top review of environmental values and features that may occur within the project area. Given the sensitive nature of this grassland site within a Wildlife Management Area, the CVGTA also commissioned field surveys for wildlife and plant species at risk. The information collected in this report should be considered in combination with the two field survey reports (Wildlife - Tierra Environmental Consulting, and Plant Communities - Hillary Page) to inform trail design and management options that will avoid or mitigate the negative impacts of recreational use on this area. The other important document included with these reports is the Adaptive Management Matrix. This matrix table suggests monitoring methods and corrective actions to follow so that stewardship of this trail network extends beyond short-term commitments.

The Deja View and Power Wagon trails are well used non-motorized recreational trails on public (crown) land within the Columbia Wetlands Wildlife Management Area. These two main trails were originally constructed without consultation or approval. Other shorter trails have since been built off the main trails (e.g., out to viewpoints) without the benefit of comprehensive trail planning design, and construction. This is a sensitive grassland area with frequent signs of wildlife use (e.g., badger, Bighorn sheep) that would really benefit from a formal trail development process.

The overall goal of the CVGTA is:

“To create a sustainable multiuse non-motorized trail network that links Dry Gulch and Radium. This network will be re-designed to minimize impact on sensitive habitat areas and reduce potential conflict with wildlife”.

To meet this goal, the CVGTA has proposed the following actions:

1. Review environmental screening information to identify sensitive areas,
2. Design a low-impact sustainable trail management plan,
3. Complete formal consultation process, and
4. Apply current trail building standards

Specific trail improvements proposed by the CVGTA in May, 2014 that will protect sensitive values and features along the trail corridor include:

- Re-route trail around existing Badger dens,
- Decommission unsanctioned trails,
- Install directional and interpretive signage to educate trail users on environmental values and sensitivity, focus use, and avoid unsanctioned trail development

Improving trail management through a process that first assesses natural values/features, and then develops a trail management plan that includes re-routes near sensitive sites (e.g., near badger dens), and finally applies current trail design and construction standards, will greatly improve the current unmanaged situation. A trail management plan for this area should also include a long-term adaptive management plan to ensure that recreation impacts will be monitored and corrective actions will be applied if unacceptable levels of change are observed (see Recreation Sites and Trails BC's adaptive management matrix table for site monitoring and corrective action suggestions).

1.2 Location

These well-used trails are located east of the Columbia River and west of Highway 93/95, linking the communities of Dry Gulch and Radium (Fig.1). Based on a survey conducted by the CVGTA, the Deja View trail is the most popular trail in the valley. These are very accessible trails that are used primarily by dog-walkers, trail runners, hikers and mountain bikers. Recreational use of the trail network is year-round depending on winter weather, but the majority of use is between March and November.

There are 6 trail types defined by Recreation Sites and Trails BC. The Deja View and Power Wagon Trails are considered Type 2 trails: *smooth, hard packed crush or natural mineral surface, 1.0-1.5m tread width, gently rolling with short steep sections (5-8% avg grade), suitable for most users.*

The Columbia Wetlands Wildlife Management Area is recognized as a vital component of the Pacific Flyway, a waterfowl migration route between Arctic nesting areas and South American wintering grounds. The wetlands below the trail bench are critical for supporting a number of sensitive species and species at risk.

