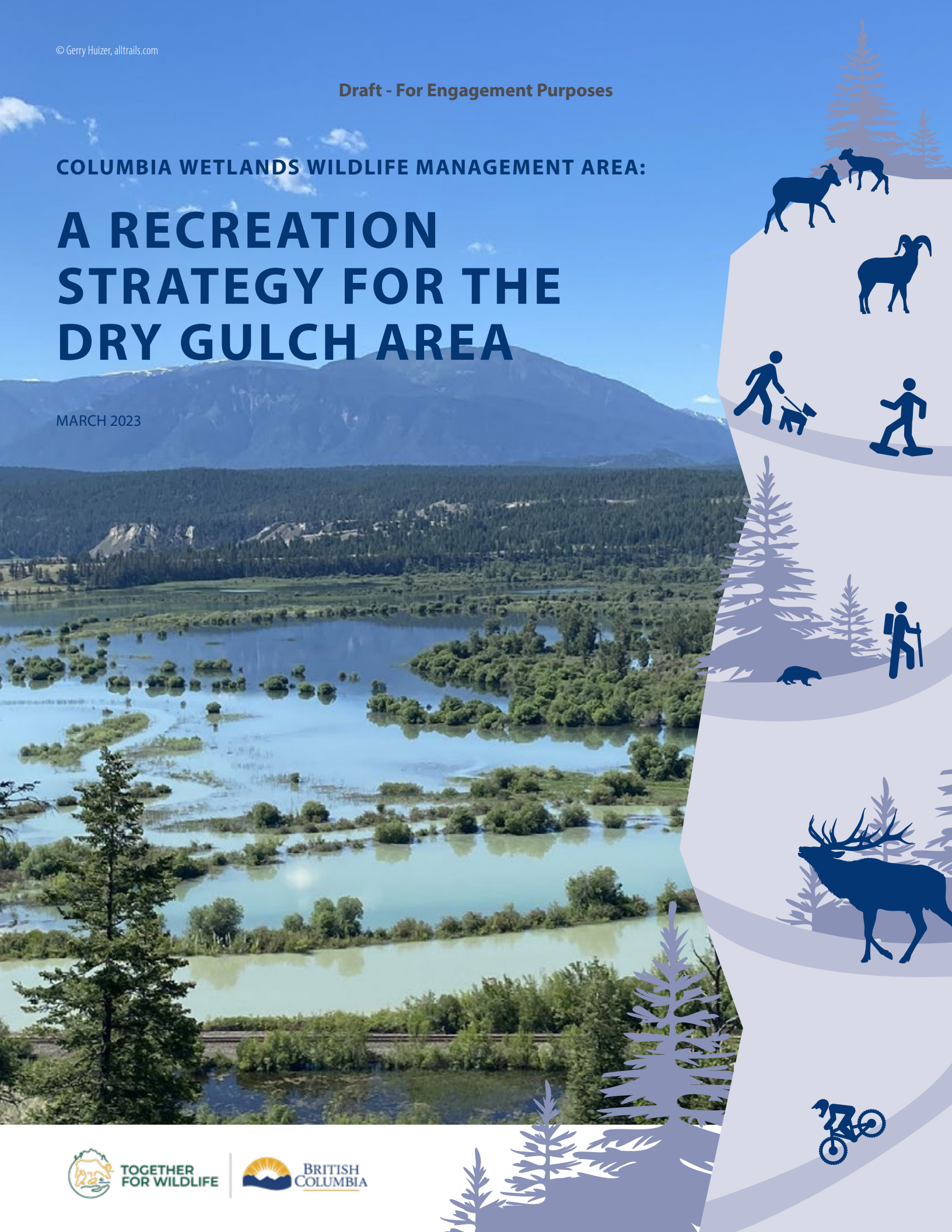
Draft - For Engagement Purposes

COLUMBIA WETLANDS WILDLIFE MANAGEMENT AREA:

A RECREATION STRATEGY FOR THE DRY GULCH AREA

MARCH 2023



TOGETHER FOR WILDLIFE | BRITISH COLUMBIA

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ACKNOWLEDGEMENTS

TERRITORIAL ACKNOWLEDGEMENT

The Columbia Wetlands Wildlife Management Area (CWWMA) is within a landscape which holds very significant cultural and ecological values to Secwépemc speaking peoples and the Ktunaxa.

It is acknowledged that the CWWMA, including the Dry Gulch recreation planning area, is within the territories of the Secwépemc First Nations, including Shuswap Band, and the Ktunaxa Nation.

The Province is working towards collaborative management of the area with the Secwépemc First Nations, including Shuswap Band, and the Ktunaxa Nation which will include management of the area to protect Indigenous values into the future.

This strategy, and the recommendations within, are intended to provide practical management guidance that will limit undesirable impacts and threats of recreation activities to the cultural and ecological value in the area.

OTHER ACKNOWLEDGEMENTS

The Ministry would also like to acknowledge and thank all stakeholders, local government and residents who took time to share input and ideas through the engagement process. These input and ideas have helped to shape this strategy and the future of recreation management within the Dry Gulch area. The Ministry would also like to thank the consulting team from RC Strategies for their work in leading and coordinating the development of the recreation strategy.

Thank you to everyone who has been part of the planning process.

1. INTRODUCTION

1.1 BACKGROUND

Dry Gulch is a 398 ha benchland parcel of Crown Lands just south of Radium Hot Springs. Much of the parcel is within the Columbia Wetlands Wildlife Management Area (CWWMA). As one of the largest contiguous systems of wetland habitats in North America, the primary mandate of the CWWMA is to conserve important fish and wildlife habitats, support landscape connectivity and enable the Columbia River Wetlands to continue to function as a natural floodplain ecosystem.[1]

While the primary management intent of the CWWMA is conservation, the volume and diversity of year-round recreational use in the CWWMA, especially the Dry Gulch area, has been increasing steadily over at least the past two decades. Recreation visitation has become particularly intense during the COVID-19 pandemic and the CWWMA, including the Dry Gulch area, was not established to support the volume or diversity of recreational activities that currently occur within it. Growing recreation pressures have led to the increased presence of hikers and mountain bikers, significant increases in domestic dog walking (on leash and off leash) and a concerning increase in the construction of unsanctioned trails.

Given the intensifying year-round recreational use that occurs in the Dry Gulch area, the Ministry of Water, Land and Resource Stewardship and the Ministry of Forests (Ministry), Indigenous communities, and conservation partners have become increasingly concerned about the potential impacts of recreation on the wildlife, wildlife habitat values and landscape connectivity in the CWWMA and the Dry Gulch area more specifically. In response, the Ministry has identified the need to take a more proactive and deliberate approach to planning for and actively managing recreation in the area.

1.2 PURPOSE

The purpose of this recreation strategy (strategy) is to guide the long-term management of public recreation within the Dry Gulch area of the CWWMA. More specifically, the strategy has been developed to:

- Elevate public and stakeholder awareness of the wildlife, wildlife habitat and Indigenous values in the planning area and the conservation mandate of the CWWMA.
- Provide an understanding of the current recreational use of the parcel.
- Identify how and where recreation may be threatening fish and wildlife, their habitats, landscape connectivity and Indigenous values.
- Clearly define the desired resource conditions and establish clear indicators, triggers and thresholds that will be used to monitor those conditions.
- Determine which recreation activities and infrastructure are appropriate in the parcel given its wildlife, wildlife habitat and Indigenous values.
- Identify the actions that may be taken by the Ministry and its partners to manage recreation to avoid or minimize undesirable impacts on fish and wildlife, their habitats, landscape connectivity and Indigenous values.

This strategy and the proposed management actions identified within are not intended to constrain or limit Indigenous practices, values, and jurisdictions nor the rights of existing tenure holders or decision makers within the WMA.

1.3 PLANNING AREA

The recreation planning area, known as the Dry Gulch area, includes 305.1 ha of the CWWMA as well as a number of small parcels of adjacent Crown land to the north and southeast where existing trails begin/end (trailheads). The Crown lands adjacent to the CWWMA boundary were included to ensure that the management of trails and recreational use entering and exiting the WMA could be meaningfully considered and functionally addressed by the strategy.

Dry Gulch is a bench land parcel that is located immediately south of the Village of Radium Hot Springs between the eastern shoreline of the Columbia River and west of highway 95. As illustrated in Figure 2, 305.1 ha (75.8%) of the planning area is within the CWWMA while remaining 92.8 ha (24.2%) are Crown Lands. The Dry Gulch planning area represents 1.8% of the much larger 16,969 ha CWWMA (Figure 3).

Importantly, the northern portion of the planning area is immediately adjacent to what is locally known as "One Mile Hill". Serving as the gateway to the Village of Radium Hot Springs, this busy segment of highway 95 has experienced increasing bighorn sheep mortality incidents during the winter as sheep move between the Dry Gulch area and the slopes to the east of the highway.

While not formally within the planning area, access to and from adjacent private land parcels to the east of the planning area is also relevant to the recreation strategy, particularly if ownership and/or land use changes occur, and the influence of these land uses on recreational use have been considered.

Figure 1 Sheep on One Mile Hill adjacent to Dry Gulch (Photo Credit: Wildsight)

Figure 2 Dry Gulch Planning Area

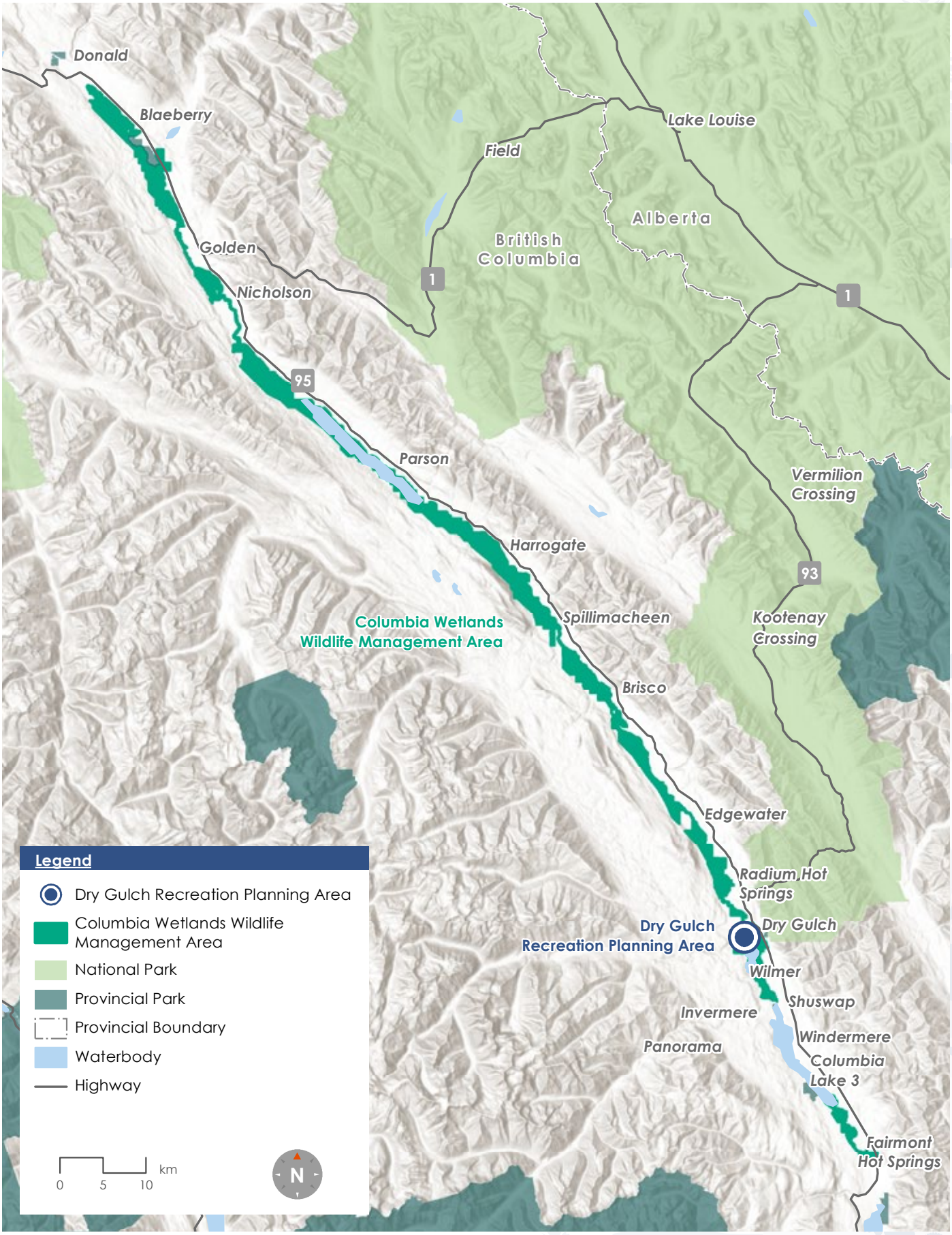


Figure 3 Regional Context

1.4 PLANNING & ENGAGEMENT PROCESS

Development of the recreation strategy was guided by the Interagency Visitor Use Management Council's Visitor Use Management Framework (VUMF)[2]. The VUMF is a process designed to collaboratively develop, implement, and monitor strategies and actions to improve the management of recreation in order to achieve clearly established resource conditions within the CWWMA.

Initiated in January 2022, and in accordance with the VUMF, development of the strategy occurred through the following planning process:

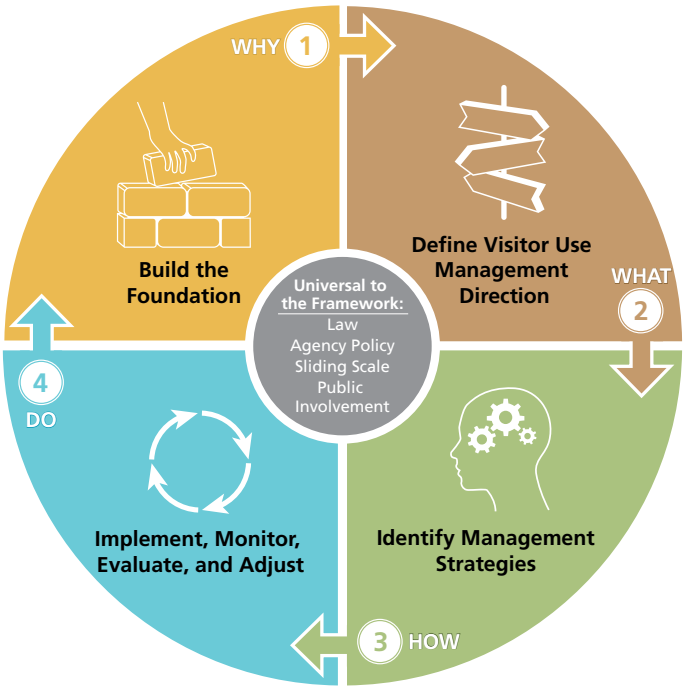


Figure 4 Visitor Use Management Framework Process

STEP 1: BUILD THE FOUNDATION

In step 1, the project team undertook a through review and assessment of available background plans, reports, policies, and relevant research in the WMA. Available spatial data (e.g. environmental values, cultural values, recreation infrastructure, geo-admin boundaries, land ownership) and non-spatial data (e.g. traffic counters) were assembled and analysed together with data from crowdsource sites (e.g. TrailForks, alltrails, Gaia, Strava) to generate the best available spatial understanding of recreational use of and values within the WMA. A three-day field-based inventory and assessment of recreation in the WMA was undertaken in early February 2022 to document where recreation was occurring, trails, trail conditions and identifiable recreation impacts. Snow conditions within the planning area limited the ability of the field team to robustly inventory the network of trails and assess the existing trail conditions and recreation caused ground and vegetation impacts. An in-depth literature review was undertaken to generate the best available understanding of potential recreation impacts on the WMA's environmental and cultural values. Learnings from the literature review informed the completion of a functional habitat assessment for the WMA as well as the development of a Miradi Threat Matrix[3]. The matrix values were spatialized within a Geographic Information System to help identify where recreation in the WMA is posing the most significant threats to environmental and cultural values.

STEP 2: DEFINE RECREATION / VISITOR USE MANAGEMENT DIRECTION

In step 2, assembled data and information was analysed and synthesized to provide best available insights on current resource conditions in the WMA. Insights generated in step 1 were used to identify and confirm the most pressing recreation management issues, identify desired resource conditions and indicators / thresholds as well as the potential management actions that could be taken to ensure the desired resource conditions are achieved. The Shuswap Band and the Ktunaxa Nation were then engaged to review the assembled research and values mapping and to provide input on the draft desired resource conditions, indicators and the proposed management strategies and actions.

STEP 3: PROPOSED MANAGEMENT STRATEGIES

Desired resource conditions were confirmed with the Shuswap Band and Ktunaxa Nation and inputs gathered through engagement with the Nations and were used to inform and refine the desired resource condition statements, indicators, proposed management strategies and actions. The draft recreation strategy was prepared and reviewed with Ministry staff and specialists.

STEP 4: RECREATION STRATEGY

A public and stakeholder engagement process was initiated in March 2023 to seek input on the draft recreation strategy. Following completion of the engagement process, the draft recreation strategy will be amended, if / where necessary, and a final recreation strategy will be prepared along with a What We Heard Summary of the engagement.

1.5 EXISTING MANAGEMENT DIRECTION

1.5.1 Wildlife Management Areas

The CWWMA, including the portion within the Dry Gulch planning area, was provincially designated as a Wildlife Management Area (WMA) in 1996. A WMA is an area of land designated under section 4(2) of the *Wildlife Act* to conserve regionally to internationally significant fish and wildlife species or their habitats and often provide important buffer zones, habitat corridors or linkages between protected areas to enable the movement of species during seasonal migrations or in response to short-term ecological variations or longer-term climate changes.[4] The primary management purpose of a WMA is the conservation and management of fish and wildlife habitat. Other land uses or activities, such as recreation, may be considered in WMA's if they are compatible with the conservation objectives for a site or represent pre-existing rights. WMAs are a key land designation in the Government of British Columbia's Conservation Lands Program[5] and are part of the province's broader spectrum of protected land and water designations[6].

WMA's are designated through regulation by the Minister responsible for the *Wildlife Act* and are managed, day to day, by Ministry Habitat and Wildlife staff. Once designated, the Director responsible for the *Wildlife Act* can establish orders that prohibit or restrict certain activities that may have impacts on wildlife or habitat and the Minister may make regulations respecting use or occupation of the WMA. Before any new use of land or resources can be undertaken in a WMA (e.g. new trail construction, new recreation infrastructure, new recreational activities), written consent from the Director is required.

Typically, management decisions within a WMA are guided by management plans that are developed or co-developed with First Nations and updated with further engagement with First Nations, local stakeholders, and public involvement.

1.5.2 Columbia Wetlands Wildlife Management Area Management Plan & Conservation Action Framework

Management decisions within the WMA portion of the planning area are guided by the 2019- 20220 Columbia Wetlands Wildlife Management Area Draft Management Plan. The original management plan, which applies to much of the Dry Gulch area, was developed in 1998 and updated in 2004. In 2019-2020, Ministry staff, with input from Shuswap Band, Ktunaxa Nation, and the Columbia Wetlands Stewardship Partners, prepared a revised draft management plan. The revised plan is currently in the consultation process. Although not yet approved, the draft management plan sets out the following vision and management goals for the WMA:

VISION

The CWWMA continues to support wildlife, aquatic and avian populations and habitat in a critical linkage corridor. The system functions as a floodplain ecosystem with a complex biological community governed by natural fluvial and ecological processes. Cultural use of the CWWMA by the Ktunaxa Nation and Shuswap Band continues and collaborative management options are explored.

GOALS

1. Proactively manage and sustain the natural values, habitats and ecological processes to address risks that threaten the ecological integrity and long-term viability of the WMA;
2. Support cultural values of First Nations and others; and
3. Monitor the natural fluvial and ecological processes that influence the Columbia Wetlands WMA so as to continuously improve science-based stewardship of its ecosystems and habitat.

The draft management plan, and the approved Columbia Wetlands Conservation Action Framework 2020-2025[7], identify growing recreation pressures as an ecological threat to the WMA's conservation targets. The following recreational pressures are specifically identified:

- Increased trail and off-trail usage of motorized and mechanically assisted recreational vehicles and mountain bikes,
- Increased new and unauthorized trail building,
- Increased motorized watercraft on lakes,
- Increased human activity in the wetlands and human-wildlife interactions
- Increased presence of planes, drones, and helicopters.

1.5.3 Access Restriction & Vessel Operating Restrictions Regulation

The following regulatory provisions apply in the WMA.

Pursuant to section 7(4) of the *Wildlife Act*, a Regional Manager order was established over the WMA in 1997 and prohibits the use of motorized conveyances that are powered by a motor which exceeds a rating of ten horsepower.[8] The order applies to the uplands and non-navigable waters of the Columbia River and wetlands. In addition to the Regional Manager Order, the Federal Vessel Operation Restriction Regulations were amended in 2009 and again in 2016 to: a) prohibit the operation of power driven vessels and vessels driven by electrical propulsion in the wetlands and main channel of the upper Columbia River; b) prohibit the towing of persons on water skis, surfboards, or other similar equipment in the main channel of the Columbia River at any time and; c) prohibit the operation of power driven vessels that exceed 20 horsepower (15 kw) on the main channel of the upper Columbia River and its tributaries[9]. The Upper Columbia River generally includes the Columbia River and its tributaries lying within the flood plain of the Columbia River from approximately Fairmont Hot Springs north to Donald but excluding Windermere Lake) The Province of BC is the responsible local authority for implementing these restrictions.

Motor vehicle use on crown land, including within WMAs, can be prohibited, or restricted through the Wildlife Act's Motor Vehicle Prohibition Regulation (MVPR), however a MVPR is not in place at this time for the lands within the Dry Gulch area.

1.5.4 Recent Recreation Management Actions

The main trail corridor through the parcel, the Old Coach Road, is operated and maintained by the Regional District of East Kootenay under a 30-year Licence of Occupation (4404257) issued by the Ministry. In 2007, 2011 and 2018, Ministry staff undertook an assessment of trails within the Dry Gulch area. Following the 2018 assessment, the following management actions were identified and implemented by the Ministry in 2020 in partnership with Shuswap Band:

- Deactivated the Power Wagon trail and install no-access signs and fully recontour the trail where visible from other trails.
  - » This action was deemed to be necessary to protect bighorn sheep, reduce the potential for sheep to be displaced onto the highway and to address concerns about trail instability and erosion.
- Deactivated portions of the Deja View trail and close portions to mechanized use.
  - » This action was deemed to be necessary as the north end of the trail travels through high quality sheep habitat where there is no escape terrain and where, if disturbed, sheep are likely to be displaced toward the highway. As this segment of trail parallels the Old Coach Road Trail, the additional linear disturbance has increased the fragmentation of habitat and the loss of grasslands. When combined with the Power Wagon trail, there is potential that the cumulative effect of these trails could encourage sheep to abandon this habitat. Segments of the Deja View Trail that travel west onto the benchlands were identified to remain open to hiking and equestrian but would restrict mechanized (e.g. cycling) use.

As illustrated in Figures 6-11, monitoring has shown that visitor compliance with these management actions is limited. Although winter use does not appear to be occurring on the Power Wagon trail (Figure 12) or northern segment of Deja View trail (Figure 13), both summer and winter hiking and cycling is reportedly common on Deja View north trail. As such, these management actions have not fully succeeded in altering recreation patterns. Further, the implementation of these management actions has been met with resistance from the recreational community and visitors as evidenced by vandalism and removal of signage and access controls.

Figure 5 2020 Closure and Deactivation (signage and debris).

Figure 6 Evidence of non-compliant trail use and partial sign removal soon after closure and deactivation (Power Wagon Trail).

Figure 7 Efforts to disguise the trail with downed vegetation were unsuccessful.

Figure 8 Power Wagon Trail south access; no visible recent winter human use.

Figure 9 2020 Closure and Deactivation (signage, debris, access control boulders).

Figure 10 Non-compliant trail use, removal of signage and movement of access control boulders following deactivation (Power Wagon Trail).

Figure 11 Sign removal and cyclists continuing to use trail after deactivation (Deja View Trail).

Figure 12 Deja View Trail north of Dry Gulch Creek; no visible recent winter human use.

2. INDIGENOUS & ENVIRONMENTAL VALUES IN THE WMA

2.1 INDIGENOUS VALUES

The WMA is within the unceded traditional territories of the Ktunaxa and Secwépemc speaking peoples.

These lands and waters have been occupied and stewarded since time immemorial by Indigenous peoples, and hold great spiritual, cultural, ecological, and economic significance.

Shuswap Band (Kenpesq't) is a member of the Secwépemc (pronounced Sec-wep-mec) Nation, an Interior Salish-speaking people who traditionally occupied a vast area in the south-central part of what is now called British Columbia, Canada since time immemorial. Today, Shuswap Band's primary community is located on its reserve near Invermere, BC, on the east bank of the Columbia River, though many of our members live throughout Secwépemcúl'ecw and beyond. Shuswap Band also has several close family ties to the neighbouring Ktunaxa Nation, and several members are from both communities (Source: **About Shuswap Band - Shuswap Band**)

Ktunaxa (pronounced 'k-too-nah-ha') people have occupied the lands adjacent to the Kootenay and Columbia Rivers and the Arrow Lakes of British Columbia, Canada for more than 10,000 years. The Ktunaxa Creation Story is an important source of information as to the significance of the area to Ktunaxa peoples. Shared lands, a rich cultural heritage, and a language so unique that it is not linked to any other in the world make the Ktunaxa people unique and distinctive (Source: **Who We Are : Ktunaxa Nation**). The Ktunaxa Creation Story is an important source of information as to the significance of the area to Ktunaxa peoples.

It is understood that the WMA contains important Indigenous values including archaeological, spiritual, cultural, and environmental values. Historically, for example, the WMA and surrounding lands served as a major travel route and provided Indigenous peoples with many food resources such as fish, early spring root crops, ungulates (deer, elk, sheep) and smaller game and predator species.

Thirteen (13) known archaeological and heritage sites, which are managed through the *Conservation Heritage Act*, have been documented within the study area. It is recognized that there are potentially many more sites and areas which are not documented. Although the known cultural and spiritually significant sites within the WMA is not exhaustive, the high density of known sites indicate the importance and sensitivity of the WMA to Indigenous peoples.

2.2 WILDLIFE & HABITAT VALUES

The CWWMA protects and represents a diversity of important wildlife and wildlife habitats and is one of the largest contiguous systems of wetland habitats in North America. The Dry Gulch area is mostly an upland benchland dominated by grassland and open Douglas Fir stands with some wetlands and riparian areas (Figure 13). The Columbia River is directly adjacent to much of the west boundary of the planning area and the Canadian Pacific Railroad transects the narrow, low-lying band of land between the river and the benchland.

The planning area protects important winter range habitat for Bighorn Sheep and other ungulates such as Elk, Mule and White-tailed Deer (Figure 14). Species dependant on low elevation grassland and open forest habitats also frequent the planning area such as Prairie Falcon, Townsend's Big-eared Bat, Tailed Frog, and Rubber Boa. The WMA also provides important habitat for American Badger, Grizzly Bear, Black Bear, Cougar, Coyote, Flammulated Owls, Lewis's Woodpecker, Long-billed Curlew, Bald Eagle, Golden Eagle, Osprey and Red-tailed Hawk. Many of the species that inhabit the WMA are also species of cultural importance to the Secwépemc and Ktunaxa peoples.

