Appendix C – 2022 Environmental Assessment Amendment Mitigations

2022 BIA
Mitigations

BNP-1011 Johnston Canyon Rock Scaling, Catwalk and Trail Repairs

Project Title	**Johnston Canyon Railing Extension**
Amendment Date	**February 2022**
Banff EA Office Reference #	**Original EIA BNP-1011 (2015)**
New EA Reference #	**BNP-1531**

EIA Amendment (2022)

The railing scope for the Johnston Canyon Railing Extension Project is more extensive than the works outlined in previous 2015 BIA, as it involves installing an additional 1,074m of railing. Furthermore, the Johnston Canyon Railing extension project has a higher level interaction with aquatic resources due to water extraction and Species at Risk, Black Swift due to timing.

Since the completion of the 2015 BIA, more information has been collected regarding non-native vegetation, requiring further mitigation; therefore, an amendment to the impact assessment is warranted.

Rationale

Soils and Vegetation

The scope and scale for railing installation portion in the 2015 BIA is relatively minor compared to the 2021 proposal, as it primarily focused on adding steel mesh to existing panels. The 2021 proposal will add ~1,074m of new railing increasing overall ground disturbance. Increasing disturbance to native vegetation, increases the potential for invasive species proliferation. In 2017, the Banff Field Unit began digitally recording non-native invasive species, confirming known infestations within the project's proposed staging location P1 (Figure 3.0). No known infestations have been detected within the railing install area (from lower falls to end of section 7.0), however, targeted survey's will be completed in summer of 2022 to confirm presence/absence in all areas of the project (fire access road, staging areas, and project location).

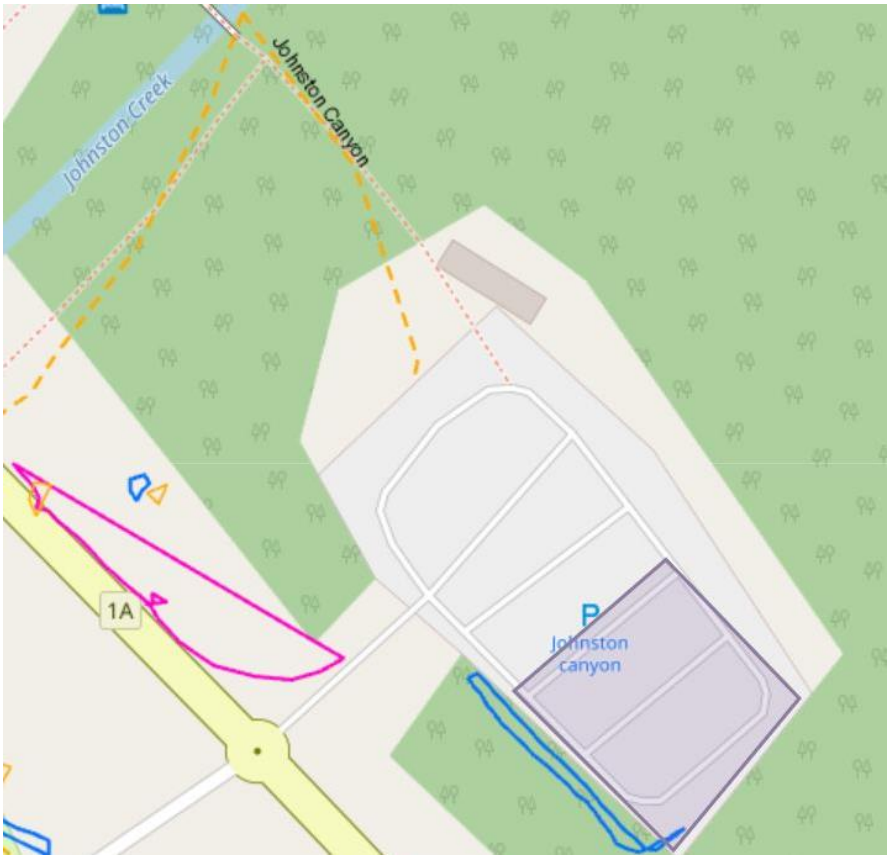

Figure 3.0, displaying known non-native vegetation (NNV) within staging area P1. The approximate P1 staging area is denoted by the purple polygon and the blue, pink and orange polygons are the known NNV, whereas the Johnston Canyon official trail is the orange dotted line.