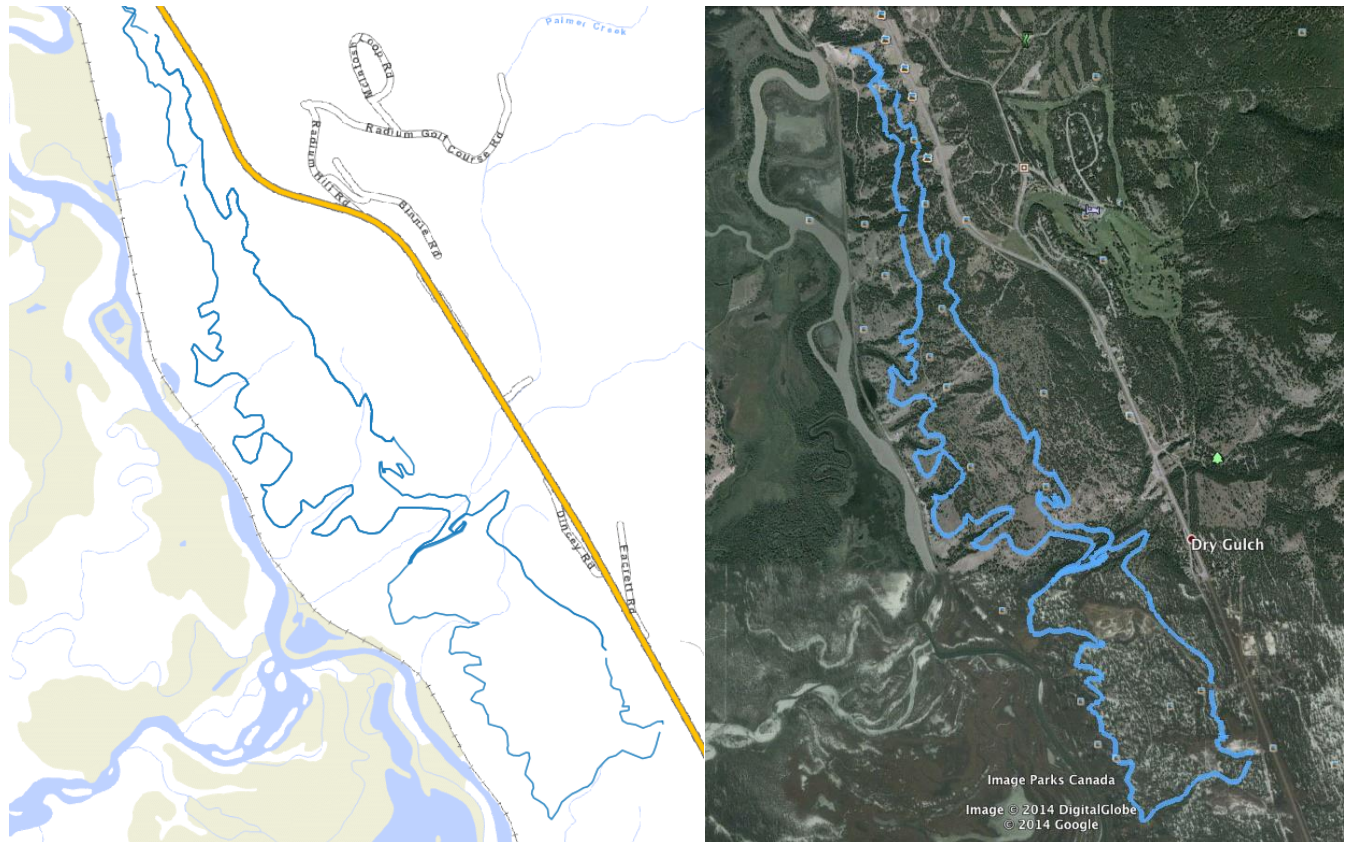


Figure 1. Overview map showing the location of the Deja View and Power Wagon trail network (blue). Right side overlays satellite imagery.

Part 2: Regulatory Overview

The following is a list of federal and provincial environmental regulations that are relevant to this project. This is not an exhaustive list but will serve to summarize the most relevant and applicable regulations to trail development in this area.

2.1 Wildlife Act

The Columbia Wetlands Wildlife Management Area is designated under Section 4(2) of the Wildlife Act. Wildlife Management Areas are the primary designation tool to conserve and manage important habitat for the benefit of regionally to internationally significant fish and wildlife species or their habitats. The Wildlife Act of BC protects vertebrate animals from direct human harm. It is an offence to kill, harm, harass, or capture an animal considered “At Risk”.