From a landscape perspective, when combined with adjacent protected areas and intact habitat, the study area functions as a north-south and cross-valley wildlife corridor. The Dry Gulch area connects the CWWMA to Kootenay National Park through Dry Gulch Provincial Park. Maintaining the natural state, value as movement corridors, and winter range values for bighorn sheep, elk and deer and American badger is a priority for the parcel.[10, 11, 12]

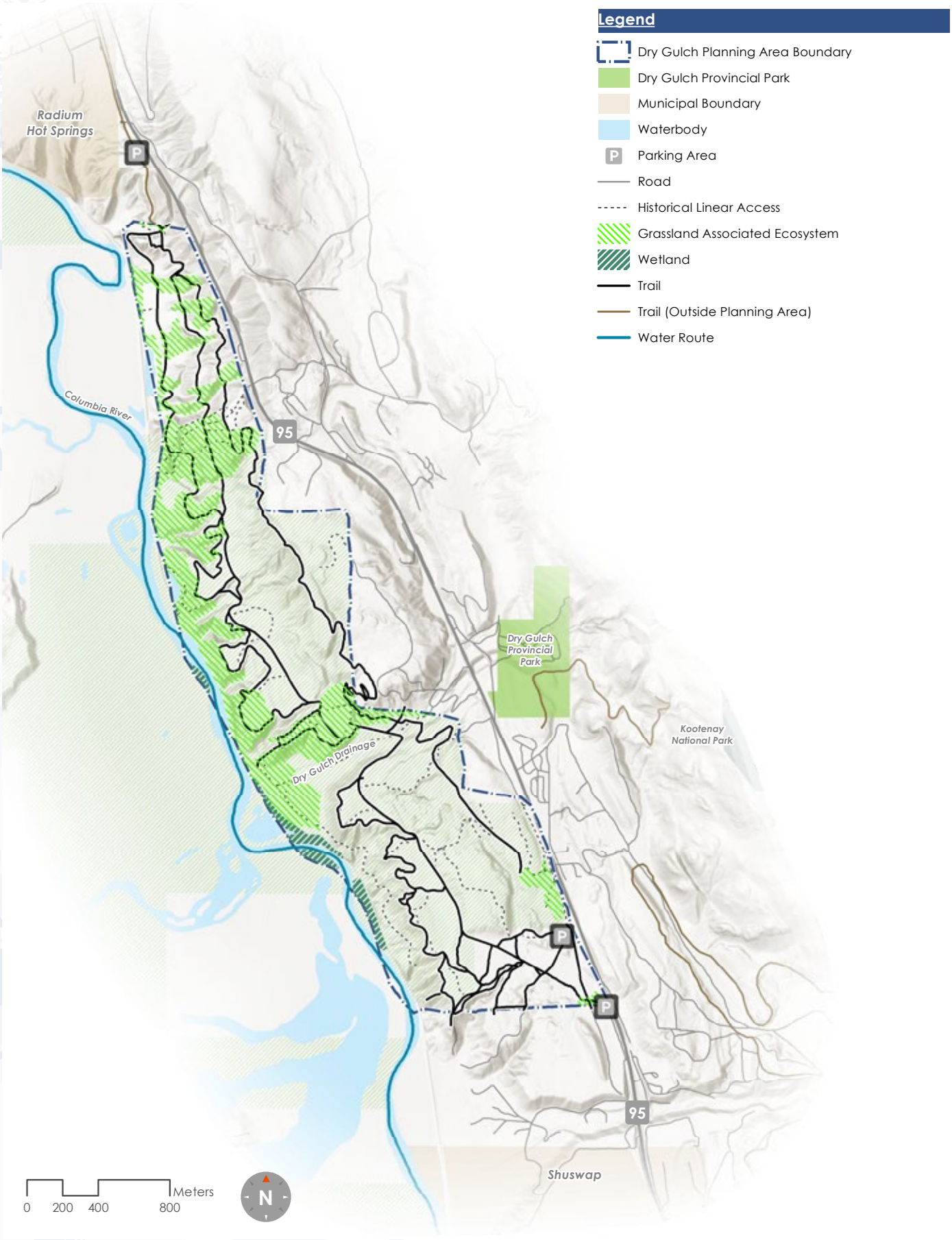


Figure 13 Grasslands and Wetlands Within Planning Area

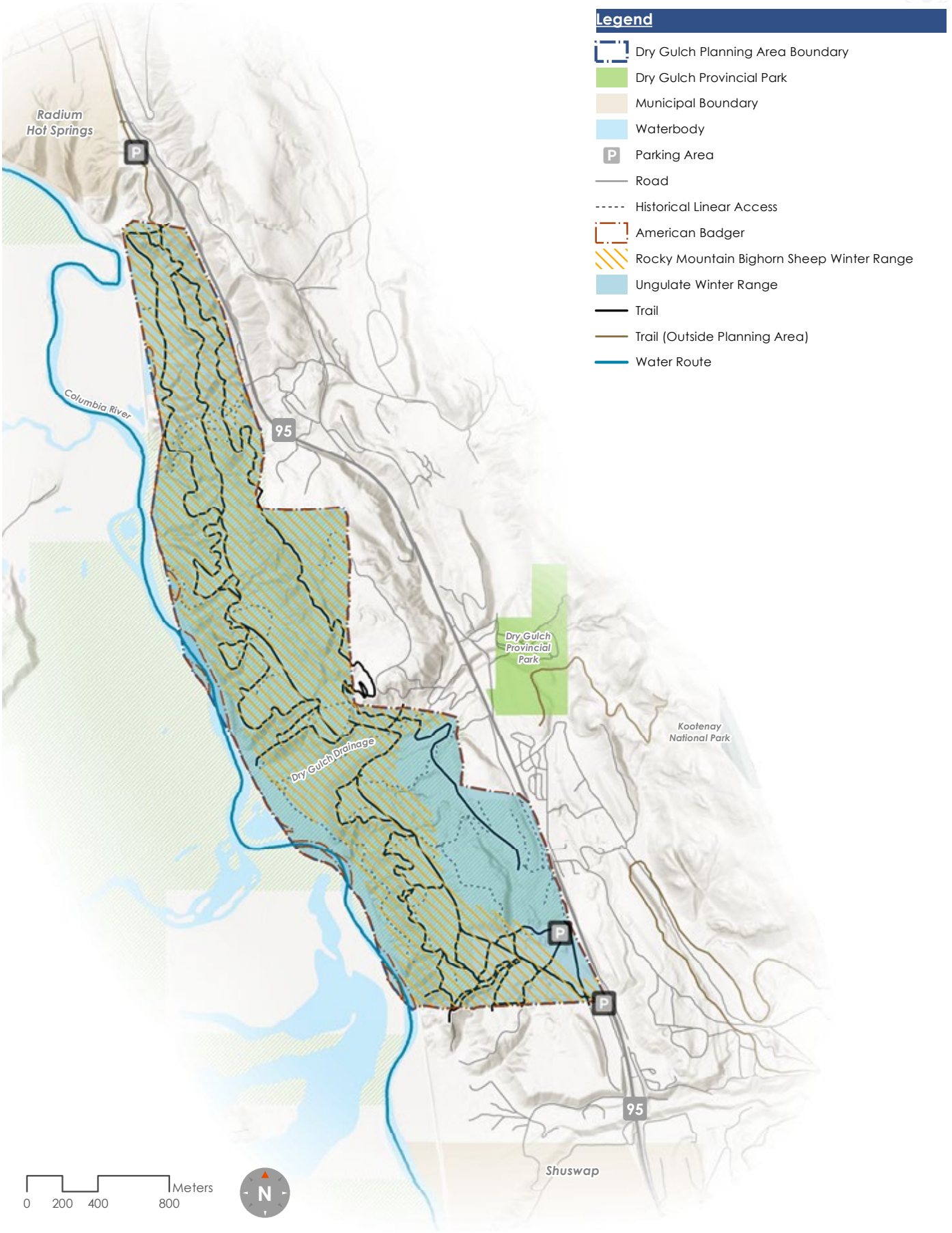


Figure 14 Ungulate and Badger Habitat

A number of the species in the planning area are considered to be species of special concern, threatened, or endangered and have been included in provincial and federal species at risk listings. Some of the most well-known species at risk that are known or likely to occur in the planning area include:

WILDLIFE:

- *Bighorn Sheep – Blue listed (S3)*
  - » According to telemetry data monitored by Parks Canada, the greatest seasonal use of the planning area by Bighorn Sheep occurs between November to April, with limited use occurring in May / June and September / October and almost no use occurring in July and August. Almost all of the documented use occurred in the northern 1km portion of the planning area which overlaps the Old Coach trail, Deja View north and Power Wagon trails.
- *American Badger – Red Listed (S2) (COSEWIC Endangered)*
  - » Badgers in southeastern BC are at the northern edge of their range, have very low population densities and have large home ranges. The main threats to badgers in southeastern BC, as identified in the Recovery Strategy for badgers, include habitat loss and degradation, road mortality, persecution, and loss of prey (ground squirrels).[13] Badgers may use hundreds of different burrows within their home range and will often change locations daily; they usually reuse old burrows rather than digging new holes and will reuse burrows from year to year, thus it is important that burrows are not destroyed.[14] Maternal dens are larger with a large dirt mound. Kits are typically born between mid-March to mid-April and females remain at the maternal den with their kits for extended period of time. Badger dens have been observed around the Deja View and Power Wagon trails. Due to the activity of ground squirrels, a recent report commissioned by the Columbia Valley Greenways Trail Alliance, concluded that it is likely that badgers will continue to use this habitat. It is also concluded that trail use, especially the presence of domestic dogs, may cause some added stress to badgers when they occupy the area; but, because badgers are nocturnal, this disturbance is likely to be modest relative to other threats that badgers face.[15]

- *Lewis's Woodpecker – Blue Listed (S2S3B)(COSWEWIC Threatened)*
  - » Lewis's Woodpecker use open ponderosa pine forests, old cottonwood stands in riparian areas with adjacent open fields, burned-over stands of Douglas-fir, and grassland with scattered decaying trees. Surveys along the Déjà View and Power Wagon trails and previous surveys of Lewis's Woodpeckers in East Kootenays have not located any Lewis's Woodpeckers in the vicinity the planning area. During a field assessment of the Deja View and Power Wagon trails, one area was identified as having open grassland adjacent to riparian cottonwoods that appeared moderately suitable for Lewis's Woodpeckers, but this area was a long way from the nearest portion of trail and it is unlikely that trails users would disturb birds if they were to nest there in the future.[16]
- *Flammulated Owl – Blue Listed (S3B)(COSEWIC Special Concern)*
  - » Flammulated Owls (*Otus flammeolus*) are restricted to a narrow range of habitat in old Douglas-fir and ponderosa pine forests, where large trees provide foraging sites, snags provide nesting sites and thickets of young trees provide roosting cover. Habitat within the planning area has been identified as suitable for Flammulated Owls, though field survey undertaken during the assessment of the Deja View and Power Wagon trails did not observe any owls occupying wildlife trees within 50 m of either trail.
- *Long-billed Curlew - Blue Listed (COSEWIC Special Concern)*
  - » Long-billed Curlew use large open grasslands with low vegetation height. It has been concluded that the habitat in planning area has low suitability for curlews as they tend to prefer more open areas with shorter vegetation and, when searched for during field assessments along the Déjà View and Power Wagon trails, none were located.[17]

PLANTS:

- *Gastony's cliff-brake – Yellow Listed (S3S4)*
- *Alkali Saltgrass – Blue Listed (S2S3)*

Many of these species are known to be sensitive to human presence and human disturbance including recreation. As such, where data on their distribution and / or habitat use is available, these species have been established as conservation targets for the purposes of this strategy and management actions identified in the plan have been prioritized for protecting these species.

Table 1: Biogeoclimatic Zones and Subzones in the WMA

Biogeoclimatic (BEC) Zone	BEC subzone	Percentage of BEC subzone in the CVWMA WMA (based on area calculation)
Interior Douglas-fir	IDF xk	100%

Figure 15 View of the WMA's Grasslands and Open Douglas Fir Forest Habitat

Figure 16 Badger Burrows and Ground Squirrel Holes Adjacent to the Power Wagon Trail

Figure 17 Wildlife Tree and Potential Habitat for Flammulated Owl

2.3 POTENTIAL RECREATION IMPACTS & MANAGEMENT CONCERNS

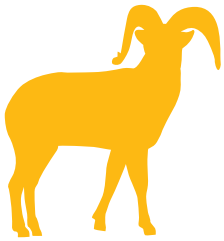
Spending time in nature, observing wildlife, and participating in outdoor recreation provides many benefits to humans. These include physiological and psychological health benefits, and spiritual fulfillment which can contribute to enhancing visitors' environmentally friendly behaviours, such as supporting conservation programs and improving treatment of wildlife.[18] Outdoor recreation is commonly assumed to be compatible with biodiversity conservation, especially in contrast to more well-known threats such as population growth, urban expansion, and industrial development.[19] However, there is growing research and evidence suggesting that even the most passive forms of outdoor recreation can have undesirable impacts on wildlife and wildlife habitat.[20, 21]

To understand the nature and mechanisms of these impacts, a literature review of 49 recreation ecology publications was undertaken. The studies ranged from experimental design, meta-analysis, and peer reviewed studies. The following sections provide an overview of recreation impacts on trails, wildlife, and wildlife habitat, to help inform ecologically appropriate management of recreation and recreation infrastructure within the planning area.

There are several terms used to describe specific recreation activities and users, "hiker" generally means a person walking along a trail for various reasons such as exercise, wildlife watching or moving between places. Similarly, "dog walker" suggests a person walking along a trail with their dog (either leashed or off-leash). "Mountain biker" refers to a non-motorized cyclist on a soft or natural surface trail. "Equestrian" refers to a person riding a horse on a trail. "Motorized user" refers to ORV use such as an ATV or snowmobile as well as use of Electric bikes regardless of their classification. Enthusiasts and participants in these different recreation activities are considered user groups.

2.3.1 Drivers of Recreation Impacts

Demand for and participation in outdoor recreation is increasing rapidly.[22] Not only is the number of recreationists increasing, the type of recreation impacts and the spatial extent of area affected are also changing. Remote, fragile, and high elevation areas that previously received little use and may have served as refuges for sensitive species, are increasingly accessed by people. Advances in off-road vehicles (ORV), snowmobiling, and mountain biking technology continue to expand the reach of these activities to more challenging terrain[23]. As demands for recreation increases, so do cumulative effects on wildlife species and their habitats over space and time. Cumulative effects can be defined as the combined effect on a species or its habitat caused by human activity (such as recreation), as well as other reasonably foreseeable events that are likely to have similar effects on the species or habitat.[24] It is important to note that while demand for outdoor recreation increases and cumulative impacts do occur, there is not a well established linear relationship between increased recreation and substantial impacts or damage to wildlife, habitat and ecosystems.[25] Rather, there is evidence to suggest that other characteristics such as behaviours of recreation users, modality, location of recreation, and management strategies are more significant indicators of impacts.



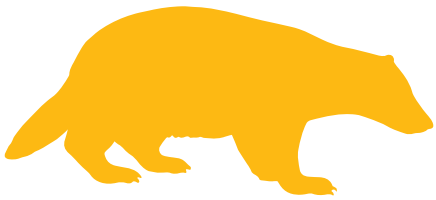
Cumulative effects are the combined effect on a species, or its habitat caused by human activity (such as recreation).

2.3.2 Direct Wildlife Impacts

Human impacts on wildlife vary based on a multitude of factors but, typically, wildlife responds to direct human recreation disturbances in ways that are similar to their response to the presence of a natural predator.[26] This reaction can include behavioural changes, physiological stress responses, flight responses, abandonment of desired habitat, and reduction in reproductive success.[27, 28, 29, 30] These responses can also decrease time spent foraging and resting, can lead to wildlife to using habitat that is less than ideal, and can displace them from key mating and rearing areas.

Research focusing on wildlife disturbance measures a number of key variables to determine impact on wildlife. Of these response measures, the most common are alert distance, flight initiation distance (FID), displacement distance, and flush distance. Flight Initiation Distance is the most reported measure; however this measure fails to take into account the severity of the disturbance. Severity includes probability (how likely a disturbance is to occur), flush distance (how far the wildlife will travel once disturbed), and response durations (how long the wildlife will be disturbed).

Based on literature review of FIDs and other measurements and variables for key species and common recreation activities, Table 2 presents recommended zones of influence when considering nature-based recreation and wildlife interaction.[31, 32, 33, 34]



FLIGHT INITIATION DISTANCE (FID)

The distance at which an animal will start to react or move away from an approaching threat such as a trail user.

ALERT DISTANCE

The distance between an animal and an approaching human at which point the animal begins to exhibit alert behaviors to the human.

FLUSH DISTANCE/ DISPLACEMENT DISTANCE

The distance an animal moves away from the perceived threat once a flight response has been initiated.

FLIGHT (DISTURBANCE) DURATION

Length of time the disturbance last, this is time when the animal is not resting, feeding, or foraging.

Table 2: Recommended ZOI by recreational activity and species during non-birthing/rutting time of year. Data based on literature review included in study.

Wildlife Species	Horseback Riding	Hiking	Mtn Biking	Dog walking (on and off leash)	Motorized recreation (ORV)
Elk	500m	500m	500m	500m	1000m
Deer*	250m	250m	250m	500m	250m
Sheep*	250m	500m	250m	500m	200m
Bear	500m	500m	500m	500m	900-1000m
Badger	500m	500m	500m	500m	900-1000m

** Humans recreating on foot recreation has been shown to have the highest level of disturbance for sheep and deer, with even greater impacts when dogs are present. As noted, hiking has been demonstrated to have the most pronounced wildlife disturbance as those traveling on foot are also more likely to venture off trail, approach wildlife for photos and viewing, and attempt to feed wildlife.*

While undesirable impacts caused by recreation have been well studied and reviewed over the past 20 years, there is still considerable variability in findings and recommendations.[35, 36] For example, some research suggests habituation occurs with predicable on trail use such as hiking, mountain biking, and equestrian use, while other studies suggest that habituation does not occur at any point.[37, 38, 39, 40]

Variability in understanding impacts on wildlife from nature-based recreation depend largely on the activity itself and how that activity is conducted. However, the literature assessing and comparing recreational activities is also varied and somewhat contradictory to popular or well-established norms. It appears that while hiking is often assumed and largely considered to be the least impactful form of recreation, research does not support this sentiment. Humans traveling on foot are more likely to go off trail, approach wildlife (to take photos or feed), and exhibit unpredictable recreation patterns.[41, 42, 43] Therefore, many studies suggest that, in fact, non-motorized recreation (hiking, dog-walking, etc.) can induce greater (or more significant) disturbance to wildlife than motorized recreation.[44, 45] Stankowich (2008) conducted a meta-analysis of ungulate flight responses and found that, across studies, responses from humans on foot (hiking and dog-walking) were far more evocative than for both motorized vehicles and anthropogenic noise.[46]

At the same time, the distance traveled during the recreational activity is considered more influential on wildlife responses than the magnitude of users or intensity of use. Multiple studies have looked at intensity of use and while there are mixed results, there is some consensus that for certain species (such as sheep), increased levels of use in a concentrated area that already experiences human use (recreation) are not as impactful as increases in low use areas or higher disbursement.[47, 48] Therefore, recreation spanning larger areas can have more negative impacts to ungulates than recreation occurring in smaller or more contained areas (when compared at relative intensity). Since motorized recreation typically requires a larger spatial area than hiking or dog-walking, it therefore increases the likelihood of wildlife disturbance.[49]

In addition, for landscapes that are home to multiple species, the research is clear that different species (e.g. sheep and grizzly bear) react very differently to recreational activities. In a recent study Naidoo and Burton found negative associations between moose and grizzly bears and mountain bikers, while no significant effects were found for other wildlife from mountain biking.[50]

Finally, other factors such as topography, visitation rates, group size, modality of travel, seasonality, and more contributed to variability in research findings. For example, as visitation rates and group size increase the impacts on wildlife may also increase.[51, 52]

Of note to all wildlife species is the impact of domestic dogs (on and off leash). The evidence is very clear and overwhelming. Human recreation with dogs is much more detrimental to wildlife than any other non-consumptive nature-based recreational activity. Habituation appears to not reduce disturbances because wildlife consistently views dogs as predators.[53] The presence of dogs causes wildlife to be more vigilant (stress responses) and to move away temporarily or permanently, reducing the amount of available habitat in which to feed, breed, and rest. Animals also become less active during the day to avoid dog interactions. Specifically, Mule

deer and sheep activity was significantly lower within 100 m of trails in areas that allowed dogs than in areas that prohibited dogs.[54, 55, 56, 57] Furthermore, even the scent of dogs disturbs wildlife and the effects remain after the dogs are gone.[58, 59] Off-leash dogs can cause even greater disturbance as they roam around their owner with erratic movements and, for some dogs, interest in flushing and chasing wildlife. This behaviour influences three factors used by many wildlife species to judge degree of threat: predictability (in behavior and to some extent occurrence), proximity, and speed.[60, 61, 62]

2.3.2.1 ELK (CERVID UNGULATE)

Nature-based recreation appears to cause significant disturbances to Elk and habituation rates are quite low.[63] In some studies Elk appear to be more impacted by ORV use, followed by mountain biking, than that of equestrian use or hiking.[64, 65, 66] Similarly, Ciuti et al., (2012) found that Elk herds exhibit increased vigilance when closer to roads (increased vehicle traffic and ORV use), and an increase in vigilance (e.g. scan frequency) leads to increased total travel time and a decreased foraging.[67] However, unlike the results of Wisdom et al. (2004;2009) Ciuti et al., (2012) did not find significant increases in elk disturbance from mountain biking (when compared with other user groups). In addition, this study found that hikers appear to have a more significant effect than mountain bikers and equestrian users. The researchers propose this is a result of bikers and equestrians staying on the trail and showing patterns of predictability.[68] Elk responses to human use may also be dependent on frequency of use, although this result was not homogenous across studies reviewed. Some research suggests activity levels of more than two persons per hour leads to signs of habitat avoidance.[69] While many studies focus on non-consumptive recreation, it is worth noting that elk appear to be most sensitive to all human disturbances in areas where hunting is allowed (i.e. increases in impact during hunting season).

2.3.2.2 BIGHORN SHEEP (NON-CERVID UNGULATE)

Sheep appear to be less sensitive to some human disturbances than other cervids.[70, 71] One highly cited study found that interactions with hikers caused bighorn sheep to flee in 61% of interactions (far more than to vehicles or mountain bikers) and that sheep fleeing from hikers moved >100 m farther than sheep fleeing from vehicles or mountain bikers. Sheep also responded to hikers for 10 minutes longer than to vehicles or mountain bikers.[72] During spring, females in the high-use area fled from hikers >3x farther than females in the low-use area. The increased sensitivity of bighorn sheep to hikers, especially during the lambing season and rut, is of concern because of the potentially negative effects on reproductive fitness at these times. Differences in responses to recreation activities were likely due to the greater predictability. Vehicles and mountain bikers were first noticed at much greater distances than hikers, which likely reduced the severity of their response to these activities. Researchers speculate that sheep's higher sensitivity to hikers is due to the greater unpredictability of hikers. Unlike consistent road traffic, nearly all hiker disturbances of sheep were off-trail and in variable locations. Also, hikers often surprise bighorn sheep at closer distances because they approached them (likely for photos and better views). Vehicles and mountain bikers that are restricted to the roads and were thus more predictable to sheep.[73]

Figure 18 Sheep scat on Deja View Trail

2.3.2.3 CARNIVORES (BEARS, BADGER, WOLVES)

Carnivore species are a vital component of healthy functioning ecosystems and their presence serves as a biodiversity indicator as they considered to be umbrella or flagship species (relative to their particular ecosystems).[74] Within British Columbia, grizzly bears are provincially listed as S3 (Vulnerable Uncertain). One of the main reasons for this is due to bears' sensitivity to human disturbances and threats to bear habitat.[75, 76] Recent research by Naidoo and Burton found that grizzly bears avoid trails with high rates of mountain biking more so than hiking and equestrian uses of those same trails (however, it is worth noting that visitation rates were much higher for mountain biking than all other user groups, suggesting that frequency and the activity are influential).[77] Grizzly bears appear to be most sensitive to roads and motorized recreation, but may habituate to predictable human behaviours (in areas with moderate to frequent human use).[78, 79] Linear disturbances such as trails and road have had significant impact on bear and badger habitat effectiveness and disturbances whereas point features such as campgrounds have not. These findings are similar for badgers and wolves; areas with even low levels of human use (nature-based recreation) are avoided. Human use related habitat loss and fragmentation is of particular concern for carnivores.[80]

2.3.2.4 BIRDS

Changes in the timing of habitat use in response to human disturbance is less documented in birds than in mammals. This is likely because they would be difficult to see at night and are less nocturnal than mammals. Mammals are generally larger and can be affixed with a GPS unit with relative ease compared to birds, making them easier to study. However, a few studies do exists measuring the impact of nature-based recreation on birds. The response of bald eagles to human activities is variable. Reported responses have included spatial avoidance of activity and reproductive failure.[81] Flammulated Owls use forest stands with mature to old ponderosa pine and Douglas-fir, multiple canopy layers, low tree densities, moderate to low canopy closure, and moderate ground cover. Human use of their habitat may cause deforestation and habitat loss.[82]

2.3.3 IMPACTS ON HABITAT, ECOLOGICAL PROCESSES AND TRAIL CONDITIONS

Much of the recreational ecology research focuses on user groups' effects on soils, vegetation, trail incision, trail widening, and trail proliferation. In general, the effects of recreational use on trails happen quickly but recovery is slow.[83] Several studies suggest that regardless of type of recreational use, the most significant physical effects occur during trail construction.[84, 85] Once a trail is built, the magnitude of additional effects depends on the amount and type of visitor use, trail density, spatial distribution, behaviour of users, and environmental variables.[86] Slope, soil type, precipitation and vegetation type strongly influence the degree of trail damage from recreational use.[87] The most commonly cited impacts on habitat and ecological process include: soil compaction, loss of organic soil, increased erosion, water runoff, increased turbidity, trampling of vegetation, loss of vegetation, invasive species, water quality impacts, noise, habitat alteration, habitat fragmentation, and loss of habitat.[88]

Resistance measures the amount of damage to plants caused by direct trampling via recreational use. At higher uses, even resistant plant species' ability to withstand effects declines.

Resilience measures plant recovery over time after trampling is halted. This is an important distinction because resistant plants are not necessarily resilient.

Tolerance is a better measure but is less frequently used; tolerance combines resistance and resilience. Plants with high tolerance are less prone to long-term damage by trail users.

2.3.3.1 TRAIL IMPACTS BY USER GROUP

Common impacts as stated above can be a result of many different forms of nature-based recreation activities, however, the level and significance of impact can vary based on the user group and activity type. In addition, other factors such as frequency of use, group size, seasonality, and the habitat sensitivity will also influence impacts.

ORV Impacts

The primary effects of ORV recreation activity on soils include altered soil structure (soil compaction in particular), destruction of soil crusts (biotic and abiotic) and desert pavement (fine gravel surfaces). Indicators of soil compaction discussed in the ORV effects literature include soil bulk density (weight per unit of volume), soil strength (the soil's resistance to deforming forces), and soil permeability (the rate at which water or air infiltrate soil). As soil compaction increases, the soil's ability to support vegetation diminishes because the resulting increases in soil strength and changes in soil structure inhibit the growth of root systems and reduce infiltration of water. As vegetative cover, water infiltration, and soil stabilizing crusts are diminished or disrupted, the precipitation runoff rates increase, further accelerating rates of soil erosion.[89] Soil compaction affects plant growth by reducing moisture availability and disrupting root penetration, therefore, the size and abundance of native plants may be reduced. Wildlife is directly affected by excessive noise and other impacts associated with ORV activities.