As a result of this new information on non-native vegetation, there is an increase risk of invasive spread, which requires further analysis and mitigations not originally included in the 2015 BIA.

Aquatic Resources

The Johnston Canyon Rock Scaling, Catwalk and Trail Repairs project did not consider potential impacts associated with instreams interactions. Furthermore, since the development of the BIA in 2015, key guidance and Species at Risk recovery strategies have been implemented, as outlined below.

- Guidance from Department of Fisheries and Oceans *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater*, was modified on February 6th 2020.
- In 2016, Whirling Disease was detected in Banff National Park; therefore, direction on water related activates was implemented.
- In 2019, Bull trout Saskatchewan-Nelson Rivers populations were considered Threatened under Schedule 1 of the *Species at Risk Act (SARA).* According to SARA recovery strategy map[1], the lower portion of Johnston Creek, including Johnston Canyon and Catwalk #6 and #7, is critical habitat for bull trout (*Salvelinus confluentus*) populations.

[1] Species at Risk. 2019. Bull Trout (Salvelinus confluentus), Saskatchewan-Nelson Rivers Recovery Strategy, 2020 (proposed). Available online: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/bull-trout-proposed-2020.html#toc12. Accessed January 4th, 2021c

BIA amendment is required to consider the potential effects associated with instream interaction, and to apply activity-specific mitigation measures to prevent/reduce any residual effects, as a result of the project.

Species at Risk
Species at Risk, Black Swift (*Cypseloides niger*) was considered in the 2015 BIA, however pre-construction surveys confirmed no nest were occupied for that year. In 2015, complete avoidance of Black Swifts was possible due to construction timing and lack of presence, however for the proposed 2022 works this is not feasible. As such, construction activity impacts need to be considered thoroughly to ensure the project will not result in significant adverse effects.

Environmental Effects and Mitigations

In addition to the potential effects and mitigations outlined in 2015 BIA *Johnston Canyon Rock Scaling, Catwalk and Trail Repairs*, the following potential environmental effects are anticipated during the completion to the Johnston Canyon Railing Extension project and will be mitigated and applied accordingly.

Soils and Vegetation
Effects Analysis
The following is a summarized list of the anticipated effects, as a result of the project:

- Soil compaction and rutting from equipment access to the site.
- Soil contamination from accidental spill or leaks from equipment, vehicles and/or during refueling.
- Increased soil compaction on the uphill slope, as a result of installing physical barrier on the downhill slope, with no increase to path width or decrease to visitor use.
- Increased vegetative damage on the uphill slope, as a result of installing physical barrier on the downhill slope, with no increase to path width or decrease to visitor use.
- Improved vegetation on the downhill slope exterior edge of railing, as visitors will be less likely to leave trail.
- Active de-compaction of heavily use areas will improve soil density and allow for better plant establishment.
- Improved vegetation on unofficial trails through passive restoration, as railing will be a physical barrier to access paths and look out points on the downhill slope.
- Potential proliferation of non-native vegetation species due to the spread of existing plants, introduction of seeds or contaminated soils, and/or increased weed establishment in areas of soil disturbance.
- Loss of vegetation, as some tree removal is required for site access.

Mitigation Measures
The following is a summarized list of the mitigations, required to reduce project effects:

Pre-construction

- The pre-construction NNV control shall be completed at the following locations, according to the schedule below:

- Perimeter of day-use parking lot (to forest edge)
- Access road (to forest edge on either side)
- Along railing extension (+ 1 m either side of JC trail)

Species to be controlled	**Timing Window**
Oxeye Daisy, Tall buttercup (and others if observed)	June 15 to July 15, 2022
Canada thistle (and others if observed)	August 15 to Sept 15, 2022

*NNV species to be controlled will be confirmed by PC Vegetation Specialist, based on the BFU species control list.

