

4-6 Roads and Parking Lot Upgrades – Year 4 (BNP-1156)

Reclamation Plan

Background

Phase 4 of the Secondary Roads and Parking Lot Upgrades project will begin in fall 2020 to upgrade existing infrastructure and perform maintenance along 4-6 series roads and associated parking areas in the Banff Field Unit (BFU). The proposed work is spread out across a variety of unique locations and construction details differ from site-to-site. General reclamation guidance in this plan will apply to all sites, while site specific prescriptions are detailed for relevant areas.

Work scheduled for 2020 includes paving, re-surfacing and asphalt repair, curb installation, ditching, vegetation clearing and slope stabilisation. Phase 4 sites include (cross-out represents activities not requiring activities laid out in the rest of this plan).

<p>Johnson Lake Road, Bridge Scope removed</p> <p>Mountain Avenue Scope removed</p> <p>Clearing, Grubbing & Ditch Cleaning - Removal of shrubs and trees within the ditch lines, sight lines and road right-of-ways and grubbing/ditch shaping where required on all affected sites within the Secondary Roads program scope of work, to include: - Lake Minnewanka Scenic Dr - Johnson Lake Rd - Tunnel Mountain Rd - Tunnel Mountain Dr - Vermillion Lakes Rd</p>
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An environmental impact analysis (EIA) was completed and amended in Phase 2 of this project (BNP-1156). All work must adhere to mitigations and best management practices (BMPs) identified in the EIA. If there are discrepancies between this plan and the Environmental Assessment, the

Environmental Assessment should be followed. Any changes to the plan require written approval from a fire and vegetation program representative.

Site Description

All proposed sites are within the Montane Ecoregion and are located within, or closely neighbor, the Bow Valley, including the adjacent Spray River Valley, Cascade River Valley and Healy Creek drainage. Ecosite and vegetation type may vary from site-to-site. Overall, roadside characteristics in the BFU can be described as dry (xeric), with exposed degraded mineral soils, high concentrations of salts, steep banks (up to 75%) and poor native vegetation cover. Native vegetation that are found in these areas include those species that can tolerate the difficult conditions. The most common are Wild Strawberry (*Fragaria virginiana*), Shrubby Cinquefoil (*Dasiphora fruticosa*), Common Yarrow (*Achillea millefolium*), Kinnikinnick (*Arctostaphylos uva-ursi*), Creeping Juniper (*Juniperus horizontalis*) and a variety of *Salix* species.

Non-native Vegetation

In the BFU, the highest concentration of non-native vegetation (NNV) is found in developed areas, especially along roads and adjacent to parking areas and DUAs. Sites identified for Phase 3 are likely to encounter rank 1, 2, 3 and 4 NNV species in the project area. The most common NNV species found along secondary roads and parking areas in the BFU are Oxeye Daisy (*Leucanthemum vulgare*), Canada Thistle (*Cirsium arvense*), Yellow Toadflax (*Linaria vulgaris*), Bluebur (*Lappula squarrosa*) and Smooth Brome (*Bromus inermis*). This plan was written using known NNV occurrence data, which can be made available to the contractor upon request. If new NNV occurrences are found on the project site, it will be the responsibility of the project manager to report and prevent/control infestations under the direction of a Fire and Vegetation program representative.

Challenges/ Reclamation Constraints

Reclamation efforts will need to consider using hardy plants (salt and drought tolerant) while minimizing wildlife attractants near roadways. Some basic concerns include:

- Difficult growing conditions,
- NNV
- Erosion

Reclamation Goal

The complete restoration of developed roadside and parking areas is not feasible, nor would a restored site conform to the functionality of these spaces. The overall goal for reclamation on Phase 4 of the Secondary Roads and Parking Lot Upgrades Project is to establish healthy native vegetation cover in all disturbed project areas, protect against erosion, minimize NNV spread, and augment the aesthetics of Parks Canada infrastructure.

Objectives

The following objectives relate to the overall reclamation goal:

1. Establish healthy native vegetation cover on all disturbed project areas.

- <50% bare soil (>50% native vegetation cover) first growing season after disturbance.
 - <20% bare soil (>80% native vegetative cover) two growing seasons post disturbance.
 - *in the case of grubbing this objective is likely not applicable; however any larger soil disturbances will need to achieve this objective.
2. No net increase rank 1 NNV species found in project areas.
 - 0% increase in extent and density of rank 1 species
 3. No net increase of rank 2 or 3 NNV species.
 - Estimated extent and density of rank 2 and 3 species is less than or equal to pre-disturbance observations at project completion.
 4. No major erosion concerns (signs of significant soil movement, rills, pedestalling, exposed bedrock or roots) identified in the spring following reclamation.