Hiking

There is a vast body of knowledge on the impacts of hiking on habitat, ecological process, and ecosystems.[90] Like other nature-based recreation activities, hiking impacts include: trail widening, erosion, habitat fragmentation, soil compaction and loss, reduced soil moisture, loss of organic litter, loss of ground cover vegetation, loss of native plant species, introduction of weeds and pathogens, and change in vegetation composition. Factors that influence these impacts include trail design and construction (slope, location, etc.), intensity of use, and compliance with desired management conditions such as staying on the trail (off-trail use may cause trail widening, braiding, and increase impacts).[91] In addition, hiking appears to be most correlated (in comparison to other recreation activities) with increases in human waste deposits (urine and feces), which have high levels of nitrogen and phosphorous and can affect plant growth and soil health.

Dog Walking

In addition to the well documented impacts domestic dogs can have on wildlife, there are additional habitat and ecosystem concerns. Estimated dog nitrogen and phosphorus fertilization rates in peri-urban forests and nature are substantial. Such levels of nutrient inputs may considerably influence biodiversity and ecosystem functioning.[92] Dog waste is also a significant contributor to a serious pollutant, E. coli bacteria. Domestic dogs can act as intermediary hosts for other bacteria such as ringworm, hookworm, and tapeworm which can all spread to humans and other wildlife.[93]

Mountain Biking

Researchers commonly indicated that mountain biking effects on soils are often the result of poor trail design, or of trails being used for activities outside of their originally intended purpose (such as unauthorized trails).[94] In addition, much of the impact as a result of mountain biking is caused through the initial trail development (or unauthorized trail development) and use in wet conditions. When users stay on designated trail the impacts from mountain biking appear to be similar to that of hiking.[95] This includes trail widening, erosion, habitat fragmentation, soil compaction and loss, reduced soil moisture, loss of organic litter, loss of ground cover vegetation, loss of native plant species, introduction of weeds and pathogens, and change in vegetation composition. However, steep slopes and unauthorized trails can lead to significant impacts.[96] There is also evidence of soil composition and compaction increasing as the number of bike passes increases (with increases beginning with 25 passes), again these impacts are similar to impacts caused by hiking until extremely high rates of use occur (500 passes on a given trail).[97]

Equestrian (horseback riding)

Horses tend to induce significant damage to trails even at low levels of use due to the concentrated weight of the horse and rider on a relatively small area (hooves).[98] Horses tend to kick up topsoil and compact the soils below. With the topsoil removed, the finer soils that remain are more easily eroded, and trails are also more prone to becoming muddy.[99] Confinement techniques also may impact the soil and tree roots when horses are tied to trees (overnight).[100] In addition, equestrian use in riparian zones has the potential to be particularly impactful (defoliation of riparian vegetation, invasive species introduction, increased turbidity, increased input of sediments, increased in nutrients which may increase algae growth).[101]

2.3.3.2 RIPARIAN HABITAT

As previously mentioned earlier, trail design can have the most significant influence on habitat impacts, especially if trails are constructed to divert or intercept water from springs and seeps. When recreation activities cross streams they may disturb stream and riverbed sediments, leading to increases in turbidity.[102] The effects of nature-based activities on water quality and riparian habitat can also include sedimentation (deposited solids), increased turbidity, and increase of pollutants. Sedimentation increases because compacted soils, disrupted soil crusts, and reduced vegetation cover can lead to decreased water filtration and increased runoff.[103]

2.3.3.3 GRASSLANDS HABITAT

Trails and linear disturbance established in grasslands can create negative edge effects that extend into the grassland. Negative edge effects include increased risk of parasitism or disease, increased risk of predation, adverse microclimate conditions, and competition from invasive species.[104] Grassland habitats appear to be much more resistant to impacts of hiking, mountain biking (when mountain bikes travel across rather than over slopes), and equestrian use than forested habitat types, with no noticeable grassland cover loss until 1,600 trampling passes.[105] Subalpine grasslands however, appear to be much more sensitive to recreation. Other studies also found grasslands and meadows, which tend to occur in flatter areas, to be more resistant to trampling than shrub or forest communities. However, trail users in flat grassland areas tend to spread out, causing wider and sometimes multiple parallel trails.[106] Motorized recreation and ORV use in grassland habitat appears to cause more significant impacts and is particularly sensitive to roads, and unauthorized trails.[107] The potential for ORVS to spread noxious weeds and to ignite wildfire are significant concerns in some areas.

2.3.4 Invasive Species

Non-native invasive species have been documented within the planning area. While the inventory of invasive species may not be comprehensive, Figure 20 illustrates that the majority of known invasive species occurrences occur south of the Dry Gulch drainage. These locations do not show a strong correlation with trails and some may be associated with legacy disturbance in the area. Invasive species occurrences north of Dry Gulch tend to be located near historical roads and linear disturbances, particularly the Old Coach Road. Available data does not appear to show strong invasive correlation with recent unsanctioned trails at this point though recreation is a known vector for spreading invasive species.

According to records in Invasive Alien Plant Program's database, non-native invasive species known to occur in the planning area include:

- Burdock
- Blue weed
- Baby's breath
- Canada thistle
- Diffuse knapweed
- Hawkweed
- Hound's-tongue
- Leafy spurge
- Oxeye daisy
- English holly
- Sulphur cinquefoil
- Spotted knapweed
- Sowthistle
- Common tansy
- Wormwood
- Yellow hawkweed

Figure 19 Leafy Spurge Infestation along Deja View Trail

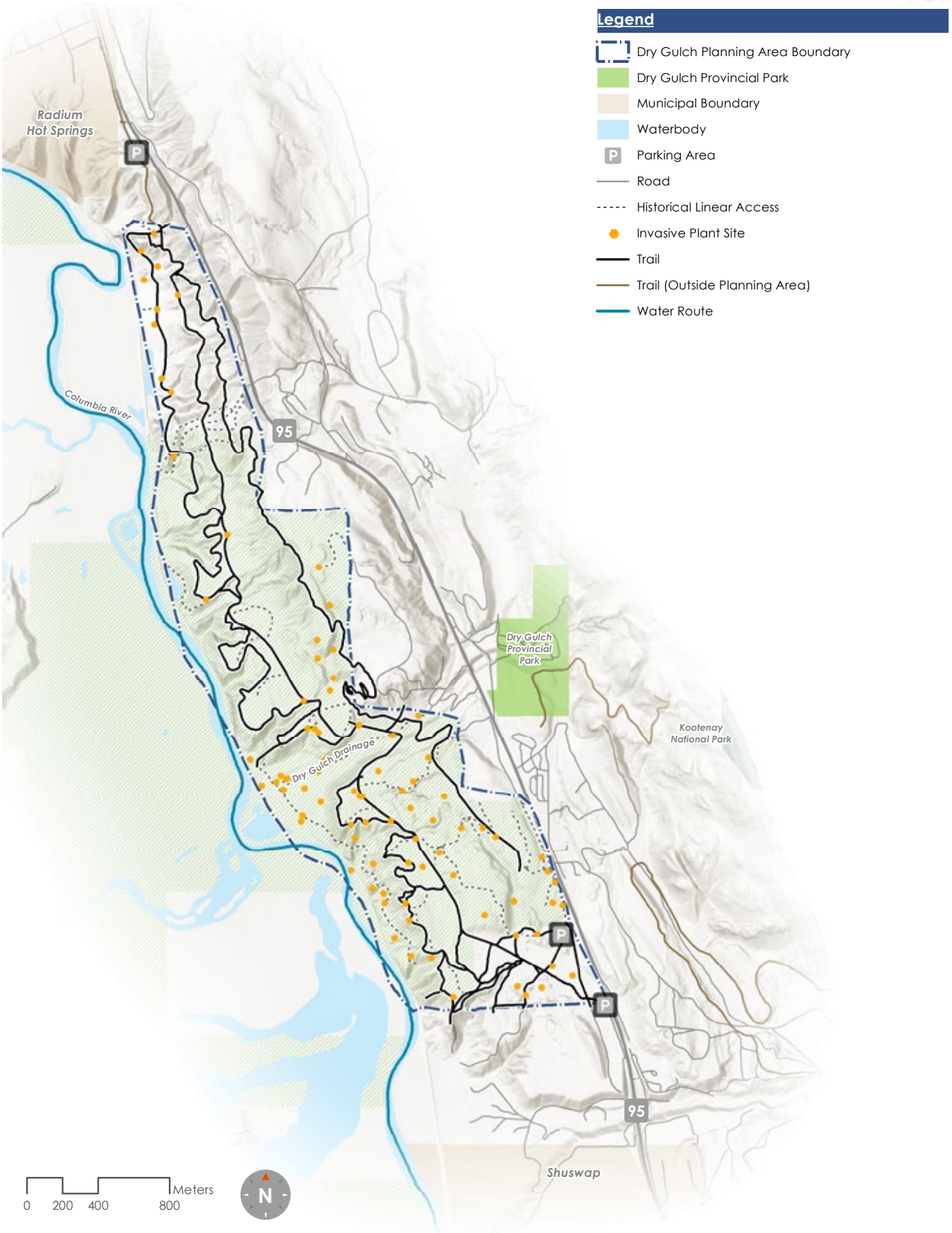
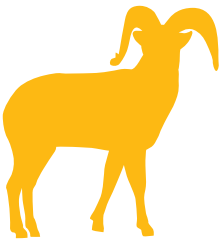


Figure 20 Known Invasive Plant Sites as Document in the Invasive Alien Plant Program – Note, this May Not Represent All Invasive Plant Infestations in the Planning Area

3. RECREATIONAL USE OF THE PLANNING AREA

Although recreation is not the primary management intent of the planning area, the open vegetation, rugged landscape, incredible scenery, and wildlife diversity make it an appealing all-season recreation destination for residents and visitors, particularly when combined with its proximity to Radium Hot Springs, Invermere and the National Park.

An important early step in the planning process was to understand what recreation opportunities are occurring and available within the planning area. A recreation opportunity is defined as the ability for an individual to take part in a desired activity within a desired recreation setting and a desired landscape in order to obtain a desired experience (Figure 22). In keeping with this definition, the recreation activities, features, and recreation settings available in the planning area were inventoried.



RECREATION OPPORTUNITY...

the ability for an individual to take part in a desire activity, within a desired recreation setting within a desired natural region to obtain a desired experience.

Figure 21 Elements of a Recreation Opportunity

3.1 RECREATION ACTIVITIES

The planning area has become an all-season recreation destination that is enjoyed through a diversity of day use recreation activities. Access to the area is facilitated through formal trailheads at both the south and north ends of the planning area that are connected by the Old Coach Road Trail with most visitors arriving by personal vehicle or from Radium Hot Springs via the trail. The most common recreation activities include:

Warmer Months

- Dog Walking (on and off leash)
- Hiking / Walking (without a dog)
- Trail Running
- Mountain Biking (inc. e-assist)
- Fat Biking (inc. e-assist)
- Leisure cycling (inc. e-assist)

Colder Months

- Dog Walking (on and off leash)
- Hiking / Walking (without a dog)
- Trail Running
- Mountain Biking (inc. e-assist)
- Fat Biking (inc. e-assist)

Recreation outings can range from a short hour-long excursion to half-day and even full day adventures pending the visitors' mode of travel and how visitors connect the various trails together.

Overnight camping is not known to occur in the planning area, but it is not explicitly prohibited and may occur at very low volumes. At the time of preparing this strategy, a private commercial campground development was proceeding immediately to the east of the planning area near Dincy Road and may increase visitation to the planning area.

Figure 22 Off-leash dog walking on Deja View

Figure 24 Mountain Biking Deja View Trail (Photo credits: Singletracks.com)

Figure 23 Cycling and leashed dog walking on Old Coach Road (Photo credit: C. MacGregor, AllTrails)

Figure 25 Hiking Deja View Trail (Photo credit: R. Steil, AllTrails)

3.2 RECREATION SETTINGS

Understanding the distribution of recreation settings is key to understanding the nature of the recreation opportunities that occur in the planning area. According to the Ministry's Recreation Opportunity Spectrum (ROS) inventory (Figure 26), the Dry Gulch area is comprised mostly of a roaded modified recreation setting (97%) and to a much lesser extent roaded (3%) recreation setting which occurs along the railway. (Figure 27)

ROS Class	Factors					
	Remoteness		Naturalness		Social Experience	
	Distance from road (km)	Size (ha)	Motorized Use	Evidence of Humans	Solitude/Self-reliance	Social Encounters
Primitive (P)	> 8	> 5000 ha	• occasional air access, otherwise no motorized access or use in the area.	• very high degree of naturalness; • structures are extremely rare • generally no site modification • little on-the-ground evidence of other people • evidence of primitive trails	• very high opportunity to experience solitude, closeness to nature; self-reliance and challenge.	• very low interaction with other people; • very small party sizes expected;
Semi-Primitive Non-Motorized (SPNM)	≥ 1	≥ 1000 ha	• generally very low or no motorized access or use • may include primitive roads and trails if usually closed to motorized use.	• very high degree of naturalness; • structures are rare and isolated except where required for safety or sanitation • minimal or no site modification. • little on-the-ground evidence of other people.	• high opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• low interaction with other people; • very small party sizes expected;
Semi-Primitive Motorized (SPM)	≥ 1	≥ 1000 ha	• a low degree of motorized access or use.	• high degree of naturalness in the surrounding area as viewed from access route; • structures are rare and isolated • minimal site modification. • some on-the-ground evidence of other people • evidence of motorized use	• high opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• low interaction with other people; • small party sizes expected;
Roaded Natural (RN)	≤ 1	N/A	• moderate amount of motorized use within the area. • may have high volume of traffic through the main travel corridor.	• moderate degree of naturalness in surrounding area • structures may be present and more highly developed; • moderate site modification. • some on-the-ground evidence of other people, • some on-site controls. • typically represent main travel corridors and recreation areas that have natural-appearing surroundings	• moderate to high opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• moderate interaction with other people; • small to large party sizes expected;
Roaded Modified (RM)	≤ 1	N/A	• moderate to high degree of motorized use for both access and recreation.	• low degree of naturalness; • moderate number of more highly developed structures; • highly modified in areas; generally dominated by resource extraction activities. • on-the-ground evidence of other people and on-site controls.	• low to moderate opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• moderate to high interaction with other people; • moderate to large party sizes expected;
Rural (R)	≤ 1	N/A	• high degree of motorized use for both access and recreation.	• very low degree of naturalness; • complex and numerous structures, high concentrations of human development and settlements associated with agricultural land. • obvious on-the-ground evidence of other people and on-site controls.	• low opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• high interaction with other people; • large party sizes expected;
Urban (U)	≤ 1	N/A	• very high degree of motorized use for both access and recreation.	• very low degree of naturalness; • highly developed and numerous structures associated with urban development; • very high site modification. • obvious on-the-ground evidence of other people and on-site controls.	• very low opportunity to experience solitude, closeness to nature, self-reliance and challenge.	• very high interactions with other people; • very large party sizes expected;

Figure 26 BC Recreation Opportunity Spectrum Class Descriptions

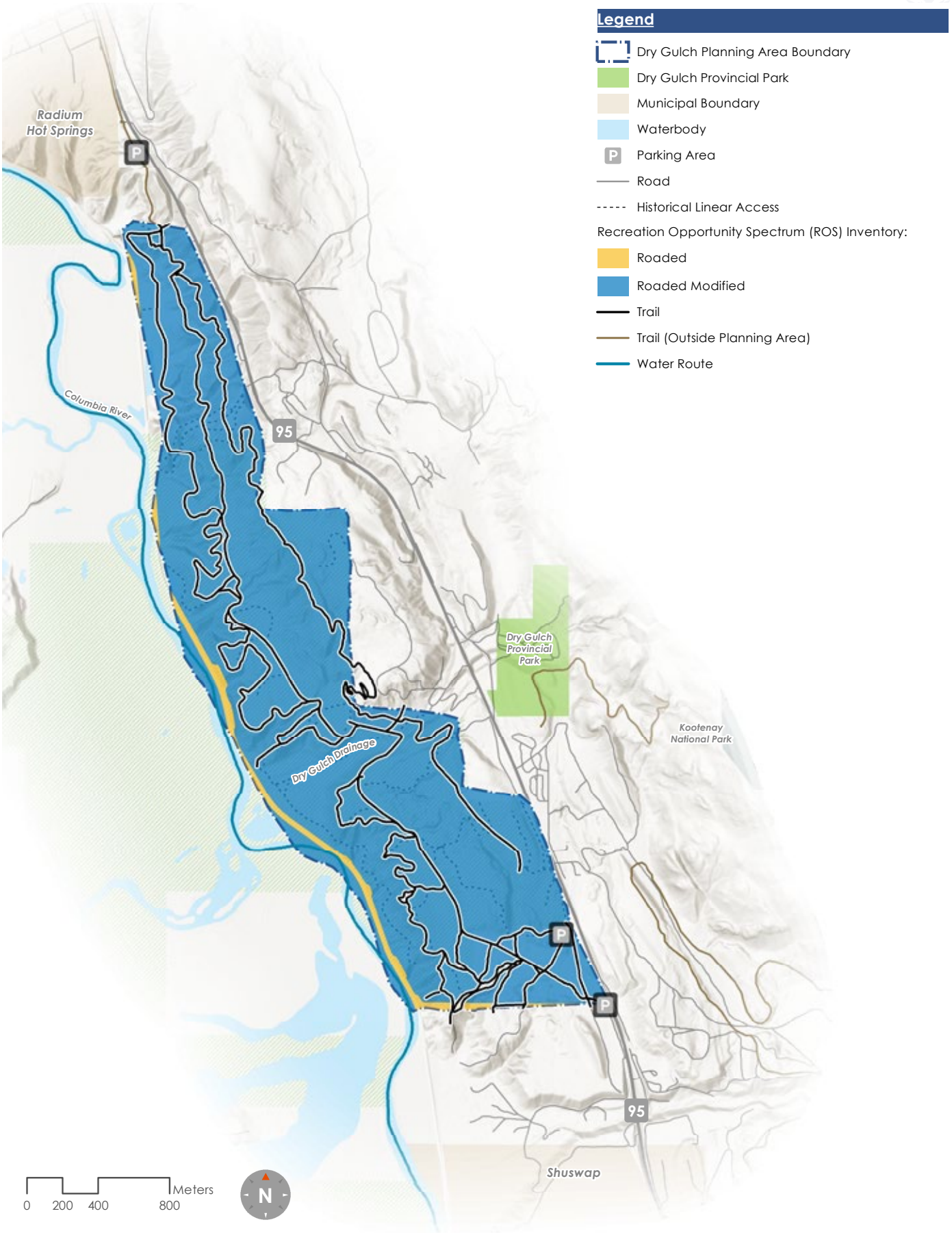


Figure 27 Recreation Opportunity Settings of the planning area

3.3 RECREATION FEATURES & AMENITIES

3.3.1 Trails

Trails, and the incredible views they offer of the Columbia Valley, are the primary recreation feature that attracts visitors to the Dry Gulch area. Approximately 27.1 km of trails have been inventoried throughout the planning area.

Named trails in the study are shown in Figure 28. They include the sanctioned Old Coach Road Trail (6.8km) and the following unsanctioned trails:

- Deja View Trail (north, middle, south segments) (8.1 km),
- Stinkin' Badger Trail (1.3 km), and
- Power Wagon Trail (5.1 km).

Of the inventoried trails, 26% of the inventoried trail length is sanctioned trail (Old Coach Road trail) which has been approved by the Ministry. The remaining 74% of unsanctioned trail has been developed without authorization or is recreational use that is occurring on pre-existing linear disturbance and industrial roads that have informally evolved into recreation resources. All inventoried trails are classified as non-motorized trails and are principally used by hikers, walkers (with and without dogs), trail runners, and cyclists (Figure 29). It should be noted that cyclists using trails within the Dry Gulch area are using a combination of mountain bikes, e-assist mountain bikes, fat bikes, gravel bikes and leisure bikes for both recreational and commuting purposes. This variety of use indicates that riders are using the area to satisfy different cycling interests.

It should be noted that, except for the Old Coach Road trail, trail names used in this strategy are informal names assigned by those who constructed the unauthorized trail. Referral to these names in this strategy should not be interpreted as approval or formalization of the trail names. Common names are used in this strategy solely to help support public understanding and reference.

27.1 km of trails

26% of trails are sanctioned (approved by the Ministry)

74% of trails are unsanctioned (no formal approval or authorization)

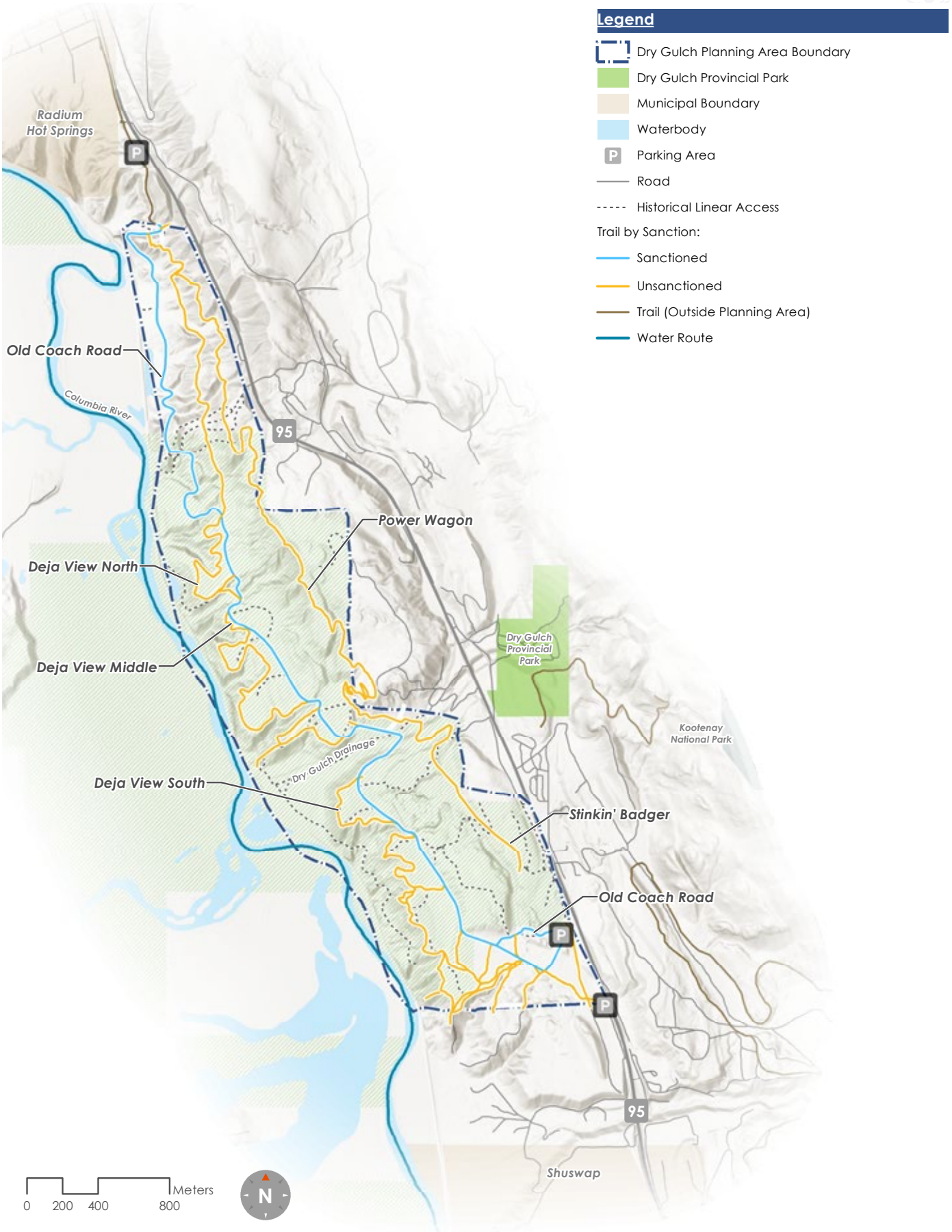


Figure 28 Trails by Sanction

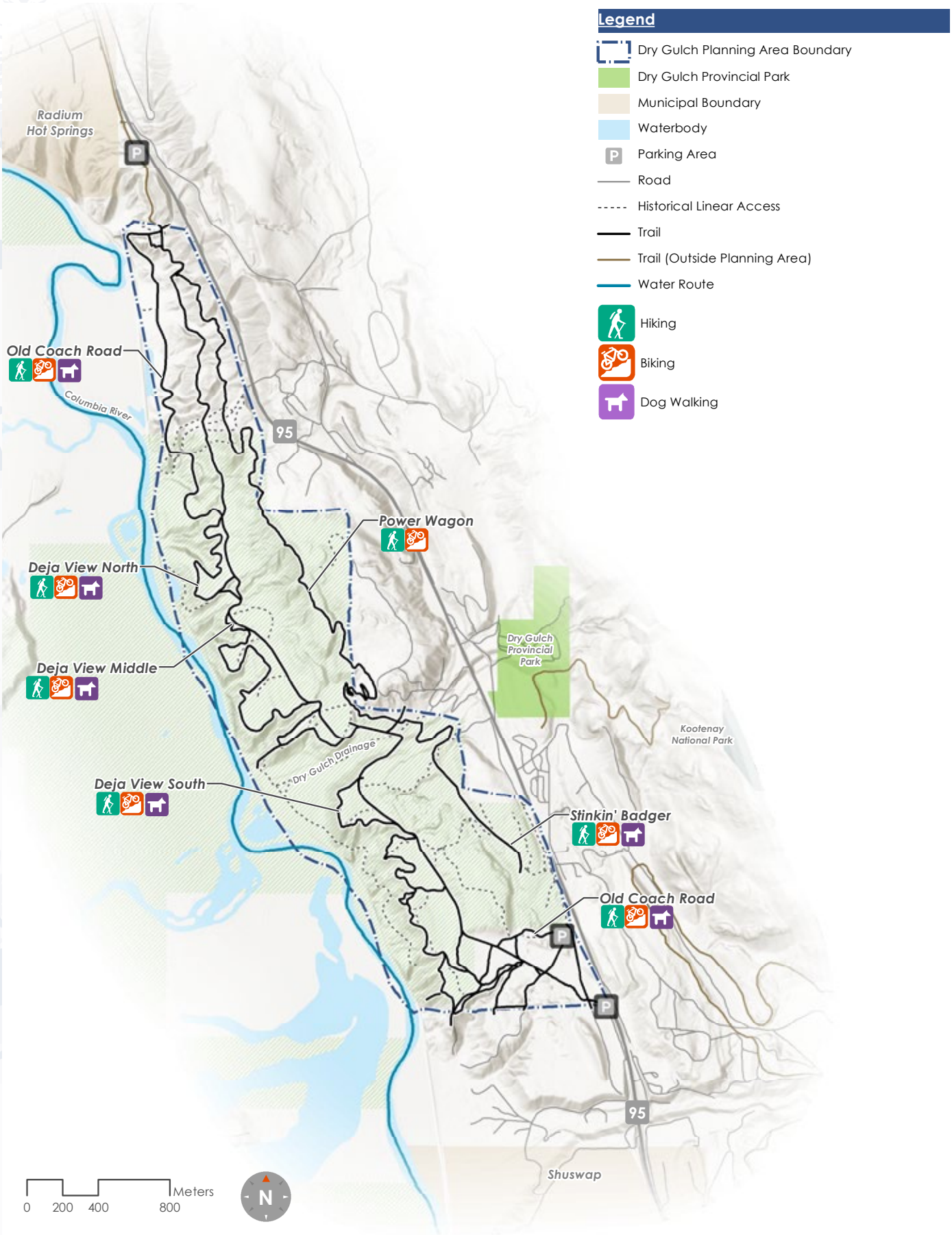


Figure 29 Trails by Current Activity

Though the area has become a popular year-round recreation destination, not all trails are used in all seasons. According to the winter-based field assessment data that was assembled for this strategy, just 58% (15.8 km) of the length of inventoried trails showed obvious signs of use in the colder months. Many other trails show little to no use in colder months (Figure 30). Unlike other parcels in the larger Columbia Wetlands WMA, unauthorized off-road vehicle use is not a frequent occurrence in the Dry Gulch area.