- Recommended control is herbicide application using a BFU-approved herbicide.
  - Other methods may be approved at discretion of the Parks Canada Vegetation Specialist.
  - Herbicide application may only be completed by an Alberta Certified Applicator.

Construction Phase

General

- Equipment shall arrive clean (weed and dirt free) on site.
- Contractor should minimize number of trips on the fire access road. A total of 3 trips (to and from) daily is recommended. In adverse conditions, consider alternative access methods (quad, helicopter, side by side or equipment with rubber tracks).
- Any snow plowing must be done over frozen grounds.
- Construction shall be completed by mid-April (or when road thaws, seasonally dependent) to avoid further degradation to access road.
- Re-fueling shall be completed on harden surfaces only, with use of drip tray.
- All generators shall have secondary containments.
- All spills shall be reported to ESO.
- Determine site specific mitigation measures for larger scale concrete manual mixing activities (around >20 liters) including buffer zones, drip trays, and daily surveillance requirements.
- Wash excess concrete from mixer trucks, chutes or bins into approved concrete washout facilities or collect in an impermeable bag for disposal.
- Perform concrete/asphalt cutting operations in a way to pick up all saw cutting residue.
- Do not dump unused wet concrete on bare ground to harden at construction sites.
- Use tarps to collect excess concrete and to prevent spills when mixing.
- Material not suitable for repurpose (i.e. curbs, excess concrete etc.) shall be removed from the park and disposed of at a suitable facility.
- If required to bring in soil, material shall adhere to the *Banff Field Unit, Topsoil Movement and Sourcing Guidelines 2021.*
- Each day before welding, the Fire Duty Officer is required to be called. Work will be permitted depending on Fire Danger Rating. Contact info: (403) 763-8025 or banff-firedutyofficer@pc.gc.ca
- During times of welding and grinding, wet the area with a Wajax bag (20L backpack pump). In the event of a fire, use the Wajax bag to extinguish the fire.
- During times of high or extreme Fire Danger, welding and grinding will not be permitted.

Excavation

- When excavating the topsoil and subsoils will be removed in a two-lift process, in order to be placed in reverse order.
- Excavated material is permitted to be spread between posts up to 20cm wide (width of the post foundation).
    - For surplus excavated material, pre-identified sites will be determined by Parks Canada Vegetation Specialist and ESO in the spring 2022. Should surplus material remain, material shall be disposed of at an appropriate facility outside the park.
    - All excavated material must be placed on non-vegetated areas, subsoils shall be tamped down after placement, unless directed by Vegetation Specialist or ESO. Topsoil material shall not be tamped.
    - Erosion and sediment controls may be installed, at the request of the ESO.
- To offset the impacts of upslope trampling, the contractor shall de-compact up to a maximum of 100m2, at a depth of 10cm. Areas will be targeted as per direction from the Parks Canada Vegetation Specialist.
    - The contractor will not be responsible for revegetation of the de-compacted areas, which are an additional request by Park Canada Vegetation Specialist.
    - The contractor will not be responsible for non-native vegetation control within the de-compacted areas (areas specifically requested by Parks Canada Vegetation Specialist), however contractor will be responsible for NNV control associated with the installation of the railing and site access, where NNV was not previously present.

Vegetation Removal

- Wherever possible, posts shall not be place directly adjacent to tree trunks and will be off-set 1m to either side of the tree. Should 50% of the roots be damage, as a result of the works, the tree will be removed by the contractor. Trees damaged by the contractor will need to be removed and disposed of accordingly, as per direction from ESO.
- Stumps shall be flush cut wherever possible.
- Trees set for removal with the project scope (e.g. not incidental trees as a result of project damage), may be permitted to remain in-situ and placed flush to ground. Should the total number of trees exceed 5, then excess trees shall be removed and disposed of accordingly, as per direction from ESO.