2.2 Migratory Birds Convention Act

The Migratory Birds Convention Act protects migratory birds and their nests from indiscriminant harvesting and destruction. The Act states that “no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird”. Any trail and infrastructure works that could destroy or disturb nests must be completed outside of the active breeding season of birds (i.e. not between April 1 and July 31). See wildlife report for specific information on Flammulated owl nests in the trail area.

2.3 Species At Risk Act

The Species At Risk Act is federal legislation that provides legal protection to “at risk” plants and wildlife and their habitats. The purpose of the Act is to prevent Canadian indigenous species from becoming extinct, provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk.

2.4 Weed Control Act

Noxious weeds are typically non-native plants that have been introduced to British Columbia without the insect predators and plant pathogens that help keep them in check in their native habitats. For this reason and because of their aggressive growth, these alien plants can be highly destructive, competitive and difficult to control. The B.C. Weed Control Act imposes a duty on all land occupiers to control designated noxious plants.

2.5 Heritage Conservation Act

The key piece of legislation affecting archaeology in British Columbia is the Heritage Conservation Act (HCA). The Act provides for the protection of British Columbia's archaeological resources, covering sites dated before 1846, located on both public and private land. The Act prohibits the destruction, excavation or alteration of archaeological sites without a permit. It also allows for the minister to order a 'heritage inspection' to assess the archaeological significance of a piece of land. HCA requires that if any previously unidentified archaeological resources are found during construction that work stops and officials are contacted.

2.6 Fisheries Act

The federal Fisheries Act is the main federal legislation protecting fish, fish habitat, and water quality. Section 36(3) of the act stipulates that "no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish. Section 35(1) states that "no person shall carry on any work or undertaking that results in the death of fish or any permanent alteration to, or destruction of, fish habitat."

2.7 Water Act

The provincial Water Act protects the quality of water, fish and wildlife habitat, and the rights of licensed water users. Under the Water Act, habitat includes the watercourse and the streamside (riparian) vegetation that provides nutrients and shade to the stream.

2.8 Riparian Areas Regulation

Riparian areas are the areas bordering on streams, lakes, and wetlands that link water to land. The blend of streambed, water, trees, shrubs and grasses directly influences and provides fish habitat. Protecting this riparian habitat, while facilitating urban development that exhibits high standards of environmental stewardship, is a priority for the Government of British Columbia. Good quality streamside habitat is essential for ensuring healthy fish populations. Enacted under Section 12 of the Fish Protection Act, calls on local governments to protect riparian areas during development.

Part 3: Environmental Conditions

3.1 Summary (key natural values and features, potential impacts and mitigation)

The negative impacts on wilderness are an inevitable consequence of recreation. Even the most thoughtful visitors will leave footprints and may unintentionally disturb wildlife (Leung and Marion, 2000). The challenge then is to design to minimize impacts and then to monitor to correct impacts before they become unacceptable.

The general environmental values that are affected by our recreational use of wilderness are typically: soil, vegetation, wildlife, fish and water. Many of these impacts (such as trail rutting and braided muddy areas) also affect the quality of the visitor experience and can be mitigated by using current trail design and construction principles and techniques (e.g., IMBA/Whistler Standards).

The following summary of environmental values and features that trail planners must be aware of is based on a desk-top review of provincial databases and the results of field surveys conducted by Tierra Environmental Consulting (*Deja View Trail and Power Wagon Trail Wildlife Assessment*) and Hillary Page (*Vegetation of the Deja View and Power Wagon Trails*). See each report for further details.