An additional 12.8 km of historical roads and other linear disturbances exist within the Dry Gulch area. These roads and disturbances were developed to support resource development and access to the railway and rail infrastructure. Although most of these routes showed no evidence of being travelled during the study's winter assessment, data is unavailable to confirm the presence and extent of use at other times of year. It is likely that some of these roads and disturbances are also used intermittently by recreationists for hiking, dog walking and potentially cycling.

Figure 30 Stinkin' Badger Trail North of Dry Gulch Creek (untravelled in winter conditions).

TRAIL CHARACTERISTICS AND CONDITIONS

The design of trails in the Dry Gulch area varies and is predominantly a mix of single and double track (Figure 31).

73% (19.6 km) of trails are narrower singletrack trails with tread widths ranging from 0.25m to 1m (Figure 32, Figure 34), while 27% (7.5 km) of the trails are wider double-track trails with tread widths of 2 – 3 m (Figure 33, Figure 35). The dimensions of the trails are directly associated with the historical human use and development in the planning area. Double-track treads occur on the historical Old Coach Road and other industrial access while narrower singletrack trails are associated with the more recent unsanctioned user-built trails. The area's singletrack trails have been intentionally designed to optimize the visitor experience for mountain biking while still providing a very appealing hiking, walking and trail running experience. Recent trail construction illustrates visitors' desire for a narrower, more varied and more natural trail experience that connects visitors to the incredible views available along the benches. These views and experiences are not possible or provided along the Old Coach Road trail.

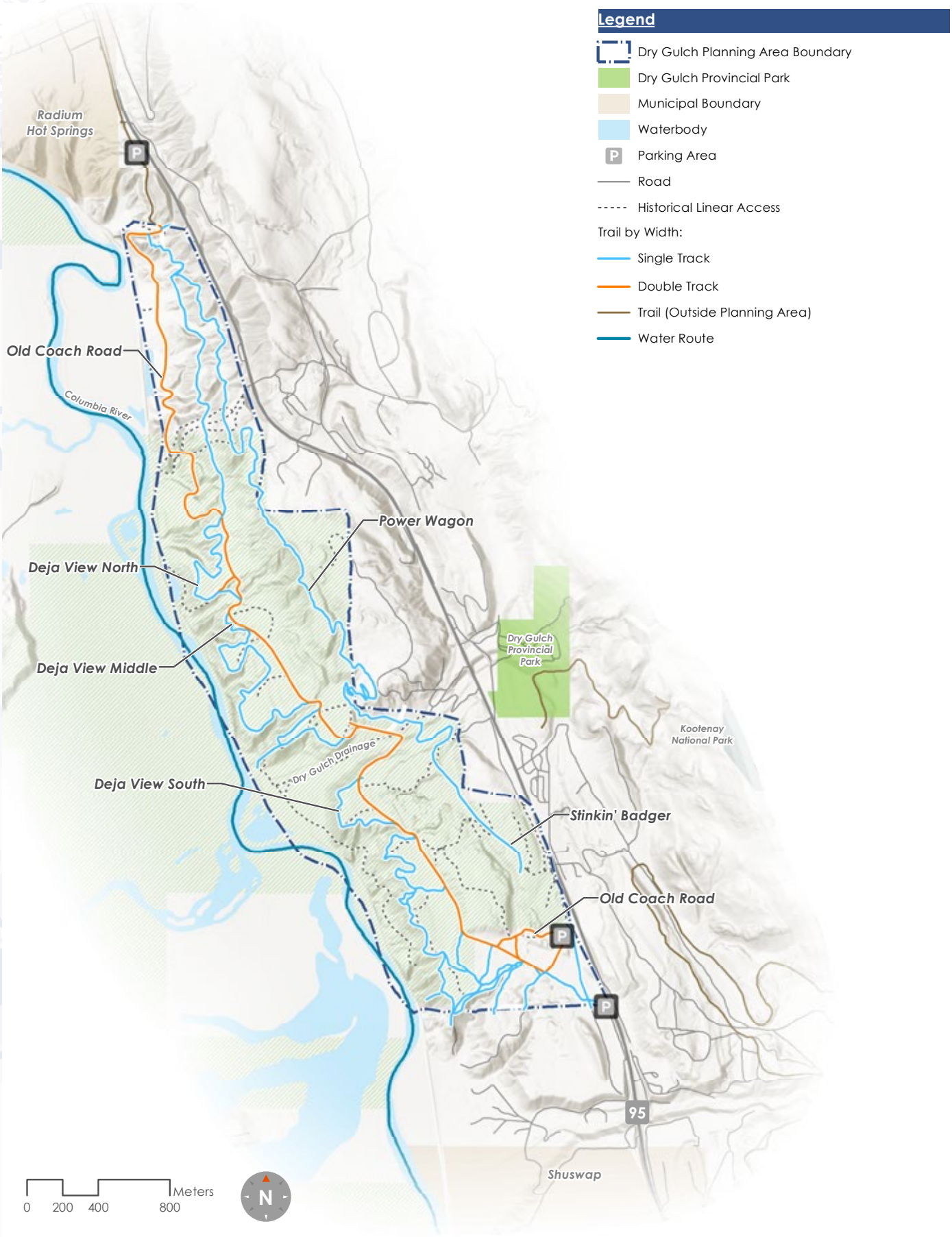


Figure 31 Trails by Width

Figure 32 Singletrack Segment of the Deja View Trail (Photo Credit: Ryan Heil)

Figure 33 Double-track Segment of the Old Coach Road Trail

Figure 34 Singletrack Segment of the Deja View Trail in Winter

Figure 35 Double-track Segment of the Old Coach Road Trail in Winter

In general, all trails appear to be in good condition and are relatively well designed and situated from a sustainable trail design perspective. However, it should be noted that the study's field assessment was conducted in the winter and trails were covered with approximately 20cm of snow making the identification of common trail sustainability problems challenging. Recognizing this, the following trail sustainability issues were identified through the winter field assessment, review of previous assessments, and through the review of available photos and video of the trails online.

TRAIL TREAD CUPPING

As illustrated in Figure 36, all trail treads will become cupped over time with routine use. The rate at which cupping occurs is expedited on trails that experience higher volumes of use, support higher impact activities such as equestrian use, are poorly designed, and/or have limited to no regular maintenance. Some degree of cupping on natural surface trails is normal and must be managed through appropriate design and maintenance.

As trail treads become cupped, the displaced tread materials form berms at the margins of the tread which can prevent water from escaping the trail tread. Cupping channelizes water on the trail and, where adequate grades exist, erosion channels can begin to form. Where grades are flat, water can remain on the trail tread creating muddy conditions that encourages visitors to avoid the water and / or mud, resulting in widening or braiding.

Due to snow conditions during this study's field inventory, the length of trail experiencing tread cupping and associated erosion could not be determined. However, as shown in Figure 37 and Figure 38 tread cupping, though a normal evolution for trails, is occurring and is a trail sustainability condition that should continue to be monitored.

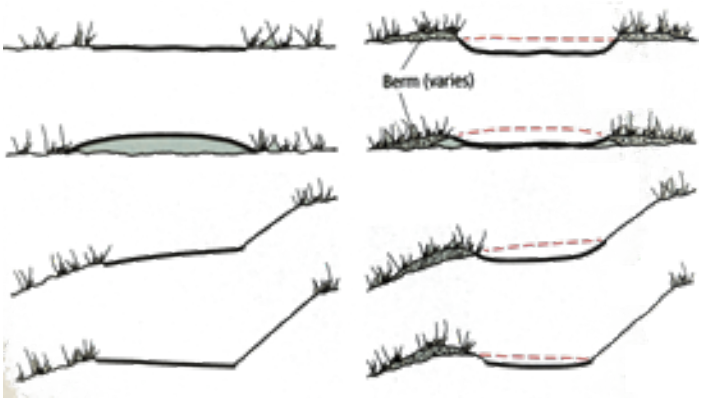


Figure 36 Evolution of Trail Treads Leading to Cupping, Erosion and Puddling

Figure 37 Minor Cupping and Berming Visible on the Old Coach Road Trail (Photo Credit: Lora Cook, AllTrails)

Figure 38 Cupping and berming (foreground) on Deja View Trail (Photo credit: Singletracks.com)

TRAIL TREAD WIDENING

As illustrated in the figures below some trail widening is occurring in some locations along the Deja View Trail. Where occurring, impacts to soils and vegetation can happen quickly and most of the impact, as illustrated in Figure 41, occurs with the first users who leave the trail.[108] Widening can lead to loss of grasslands and native vegetation cover. Trail tread widening in the planning area has been observed where:

- Visitors stop and congregate to look at an attraction or viewpoint.
- Congestion and passing occurs as users travelling at different speeds or directions encounter each other at the same location.
- Visitors are trying to avoid undesirable trail tread conditions (e.g. mud, water).

Due to winter conditions during the field assessment, the number and extent of all trail widening sites could not be documented.

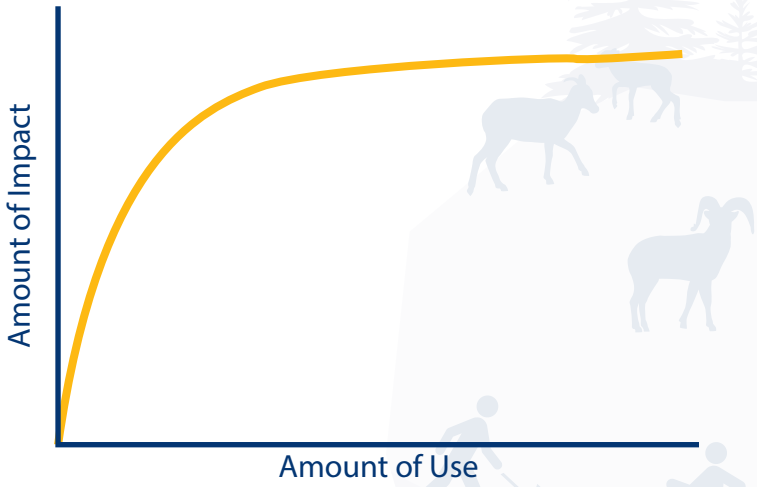


Figure 39 Asymptotic Relationship Between the Amount of Recreational Use and the Amount of Impact

Figure 40 Trail Tread Widening on the Deja View Trail

Figure 41 Trail Tread Widening on the Deja View Trail Near a Viewpoint

Figure 42 Trail Tread Widening on Power Wagon due to riders avoiding rehabilitation efforts

Figure 43 Early Trail Widening at viewpoint (Photo credit: Singletracks.com)

TRAIL GRADES

As a general trail sustainability guideline, the average grade of a trail should not exceed 10% and trails should not be sited on the fall-line of a slope. Trail grades can exceed 10% and remain sustainable if the segments are short and contain appropriate trail designs (e.g. outsloping, crowning, grade reversals). Of the trails assessed during the field program, no trails contained an average grade exceeding 10%. However, at least 5 instances of short and potentially unsustainable grades (20% +) were identified (Figure 47). Though no obvious erosion was evident, these locations have the potential to erode and lead to trail widening and braiding as visitors travel off trail to find shallower grades or to avoid potential erosion channels. The potential for erosion is elevated where visitation is increasing and where more extreme rain events associated with climate change are expected.

Figure 44 Short but Steep Grade on the Deja View Trail (South)

Figure 45 Steep Trail Alignment on the Deja View Trail (North)

Figure 46 Very Steep Grade Descending from Power Wagon to the Old Coach Road

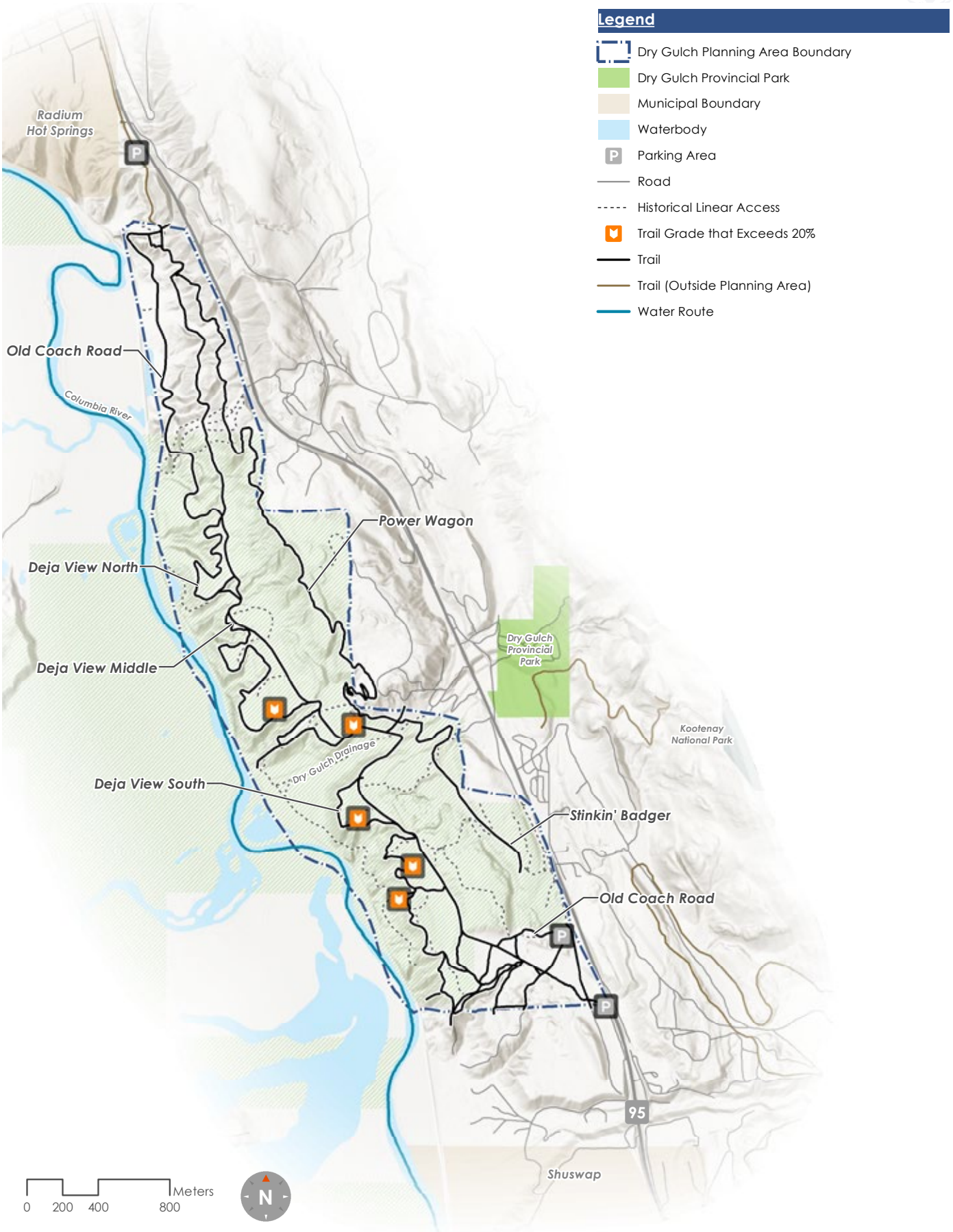


Figure 47 Noted Grade Exceptions

WATERCOURSE CROSSINGS

Desktop analysis of existing hydrology and the existing inventory of sanctioned and unsanctioned trails suggests that the current trail network could contain 12 watercourse crossings (Figure 48). However, many watercourses appear to be classified as a first order streams and likely only contain water during run-off, wet periods, or major rain events though this could not be confirmed through field analysis due to winter conditions. While no trail bridges or hardened crossing have been developed to provide sustainable watercourse crossings, no obvious instances of serious erosion and sedimentation or impacts to watercourses and riparian vegetation were observed though the assessment is limited due to winter conditions and further summer assessment is warranted.

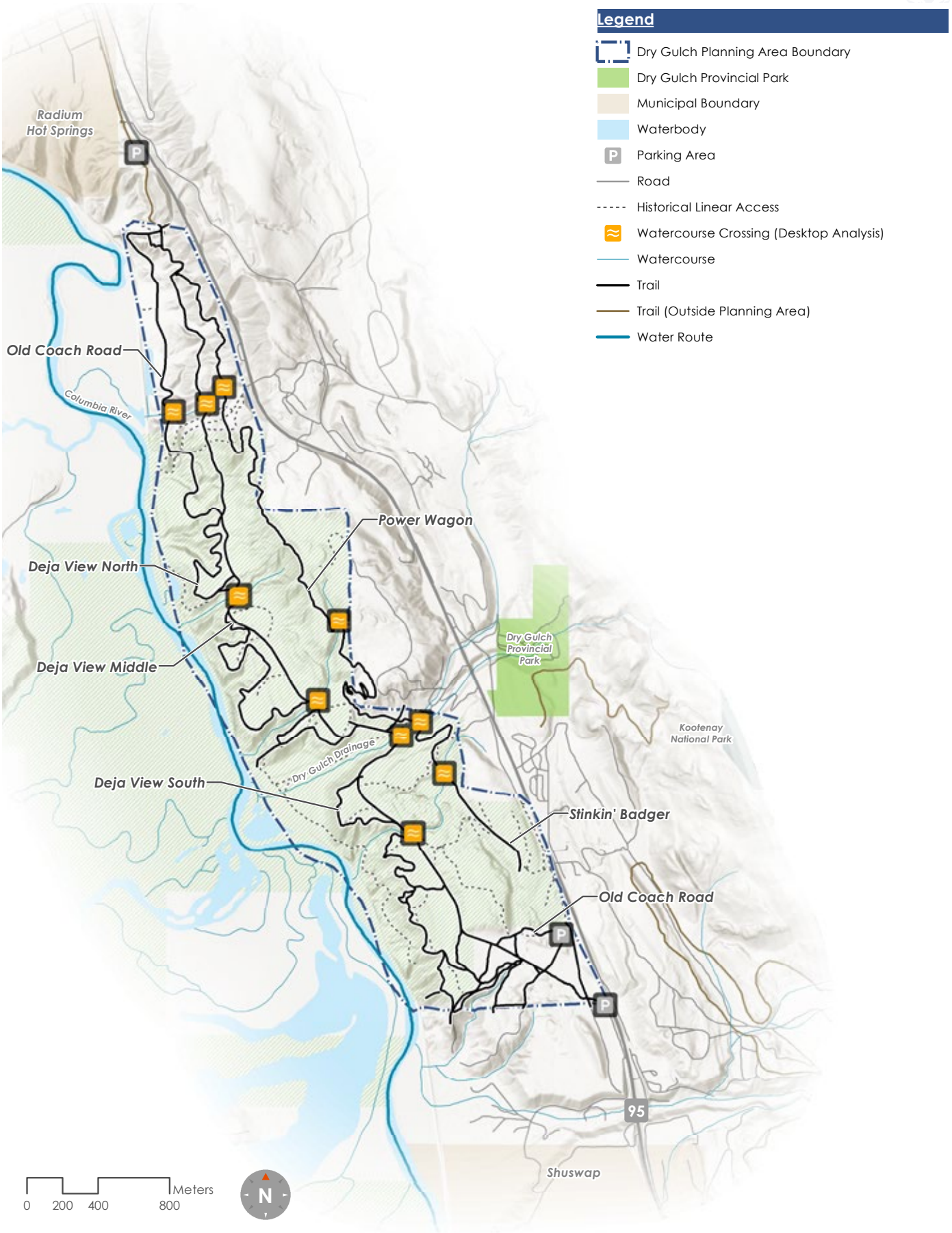


Figure 48 Noted Water Crossings

3.3.2 Access and Parking Areas

Primary parking and access location for the planning area are shown in Figure 53. Most visitors who travel to the area via a personal vehicle park and access the area from the main southern trailhead parking lot (Figure 49). This large lot can accommodate approximately 40-50 vehicles and is reported to reach capacity in busier times. From the north, vehicle-based visitors can park and access the planning area through the northern trailhead parking lot (Figure 50). This lot is very small and can accommodate only a few vehicles (e.g. <5). In addition to the two formal parking lots, an informal lot parking area has been created by users at the most southeastern boundary of the planning area which is accessed from Stoddart Creek Road (Figure 51). Gates and fencing at these locations prevent access by motorized vehicles.

Given the proximity to the Village of Radium Hot Springs, visitors also walk or cycle to the planning area and most often access the area via the Old Coach Road trail from the north (from the Village of Radium Hot Springs) and the south. Obvious access paths from adjacent private lands suggest that informal access occurs from adjacent private lands into the planning area as well. At the time of preparing this strategy, it is unclear what changes to current access into the planning area may be planned or expected with the private campground being developed near Dincy Road.

Figure 49 Major Parking Lot - South

Figure 50 Minor Parking Lot – North Boundary

Figure 51 Informal Parking Lot – South Boundary from Stoddart Creek Road

Figure 52 Dincy Road Access (Sept., 2021).

Figure 53 Parking /Access Locations

3.3.3 Comfort and Convenience Amenities & Infrastructure

Providing and facilitating quality visitor experiences has not been a management objective in the planning area and, as a result, visitor infrastructure and amenities have not been developed to mitigate recreation impacts and support visitor needs. It is worthwhile noting, however, that strategically planned, situated, and managed amenities can be effective options for shifting human behaviour and for reducing and mitigating impacts (e.g. human waste disposal, dog waste disposal, trash disposal, benches to concentrate overlook traffic) while also enhancing the visitor experience where trail authorization is considered.

3.3.4 Signage

Effective on-site signage is essential to helping visitors enjoy an area responsibly and safely as well as helping visitors know and follow the rules. Quality signage also demonstrates to visitors that an area is actively managed. To be effective, sign types, locations, designs and content must be well-planned and well-designed.

Approximately 51 signs have been installed in the Dry Gulch area (Figure 54) including:

- 1 kiosk,
- 22 basic wayfinding,
- 24 regulatory,
- 1 interpretive,
- 1 caution sign, and
- 2 visitor / responsible use education.

The approach to signage and wayfinding in the planning area can be improved. As illustrated in the images below, the branding, consistency, condition, and siting of the existing signage varies considerably, as does the messaging. 66% of the inventoried signs were in fair to good condition while 35% were assessed as being damaged or in poor condition due to vandalism, fading, peeling etc. A strategic review of the signage deployed in the planning area suggests that:

- Signage is limited to the parking lots and the Old Coach Road trail.
- Signage is inconsistently branded.
- Wayfinding signage is limited or absent at trail intersections. This may lead visitors to travel on linear disturbance that is not intended to be a trail.
- Signs provide variable and sometimes inconsistent messaging to visitors about responsible use, skills and ethics.
- The activities permitted in the planning area are not clearly communicated on current signage and at trailheads / parking lots.
- Some messaging on signage installed by the RDEK is contradictory to signage installed by the Ministry regarding cycling use.
- Some signs are installed on trees rather than on posts which can lead to impacts to the trees and damage to signage.

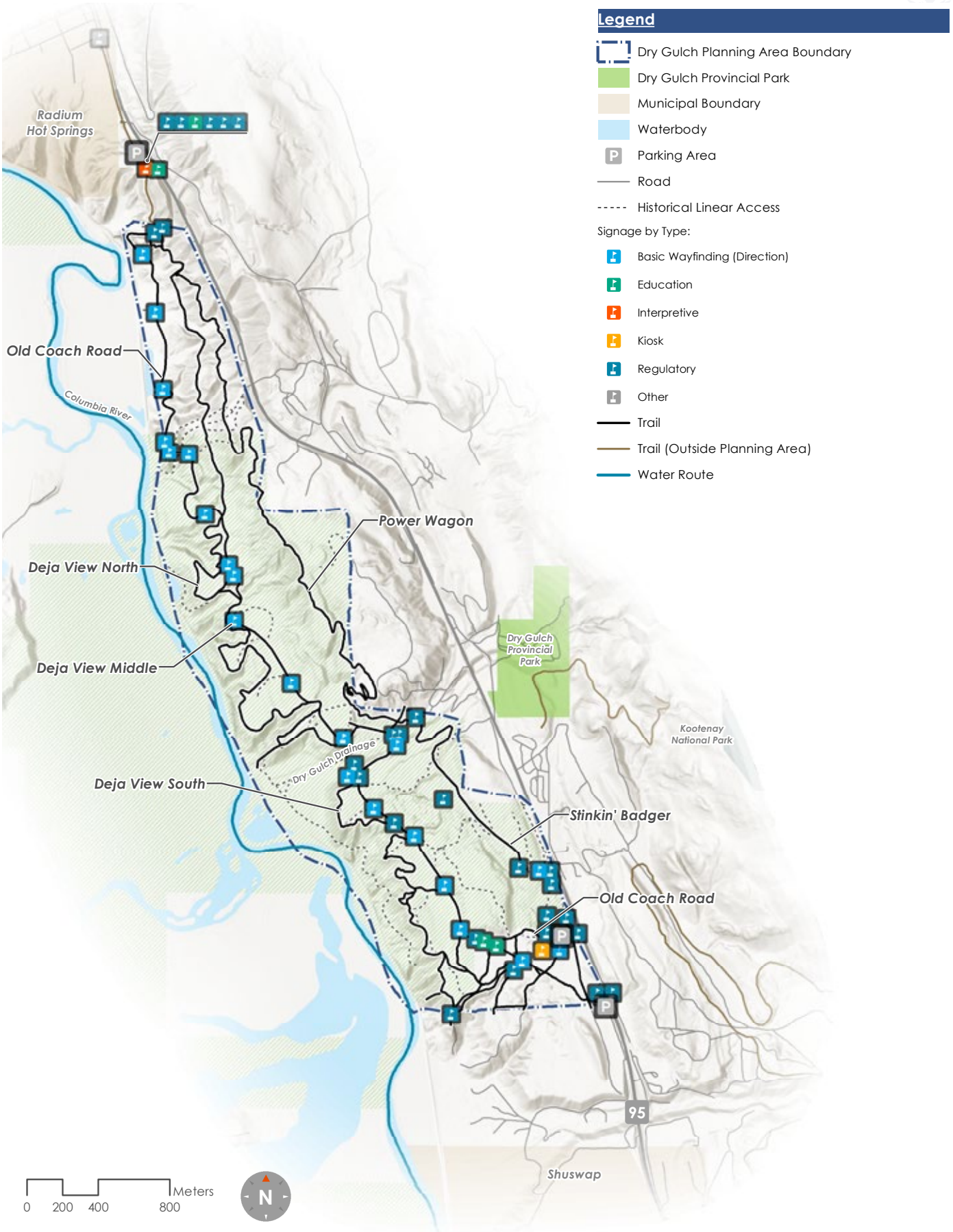


Figure 54 Observed Signage

- Some signage installed to communicate permitted uses of the Deja View trail and closure of Power Wagon trail has been damaged or removed entirely.
- Many different signs have been installed in a relatively small area in the main parking lot. This is resulting in signage clutter and reducing the likelihood that the signs will be observed (Figure 55).
- Current signage relies heavily on dense text, which most users will not read, rather than using symbology or iconography to communicate messaging quickly and effectively.
- WMA boundary signs are inconsistently posted along the Old Coach Road trail in the southern portion of the planning area and are posted outside of the actual legally designated WMA boundary at the northern trailhead parking lot.
- Some adjacent private landowners appear to have posted informal signs on lands within WMA indicating that the land is private property (Figure 56).