Non-native Vegetation

- It is expected NNV along the rail installation will be minimal. However, if priority NNV are identified during the pre-construction survey, the Parks Canada Vegetation Specialist may request additional mitigations (equipment cleaning when finished in that area, or adjusting order of operations).

Post-construction

- In areas of additional ground disturbance, above and beyond scope of work post installation (e.g. disturbance along access points, fire access road or trail), the contractor is required to (in 2023):
    - Revegetate with an BFU-approved seed mix (prior to June 15 or post September 15)

- Seed mix shall be reviewed and approved by Parks Canada Vegetation specialist prior to purchase. Table 4.0 seed mix below is an example that may be used for the project. Substitutions may be required at the request of the Parks Canada Vegetation Specialist, due to site specific conditions. The seeding rate will be 25kg/ha.

Table 4.0 Example seed mix for Johnston Canyon Railing Extension Project

Developed Area Seed Mix and Common Plantings (BFU2020)			
Species	Species (Latin)	% Weight	Comments
Smooth Wild Rye	*Elymus glaucus*	35	quick germ, drought tolerant
Rocky Mountain Fescue	*Festuca saximontana*	20	Deer resistant/unpalatable
June Grass	*Koeleria macrantha*	15	Good competitor for Kentucky Bluegrass - early spring growth
Alpine Blue Grass	*Poa alpina*	5	tolerates heavy traffic, pioneer
Awned wheat grass	*Agropyron trachycaulus var. subsecundus*	10	Saline; short plant, quick establishment
Fringed brome	*Bromus ciliatus*	10	cold tolerant, excellent for roadside
Yarrow (white)	*Achillea millefolium*	5	Must be white variety.

- Complete up to two rounds of NNV control, (as appropriate for the species present), as follows:

• **Species to be controlled**	**Timing Window**
Oxeye Daisy, Tall buttercup (and others if observed)	June 15 to July 15, 2023
Canada thistle (and others if observed)	August 15 to Sept 15, 2023

*NNV species to be controlled will be confirmed by PC Vegetation Specialist, based on the BFU species control list.

- Vegetation specialist and ESO will monitor to determine if disturbed areas are on an acceptable revegetation trajectory. Contractor will be required to reseed and/or control NNV in 2024/25 if deficiencies are observed. Criteria for acceptable revegetation are:
    - <50% bare soil (>50% native vegetation cover) first growing season after disturbance.
    - <20% bare soil (>80% native vegetative cover) two growing seasons post disturbance.
    - 0% cover of rank 1 NNV species
    - No net increase in rank 2 or 3 NNV species relative to pre-construction survey
    - No erosion concerns (signs of significant soil movement, rills, pedestalling, exposed bedrock or roots)

Residual Effects

After the above mitigation measures are implemented, impacts on vegetation trampling, soil compaction and erosion are expected on the uphill slope, as the added railing will confine the path forcing trail users to step off the official trail. These impacts to the uphill slope are anticipated to be localized long-term,

reversible, and low in magnitude. Conversely, the downhill slope exterior to the railing, will likely see improved re-vegetation, due to reduced access to unofficial viewpoints or trails. In addition, some de-compaction as a result of the project will occur in select locations, helping to expedite revegetation and help with the uphill compaction offset. This project requires minimal tree (~3 trees) for site access, as such these impacts are considered negligible, due to the volume of trees existing within the project scope.

Aquatic

Effects Analysis
The following is a summarized list of the anticipated effects, as a result of the project:

- Extraction of water could result in possible impingement and entrainment of fish.
- Introduction of whirling disease through the use of materials, equipment and tools contaminated with soil that may contain the various life stages of the parasites (*Myxobolus cerebralis).*
- Deleterious substance entering the watercourse, as a result of ground disturbance or material handling (e.g. concrete).

Mitigation Measures
The following are mitigations are required to address the anticipated effects:

- For water extraction, proponent shall follow interim code of practice: *End-of-pipe fish protection screens for small water intakes in freshwater* (Appendix 5).
- Any equipment entering the watercourse will follow BFU Whirling Disease decontamination protocol .
- Excess subsoil material will be tamped down to prevent erosion. Sediment and erosion controls will be installed where required, or as directed by ESO.
- Prevent wash water, concrete, debris and sediment from directly or indirectly entering water by establishing and maintaining effective separation of the concrete work from the waterbodies.