American Badger

- **Badger den field inventory results: 19 holes at 10 trail locations**
- **Provincial wildlife database shows badger point locations within the trail network. The long-term East Kootenay Badger Project initiated badger monitoring in 1996.**

Natural values and risks:

- Badgers in southeastern BC are Red Listed (endangered, threatened) and are at the northern edge of their range. They have very low population densities and have large home ranges.
- The integrity of an ecosystem can be measured by the health of its predator or carnivore populations. Carnivores such as badgers influence the structure of an ecosystem and reflect the health of trophic levels on which they depend. Carnivores are also generally sensitive to the abundance and behavior of humans.

- Badgers usually reuse old burrows rather than digging new holes and will reuse burrows from year to year (Terra Environmental report).

Mitigation options:

- If, in the future, a badger establishes a maternal den, reroute the trail away from the den or close a section of the trail while the den is in use.
- Include educational signage at trail heads and in areas with signs of badger and ground squirrel use to inform the public that this is a Wildlife Management Area, provide information on badger ecology and inform users on the importance of keeping dogs on leash. Dogs are likely the primary concern when considering impact to badgers and ground squirrels.
- Long-term trail management should consider the opportunity to partner with the East Kootenay Badger Project to routinely review badger data within the trail network. This may be an effective way to monitor whether recreational use of the area is affecting badgers and to trigger corrective actions such as trail closures or educational signage.

Bighorn sheep

- **Pellet piles indicate high use of bighorn sheep at the northern end of both the Deja View and Power Wagon trails. Grassy outcrops/bluffs were covered with sheep pellets.**
- **Parks Canada telemetry data shows that sheep locations are concentrated across the northern 1 km of trail, on open grassland patches, and primarily between November and April.**

Natural values and risks:

- Rocky mountain bighorn sheep are provincially Blue listed (special concern, characteristics that make them particularly sensitive or vulnerable to human activities or natural events) by the BC Conservation Data Centre.
- Recreational trail use has been shown to negatively affect bighorn sheep during lambing periods (ewes abandon lambing areas) when recreationalists stray from the trail and traverse lambing habitat in erratic and unpredictable manner (Wiedmann and Bleich 2014).

Mitigation options:

- Voluntary closure – One possible solution is to put in signs at the north end of the trail indicating voluntary closure of the trail during peak bighorn sheep use (e.g., November 1 to May 1). This may require connecting the Deja View Trail to the Power Wagon trail before the upper pullout on the Radium Mile Hill. As well, it would likely be beneficial to have an additional connection to the Old Coach Trail, to accommodate users approaching from the Radium. Other trails in the region including trails in Golden and Revelstoke have instituted temporary voluntary closures on certain trails for bighorn sheep and caribou respectively.
- Re-route and decommission trail at north end. If warranted, another possible corrective action would be to decommission the trail at the north end. However, considering that the majority of human use on these trails occurs from May – September, during non-peak bighorn sheep use periods, this option seems more drastic, but could be considered if temporary voluntary closures are not effective.
- Determine level of recreational trail use occurring between November and April using trail counters or surveys. This will help assess the potential impact during peak bighorn sheep use of this area (sheep: November to April).
- Consistency and predictability in trail use will reduce the impact of human presence. Install signage at trail heads and areas where sheep congregate to encourage users to stay on the trail and keep pets on leash. Remind users that this is a Wildlife Management Area.

Grassland sandy soils with thin biological crusts

- **Biological crusts provide soil stability, and important nutrients to plant communities**
- **Recovery of biological crusts after trampling disturbance is very slow (up to 250 years).**
- **Where crusts are damaged, invasive plant species often occur**
- **There are several occurrences of trail sluffing and soil erosion**

Bluebunch Wheatgrass – Junegrass Plant Community (Blue Listed)

- **Level to gently sloping areas**
- **Most sites degraded by non-native invasive plant species (alfalfa, yellow sweet clover, white sweet clover) likely introduced by horses.**

Hooker's Townsendii (Red Listed)

- **Four occurrences along the trails**
- **Found on dry, grassy slopes and meadows**

Invasive Plants

- **Several occurrences of Canada thistle, leafy spurge, and spotted knapweed on trail.**

Natural values and risks:

- There are several rare and sensitive grassland plant species occurring in this area.
- Non-native plants invade impacted areas further slowing recovery.