Under the current signage regime, the likelihood that visitors will read and adequately understand the current information presented is limited. This may further limit visitors' ability to be informed, prepared, and compliant during their outings.

Figure 55 Signage Clutter Limits the Effectiveness of All Signs

Figure 56 Private Land Sign Posted in the WMA Approximately 200 m from the Private Land Boundary

EXAMPLES OF CURRENT SIGNAGE

Kiosks

Kiosk at Southern Trailhead Parking Lot (one of three panels)

Kiosk at the Northern Trailhead Parking Lot Posted Outside of the Actual WMA Boundary

Wayfinding

Basic Wayfinding Kilometer Marker on the Old Coach Trail

Basic Wayfinding Marker on the Old Coach Trail

Regulatory

Regulatory Sign at the Northern Trailhead Parking Lot

Permitted Use

WMA Boundary Sign Posted on the Old Coach Road Trail

WMA Boundary & Regulatory Sign Posted on the Old Coach Road Trail

Interpretive

Fading Interpretive Signage on Old Coach Road Trail

Interpretive Signage on Old Coach Road Trail

Visitor Education

Visitor Etiquette Sign on the Old Coach Road Trail

Mixing of Signage Branding with Varying Messaging

Trail Etiquette & Yield Hierarchy Sign on Old Coach Road Trail

Visitor Education Sign at the Northern Trailhead Parking Lot

Caution

Caution Sign

Sign with an Unclear Purpose

3.4 DISTRIBUTION OF RECREATION ACTIVITIES & RELATIVE INTENSITY OF USE

While recreation occurs through the Dry Gulch area year-round, the distribution and intensity of recreational use varies by season. Insights gathered from field assessment observations, open data sources (e.g. Strava Global Heat Map, Gaia), trail counters at the north and south ends of the Old Coach Road, and local knowledge of Ministry staff provide valuable insights of the distribution and relative intensity of recreational use in both warmer months and summer months.

As illustrated in Figure 58, recreational use in the **warmer months** is most intense on the Old Coach Road trail and Deja View trail's south and middle segments. Recreational use of the northern segment of the Deja View trail is high, but not as high as the other segments. Unauthorized use appears to be continuing on Power Wagon and Stinkin' Badger trails since they were officially closed in 2020, but Strava and Gaia heatmaps suggests that levels of use is lower than other trails in the area (Figure 57). It also suggests that visitation on the unnamed trails in the southern portion of the planning area is shown to be considerably lower than that of the Old Coach Road and Deja View trails. It should also be noted that a significant amount of trail use from the south parking lot may be bypassing the trail counter installed on the Old Coach Road trail entrance on the west side of the parking lot.

Recreational use in the **colder months** is most intense on trails in the southern portion of the Dry Gulch area (Figure 59). The Old Coach Road Trail and Deja View trail's southern segments experiences the highest volume of use in the planning area. North of the Dry Gulch drainage, visitation on the Old Coach Road trail to the northern boundary of the planning area is notably less than the southern segment. Visitation on the Deja View trail's middle segment is very low. Finally, based on the field assessment observation in February 2022, there was no evidence of cold weather recreational use on the Stinkin' Badger and Power Wagon trails and only occasional activity on portions of Deja View trail's northern segment.

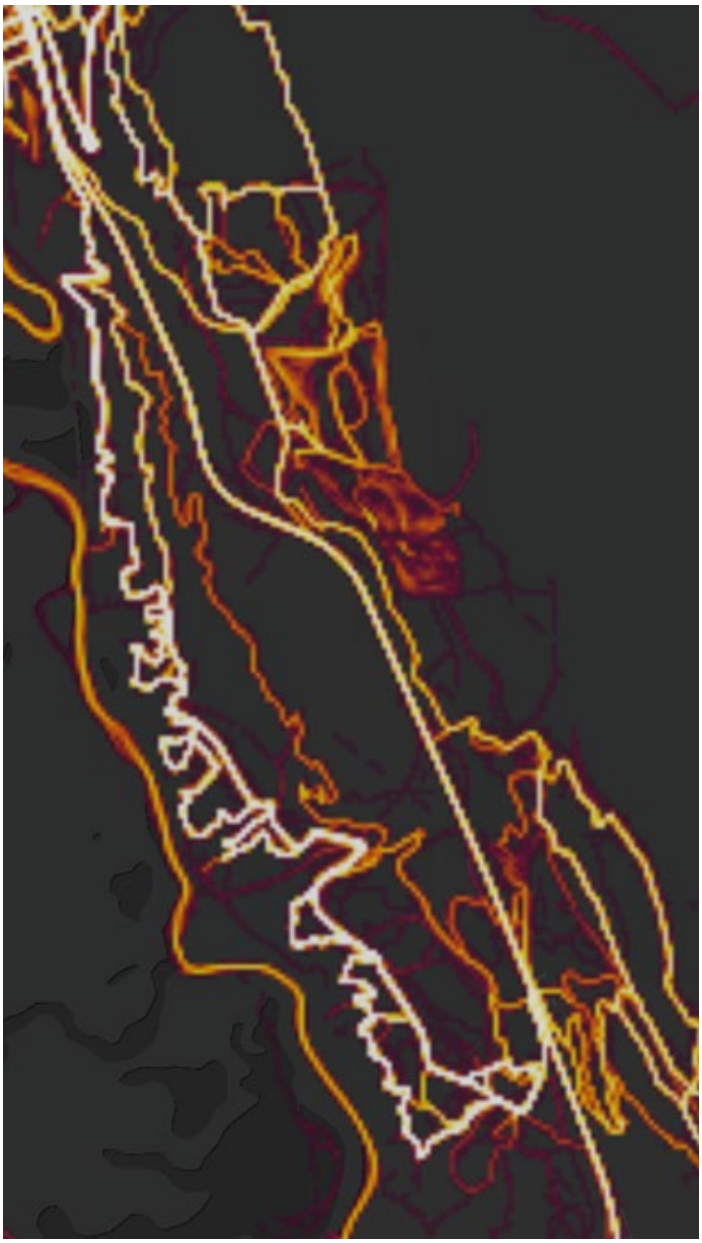


Figure 57 Strava Heat Map of Dry Gulch Area

Figure 58 Recreation Use Warmer Months

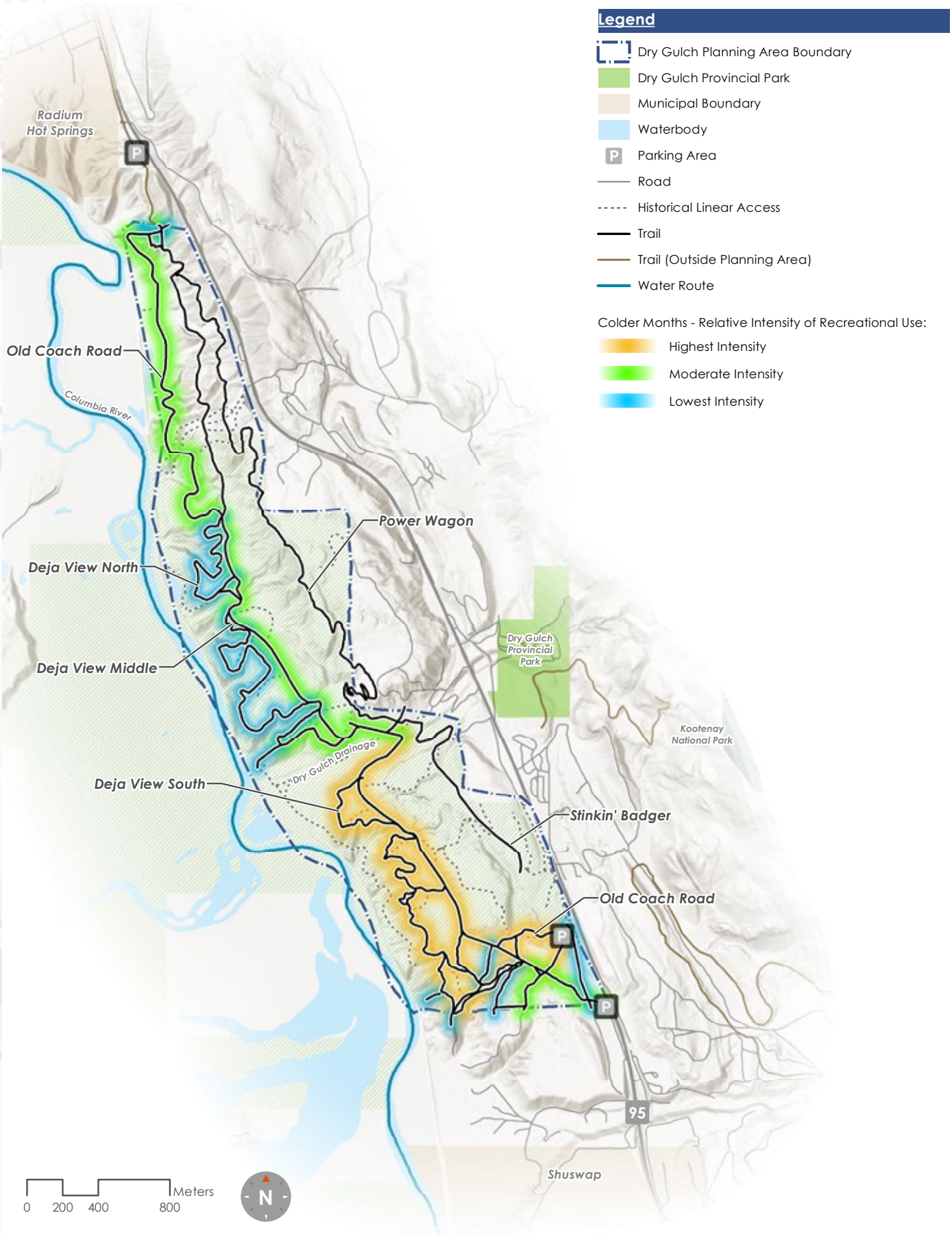


Figure 59 Recreation Use Colder Months

3.5 UNAUTHORIZED MOTORIZED VEHICLE USE

As indicated earlier, motor vehicle use over 10 horsepower in the non-navigable waters and lands of the CWWMA portion of the planning area is prohibited. Insights gathered from the field assessment and Ministry staff suggest that unauthorized motor vehicle use does not occur regularly in the planning area. Evidence of unauthorized of snowmobile use was observed in one location with a single machine above the water infrastructure along the river (Figure 61). The machine appeared to have entered the planning area from adjacent private lands (Figure 60). Additional potential for non-motorized access may exist from the railway alignment through compromised fencing, although none was observed during the winter field assessment.

Figure 60 Non-Compliant Snowmobile Track Leading Toward the River and Hydro Infrastructure

Figure 61 Snowmobile Track Leading East Toward Private Lands and the Highway

4. FUNCTIONAL HABITAT ASSESSMENT & CUMULATIVE THREAT ANALYSIS

As indicated in section 2.3, recreational use, regardless of the activity, can disturb wildlife. Pending the predictability of recreational patterns, research has shown that wildlife can react in different ways (e.g. vigilance, alert behaviours, elevated stress, displacement / flush) to different activities at different distances.

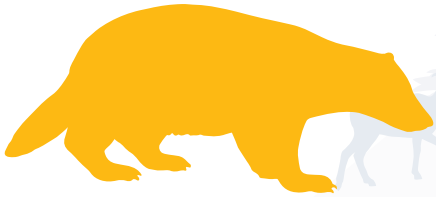
Given that the management purpose of the planning area is to protect wildlife and their habitats, it was important to understand how much of the habitat within the planning area is reasonably free from potential recreational influence. A functional habitat assessment was undertaken using general findings from research on wildlife, particularly ungulate, flight alert distance, flight initiation distance, flush distance, and duration and severity of disturbance. This zone of influence data is presented in section 2.3.[109] It is worth noting that while Flight Initiation Distance is a useful statistic, it can be challenging to accurately measure and lacks detail of whether animals are actually disturbed and the impact that disturbance had on the animal.

To provide zone of influence recommendations trails that are used for recreation in each season (warmer and colder) were mapped and then buffered based on the wildlife disturbance variables (flight initiation distance, flush distance) for each activity that is known to occur on each trail. The results illustrate that approximately 97% of the planning area could be potentially impacted by the presence of recreational users in the warmer and colder seasons (Figure 62 and Figure 63), but the severity of impact would vary based on type and frequency of use, and the timing of when wildlife are present in the area. As illustrated in Table 3 , the amount of habitat that is potentially impacted in each season varies slightly based on the recreational activity that is being considered.

Table 3: Proportion Impacted by Activity

Activity	Proportion of the WMA that is Potentially Impacted by Activity Presence (%)	
	Warmer Season	Colder Season
Hiking & Dog Walking	97%	97%
Cycling / Mountain Biking	71%	68%
Motor Vehicle Use Within WMA*	8%	7%

** Assumes recurring use of observed snowmobile track.*



ZONE OF INFLUENCE

The immediate spatial effect of a particular road- or trail-associated factor that alters the distribution and abundance of wildlife in a given area.

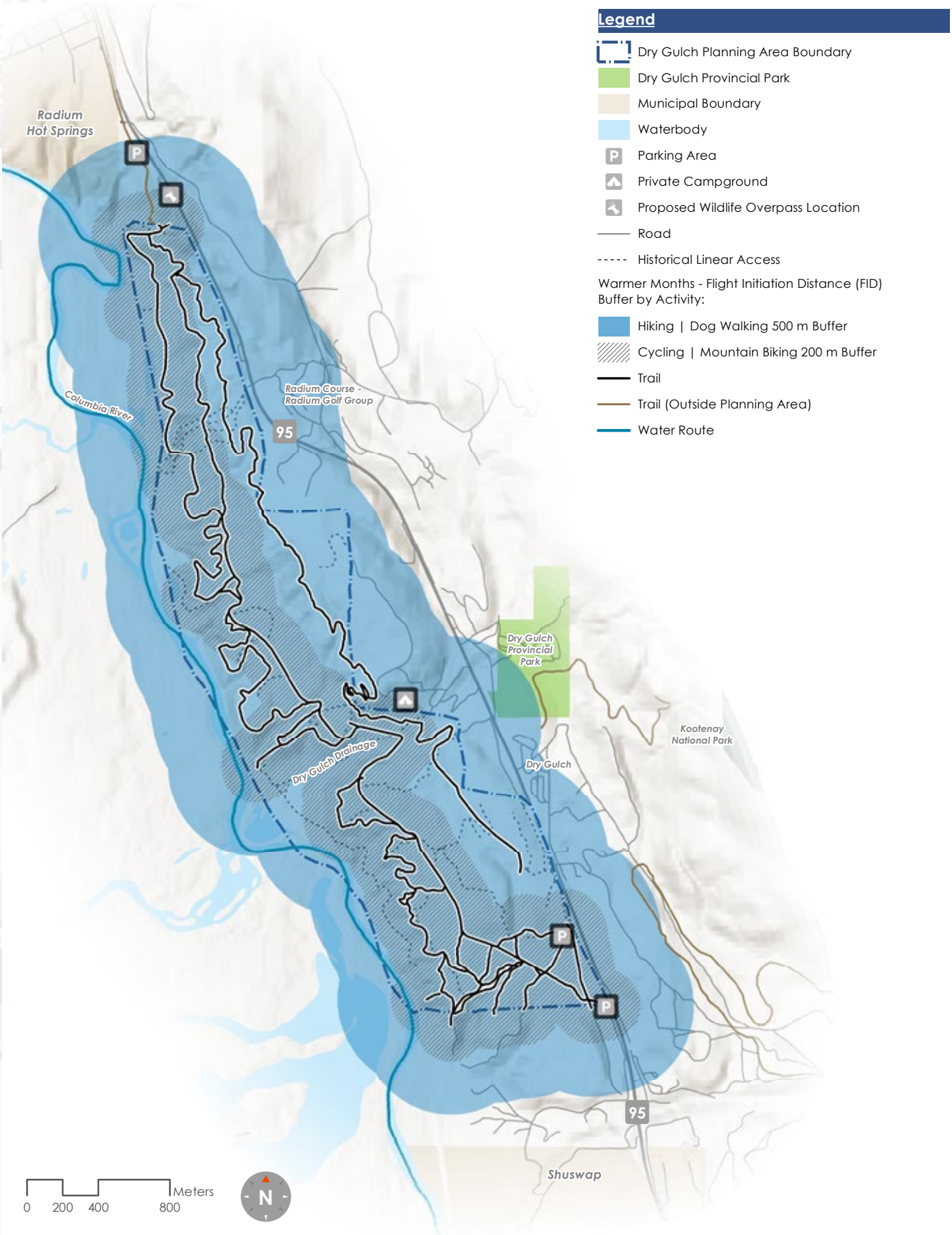


Figure 62 Zone of Influence Warmer Months

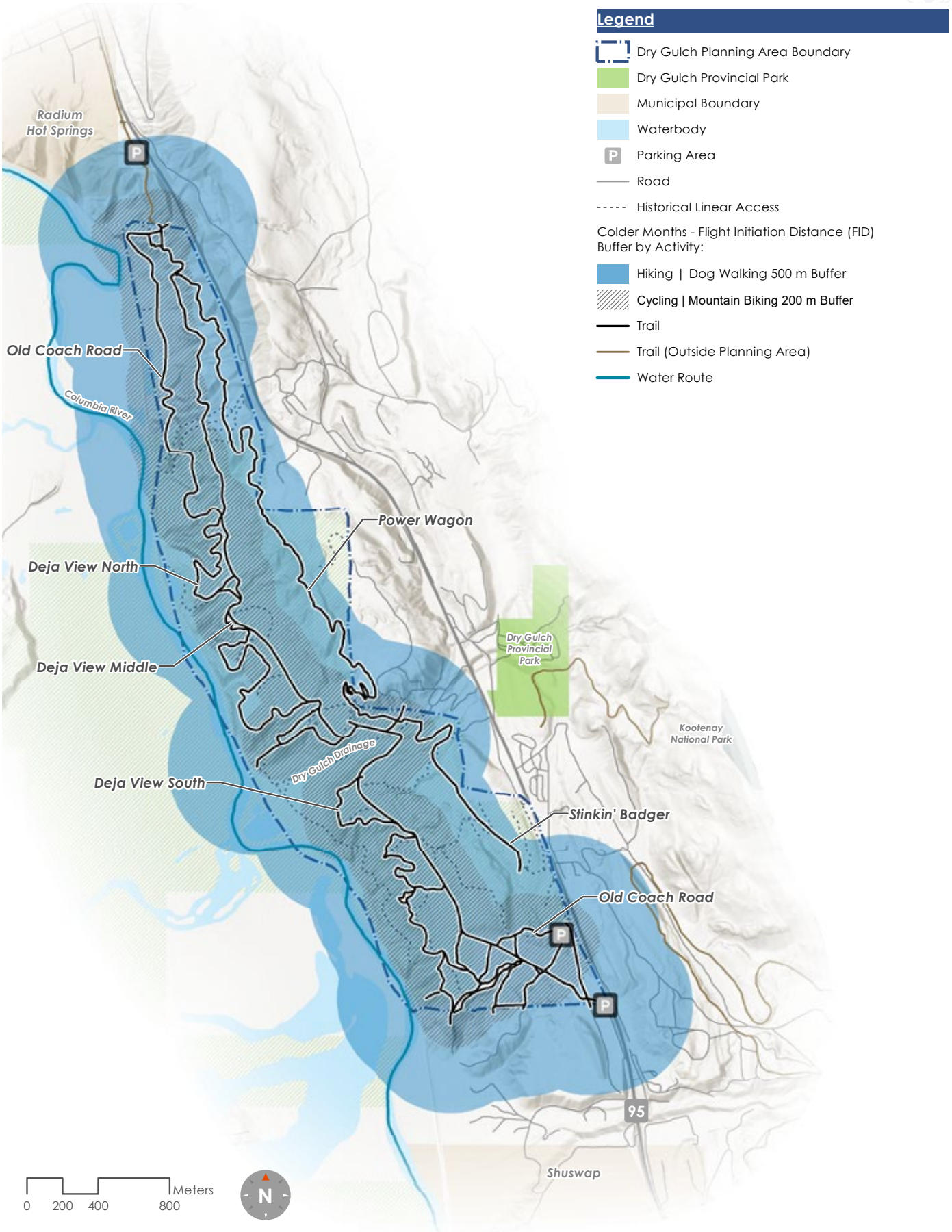
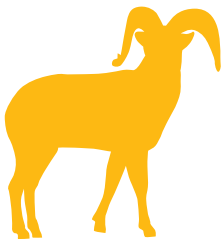


Figure 63 Zone of Influence Colder Months

4.1 CUMULATIVE RECREATION THREAT ANALYSIS

A Miradi Threat Analysis,[110] an established conservation planning process and tool, has been used to identify the primary conservation targets in the planning area, identify the recreation related threats to those targets, and to systematically rate the significance of each threat on each conservation target. The resulting matrix identifies which threats require priority attention. Research presented in section 2.3, professional opinion and discussions with the Shuswap Band and Ktunaxa Nation were used to rate the significance of each recreation threat on each conservation target.



"Cultural heritage and recreation are not synonymous; our heritage is not your life."

– (Cultural Heritage Specialist, March 12, 2021)

Conservation Targets

The primary conservation targets in the WMA include:

- Ungulates & Bighorn Sheep – summer range, winter range, salt / mineral licks
- Badger – habitat, natal dens, burrows
- Grasslands
- Flammulated Owls
- Long-billed Curlew
- Lewis's Woodpecker
- Landscape Connectivity Corridor
- Indigenous – archaeological sites, culturally important plants, cultural / spiritual / ceremonial areas

Recreation Caused Threats

The primary recreation related threats to conservation targets in the WMA include:

- Human Presence – high volume & frequency, moderate to low volume & frequency, on-trail travel, off-trail travel
- Recreation Infrastructure Development – unsanctioned trails, moderate to high relative trail density, trail design deviations, unbridged / hardened watercourse and wetland crossings
- Disturbance of Vegetation & Soil – trampled / compacted areas, erosion, invasive species occurrence
- Domestic pets – on-leash dogs, off-leash dogs
- Noise & Speed of Travel – noisy travel, fast and quiet travel

Table 4: Miradi Threat Matrix

Threat Category	Recreation Induced Condition / Behaviour	Ungulate Summer Range	Ungulate Winter Range	Sheep Winter Range	Salt / Mineral Licks	Badger Habitat (VH & H)	Badger Natal Den Sites	Badger Burrows	Flammulated Owl Nest Sites	Lewis's Woodpecker	Grassland Ecosystem
Human Presence & Patterns	High volume and / or frequency of human presence	Moderate	Very High	Very High	Very High	Moderate	Very High	High	High	High	High
	Moderate to low volume and frequency of human presence (warm months / cold months)	Low	Moderate	Moderate	High	Low	Very High	Moderate	Moderate	Low	Moderate
	On-trail travel (predictable)	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low	Low	Low
	Off-trail travel (unpredictable)	High	High	High	High	High	High	High	Moderate	Moderate	Moderate
	High Noise (e.g. motors, exhaust, portable speakers)	High	High	High	High	High	Very High	High	Very High	High	Low
	High speed (fast movement) and quiet travel	Moderate	High	High	Moderate	Low	Low	Low	Low	Low	Low
Recreation Infrastructure	Construction of unsanctioned trails	High	Moderate	Moderate	Very High	Moderate	Very High	High	Moderate	Moderate	Very High
	Moderate to High Trail / Infrastructure Density or Footprint	High	High	High	Very High	Moderate	Very High	High	Moderate	Moderate	Very High
	Unsustainable deviations from Trail Management Objective (e.g. Trail widening / braiding / Erosion)	Low	Low	Low	Low	Low	Low	Low	Low	Low	Moderate
	Unbridged / hardened watercourses / wetland trail crossings	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Vegetation & Soil Conditions	Trampled / compacted and bare areas	Low	Low	Low	Very High	Low	Very High	Very High	Low	Low	Very High
	Recreation induced erosion (e.g. non-trail)	Low	Low	Low	Very High	Low	Very High	Very High	Low	Low	High
	Invasive species transmission or occurrence on / adjacent to trails	Very High	Very High	Very High	Low	Low	Low	Low	Low	Low	Very High
Non-Human Presence, Patterns,	Domestic Dogs Off-Leash	Very High	Very High	Very High	Very High	Very High	Very High	Very High	High	Moderate	High
	Domestic Dogs On-Leash	High	High	High	High	High	High	High	Moderate	Moderate	Moderate

Threat ratings are defined as follows:

- **Low -** Threat is likely to minimally degrade the target, or is narrow in scope, or is easily reversed at low cost to restore.
- **Moderate -** Threat is likely to moderately degrade the target, or is restricted in scope, or is reversible with a reasonable commitment to restore.
- **High -** Threat will seriously degrade the target, or is widespread, or may be technically reversed but may not be affordable to restore.
- **Very High -** Threat may destroy the target, or is pervasive, or cannot be reversed, or is unlikely to be able to be restored.

Table 4: Miradi Threat Matrix (Continued)

Threat Category	Recreation Induced Condition / Behaviour	Connectivity Corridor	Fish Habitat	Riparian Areas , Shorelines & Wetlands	Indigenous - Archaeological Sites	Inidgenous - Culturally Important Plants	Indigenous - Cultural / Spiritual / Ceremonial Areas / Sites
Human Presence & Patterns	High volume and / or frequency of human presence	High	High	High	Very High	Very High	Very High
	Moderate to low volume and frequency of human presence (warm months / cold months)	Moderate	Moderate	Moderate	Very High	Very High	Very High
	On-trail travel (predictable)	Low	Low	Low	Very High	Very High	Very High
	Off-trail travel (unpredictable)	Moderate	Low	Low	Very High	Very High	Very High
	High Noise (e.g. motors, exhaust, portable speakers)	High	Low	Low	Very High	Very High	Very High
	High speed (fast movement) and quiet travel	Moderate	Low	Low	Very High	Very High	Very High
Recreation Infrastructure	Construction of unsanctioned trails	High	High	High	Very High	Very High	Very High
	Moderate to High Trail / Infrastructure Density or Footprint	High	High	High	Very High	Very High	Very High
	Unsustainable deviations from Trail Management Objective (e.g. Trail widening / braiding / Erosion)	Low	Moderate	Moderate	Very High	Very High	Very High
	Unbridged / hardened watercourses / wetland trail crossings	Low	Moderate	Moderate	Very High	Very High	Very High
Vegetation & Soil Conditions	Trampled / compacted and bare areas	Low	Moderate	Very High	Very High	Very High	Very High
	Recreation induced erosion (e.g. non-trail)	Low	Very High	Moderate	Very High	Very High	Very High
	Invasive species transmission or occurrence on / adjacent to trails	Low	Moderate	High	Very High	Very High	Very High
Non-Human Presence, Patterns,	Domestic Dogs Off-Leash	High	Moderate	Very High	Very High	Very High	Very High
	Domestic Dogs On-Leash	Moderate	Low	Low	Very High	Very High	Very High

Threat ratings are defined as follows:

- **Low -** Threat is likely to minimally degrade the target, or is narrow in scope, or is easily reversed at low cost to restore.
- **Moderate -** Threat is likely to moderately degrade the target, or is restricted in scope, or is reversible with a reasonable commitment to restore.
- **High -** Threat will seriously degrade the target, or is widespread, or may be technically reversed but may not be affordable to restore.
- **Very High -** Threat may destroy the target, or is pervasive, or cannot be reversed, or is unlikely to be able to be restored.