General Reclamation Activities

The following recommendations apply to all project site locations and all relevant activities.

Non-Native Vegetation General Info

The entire project occurs in known NNV infestations. The activity of crack sealing does not require any NNV mitigations. Clearing, grubbing and ditch cleaning has a high potential to disturb soils and move weed seed; both promoting increase extent and density of NNV.

Mountain Ave, Lake Minnewanka Scenic Dr, Johnson Lake Rd, Tunnel Mountain Rd, Tunnel Mountain Dr, Vermillion Lk Rd and the staging for the Johnson Bridge Replacement will all require control as well as ensuring the equipment has been cleaned after each pass within an area with large infestations of rank 1 species (2 locations, see table 2). Fire/Veg will complete control on smaller patches of higher ranking species in concert with project delivery.

Control timing is extremely important – species must be controlled before they bloom, ideally in rosette; generally, for the proposed project timeline between June 15-30th (will depend on season).

Vermillion Lake road will require mechanical control due to proximity to a designated environmental sensitive site.

Arranging this contract will be a significant undertaking due to the geographic scope of the project. Fire/Veg can provide required support but will not have the capacity to complete the contracting or day-to-day coordination of contractors. There is a standing offer with ACE Vegetation which is the recommended contractor. All spray records must be provided to fire/veg for tracking.

All NNV data is accessible on the field unit web app (Fire/Veg – NNV Master) – specific data request can be completed upon request.

<https://van-map3.apca2.gc.ca/arcgiswa/apps/webappviewer/index.html?id=530a3bf07ba9443985a77cbffd070891>

Rank 1 Special Areas

Rank 1 species must not be transported. This can be accomplished by cleaning machinery between identified rank 1 areas (table 2) or alternative grubbing methods. Ideally these areas would be completed in the winter or completed by hand to reduce the number of times machinery will need to be washed and reduce/eliminate the ground disturbance.

The extent of these areas has been marked on the original project drawings.

Location Name	Species
Two Jack Canal/Johnson Lake Road	Meadows hawkweed
Minniwanka Loop turn off to Cascade Pit	Spotted knapweed.

Table 2 – Ranke 1 special areas

NNV Control

It is expected that the majority of the Phase 4 project sites will contain NNV.

- All work sites within this project requiring ground disturbance (any machinery that creates ruts; moves litter, vegetation or soil) will require control unless completed during frozen conditions.
 - * There should be a delay between herbicide application and ground disturbance; follow the product label recommendations with respect to this delay.
 - * Clearview will be the approved herbicide – other herbicides can be recommended by the spray contractor for written approval.
 - * **Vermillion Lk Road will require mechanical control**
- A general schedule for control application is presented in Table 1. Follow the product label and Banff Field Unit *NNV Control Guide* for species specific recommendations. The current plan is for a fall delivery, the other options are for the likely event of project delay, or if only sections of the project are completed in fall.

Project Delivery	Pre-Project	During Project	Post-Project
Spring (before June 01)	None	All machinery needs to be cleaned between rank 1 identified sites	Herbicide control summer (4 weeks post construction and next spring (completed June 15-30 th))
Fall (after September 15 th)	None	All machinery needs to be cleaned between rank 1 identified sites	Herbicide control late spring (completed June 15-30 th)
Winter (frozen ground with snow cover)	None	None	Herbicide control spring. (completed June 15-30 th)
Summer (after June 01, before September 15)	Herbicide control	All machinery needs to be cleaned between rank 1 identified sites	Herbicide control spring. (completed June 15-30 th)

Table 1 – Recommended timing for control work associated with project activities.

Soil Works

All soil disturbance and soil excavation for the project should use a two-lift process; the first lift consists of organic matter (sod, litter, etc.) and topsoil, while the second lift contains subsoil. Topsoil must be stored separately from subsoil in such a way that they will not be admixed.