Mitigation options:

- Identify and treat all noxious weed infestations.
- Educate users through signage about invasive plants and ways to limit their spread.
- Upgrade existing eroded trail sections to meet current standards for trail design.
- Decommission alternative trails branching off main trail.
- Limit sprawl at view points by strategically placing benches and fence sections that focus trampling impact to a defined area.
- Create an adaptive management plan:
 - Monitor most impacted sites for indications of improvement or continued negative impact.
 - Set defined limits of acceptable change (e.g., No increase in exposed soil areas, No increase in invasive plant abundance/distribution)
 - Commit to specific corrective actions (e.g., Signage to educate visitors about invasive plants, create rehabilitation plan) if impacts exceed pre-stated limits of acceptable change.

3.2 Ecological Communities at risk

Deja View and Powerwagon trails are within the IDFxk biogeoclimatic zone. The IDFxk (dry, cool Interior Douglas-fir), (Fig. 2, and see Plant Community report for full details).

Based on a search of the BC Conservation Data Centre's database, there are two Blue listed ecological communities that can occur within the IDFxk biogeoclimatic zone in the Kootenay Region: Hard-stemmed bulrush Deep Marsh, and Common Cattail Marsh. Neither of these ecological plant communities are within the impact zone of the trail network.

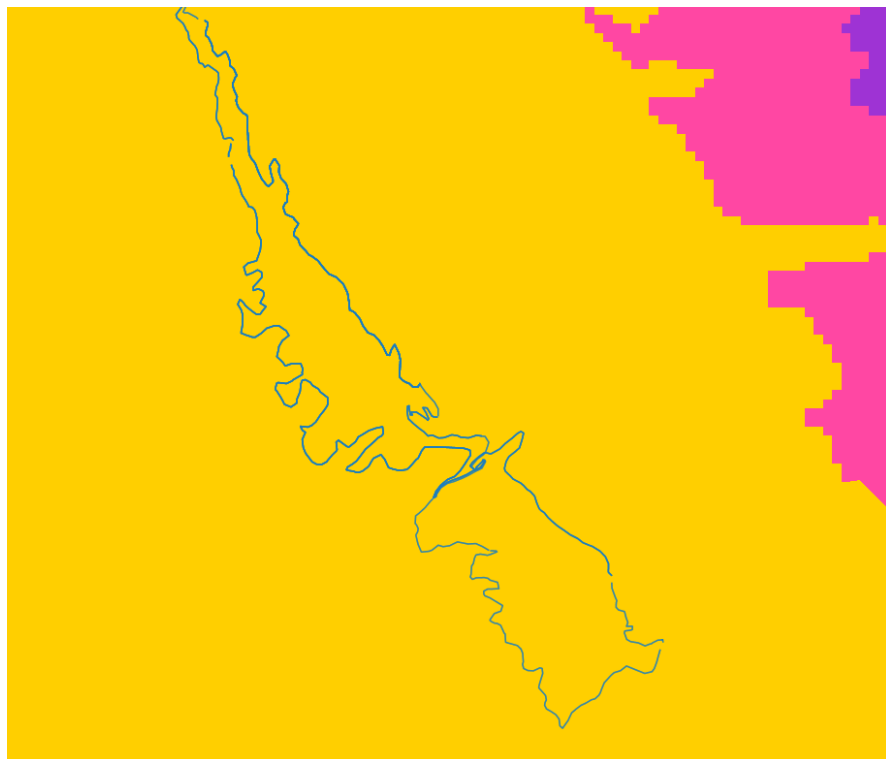


Figure 2. Map showing that the trail system is completely within the IDFxk biogeoclimatic zone (yellow).