Using the Miradi Threat Matrix as inputs and available spatial data on conservation targets and recreation threats, a Geographic Information System (GIS) based model was developed to apply the threat ratings spatially and quantitatively across the planning. Given that both recreation conditions and wildlife patterns vary considerably between the warmer and colder months, the model was implemented for the warmer months and for the colder months. The results of this analysis identify where existing recreation conditions are posing the highest to lowest cumulative threats to the conservation targets in the planning area. However, there are a number of limitations to this analysis that should be noted:

- Spatial data was not available for all conservation targets (e.g. Long-billed Curlew, Flammulated Owl, Lewis's Woodpecker, Indigenous Culturally Important Plants, Indigenous spiritual / ceremonial areas / sites) and, where not available, these conservation targets were not reflected into the spatial analysis results. The lack of data may indicate that these targets are not present in the planning area, or they simply have not been inventoried / observed and documented.
- The analysis relied upon available spatial data on conservation targets which have been developed during other planning processes or wildlife inventories. Production of these datasets may or may not have considered traditional ecological knowledge or qualitative insights from experts.
- *At this stage in the planning process, all recreation threats to Indigenous values have been rated as very high. Identifying all recreation threats as very high is intended to prompt a more collaborative and direct discussion with First Nations regarding future management of Indigenous conservation values as decision making occurs about recreation management. However, this very high ranking of Indigenous values has not been incorporated into the spatial analysis shown in the maps. Impacts to Indigenous values are integrated into decision making at the government-to-government table.*

The results show that given current conditions:

- In the warmer months, lower threats exist south of the dry gulch drainage and, overall, threat levels are lower than in colder months but are spread over a larger area. This suggests that different management approaches may be considered and applied north and south of the drainage (Figure 64).
- In the colder seasons, largely due to increased presence of ungulates using their winter range, threat levels are higher and more concentrated along the primary trails. This suggests that more stringent management approaches may need to be considered and applied in colder months than in warmer months (Figure 65).
- Warmer and colder month threats are combined and presented in Figure 66.

These results have been used to inform the key recreation management issues in the WMA and the identification and application of proposed recreation management actions such as permanent trail closures and restoration, seasonal closures, activity restrictions, and access controls among others.

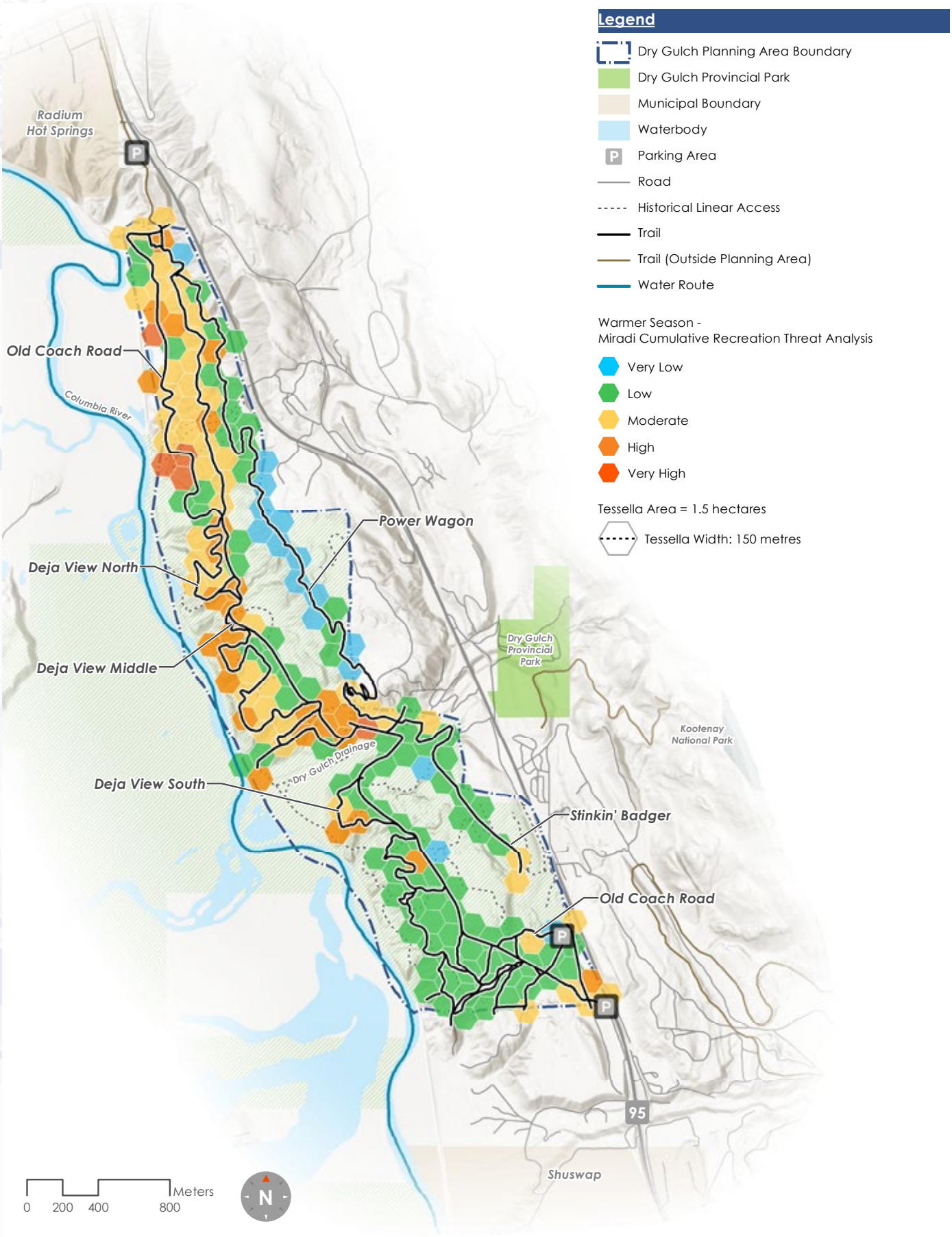


Figure 64 Cumulative Threat Map, Warmer Months

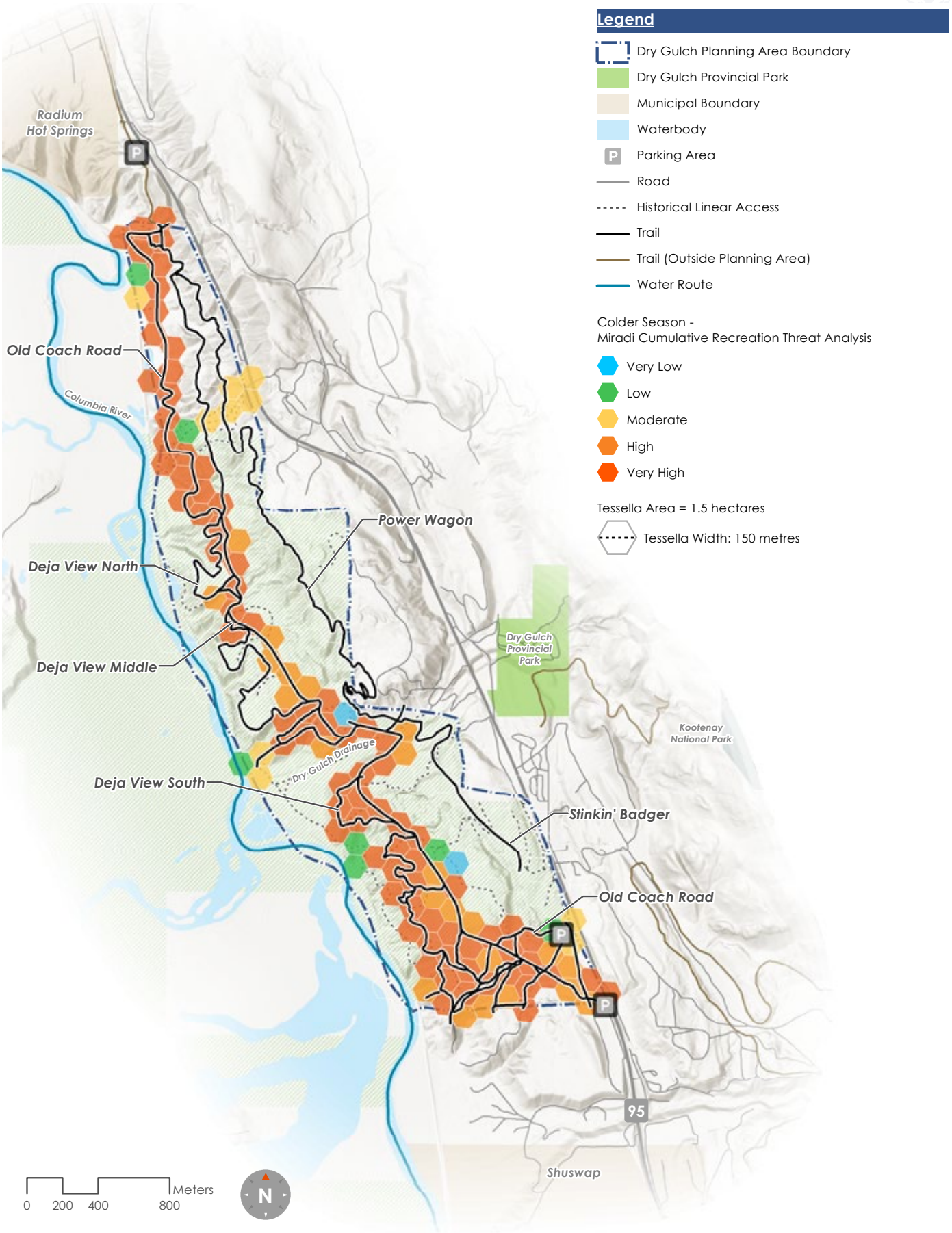


Figure 65 Cumulative Threat Map, Colder Months

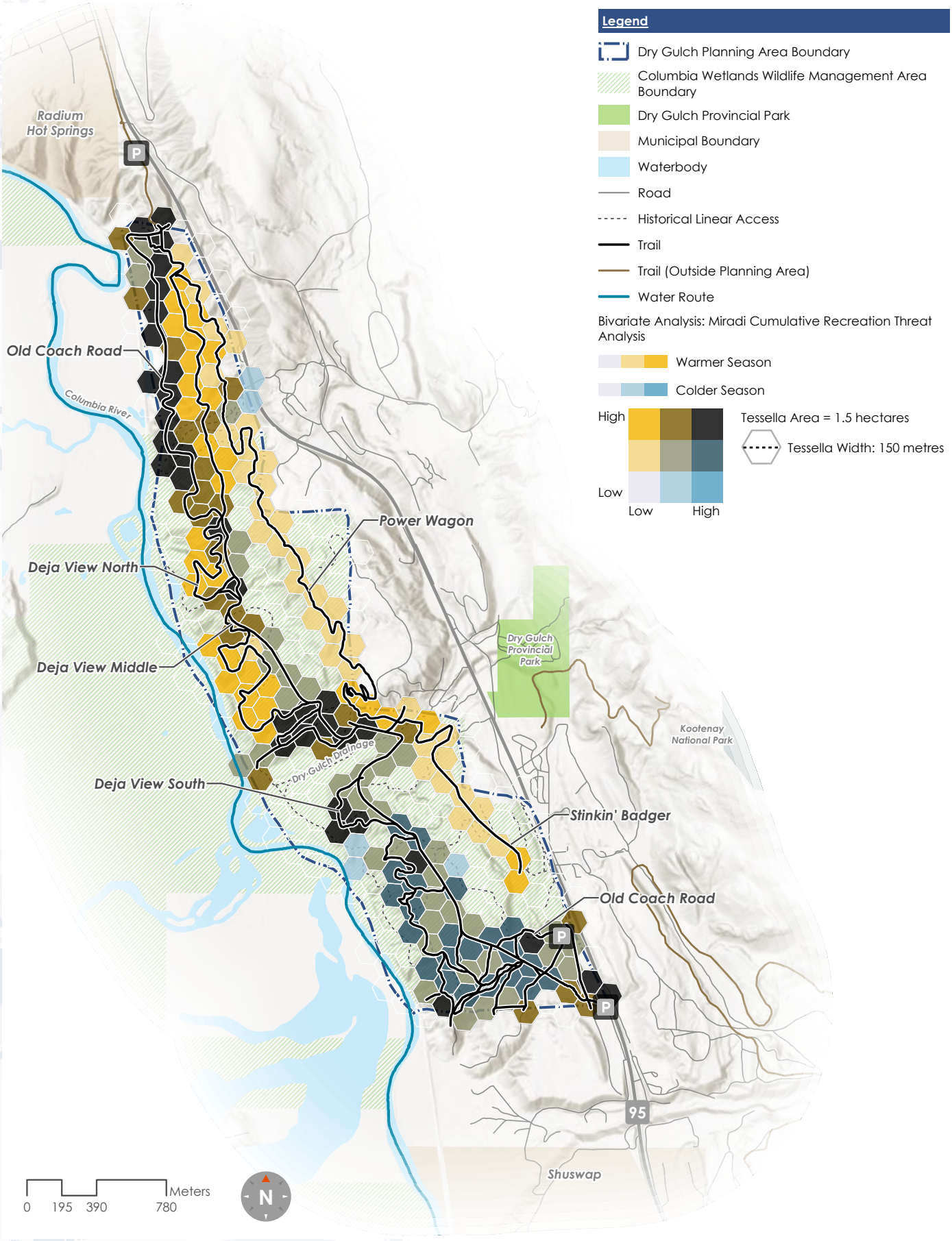


Figure 66 Cumulative Threat Map, Bivariate Warmer and Summer

4.2 PRIORITY RECREATION MANAGEMENT ISSUES

Indigenous governments, wildlife managers, and local stakeholders have expressed growing concerns about the potential for recreation to create unacceptable impacts on the wildlife, wildlife habitat, and Indigenous values in the Dry Gulch area. Based on these concerns, and the research and analyses presented in the earlier sections, the priority recreation management issues to be addressed by this strategy include:

- Recreation induced displacement of ungulates, especially bighorn sheep, from their winter range.
- Potential harassment and displacement of wildlife in response to the presence of domestic dogs (on and off leash) and other recreational use.
- Fragmentation of functional habitat and landscape connectivity due to high trail density and use.
- Unsanctioned existing trails and the building of further unsanctioned trails leading to impacts to grasslands, wildlife habitats, wildlife habitat features and archaeological resources.
- Conversion and loss of native grasslands through trail widening, braiding and erosion.
- Introduction and spread of invasive plant species from recreation.
- Unintended recreational use of historical industrial resource roads and linear access.
- Unauthorized use of trails that have been closed and deactivated.
- Disturbance and damage to archaeological sites.
- Increasing visitation and public presence resulting in impacts to Indigenous traditional and cultural use of the planning area.
- Emergent and changing access requirements that may be associated with the adjacent private development.

5. REGIONAL & LOCAL GOVERNMENT PLANNING & POLICY CONTEXT

Although the Ministry and Indigenous governments hold the responsibility and authority for decision making within the planning area, regional and local government planning and policies can provide support for or have implications on the management of recreation within the Dry Gulch area. Local and Regional District official community plans were reviewed to understand the recreation related interests of local and regional governments and how those interests may align with or contradict the management intent and direction in the planning area. See Appendix A for a summary of the most relevant local and regional government direction.

6. DESIRED RESOURCE CONDITIONS

6.1 DESIRED RESOURCE CONDITIONS

Guided by the planning area's primary purpose of conserving important fish and wildlife habitats, supporting landscape connectivity, and enabling the Columbia River wetlands to continue to function as a natural floodplain ecosystem,[111] desired resource conditions are more detailed and future focused statements that describe the ecological, Indigenous and recreation conditions that will be achieved and maintained in the planning area into the future. These conditions may not necessarily reflect the conditions that exist today.[112]

The following desired resource conditions are draft and are intended for public review and comment. These resource conditions statements are subject to review and final approval by statutory decision makers and First Nations.

ECOLOGICAL VALUES - DESIRED RESOURCE CONDITIONS

Wildlife & Habitat

1. Ungulates, including big horn sheep, elk, and deer, are not displaced from their most productive winter or summer ranges as a result of recreation.
2. Predictable recreation patterns allow ungulates to habituate to the recreational use and limit flight distances and energy expenditures.
3. Wildlife trees that provide habitat for flammulated owl and Lewis' woodpecker are occupied and undisturbed by recreation.
4. Badger burrows and dens are protected and free from disturbance or damage from recreation.
5. Human wildlife conflicts are avoided.
6. Native grasslands remain intact, free of invasive species and, where appropriate, are enhanced.
7. The planning area remains a functional and interconnected north-south and east-west habitat corridor for wildlife movement.

Riparian Areas, Wetlands & Watercourses

8. Watercourses are unimpeded and are free of recreation caused sediment loading or contamination. Appropriate watercourse crossings (e.g. hardening, bridge) are installed where sanctioned trails cross permanent watercourses.
9. Wetlands are protected, continue to function and are free from recreation caused impacts such as trampling, vegetation damage, rutting, soil compaction and hydrological changes.

INDIGENOUS VALUES – DESIRED RESOURCE CONDITIONS

10. Indigenous peoples continue to access and use the area to harvest traditional resources and practice their culture. Traditional use and cultural practices are not impeded by public recreation and management of public recreation.
11. Archaeological sites and cultural heritage resources are protected and undisturbed.
12. Visitors to have the opportunity to learn about and appreciate Indigenous culture, knowledge, and practices.

RECREATION VALUES - DESIRED RESOURCE CONDITIONS

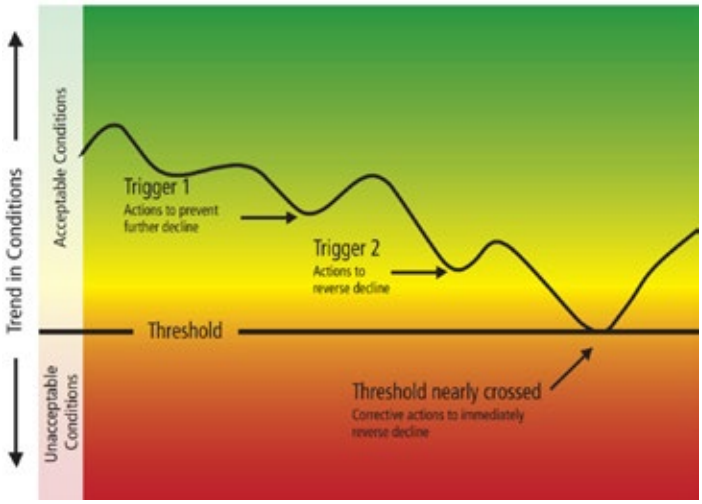
13. The Dry Gulch area provides visitors with all-season access to enjoyable non-motorized and appropriate mechanized recreation experiences that are quiet and enable visitors to connect with, learn about and appreciate the natural beauty, wildlife, and cultural significance of the planning area with minimal impact to identified values. On-leash dog walking is limited to designated trails and off-leash dog walking is confined to the designated area. Off-road vehicle recreation, motorized vehicle use, and overnight use does not occur in the planning area.
14. Basic recreation infrastructure and amenities are provided only where it is needed to minimize visitor impacts, concentrate recreational use, provide visitor information, and support compliance and public safety. All infrastructure is designed and constructed in way that is harmonious with the area and will have minimal impact on wildlife, Indigenous and scenic values.
15. Visitors have access to and utilize a network of sanctioned non-motorized multi-use trails that are sustainably designed, constructed, and maintained in accordance with best practices. The trail network may be an interconnected stacked-loop system of double track (Old Coach Road trail) and single-track trails that provide easy (green circle) and moderate (blue square) levels of challenge for walking, hiking, running, snowshoeing, mountain biking, fat biking, leisure cycling and ungroomed cross-country skiing. Off-trail use does not occur, unsanctioned trails are not constructed, and the total length of sanctioned trails does not exceed what is established in this plan.
16. Visitors are respectful of others, compliant with the rules, and do not engage in behaviours that threaten wildlife, increase the risk of human wildlife conflicts, or create avoidable impacts to environmental or Indigenous values.
17. Public safety incidents are limited as visitors arrive prepared and with the appropriate skills and equipment for the authorized recreation activities they are undertaking.
18. Visitors are active stewards and potential partners in the maintenance and management of the trail system and recreation and support the conservation management priorities for the planning area and actively participate in sharing information and observations of ecological values in the WMA.

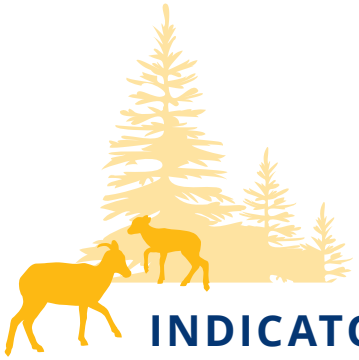
6.2 INDICATORS, TRIGGERS & THRESHOLDS

The VUMF process is predicated on adaptive management and determining the levels of impacts to the values in the planning area that are considered acceptable.

Indicators that reflect the status of desired resource conditions have been identified in Table 5 and will be monitored over time by the Ministry, Indigenous governments and / or partners to determine whether the desired conditions are being achieved.

For each indicator, a trigger has been determined and will be used to signal when desired resource conditions are changing in an undesirable way. When identified, these conditions may trigger the implementation of additional management actions to bring current conditions back in line with the desired resource conditions. In addition to triggers, thresholds have been established to clearly communicate the minimum acceptable resource condition.





INDICATOR

Specific, measurable variables that indicate the status of a specific desired condition.

THRESHOLD

The minimum acceptable condition for change in indicators.

TRIGGER

A condition of concern for an indicator that is enough to prompt a management response to ensure a threshold is not crossed.

MANAGEMENT ACTION

Implemented to preserve or restore desired conditions, generally in phases, after monitoring documents that a threshold is being approached or exceeded.

Table 5: Desired Resource Condition Indicators, Triggers & Thresholds

Desired Condition	Indicator	Data Source	Trigger	Threshold
Environmental				
Wildlife & Species at Risk	Wildlife population by species	Wildlife Surveys	Decrease	Any decrease
	Number of reported human wildlife conflicts per visitor	Ministry reports / public reports	Any increase	Any increase
Grasslands	Total area of recreation caused grassland disturbance (trampling, bare area).	Trail condition & recreation impact assessment	Any increase	Any increase
	Abundance and spatial extent of invasive species along trails and recreation infrastructure	Field survey	Any increase	Any increase
Wetlands, Riparian Areas & Shorelines	No. of unhardened / bridged / treated trail crossings over permanent water courses.	Trail condition & recreation impact assessment	1 crossing	1 crossing
	Total area of recreation caused wetland disturbance.	Trail condition & recreation impact assessment	Any increase	Any increase
	Total area of recreation caused alteration of riparian area and shoreline.	Trail condition & recreation impact assessment	Any increase	Any increase
Indigenous				
Archaeological Sites & Traditional Use	Indigenous peoples reported level of comfort undertaking traditional use or cultural practices in the area	First Nations reporting through the Government-to-Government Table	Any decrease	Any decrease
	Trends in Indigenous peoples accessing the area for traditional use and cultural practices	First Nations reporting through the Government-to-Government Table	Any decrease	Any decrease
	No. of complaints that Indigenous traditional use or cultural practices were being impeded or undesirably impacted by recreation.	First Nations reporting through the Government-to-Government Table	Any increase	Any increase
	No. of archeological sites damaged by recreation.	First Nation / archaeologist field assessment	Any increase	Any increase
Learning & Appreciation	% of visitors that indicate they are aware that they are recreating within the traditional territory of Secwépemc and the Ktunaxa peoples	Visitor survey	Decrease	Any decrease
	% of visitors who indicate that they are more informed about traditional and cultural practices of the Secwépemc and Ktunaxa peoples after their visit to the planning area.	Visitor survey	Decrease	Any decrease

Desired Condition	Indicator	Data Source	Trigger	Threshold
Recreation				
Trail Sustainability	Total length of sanctioned trail	Trail condition & recreation impact assessment	N/A	N/A
	Total length of eroded trail occurrence on sanctioned trails	Trail condition & recreation impact assessment	Any increase in incidents.	Any increase in incidents.
	No. of braiding / widening incidents on sanctioned trails	Trail condition & recreation impact assessment	Any increase in incidents.	Any increase in incidents.
	No. of trail sustainability problems per kilometer of sanctioned trail	Trail condition & recreation impact assessment	Any increase	Any increase
	Total length of social trails	Trail condition & recreation impact assessment	Any increase	Any increase
	Total length of unsanctioned trail construction	Trail condition & recreation impact assessment	Any increase	Any increase
Respectful, Compliant & Prepared Visitors	No. of annual conflict complaints per visitor	Communications to Ministry, trail counters	Any increase	Any increase
	No. of compliance / enforcement actions taken per patrol day	Conservation Officer and Aknusti Guardian Program Records	Any increase	Any increase
	No. of emergency responses per visitor	RCMP / SAR / BCAS	Increasing ratio	N/A
Visitation	Number of visitors – warm months & cold months	Trail Counters and Cameras	Significant increase. Declining visitation will trigger no management response.	Significant increase
Environemntal Stewardship & Resourcing	No. of environmental stewardship events (e.g. weed treatings, trail management, visitor education etc.) held annually	Ministry and/or partner reports	Decreasing	Decreasing
	No. of volunteers that take part in environmental stewardship events in the area annually	Ministry and / or partner reports	Decreasing	Decreasing
	No. of volunteer hours invested in management of the planning area per visitor annually	Ministry and / or partner reports	Decreasing	Decreasing

6.3 APPROPRIATE RECREATION ACTIVITIES & INFRASTRUCTURE

In alignment with the scope of this strategy, the following table addresses the appropriateness of land-based public recreation activities and infrastructure. Table 6, identifies the recreation activities and recreation infrastructure that are considered compatible with the desired resource conditions and are appropriate to occur within the planning area. The activities and infrastructure that may be compatible under specialized design, conditions, or management actions and those that are not compatible are also identified. This table does not address water-based activities or commercial recreation activities authorized under the adventure tourism policy.

NOTE: This recreation strategy, including the identification of compatible recreation activities and infrastructure, are not intended to constrain or limit Indigenous practices, values and jurisdictions, existing legislation, nor the rights of existing tenure holders within the planning area.

Table 6: Compatible, Permitted & Non-Compatible Recreation Activities & Infrastructure

Activity	Compatibility
Hiking, Walking	P (on sanctioned trails & subject to seasonal and temporary closures)
Trail Running	P (on sanctioned trails & subject to seasonal and temporary closures)
Mountain Biking – Cross Country & Enduro	P (on sanctioned trails & subject to seasonal and temporary closures)
Mountain Biking - Downhill	N
Adaptive Mountain Biking (self-propelled, electric-assist)	P (on sanctioned trails with suitable tread and clearing widths)
Bikepacking, Cycle Touring, Gravel Biking	P (on sanctioned trails & subject to seasonal and temporary closures)
Fat Biking	P (on sanctioned trails & subject to seasonal and temporary closures)
Class 1 Electric Assist Bicycles	P (on sanctioned trails & subject to seasonal and temporary closures)
Class 2 & 3 Electric Bicycles	N
Equestrian (horse or other pack animal)	P (on trails designated for equestrian use)
Equestrian Drawn Vehicle / Wagon	N
Dog Walking – Off Leash	P (in designated area only)
Dog Walking – On Leash	P (south of Dry Gulch drainage on designated trails)
ORV – Summer (inc. electric)	N
ORV – Winter (inc. electric)	N
Snowmobile / Snowbikes (inc. electric)	N
4x4 / On-Highway Vehicle	N
Cross Country Ski – groomed / track Set	N
Cross Country Ski – ungroomed	P (south of Dry Gulch drainage on designated trails)
Ski-jouring, Dog Sledding	N
Snowshoeing	P (south of Dry Gulch drainage on designated trails)
Picnicking	C
Dispersed Camping	N
Concentrated Camping	N

Activity	Compatibility
Campfires	N
Recreation Focused Special Events (e.g. races, group events) – focused within or passing through planning area	N
Target Shooting	N
Recreational Drone Flying	N
Portable speakers	N
Generators	N
Recreation Infrastructure	
Sanctioned Dense/ Compact Trail Network	N
Sanctioned Dispersed Trail Network	C
Black, Double Black and Proline Difficulty MTB Trails	N
New Adaptive Mountain Bike Trails	N
Universally Accessible Trails	N
Technical Mountain Bike Trail Features (natural or built)	N
Viewing Platforms	N
Interpretive Signage	C
Wayfinding, Education & Regulatory Signage	C
Staging / Parking Area (South end)	C
Equestrian Infrastructure (hitching rails, corrals, etc.)	N
Vault Toilet or Porta-Potty	C (in staging areas or designated areas only)
Bicycle Parking	C (in staging areas or designated areas only)
Wildlife-Proof Waste Receptacles	C (in staging areas, not permitted outside staging areas)
Benches	C
Picnic Tables / Day Use Areas	C (in staging areas, not permitted outside staging areas)
Shade structure / shelter	N
Fire Pits	N
Manicured beach	N
Constructed powerboat or non-motorized boat launch	N
Designated Campsites / Campground	N
Backcountry Huts	N
Gates, Access Controls & Wildlife Friendly Fences	C

Compatible Use (C)	Activities and infrastructure that is compatible with the management intent of the WMA under typical designs and management practices.
Permitted Use (P)	Activities and infrastructure that may be compatible with the management intent of the WMA with specialized planning, designs and / or management practices.
Non-Compatible Use (N)	Activities and infrastructure that is not compatible with the management intent of the WMA.