- Soil materials should be stored on a nearby hardened area during construction, not on top of adjacent vegetated areas.
- If the soil medium at project site is insufficient to support vegetation establishment, topsoil additions or amendements need to be completed.
- All topsoil imports are subject to third-party testing as prescribed by a Parks Canada Fire and Vegetation program representative, as detailed in the *Vegetation Removal and Restoration/Reclamation Guidelines for the Banff Field Unit*.
**This process may take more than 3 weeks to coordinate; the project is responsible for all logistics and associated costs.*
- A weed free organic soil blend (ex. NutriLoam or equivalent product) can be used instead of topsoil import upon approval by a Fire and Vegetation program representative.
- Apply soil amendements to a MAX depth of 20mm.
- Relieve all soil compaction before planting by breaking up the subsoil mechanically (excavator bucket) or using handtools (at smaller sites).
- Final seedbed should be rough and undulating; “rough and loose”.
- No topsoil or vegetated areas should be compacted unnecessarily (ex. by driving over repeatedly). Keep vehicles/machinery on hardened surfaces as much as possible.
- Machinery/vehicles should take care not to drive off hardened surfaces during wet conditions to reduce the chance of creating ruts. All incidental rutting should be reported to a Parks Canada Vegetation Specialist who will prescribe reclamation methods. The project will be responsible for fixing the ruts, as prescribed.

Seeding

Based on the project description seeding is not likely to be required – this section is provided in the case of an increased rutting or staging area reclamation. Any area greater than 5m² will be re-seeded.

- The project is responsible for sourcing and purchasing prescribed seed mixes. Seed certificates MUST be verified and approved by a Parks Canada Vegetation Specialist PRIOR to seed being purchased; do not purchase seed without written approval.
- Fertilizer and/or seed coating (including ultra-coating) is NOT permitted for use on this project.
- Construction should be scheduled so that seeding can coincide with seasonal planting windows (i.e., periods of time when seeding is most likely to result in successful plant germination and growth). Rough seasonal planting windows are outlined below, but seasonal variability must be accounted for.
 - Spring: April-June: No snow cover; ensure machinery does not compact/rut soils.
 - Summer: July-September: DO NOT seed; conditions not suitable for germination.
 - Fall: Late September to early November; until snow cover/ground freezes.

- Seed at a rate of 50 kg/ha. Broadcast seed and set using rakes (seeds need good contact with soil).

Seed Mix 1 – For moist to dry areas (sub mesic – xeric). Use on roadside and banks.

<i>Common name</i>	<i>Scientific name</i>	<i>Percent by weight (in mix)</i>
Hairy wild rye*	<i>Elymus innovatus</i>	30%
Tickle grass	<i>Agrostis scabra</i>	35%
Awed wheatgrass**	<i>Agropyron trachycaulus var. subsecundus</i>	20%
June grass	<i>Koleria macrantha</i>	11%
Yarrow (must be WHITE and canadian origin)	<i>Achillea millefolium</i>	4%

*Substitute Smooth wild rye or Canada wild rye if Hairy wild rye is unavailable.

**Can substitute Slender wheatgrass (*Agropyron trachycaulus var. trachycaulus*)

Hydromulch

Apply a hydro mulch to all disturbed areas after seeding. This will help retain moisture, increase germination success and exclude NNV.

- Use an organic wood fibre mulch
- Follow product specifications (Apply at the recommended application rate).
- Follow *Vegetation Removal and Restoration/Reclamation Guidelines* for the BFU.
- Apply mulch **AFTER** seeding. Hydro seeding is not permitted on this project.
*Hydromulch product to be approved by a Fire and Vegetation representative.

Woody Debris Management

- All identified trees are to be hand-felled by a qualified individual and according to the *BFU/LLYK Woody Vegetative Debris Management Guidelines*.
- Removal of mature Douglas-fir trees (*Pseudotsuga menziesii*) should be avoided.
- Grubbing and stripping is not permitted on steep slopes.
- Minimize grubbing and the removal of stumps on the project so as to minimize ground disturbance.
- All vegetative debris generated by the project will be disposed of outside the park, except logs greater than 15 cm in diameter. No other debris management options (piling and burning, mulching, etc.) have been approved for this project; any change from removing debris will require approval from a Fire and Vegetation program representative on a site-by-site basis.

Referenced Documents

BFU/LLYK Woody/ Vegetative Debris Management Guidelines

BNP#1156 Year 3 Fall SPECIFICATIONS

Detailed Restoration Plan: 4-6 Roads and Parking Lot Upgrades – Year 2 (EA # BNP-1232)

Vegetation Removal and Restoration/ Reclamation Guidelines for Banff National Park