3.3 Plant Species at risk

A search of the BC Conservation Center's database for vulnerable plant species that could exist in the trail area (using the online tool Hectares BC), resulted in a list of 6 Blue listed plants and 1 Red listed plant species (Appendix 1, Table 1). Field assessments documented the presence of a second Red listed species Hooker's Townsendii (see Plant Community Report for details). Any new trail development, upgrades, or decommissioning should avoid disturbing the area where Red listed plants occur.

Every new trail development must recognize the potential for trail users to inadvertently spread invasive plant species. Long-term management of these trails should include monitoring for the spread of invasive plants. Trail users should be encouraged to learn to identify invasive plants, inspect their clothing, equipment, and pets for plant parts before and after an activity. The Invasive Species Council of BC can provide resources to support this effort (<http://bcinvasives.ca/>).

3.4 Wildlife Species At Risk

As discussed in the preceding summary of environmental conditions, key wildlife species of concern in the Deja View and Power Wagon trail network are badger and Bighorn sheep (see Tierra Environmental report for details). Other wildlife species of concern that may occur in this area are listed in Appendix A Tables 2-5 (source: BC Conservation Center's database using Hectares BC). Typical habitats of many of these species do not occur in the project area, however occasional use is still possible. Field assessments for Flammulated owl, Lewis's Woodpecker, and Long-billed Curlew were also conducted where suitable habitat was found along the trail network (see Tierra Environmental report). No observations of these species were made at this time, however recommendations for mitigation include:

- Leave wildlife trees and large firs in the area.
- Set up nest boxes in forests that have few or no suitable nest sites.
- Close or reroute sections of trail within 50 m of a Flammulated Owl nest, if one is detected in the future.

A spatial search of provincial wildlife data found that the almost the entire trail network is within provincially managed Ungulate Winter Range (UWR U-4-008). These areas contain habitat that is necessary to meet the winter habitat requirements of an ungulate species. UWR U-4-008 was approved to protect winter range habitat for White-tailed deer, Mule deer, moose, elk, bighorn sheep, and mountain goat.



Figure 3. Map showing the trail system almost completely within provincially managed Ungulate Winter Range (UWR U-4-008) in beige.