7. MANAGEMENT STRATEGIES & ACTIONS

While the planning area is highly appealing for recreation, unmanaged recreation is unsustainable and incompatible with the WMA's management intent. It is recognized that though recreation is not a management objective of WMA's, the full exclusion of recreational use is likely to be impractical and highly unpalatable with the community. Management strategies and actions must be practical and, to the greatest extent possible, engender cooperation and voluntary stewardship.

Growth in recreational interests and activities are expected to continue to increase in the region. This strategy recognizes that attempts to manage undesirable recreation impacts solely through a regulatory or rules-based approach, even if considerable enforcement capacity is available, are unlikely to be successful or enduring. Instead, this strategy has focused on adopting an active and adaptive management approach and the implementation of a comprehensive mix of management actions that leverage human interests and commitment to area and recognizes that establishing predictable patterns of human behaviour is more likely to result in reducing recreation impacts to wildlife and wildlife habitat while strengthening community level support for the WMA's conservation mandate.

While, at first read, some of the following strategies and actions may appear somewhat incongruous and inconsistent with sustaining the area's ecological values, they are deliberately intended to consolidate and concentrate recreational interests that have minimal and/or manageable impacts while simultaneously discouraging and preventing activities with higher impacts and threats to wildlife, wildlife habitat, and indigenous values.

To mitigate and / or avoid recreation impacts to wildlife and wildlife habitat in the planning area, the following strategies are proposed to be implemented:

- Establish Regulatory Support for Implementing the Plan
- Establish a Sanctioned Trail System
- Address Trail Sustainability on Sanctioned Trails
- Actively Manage Domestic Dog Walking
- Provide Basic Visitor Amenities & Manage the Number of Access Points
- Develop and Implement a Comprehensive Visitor Education Program
- Enhance Signage & Wayfinding
- Reclaim Unsanctioned Linear Access & Recreation Caused Disturbances
- Increase Management Presence in the WMA and Direct Engagement with Visitors
- Build the Capacity & Skills to Manage Recreation
- Improve Data Collection & Monitoring

The following sections provide greater detail on each of the proposed strategies and the associated actions that are proposed to be implemented.

7.1 ESTABLISH A SANCTIONED TRAIL SYSTEM

Actively managed, sanctioned trail systems provide the means to predictably accommodate and manage recreational activity in an orderly fashion.

Proposed Actions:

1. Sanction the trail network and formally establish the trails under appropriate legislation and regulatory mechanisms.

As illustrated in Figure 67, the following trails are proposed to be considered for sanctioning under appropriate legislation:

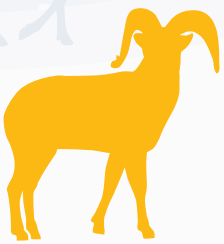
- Old Coach Road Trail
- Deja View South
- Deja View Middle (subject to seasonal closure)
- Deja View North (subject to seasonal closure)
- Indicated trails within the southeast corner of the study area outside of the WMA

The general alignment of these trail networks will be retained over time. However, trail alignments may be adjusted, when required, to respond to changes in wildlife behaviours, adapt to changes in wildlife habitat features and / or natural disturbance patterns (e.g. floods, fires, slumping), or for other management reasons. Sanctioned trails from adjacent private land parcels are not envisioned in the sanctioned trail network.

2. Ensure trails are managed and maintained in accordance with a "Trail Management Objective" assigned to each trail (Appendix B).

All sanctioned trails are proposed to be managed and maintained in accordance with a Trail Management Objective (TMO) (Figure 68). In keeping with the intended recreation experiences that will be enabled in the planning area, sanctioned trails should be managed and maintained according to the following TMO's:

Trail Management Objective	
TMO 1 (See Appendix B)	TMO 2 (See Appendix B)
• Old Coach Road Trail • Sanctioned trails within proposed Off-Leash Park in southeast corner of the study area.	• Deja View South • Deja View Middle • Deja View North



TRAIL MANAGEMENT OBJECTIVE

A TMO synthesizes and documents, in a single form, the intended trail design parameters and management intention for the trail in a clear, consistent, and understandable way.

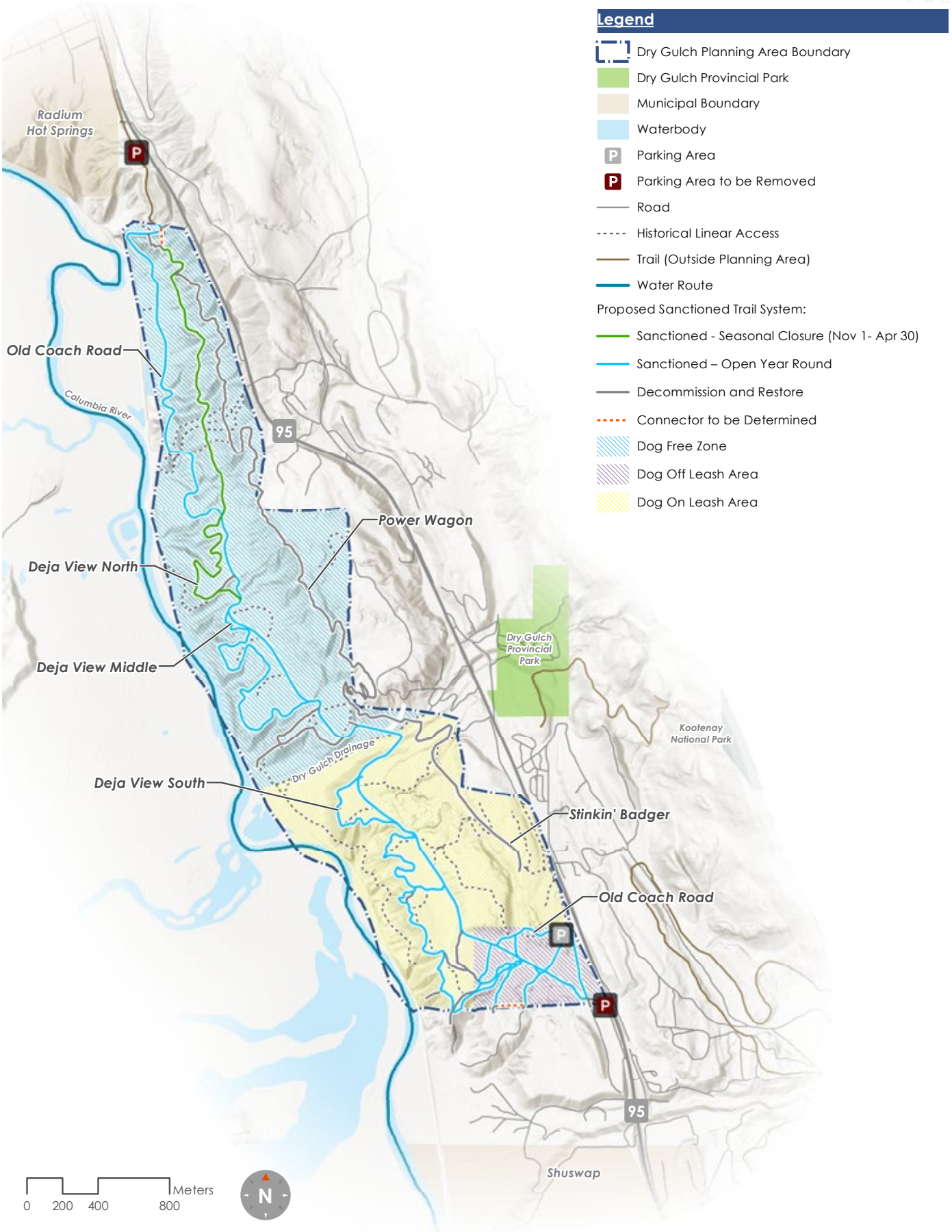


Figure 67 Proposed Sanctioned Trail Network

Figure 68 Trail Management Objective (TMO) Map

3. Implement seasonal trail closures to protect wildlife during sensitive periods.

The planning area provides critical winter habitat for bighorn sheep and a variety of other species. Wildlife in the area are especially sensitive to disturbance during the winter when their energy stores are low, access to food is more difficult and many female ungulates are pregnant. To minimize impacts to ungulates and especially bighorn sheep, the following sanctioned trails, north of the Dry Gulch drainage, are proposed to be closed from November 1 to April 30 each year (Figure 67):

- Deja View North
- Deja View Middle

Trails with seasonal closures should be clearly identified for visitors through signage and visitor education. The Ministry may add or remove trails to this list, or modify timing, as necessary to respond to changes in wildlife patterns, habitats values or for other management reasons.

4. Implement short-term temporary trail and access closures when and where necessary.

Some of the most pressing and impactful recreation impacts are time limited and can occur in very specific conditions that may only exist for a few hours, days, or weeks. As necessary, the Ministry and / or trail partners should apply temporary trail closures to respond to trail condition, weather, wildlife concerns, Indigenous values or public safety concerns. Every effort should be made to effectively communicate the rationale and details of these short-term temporary closures to visitors and to leverage communication channels of organizations who potentially able to exert influence on non-compliant activity.

Trail Conditions & Weather

Trails are particularly susceptible to damage during wet periods, when the ground is saturated and during freeze-thaw cycles. Use during these times can quickly lead to damage to the trail tread and erosion which can result in trail widening, braiding and greater maintenance demands. To ensure the sanctioned trails in the planning area remain sustainable, are able to support a quality experience, and are not subject to unnecessary trail widening and braiding, weather-based closures should be utilized, as necessary, to minimize impacts to the trails when they are vulnerable to damage (e.g. saturated grounds, freeze-thaw cycles). Temporary closures should also be used if trail conditions change and become unsafe for visitors (e.g. washout).

Wildlife

As data and understanding of wildlife patterns or presence in the planning area continue to improve and evolve, it may be beneficial to some species to limit or restrict some types of access at certain times. For example, a badger natal den is established along a designated trail, a temporary trail closure (voluntary or regulatory) may be implemented in that specific area to protect the badger. In other instances, predator species such as may occupy a portion of the planning area (e.g. feeding at a kill site). Short-term temporary closures should be utilized, where and when necessary, to protect the wildlife and public safety.

First Nation Values

The planning area is important to local First Nations. As determined in partnership with the Shuswap Band and Ktunaxa Nation, short-term temporary closures should be applied periodically when First Nations require the use of certain portions of the planning area for ceremonial, spiritual or traditional uses.

5. Prohibit and discourage recreational use of trails and accesses that are not included in the sanctioned trail system.

To limit the spatial extent of potential recreation induced disturbance to wildlife and habitat, an order under the WMA or other relevant legislation should be established to prohibit recreational use off the sanctioned trail system including dog walking, cycling, snowshoeing, cross-country skiing, or any other non-compatible uses as identified in section 6.3. These prohibitions are not intended and will not implicate First Nation traditional use. Public access and use of non-sanctioned trails and historical resource roads and linear access should be discouraged through signage, visitor education, information, and enforcement.

6. Establish/expand formal agreement(s) with a local club(s) or organization(s) to maintain and operate the sanctioned trails.

Active maintenance is critical to ensuring a sustainable trail network. To enable the trail network to remain open for public recreation and ensure that it is maintained in accordance with the established TMO's (Appendix B) the decision makers and First Nations should:

- Work with the Regional District to review the terms of the Old Coach Road trail lease and, if necessary, work to update or modify this arrangement to align with this plan and the trail's TMO.
- Enter into a formal partnership agreement with the Regional District or other suitable recreation club or organization (e.g. Stewardship Group) for the operation and stewardship of the other sanctioned trails in the planning area.

These partnerships can provide a level of autonomy to local recreation interests, but under the oversight of the Ministry and First Nations, to support provision of desirable recreation experiences, support the maintenance of recreation infrastructure, actively help decision makers ensure responsible recreational use, and help to ensure the area's primary conservation management intent is achieved. If a Partner(s) can not be found to steward the trails, the decision makers, working with First Nations, may consider prohibiting access to and restoring the trails.

7.2 ADDRESS TRAIL SUSTAINABILITY ON SANCTIONED TRAILS

Trail issues that are allowed to develop can quickly grow into exponentially more complex and expensive problems to address. Active trail monitoring and maintenance using industry best practices is key to resource-efficient trail management and maintaining a sustainable trail system. Trail sustainability issues need to be identified and addressed expeditiously.

Proposed Actions:

1. Undertake a detailed summer-based trail condition and recreation impact assessment.

To inform this plan, a trail inventory and recreation assessment was undertaken in February 2022. Winter conditions at that time limited the ability to adequately assess the conditions of trails and identify trail sustainability problems and other recreation impacts in the planning area. Using the TMO's established in strategy 7.1, a summer-based trail condition and recreation impact assessment should be undertaken to:

- Identify and document current trail design characteristics (e.g. tread widths, grades, cross slopes, clearing widths etc.)
- Identify where the current trail design characteristics deviate from the trail management objectives in support of future monitoring, and
- Identify trail sustainability problems and solutions that were not observed and documented during the winter 2022 field assessment.

2. Re-route sanctioned trail segments with unsustainable grades and erosion risks.

Some segments of the proposed sanctioned trails have grades that may be unsustainable and have potential for erosion, widening and braiding over time. The trail alignment in these locations should be re-designed and, where feasible, should integrate appropriate switchbacks, bench cutting or other sustainable trail design best practices. Archaeological assessment should be undertaken in co-operation with First Nations before re-routing and construction.

3. Re-establish the trail prism, outsloping and de-berm cupped trails to promote appropriate water drainage and install rolling grade dips where appropriate.

Basic maintenance should be undertaken on cupped sections of sanctioned trails to de-berm the treads, re-establish appropriate trail tread outsloping to promote appropriate drainage and, where necessary on sustained grades, integrate rolling grade dips. Improvements should be designed with consideration of the implications of climate change on the trails (e.g. extreme precipitation events, drought). Innovative approaches such as capping trails should be evaluated to determine their appropriateness and effectiveness as a measure to avoid impacts to archaeological values.

4. Harden or bridge trail crossings over permanent and ephemeral watercourses.

Trail crossings of permanent and ephemeral watercourses will either be bridged or hardened using best practices where the trail crossing poses unacceptable risk for erosion, sedimentation of the waterway and/or damage to riparian areas.

7.3 ACTIVELY MANAGE DOMESTIC DOG WALKING

Research presented in section 2.3 provides evidence that the prevalence of dogs in the WMA, particularly during colder months when sheep and other ungulates are more likely to use the study area and when the dog's behaviours and locations are unpredictable (e.g. off-leash and/or off-trail), is highly disruptive to ungulates. As the most pressing habitat-related recreation management threat in the WMA, not actively managing the area's increasing dog use would reduce the habitat effectiveness of increasing large areas of the WMA.

Proposed Actions:

1. Establish a designated area for off-leash dog walking area in lower-value ungulate habitat.

Recognizing the popularity of the area to dog walkers and the wildlife and wildlife habitat conservation management intent of the planning area, the southeast corner of the study area, which is outside of the CWWMA, should be designated as a dog off-leash zone (Figure 67). Such a designation is intended to provide a managed area to attract and concentrate undesirable dog-related impacts and divert these impacts away from other portions of the planning area that contain greater wildlife and wildlife habitat sensitivities. This area should be considered and for the establishment of community off-leash dog park that is managed under a lease to the Regional District. The area should be fenced with appropriate and wildlife conscious fencing to delineate the boundary, control dogs, and minimize undesirable impact to wildlife.

2. Permit on-leash and on-trail domestic dog walking south of the Dry Gulch drainage within the WMA.

The area should of the Dry Gulch drainage should be designated as an on-leash zone. This area will permit dog on-leash dog walking on the sanctioned trail system. Off-leash dog walking should be prohibited. Prohibit dog walking – on leash and off leash – north of Dry Gulch drainage.

3. Establish a dog-free zone north of the Dry Gulch drainage.

A dog-free zone should be established north of the Dry Gulch drainage in recognition of the area's ungulate habitat, bighorn sheep habitat and sensitive grasslands. Dog walking, whether on-leash or off-leash, should be prohibited in this zone.

7.4 PROVIDE BASIC VISITOR AMENITIES & MANAGE THE NUMBER OF ACCESS POINTS

Basic amenities such as wildlife proof waste receptacles and toilets are fundamental to mitigating undesirable visitor impacts such as litter, dog waste bag disposal and human waste. The location of parking areas and trailheads can greatly influence visitor patterns though the development of informal access points can increase management challenges and impacts. Amenities such as picnic tables and benches are fundamental to supporting socializing, improving the visitor experience and support visitors with varying abilities.

Proposed Actions:

1. Provide basic day use amenities at the southern trailhead.

The southern trailhead parking lot is intensively used in both warm and colder seasons. Basic visitor amenities including wildlife proof waste receptacles, outhouse and picnic tables should be installed in or adjacent to the parking lot to encourage visitors to dispose of the trash, dog waste bags and human waste appropriately. In addition to benefits to the WMA and the habitat they would provide, these services would also support visitor use and experiences along the Old Coach Road trail and partnership opportunities may be possible with the Regional District and/or the prospective partners that would steward the sanctioned trails.

2. Remove the northern trailhead parking lot and the informal southern parking area.

Most visitors currently travel to the planning area via their personal motor vehicles. Given the extent of ungulate use in the northern portion of the planning area, there is very high and undesirable potential for sheep to be displaced from the northern trailhead parking lot and road onto the highway when sheep are present. To eliminate this concern, as well as reducing safety concerns with access / egress from the highway, all motor vehicle access to the planning area should be directed to the southern trailhead. The northern trailhead parking lot should be gated and closed to public vehicle access year-round but will still allow public non-motorized access subject to the other conditions of this strategy.

Provisions should be made to allow maintenance, service, research, and emergency response vehicles as required. The informal parking area in the southeastern corner of the planning area that is accessed from Stoddart Creek Road should also be closed to public access.

3. Proactively manage direct access from adjacent private land developments.

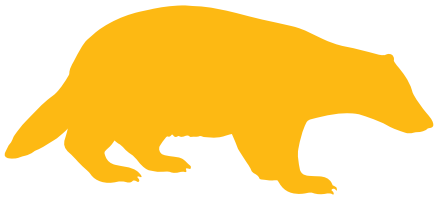
While public access to the study area's western boundary is constrained by the railroad, considerable sections of the eastern boundary are adjacent to private land, including some zoned for commercial use. Any commercial development that is intentionally built to attract visitors (e.g. campgrounds, fixed-roof accommodation) will likely increase the potential for recreational use and pressure within the WMA and demands for access to the sanctioned trail system from those adjacent lands. The Ministry should ensure the Village and the Regional District are well-informed about the management intent of the WMA, the actions identified in this strategy, and should seek their assistance in working with development proponents on a case-by-case basis to manage access to the WMA appropriately (e.g. signage, fence infrastructure maintenance, access controls, proactive cooperative visitor messaging with proponents). The development of new access trails, or formalization of existing unsanctioned trails, from adjacent private lands are not envisioned in the sanctioned trail system.

7.5 DEVELOP AND IMPLEMENT A COMPREHENSIVE VISITOR EDUCATION PROGRAM

Visitor impacts are often the result of undesirable visitor behaviours. Most often, undesirable visitor behaviours occur because visitors are uninformed and / or unskilled about responsible behaviours, have bad habits or, in some cases, are careless. Visitors impacts that are the result of uninformed, unskilled, bad habits and / or careless behaviours are well suited to be addressed through an effective visitor education programming. Visitor education is much less successful at addressing visitors who simply do not care. By educating the visitor about their impacts and providing them the skills to reduce them, the visitor gains the necessary knowledge and skills to enable them to change their behaviours. This management approach creates better relationships between WMA managers and visitors and is more likely to generate long-term support for the WMA and this plan. Though more heavy-handed approaches such as enforcement can change behaviours in the immediate short-term, long-term changes in visitor attitudes and skills are better created through education. For these reasons, the Ministry and First Nations as co-managers together with stewardship partners, should focus concerted effort on developing and implementing a comprehensive visitor education program.

To be effective, the visitor education program must go beyond generalized requests of visitors such as "be responsible", "use respect", "respect wildlife" or "respect the land" messages. To maximize the effectiveness of visitor education:

- A clear link must be established between an undesirable visitor behaviour and the undesirable visitor impact, and this link must be communicated to visitors,
- The messaging must give visitors the specific skills or techniques to know how to change their undesirable behaviours,
- The visitor message must be consistent and repeated,
- The visitor message must be delivered by someone that the visitor believes has credibility and they look upon favourably, and
- The right message must be received at the right time (e.g. during trip planning, just before the visitor makes key decisions about food waste etc.).



COMMON BARRIERS TO RESPONSIBLE VISITOR BEHAVIOUR

- Ignorance & misinformation
- Poor skills
- Bad habits
- Perceived social norms
- Competing attitudes
- Site design & lacking infrastructure

Proposed Actions:

1. **Leave No Trace (www.lnt.org, www.leavenotrace.ca) will be adopted as the visitor education program for the WMA.**

Underpinning the Ministry's visitor education efforts should be the Leave No Trace program. Leave No Trace has been widely adopted by many land managing agencies throughout North America as a consistent and science-based means to educate visitors about their recreation impacts and the skills and ethics that can be applied by visitors to avoid or minimize their impacts. The principles of Leave No Trace will be adopted and the principles and educational tools will be integrated into all visitor education efforts.

2. **Visitor education signage that addresses common undesirable visitor behaviours and impacts should be prepared and installed at sites where undesirable visitor behaviours are persistent and at any future sites (e.g. adjacent private campground) where the potential for undesirable behaviour exists.**

3. **Working with First Nations and the Columbia Wetlands Stewardship Partners, visitor education materials will be adopted and / or developed to educate visitors about the WMA, regulations, responsible recreation and to address persistent visitor impacts.**

4. **Working in partnership with First Nations, the Columbia Wetlands Stewardship Partners, local recreation organizations, and adjacent private service providers, in-person visitor education / awareness sessions should be developed and implemented in the WMA during peak visitation periods.**

5. **Hard copy visitor education materials should be distributed to residents and adjacent property owners educating them about the WMA, regulations, and responsible recreation.**

6. **The Ministry's WMA Website should be updated to provide better recreation planning and visitor education information.**

7. **Destination Marketing Organizations and economic development entities should be asked to remove the WMA from current and historical promotion materials.**

8. **Destination Marketing Organizations and others should be engaged to actively promote more suitable areas for activities such as mountain biking and dog walking which are less suitable in the WMA.**

9. **The Ministry and / or formal trail partner(s) should work with TrailForks, All Trails and similar crowdsource applications to ensure data on the sanctioned trails, permitted uses (Figure 68) and permanent and temporary closures are updated regularly.**

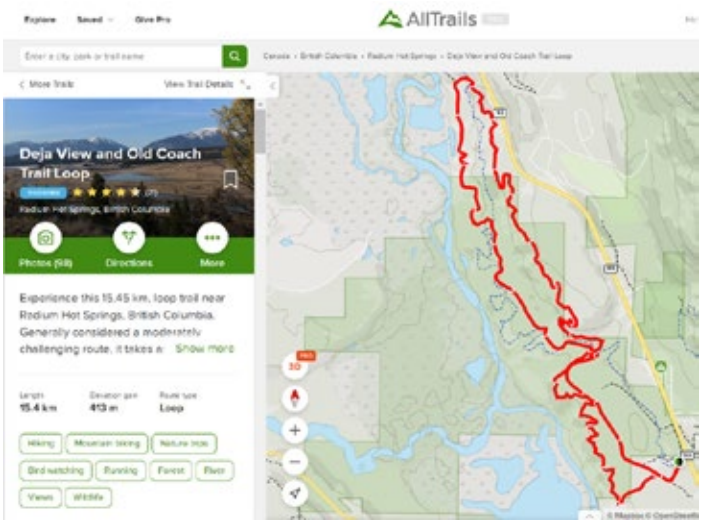


Figure 69 All Trails Inappropriately Promoting Use of Power Wagon Trails as Part of a Deja View and Old Coach Trail Loop

7.6 ENHANCE SIGNAGE & WAYFINDING

Quality signage that is effectively integrated into the site ensures the timely and efficient communication of required information, clearly conveys to visitors that the site is actively cared for and that they are welcome to enjoy the area provided they view and conduct themselves as responsible guests and stewards of the area. Signage, when implemented well, can greatly improve the visitor experience, responsible recreation behaviours, and the compliance of visitors. There is opportunity and a need to address signage throughout the planning area in a strategic and integrated way.

Proposed Actions:

1. Develop and implement a comprehensive and integrated signage plan.

A detailed signage and wayfinding strategy should be prepared and implemented in the planning area. The signage strategy should identify the locations, content, designs and installation details required for individual boundary, trailhead, wayfinding, regulatory, caution / warning, education, and interpretive signs.

The signage strategy should ensure that signage in the planning area provides accurate information, is consistently branded, suitable for the area, and sited appropriately. Specific attention should be paid to ensuring:

- Signage acknowledges the traditional territory of First Nations peoples and potentially integrate First Nation place naming,
- Signage is kept to the minimum to maintain the desired recreation setting,
- Cross departmental / jurisdictional land management messaging is integrated and consolidated into a consistently branded signage hierarchy to minimize sign clutter and provide a more user-friendly sign system,
- Signage clearly communicates the legislated purpose of the WMA, values in the WMA and provides visitors with the information they require to mitigate impacts and remain compliant,
- Iconography is used to minimize text and elevate the likelihood that visitors will pay attention to the sign and its messages,
- Sign messaging promotes active cooperation and a call to action to help maintain wildlife and habitat,
- Wayfinding signage is available at all intersections and decision points to help limit off-trail travel, and
- Signs are sited in visible locations that where visitors are most likely to stop and read them.

At a minimum, the following signage should be installed (Table 6):

2. Formalize trail names for sanctioned trails.

Working with First Nations, Regional District, and trail groups, the Ministry should undertake a formal process to establish names for each trail in the sanctioned system. The naming process should ensure trail names recognize and respect Indigenous place naming if and where desired by First Nations.