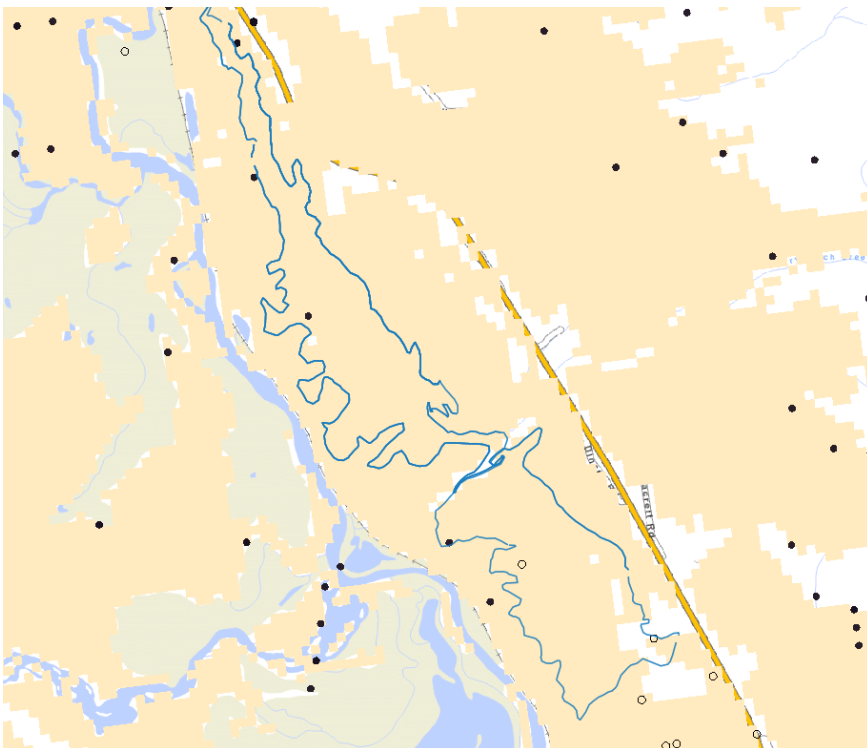


Figure 4. Map showing point locations of wildlife from the provincial wildlife inventory database (SPI). Solid points are visual observations, outlined points are telemetry (from animals fitted with radio collars). Ungulate Winter Range (UWR U-4-008) is also shown in beige.

Another spatial search overlaid the provincial wildlife inventory database (SPI) on the trail network revealing previous studies that recorded locations of Bighorn sheep (6 points), badger (4 points, 2 from radio collared animals), and White-tailed deer (2 points) in the project area (Fig 4).

3.6 Soil and water degradation

Many of the open grassland areas throughout this trail system and at viewpoints are sandy soils held together by biological crusts and are extremely sensitive (see Plant Community report). Trail development and upgrades must incorporate current trail design and construction standards for slopes and grades to avoid erosion and compaction of soils outside of the trail corridor. Trails must be designed to avoid stormwater runoff down the trail. Soil damage will lead to an increase in invasive plants, which were observed at almost all viewpoint areas where trampling has caused an increase in cheatgrass (*Bromus tectorum*).

References and Web-based Information Sources

Leung, Y., and J.L.Marion. 2000. Recreation impacts and management in wilderness: A state-of-knowledge review. USDA Forest Service Proceedings RMRS-P-15-VOL-5.

Newhouse, N.J., and T.A. Kinley. 2002. Annual Update on Population Ecology of Badgers in the East Kootenay. Columbia Basin Fish and Wildlife Compensation Program.(also see web link below for East Kootenay Badger Project).

Wiedmann, B.P. and V.C. Bleich. 2014. Demographic Responses of Bighorn Sheep to Recreational Activities: A Trial of a Trail. Wildlife Society Bulletin.

BC Species and Ecosystem Explorer: <http://www.env.gov.bc.ca/atrisk/toolintro.html>

East Kootenay Badger Project: <http://a100.gov.bc.ca/pub/siwe/details.do?id=711>

Hectares BC (BC Conservation Framework): <http://www.hectaresbc.org/app/habc/HaBC.html>

iMAP BC: <http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc>

Invasive Species Council of BC: <http://bcinvasives.ca/>

Appendix A: Species At Risk Potentially Occurring in the Deja View and Power Wagon Trails Area

Table 1. Plant species at risk potentially occurring in the project area:

Layer Name	BC List	Habitat Type
lumber pine (<i>Pinus flexilis</i>)	Blue	Forest;Rock/Sparsely Vegetated Rock
slender paintbrush (<i>Castilleja gracillima</i>)	Blue	Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Gastony's cliff-brake (<i>Pellaea gastonyi</i>)	Blue	Rock/Sparsely Vegetated Rock
southern maiden-hair (<i>Adiantum capillus-veneris</i>)	Red	Stream/River;Rock/Sparsely Vegetated Rock
Enander's sedge (<i>Carex lenticularis</i> var. <i>dolia</i>)	Blue	Alpine/Tundra;Grassland/Shrub Steppe;Lakes;Wetland;Stream/River;Rock/Sparsely Vegetated Rock
plains reedgrass (<i>Calamagrostis montanensis</i>)	Blue	Forest;Grassland/Shrub Steppe;Rock/Sparsely Vegetated Rock;Shrubland
swollen beaked sedge (<i>Carex rostrata</i>)	Blue	Wetland

Table 2. Bird species at risk potentially occurring in the project area:

Species	BC List	Habitat Type
Barn Swallow (<i>Hirundo rustica</i>)	Blue	Agricultural;Estuary;Grassland/Shrub Steppe;Lakes;Wetland;Stream/River;Rock/Sparsely Vegetated Rock
Bobolink (<i>Dolichonyx oryzivorus</i>)	Blue	Agricultural;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Flammulated Owl (<i>Otus flammeolus</i>)	Blue	Forest;Rock/Sparsely Vegetated Rock
Great Blue heron, herodias subspecies (<i>Ardea herodias herodias</i>)	Blue	Agricultural;Estuary;Forest;Grassland/Shrub Steppe;Lakes;Wetland;Stream/River;Rock/Sparsely Vegetated Rock
Le Cortes' Sparrow (<i>Ammodramus leconteii</i>)	Blue	Agricultural;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Lewis's Woodpecker (<i>Melanerpes lewis</i>)	Red	Agricultural;Forest;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Long-billed Curlew (<i>Numenius americanus</i>)	Blue	Estuary;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	Blue	Forest;Wetland;Rock/Sparsely Vegetated Rock
Prairie Falcon (<i>Falco mexicanus</i>)	Red	Agricultural;Alpine/Tundra;Grassland/Shrub Steppe;Rock/Sparsely Vegetated Rock
Rusty Blackbird (<i>Euphagus carolinus</i>)	Blue	Agricultural;Forest;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock;Shrubland
Short-eared Owl (<i>Asio flammeus</i>)	Blue	Agricultural;Alpine/Tundra;Estuary;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock
Upland Sandpiper (<i>Bartramia longicauda</i>)	Red	Agricultural;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock

Table 3. Mammal species at risk potentially occurring in the project area:

Species	BC List	Habitat Type
Badger (<i>Taxidea taxus</i>)	Red	Grassland/Shrub Steppe;Rock/Sparsely Vegetated Rock
Bighorn Sheep (<i>Ovis canadensis</i>)	Blue	Alpine/Tundra;Forest;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock;Shrubland
Fisher (<i>Martes pennanti</i>)	Blue	Forest;Wetland;Rock/Sparsely Vegetated Rock
Grizzly Bear (<i>Ursus arctos</i>)	Blue	Alpine/Tundra;Forest;Grassland/Shrub Steppe;Wetland;Stream/River;Rock/Sparsely Vegetated Rock;Shrubland
Tomswends' Big-eared Bat (<i>Conyrorhinus townsendii</i>)	Blue	Agricultural;Forest;Grassland/Shrub Steppe;Wetland;Rock/Sparsely Vegetated Rock;Shrubland;Subterranean
Wolverine, <i>Iuscus</i> subspecies (<i>Gulo gulo luscus</i>)	Blue	Alpine/Tundra;Forest;Grassland/Shrub Steppe;Rock/Sparsely Vegetated Rock;Shrubland

Table 4. Amphibian species at risk potentially occurring in the project area:

Layer Name	BC List	Habitat Type
Western Toad (<i>Bufo boreas</i>)	Blue	Agricultural; Forest; Grassland/Shrub Steppe; Lakes; Wetland; Stream/River; Rock/Sparsely Vegetated Rock

Table 5. Dragonfly and Butterfly species at risk potentially occurring in the project area:

Layer Name	BC List	Habitat Type
Aphrodite Fritillary, whitehousei subspecies (<i>Speyeria aphrodite whitehousei</i>)	Blue	Grassland/Shrub Steppe; Rock/Sparsely Vegetated Rock; Shrubland
Monarch (<i>Danaus plexippus</i>)	Blue	Agricultural; Forest; Grassland/Shrub Steppe; Wetland; Rock/Sparsely Vegetated Rock; Sand/Dune; Shrubland
Pronghorn Clubtail (<i>Gomphus grasilinellus</i>)	Blue	Lakes; Stream/River
Twelve-spotted Skimmer (<i>Libellula pulchella</i>)	Blue	Lakes
Vivid Dancer (<i>Argia vivida</i>)	Red	Stream/River