Table 7: Recommended Signage

Sign Type	Typical Location	Typical Content
Boundary	• Public road and trail intersections with the property boundary.	• WMA name • Manager
Trailhead Kiosk	• Trailhead parking lot near the entrance to the trail. • Any existing or future site where significant non-motorized access can be expected.	• WMA name • Trail name • Territorial acknowledgment • Purpose & values in the WMA • Permitted activities (iconography) • Seasonal restrictions (where applicable) • Trail design characteristics: » Length » Tread surface » Tread width » Avg / max grades » Obstacle frequency / height • Preparedness (equipment, skills) • On-trail amenities • Hazards / risk identification & safety messaging • Leave No Trace principles & practices • Regulations • How to report non-compliance (to Ministry of First Nation Guardians) • Map of sanctioned trail(s)
Permitted Activity Bollards	• Entrances to all trails at trailhead parking lots • Where trailhead parking lots are not provided, on the trail where the trail enters the WMA	• Permitted activity icons • Prohibited activity icons • Seasonal restrictions where appropriate

Sign Type	Typical Location	Typical Content
Wayfinding / Waymarker	• Trail intersections	• Trails names • Navigation directions and distances • Map (optional)
Hazard / Warning	• Where major natural or visitor caused hazards exists	• Hazard identification and instruction to visitor
Regulatory	• Trailheads • Areas of persistent non-compliance	• Regulatory requirement • How to report non-compliance
Visitor Education	• Trailhead parking lots • Destinations and gathering locations • Locations with persistent of concerning visitor impacts • Remediation and restoration sites	• Undesirable behaviour that is occurring. • Impact(s) to WMA value(s) from the undesirable behaviour. • Appropriate practices to take to avoid / mitigate the impact from the undesirable behaviours

7.7 RECLAIM UNSANCTIONED LINEAR ACCESS & RECREATION CAUSED DISTURBANCES

Many of the historical linear access and roads in the planning area, which were developed to support resource extraction and exploration, have become default recreation features. Recreational use of these features can expand recreation impacts such as wildlife disturbance, spread of invasive species and risks to archaeological values among others. Continued recreational use of these linear disturbances also slows the natural restoration processes. Efforts to reclaim these features as well as unsanctioned recreational disturbances can help to mitigate further impacts to wildlife, wildlife habitat and cultural values.

Proposed Actions:

1. Work with partners to actively reclaim segments of existing unsanctioned trails and historical linear access / roads that will not become part of the sanctioned trail network, visually screen the routes from visitors where possible.

Trails and linear disturbance that are not identified as part of the sanctioned trail network should be reclaimed over time. The Ministry should partner with interested organizations to pursue, where appropriate, active reclamation of these disturbances and should work, as best as possible, to visually screen and disguise these disturbances to discourage further use.

7.8 ESTABLISH REGULATORY SUPPORT FOR IMPLEMENTING THE PLAN

Suitable, sufficient, and practically enforceable regulation must be in place in order for management to function efficiently and be implementable. Regulatory amendments and / or new director orders are needed to enable implementation of the strategy and to ensure that the objectives of the strategy can be achieved across the entire planning area.

Proposed Actions:

1. Expand and alter the legal boundaries of the CWWMA to enable effective and consistent habitat and visitor management.

The legal boundaries of the WMA should be expanded to incorporate all Crown Lands between the northern boundary of the WMA and the northern trailhead parking lot. Crown lands proposed to support off-leash dog walking in the southern portion of the planning area should not be included in the boundary amendment but must be actively managed in coordination with the WMA. Expanding the boundary of the WMA will ensure that the regulatory provisions and orders made for the WMA will be applicable to and enforceable within the planning area.

2. Establish a Motor Vehicle Closed Area under the *Motor Vehicle Prohibition Regulation*.

To clarify and support the implementation and enforcement of motor vehicle closure, a "Motor Vehicle Closed Area" should be designated over the planning area with consideration to mobility needs on the Old Coach Road trail and Class 1 e-bikes. This designation will better support the restriction of motor vehicle use and provide more efficient enforcement tools to Conservation Officers.

3. Amend the *appropriate Regulations and / or Orders* to support implementation of the plan.

Through appropriate regulatory update processes, the Ministry should amend the necessary regulations and / or update / establish Orders to:

- Prohibit activities identified in this strategy as being "not compatible" (see Table 6) within the WMA,
- Require recreational use to occur on the sanctioned trail system and prohibit recreational use off of the sanctioned trail system,
- Prohibit unsanctioned trail building,
- Prohibit off-leash dog walking outside of the designated off-leash area,
- Prohibit on-leash dog walking outside of the on-leash or off-leash designated areas,
- Prohibit on-leash and off-leash dog walking in the dog-free area,
- Prohibit camping and campfires,
- Require visitors to pick up and properly dispose of dog waste.

7.9 INCREASE MANAGEMENT PRESENCE IN THE WMA AND DIRECT ENGAGEMENT WITH VISITORS

Periodic visible presence of Ministry staff, First Nations Guardians, and other stewardship partners, in both enforcement and non-enforcement capacities, is one of the most powerful signals of management commitment. Management presence in the planning area is currently limited and elevating this presence will support visitor education and promote responsible recreation as well as compliance. Maintaining a management presence, including the presence of enforcement officers, is essential to backstopping the implementation of this plan and the shifting of engrained visitor behaviours.

Proposed Actions:

1. Increase Ministry presence, patrols and check stops during peak visitation periods.

The Ministry should increase the presence of staff, including Conservation Officers, throughout the busiest peak visitation periods. Increased presence will be especially important during the early implementation of the plan to inform and educate visitors about the changes to the management of the WMA. Management presence should be prioritized to areas of the WMA that have higher levels of visitation, higher probabilities of violations and where violations are likely to have more concerning environmental, cultural, public safety and visitor experience impacts. To support the implementation of this plan and the shifting of historical visitor behaviours, compliance priorities should include:

- Unsanctioned trail building,
- Recreational use of unsanctioned trails,
- Unauthorized motor vehicle use,
- Off-leash dog walking where prohibited, and
- On-leash dog walking where prohibited.

2. Work with First Nations to Explore Opportunities to Engage a First Nations Guardian Program in the Planning Area

First Nation Guardian programs, such as the Aknusti Guardian Program, could be engaged to provide management presence, visitor education about wildlife and Indigenous values and responsible recreation, and compliance assurance throughout the planning area. Government to Government discussions should be held to explore the potential of engagement First Nation Guardians in the planning area to support implementation of the recreation strategy.

3. Actively investigate and enforce unauthorized trail building.

Unauthorized trail building can create undesirable and lasting impacts of grasslands, wildlife, archaeological resources, and Indigenous values. The Ministry, First Nations and partners should monitor the WMA for any new unsanctioned trail building. When found, unauthorized trail building should be actively investigated and, where appropriate, followed with enforcement action.

4. Encourage visitors and the public to document and report non-compliance.

The Ministry and its partners should utilize visitor and public education and on-site signage to encourage the public to document and report irresponsible and illegal behaviours and how to do so.

5. Encourage and support volunteer environmental stewardship initiatives.

Working with partners, the Ministry should support and encourage the planning and delivery of volunteer environmental stewardship initiatives in the planning area. Initiatives such as trail ambassadors, trail maintenance days, invasive species removal, visitor research, public education and Leave No Trace Trail awareness sessions among others should be actively encouraged and supported.

7.10 BUILD THE CAPACITY & SKILLS TO MANAGE RECREATION

Equipping the Ministry and staff responsible for achieving conservation outcomes with the skills, tools and confidence to actively and effectively manage the most persistent and impactful threats to habitat will enable more proactive, functional and nimble solutions to ongoing and emergent needs. Recreation demands on the planning area are likely to continue to intensify as will the public's expectation that recreation in area is appropriately managed. Given that human use is, and will continue to be, one of the most pressing threats to wildlife it is essential that Ministry staff and partners have the knowledge, tools, and capacity to manage both wildlife and human use of the planning area.

Proposed Actions:

1. Continue to build capacity to effectively manage recreation in the WMA.

The Ministry should work with partners to continue to build staff, First Nation as well as partner understanding of sound recreation management practices and tools, the VUMF, recreation ecology and how to educate the public about responsible recreation skills and ethics.

2. Train Ministry Staff and Partners as "Leave No Trace Trainers"

To enable Ministry staff, First Nations, and partners to effectively educate visitors about the Leave No Trace principles, skills and ethics, staff and partners who will interact with visitors to the planning area should be formally trained as Leave No Trace trainers.

7.11 IMPROVE DATA COLLECTION & MONITORING

In keeping with the VUMF and adaptive management, visitor use management decisions need to be based on the collection and monitoring of good data (e.g. visitation, recreation impacts, environmental values, Indigenous values). Monitoring allows the Ministry, First Nations, and partners to transparently and objectively determine whether the desired resource conditions are being achieved and how they are changing over time and to report this to the public and stakeholders. Without regular and effective monitoring, the Ministry, First Nations and partners are unable to know whether the applied management strategies and actions are working, and the desired resource conditions are being achieved. Monitoring also provides objective data and information about visitation patterns and on which to educate visitors and decision makers about the conditions within the planning area and to improve their understanding of the need for management and effective resourcing and capacity.

Proposed Actions:

1. Enhance data collection and monitoring of visitors and visitation.

The Ministry, First Nations and, where relevant, partners and public stewards should design and implement a coordinated and integrated visitor and visitation research and monitoring program. This program should be adaptable to prioritize pressing data and information gaps (e.g. number, trends and geographic distribution of dogs). Unless big data becomes more readily available, the program should include the systematic deployment of trail counters, trail counter calibration studies, and the implementation of visitor intercept surveys every 3-5 years to better understand visitors, visitor origins, visitor awareness and visitor opinions. Efforts to secure access to and monitor user generated data from big data should be a priority and will be provide further insights on visitors and visitation in the planning area. The Ministry should establish an online channel to share available research on visitors and visitation within the WMA.

2. Regularly monitor the conditions of trails and recreation impacts.

The Ministry and / or the partnership agreement holders should undertake a trail condition and recreation impact assessment every two years to obtain data on how trail and recreation conditions are changing in the WMA. This data should be used to report on the indicators that are identified is this strategy (section 6) which are being used to monitor progress toward the desired resource conditions.

3. Continue to monitor the status of priority species in the WMA.

The Ministry, First Nations and / or partners should continue to monitor the status of wildlife populations and population distribution throughout the WMA (e.g. cameras, aerial surveys). The public should be enabled and encouraged to upload wildlife sightings to the provincial Species Information Management System. This data should be meaningfully and regularly used to inform adjustments to management actions (e.g. VUMF indicators, triggers and thresholds).

4. Continue to monitor and effectively treat the introduction and spread of invasive species.

The Ministry should continue to partner with East Kootenay Invasive Species Council to monitor the presence and spread of invasive species in the planning area and to devise plans to treat and remove identified invasive species. Priority should be placed on monitoring and removal of invasive species that are identified along sanctioned trails to limit further spread.

5. Enable and encourage visitors to report ecological, wildlife and invasive species observations to WMA managers.

The Ministry, First Nations and partners should encourage and educate visitors about how they can report observations of ecological features, wildlife, and invasive species occurrences in the Dry Gulch area to assist with monitoring and site management. Public reporting tools and mechanisms, where they exist, should be promoted to visitors and the feasibility of establishing citizen science monitoring sites and other methodologies should be explored to assist with ecological and wildlife monitoring.

APPENDICES

APPENDIX A – LOCAL & REGIONAL GOVERNMENT POLICY DIRECTION

Village of Radium Hot Springs

The Village of Radium Hot Springs Official Community Plan (OCP) was prepared in 2013 and presents a long-term vision for the community. Relevant policy and direction includes:

- 3.4.1 Rural - Protect high value rural landscapes for their intrinsic wilderness and green belt values. Acquire portions of rural lands located adjacent to Sinclair Creek and the Columbia River wetlands for public park purposes.
- 3.5.2/3 Parks, Recreation and Culture - Support the protection of environmentally significant areas when considering the acquisition and development of parks and open space. Work with the community, non-profit societies, developers, First Nation's, other levels of government, and Parks Canada in acquiring and maintaining parks, recreational trails and publicly accessible open spaces. Continue to develop parks, trails and interpretive information adjacent to the Columbia River Wetlands and Sinclair Creek.
- 3.8.3 Regional Context / Boundary Expansion - The Village will consult with provincial, regional, Parks Canada, the Agricultural land Commission, and adjoining municipal jurisdictions on issues of mutual concern related to land use, development, transportation and service planning.
- 4.1.2 Environment - Protect and enhance the Columbia Valley Wetlands and Sinclair Creek to support fish and wildlife populations. Heighten awareness of the ecological importance of ESAs by providing opportunities for public enjoyment of them in ways that respect their environmental sensitivity. Balance economic and recreational use of the land with the protection and enhancement of areas of natural habitat for Rocky Mountain Bighorn Sheep and other wildlife. Support the development of wildlife corridors and greenways throughout the region.
- 4.3 Wildlife Corridors - Work with Parks Canada and the RDEK to maintain functional wildlife corridors surrounding the Village, especially those allowing connectivity between the Purcell and Rocky Mountains. Support restoration activities that improve the corridors utilized by Bighorn Sheep in their journey to and from lambing areas.
- 5.1.2 Pathway Network System - Incorporate public walking and biking pathways as an integral component of the transportation system in community planning and development approvals. Include public pathways in the requirements for new developments. Work with Kootenay National Park, First Nations, the RDEK, and neighbouring communities to build pedestrian and bicycle links. Pursue incentives and partnerships with local jurisdictions, non-profit organizations, and provincial and federal entities in the development of greenspace initiatives. Ensure that pathway design and construction criteria are appropriate for the type of pathway to be developed. Provide pathway network signage that provides information on routes, directions, potential hazards, rules and regulations.

Regional District of East Kootenay

REGIONAL SUSTAINABILITY STRATEGY

In 2014, the RDEK approved the Regional Sustainability Strategy. The strategy establishes a long-term vision for the region that is to be used as a lens to guide and evaluate operations and decision making. Relevant policy direction includes:

- 3.3.3 Greenways – the expansion of the system of non-motorized greenways between communities, including rail to trail conversions, is supported.
- 4.3.3 Compliance – Help curtail environmental transgressions by advocating for the improved enforcement of existing regulations by all orders of government.
- 4.3.4 Crown Land – Support land use planning on Crown land, including resource and recreation management.
- 4.3.5 Partnerships – Collaborate with industry, public agencies, Columbia Basin Trust and other non-governmental organizations to advance environmental protection and enhancement programs.
- 5.3.2 Backcountry – Maintain and enhance backcountry recreation assets and wilderness opportunities to support a diversified tourism sector.

FAIRMONT HOT SPRINGS & COLUMBIA LAKE AREA OFFICIAL COMMUNITY PLAN

In 2017, the RDEK adopted the Fairmont Hot Springs and Columbia Lake Official Community Plan (OCP). The OCP guides priorities and decision making by the RDEK within the planning area which includes the WMA and surrounding lands shoreline. The vision for the OCP planning area recognizes the need to respect, enhance and celebrate the natural environment and cultural heritage. But it also strongly sets for a vision that "access to recreation can be found from one's doorstep". Relevant policy direction includes:

- 3.2(5) – enhance wildlife connectivity and habitat values within and surrounding the plan area by preserving important natural features and wildlife corridors.
- 3.2(7) – promote opportunities for connectivity and the creation of a non-motorized trail network within and between new development, existing communities, commercial areas and recreational opportunities.
- 3.2(9) – recognize and conserve the rich cultural resource and archaeological sites located within the plan area.
- 4.3(2)(c) Fairmont Hot Springs - new residential development should include internal non-motorized trail networks and identify connectivity with an existing trail network where possible.
- 10.2(1) Open Space, Recreation and Trails – support the design and establishment of a comprehensive network of trails and open space that connects communities within the plan area.
- 10.2(3) – promote trail construction and maintenance standards that protect trail users and the environment.
- 12.1(2)(b) Environmental Considerations – retain critical wildlife habitat, wildlife corridors and ungulate winter range.
- 12.1(2)(c) – maintain north-south and east west habitat connectivity through undisturbed open space and wildlife corridors to support the movement of various wildlife species and access to important habitat.
- 12.1(3) (g) – residents and visitors accessing Crown land are encouraged to minimize impacts to grazing, habitat, wildlife and sensitive soils.
- 12.1(3)(h) – future land use should not compromise the integrity of badger habitat, Class 1 and 2 ungulate winter range and Big Horn Sheep habitat particularly range location along west facing slopes.
- 12.2(3)(b) Invasive Species – recreational users within the plan area are encouraged to inspect their ATVs, mountain bikes, boats and vehicles for invasive plans and animals to assist in the prevention of the spread and establishment of these species.
- 14.3(3) Archaeological and Heritage Resources – Armstrong Bay is a significant feature on the east side of Columbia Lake and efforts to protect the area from negative impacts are supported.
- 19.2(3) Crown Land Management – preserve public access to Crown land for recreation purposes.

APPENDIX B - TRAIL MANAGEMENT OBJECTIVES

TRAIL MANAGEMENT OBJECTIVE #1

Region: Dry Gulch **Trail Operator:** **Land Manager:** LWRS

Trail Name: All trails managed in accordance with TMO #1 - see recreation strategy **Trail Number:** NA

Trail Beginning: NA **Beg. Milepost:** NA

Trail Ending: NA **End. Milepost:** NA

Trail Inventory Length: NA km **Trail Mileage Source:** ☐ Wheel ☐ GPS ☐ Map ☐ Unknown

TMO Trail Section

NA **Sec. #**

Section Beginning: NA **Beg. Milepost:** NA

Section End: NA **End. Milepost:** NA

Trail Classification

(Check any that apply)

Season:

- ☐ Summer (snow-free)
- ☐ Winter (snow-covered)
- ☑ All

Level of Development:

- ☐ Developed
- ☐ Moderately Developed
- ☑ Minimally Developed

(Check one in each category)

Mode of Travel:

- ● Non-Motorized
- ☐ Motorized
- ☐ Mixed Use

Use Type:

- ☐ Single Use
- ● Multi-Use
- ☐ Activity-Optimized

Level of Challenge:

- ● Easiest
- ☐ Moderate
- ☐ Difficult
- ☐ Very Difficult

Preparedness:

- ● Standard
- ☐ Enhanced

Optimized Activity Types

(Check all that apply)

- ☑ Pedestrian
- ☐ Equestrian
- ☐ X-Country Ski
- ☐ Snowshoe
- ☐ Mountain Bike
- ☐ Two-Wheel Motorized
- ☐ Motorized (<1.83 m wide)
- ☐ Motorized (1.5-1.83 m wide)
- ☐ Motorized (>1.83 m wide)
- ☐ Snow Vehicle (<1.83 m wide)
- ☐
- ☐
- ☐
- ☐

Design Parametres

(Fill in all that apply)

2.5 - 3	Travelled Surface Width (m)
2	Target Grade (%)
10	Max Grade (%)
5	Proportion Grade (%)
2	Target Cross Slope (%)
3	Max Cross Slope (%)
5	Proportion Cross Slope (%)
4 / 4	Clearing Width/Height (m)
2.5	Turning Radius (m)
Infre / 0.1	Obstacle Frequency/Height

Tread Surfacing:

- ☐ Asphalt/Concrete/Paver
- ☑ Agg - Firm
- ☐ Agg - Loose
- ☐ Nat - Firm
- ☐ Nat - Loose
- ☐

Target Frequency

Per Year *(Fill in all that apply)*

As required	Tread Repair
2 x year	Drainage Cleanout
As required	Tread Grading
As required	Brushing
2 x year	Condition Survey
Peak periods	Enforcement Patrols

Trail Name: Dry Gulch TMO 1 **Trail Number:** NA

Travel Management Strategies

Permitted Uses (Check all that apply)	From Date (mm/dd)	To Date (mm/dd)
✓ Pedestrian	01/01	12/31
☐ On-Road Cycling		
✓ Leisure Cycling	01/01	12/31
✓ Mountain Biking	01/01	12/31
✓ Adaptive Cycle/MTB	01/01	12/31
✓ Equestrian	01/01	12/31
☐ Equestrian Drawn Vehicle		
✓ X-Ctry Ski - Classic	Snow	Snow
✓ X-Ctry Ski - Skate	Snow	Snow
✓ Snowshoe	Snow	Snow
☐ Off-Road Motorcycle		
☐ OHV <1.5m		
☐ OHV 1.5m - 1.83m		
☐ OHV >1.83m		
☐ Snowmobile <1.5m		
☐ Snowmobile >1.5m		
✓ Class 1 E-Bike	01/01	12/31
☐ Class 2 E-Bike		
☐ Class 3 E-Bike		
✓ Electric Mobility Assistive Devices	01/01	12/31
☐ Electric Skateboards/One-Wheels		

Prohibited Uses (Check if applicable)	From Date (mm/dd)	To Date (mm/dd)
✓ All Motorized Use	01/01	12/31
(Fill in all that apply)		
Class 2 & 3 e-bikes	01/01	12/31
Off-leash dog walking	01/01	12/31
On-leash dog walking north of Dry Gulch	01/01	12/13
Off road vehicles & motor vehicles	01/01	12/13
Snowmobile	01/01	12/13
Equestrian drawn vehicle / wagon	01/01	12/13

Other Uses (Optional: type any that apply)	Accept	Discourage
Fat Biking	●	

Universally Accessible: Yes ☐ No ●

Trail User Objectives

- ☐ Escape
- ☐ Solitude
- ☐ Challenge
- ☐ Play
- ✓ Nature
- ☐ Risk
- ✓ Exercise
- ✓ Socializing
- ☐ Efficiency
- ✓ Connectivity

Remarks/Reference Information

Trail Designer or Manager

Name: **Signature:**

Title: **Date:**

TRAIL MANAGEMENT OBJECTIVE #2

Region: Dry Gulch **Trail Operator:** TBD **Land Manager:** LWRS

Trail Name: All trails managed in accordance with TMO 2 - see recreation strategy **Trail Number:** NA

Trail Beginning: NA **Beg. Milepost:** NA

Trail Ending: NA **End. Milepost:** NA

Trail Inventory Length: NA km **Trail Mileage Source:** ☐ Wheel ☐ GPS ☐ Map ☐ Unknown

TMO Trail Section

NA **Sec. #**

Section Beginning: NA **Beg. Milepost:** NA

Section End: NA **End. Milepost:** NA

Trail Classification

(Check any that apply)

Season:

- ☑ Summer (snow-free)
- ☐ Winter (snow-covered)
- ☑ All

Level of Development:

- ☐ Developed
- ☐ Moderately Developed
- ☑ Minimally Developed

(Check one in each category)

Mode of Travel:

- ● Non-Motorized
- ☐ Motorized
- ☐ Mixed Use

Use Type:

- ☐ Single Use
- ● Multi-Use
- ☐ Activity-Optimized

Level of Challenge:

- ● Easiest
- ☐ Moderate
- ☐ Difficult
- ☐ Very Difficult

Preparedness:

- ● Standard
- ☐ Enhanced

Optimized Activity Types

(Check all that apply)

- ☑ Pedestrian
- ☐ Equestrian
- ☐ X-Country Ski
- ☐ Snowshoe
- ☐ Mountain Bike
- ☐ Two-Wheel Motorized
- ☐ Motorized (<1.83 m wide)
- ☐ Motorized (1.5-1.83 m wide)
- ☐ Motorized (>1.83 m wide)
- ☐ Snow Vehicle (<1.83 m wide)
- ☐
- ☐
- ☐
- ☐

Design Parametres

(Fill in all that apply)

0.5 - 0.6	Travelled Surface Width (m)
5	Target Grade (%)
20	Max Grade (%)
5	Proportion Grade (%)
5	Target Cross Slope (%)
15	Max Cross Slope (%)
5	Proportion Cross Slope (%)
2.5 / 4	Clearing Width/Height (m)
2	Turning Radius (m)
Reg / 0.3	Obstacle Frequency/Height

Tread Surfacing:

- ☐ Asphalt/Concrete/Paver
- ☐ Agg - Firm
- ☐ Agg - Loose
- ☑ Nat - Firm
- ☐ Nat - Loose
- ☐

Target Frequency

Per Year *(Fill in all that apply)*

As required	Tread Repair
2 x year	Drainage Cleanout
As required	Tread Grading
As required	Brushing
2 x year	Condition Survey
Peak period	Enforcement Patrols

Trail Name: Dry Gulch TMO 2 **Trail Number:** NA

Travel Management Strategies

Permitted Uses

(Check all that apply)

		From Date (mm/dd)	To Date (mm/dd)
✓	Pedestrian		
	On-Road Cycling		
	Leisure Cycling		
✓	Mountain Biking		
	Adaptive Cycle/MTB		
✓	Equestrian		
	Equestrian Drawn Vehicle		
✓	X-Ctry Ski - Classic		
✓	X-Ctry Ski - Skate		
✓	Snowshoe		
	Off-Road Motorcycle		
	OHV <1.5m		
	OHV 1.5m - 1.83m		
	OHV >1.83m		
	Snowmobile <1.5m		
	Snowmobile >1.5m		
✓	Class 1 E-Bike		
	Class 2 E-Bike		
	Class 3 E-Bike		
	Electric Mobility Assistive Devices		
	Electric Skateboards/One-Wheels		

Prohibited Uses

(Check if applicable)

		From Date (mm/dd)	To Date (mm/dd)
✓	All Motorized Use	01/01	12/31

(Fill in all that apply)

	Class 2 & 3 e-bikes	01/01	12/31
	Electric mobility assistive devices	01/01	12/31
	Off-leash dog walking	01/01	12/31
	On-leash dog walking north of Dry Gulch	01/01	12/31
	Off road vehicles & motor vehicles	01/01	12/31
	Snowmobile	01/01	12/31
	Equestrian drawn vehicle / wagon	01/01	12/31

Other Uses

(Optional: type any that apply)

	Accept	Discourage
Fat Biking	●	

	Yes	No
Universally Accessible:		●

Trail User Objectives

✓ Escape	✓ Nature	✓ Socializing
Solitude	Risk	Efficiency
Challenge	✓ Exercise	Connectivity
Play		

Remarks/Reference Information

See recreation strategy for seasonal closure periods on Deja View North & Deja View Middle and dog management zones.

Trail Designer or Manager

Name: **Signature:**

Title: **Date:**

GLOSSARY

Indicator – Specific, measurable variables that indicate the status of a specific desired condition.[113]

Mixed Use Trail – a trail that supports motorized and non-motorized activities.

Motorized Trail – a trail that permits travel that is fully propelled by any power other than human or animal muscular power.

Motor Vehicle – means a device in, on or by which a person or thing is being or may be transported or drawn, and which is designed to be self propelled, and includes an atv or snowmobile but does not include a) a device designed to be moved by human, animal or wind power, b) a device designed to be used exclusively on stationary rails or stationary tracks, or c) a boat propelled by motorized power.[114]

Non-motorized Trail – a trail that permits travel that is propelled by human (muscular power) or animal muscular power (e.g. horse).

Sanctioned Trail – Trails that are formally approved and recognized by the land manager.

Social Trail – An informal route that is created by visitors travelling off of a sanctioned trail often to bypass a barrier, take a short-cut or access an attraction or point of interest.

Technical Trail Feature – Are constructed or natural obstacles that are purposefully integrated or built into a trail to deliver specific user objective (e.g. risk, challenge, skill development) and require visitors to negotiate them.

Trail Management Objective – A TMO synthesizes and documents, in a single form, the intended trail design parameters and management intention for the trail in a clear, consistent, and understandable way.[115]

Threshold – The minimum acceptable condition for change in indicators.[116]

Trigger – A condition of concern for an indicator that is enough to prompt a management response in order to ensure a threshold is not crossed.[117]

Unsanctioned Trail – Trails that have been constructed without the approval from the land manager or access that was built for another purpose and has evolved into a recreational trail without the authorization of the land manager.

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