Residual Effects
Provided the above mitigation measures are implemented, no residual or negative effects to aquatic resources are anticipated.

Wildlife

Effects Analysis
The following is a summarized list of the anticipated effects, as a result of the project:

- Short-term effects to wildlife are expected during the construction period due to sensory disturbance from project activities. The Johnston Canyon trail is a high use facility; therefore, wildlife present in and around the canyon are likely habituated to human presence, however the type of noise construction activities is likely to have a more pronounced, albeit intermittent wildlife disturbance effect.
- Increased traffic along the fire access road is anticipated. The fire road is likely used by wildlife to travel up Johnston Creek, which normally sees relatively little human use. Increased human use on this trail, combined with equipment noise will likely to result in displacement of wildlife from this trail and its immediate vicinity during construction activities.

- Disturbance, injury and/or mortality of breeding birds as a result of vegetation removal (i.e., disturbance or destruction of occupied nests).
- Disturbance, injury and/or mortality of bats as a result of vegetation removal (i.e., disturbance or destruction of occupied trees).
- Wildlife entrapment is possible should excavated areas be left unattended.
- Wildlife food habituation is possible, if care and attention is not given to proper waste management.
- Improved visitor management, as railing extension will provide physical barrier reducing the visitor impacts on the downhill slope towards Johnston Canyon.

Mitigation Measures
The following are mitigations are required to address the anticipated effects:

- If removing vegetation within the Migratory Bird Nesting Period (April 1st to August 31st), a migratory bird nest survey must be completed within 5 days prior to tree removal by a Qualified Environmental Professional (QEP).
- If removing trees (>25cm DBH) between April 15th to September 1st, a survey by a QEP must be completed to ensure there are no roosting bats present. Surveys must be conducted in accordance with the Parks Canada *Banff Field Unit Pre-Construction Bat Roost Survey Guidelines for Projects Requiring Tree Removal* (Draft 2016 – appendix 7).
- Excavations will not be left unattended and will be covered or fenced off at the end of each day.
- Ensure that all petroleum products, food and garbage is secured from wildlife. If wildlife gain access to any food or garbage, it must be immediately reported to Banff Dispatch 403-762-1470.
- If wildlife is observed on site, avoid or terminate activities on site that attract or disturb them. Vacate the area if wildlife displays aggressive behaviour or remains on site. Contact Banff Dispatch 403-762-1470. Never approach or harass wildlife (e.g., feeding, baiting, luring).
- All bins (garbage or construction waste) shall be wildlife proof.
- Vehicle use along the fire access road, shall be minimized wherever possible, to reduce impacts on wildlife. It is recommended that a maximum of 3 trips (to and from) be completed daily.
- In order to reduce sensory disturbance to wildlife, machinery work is only permitted during the following daylight hours (table 5.0):

Table 5.0 Outlines the permissible construction hours.

Month	Start	Finish
January	9:00 am	4:30 pm
February	8:30 am	5:00 pm
March	8:30 am	6:00 pm
April	7:30 am	8:00 pm
May	7:30 am	8:30 pm
June	7:30 am	9:00 pm
July	7:30 am	9:00 pm
August	7:30 am	8:00 pm
September	8:00 am	7:00 pm
October	9:00 am	5:30 pm
November	9:00 am	4:00 pm
December	9:00 am	4:00 pm

- Workers may elect to access site outside the hours above (e.g. within crepuscular period, an hour before or an hour after, sunrise and sunset), should the following conditions be followed:
    - Access is only permitted via the main Johnston Canyon trail by foot. No access via the fire road with vehicles, quads etc.
    - No machinery is used during that time (e.g. generators, drills etc.)
    - Lunches/food are secure at all times.

Residual Effects
Provided the above mitigation measures are implemented, no significant residual effects to wildlife are anticipated. Negative residual effects to wildlife from the project will comprise temporary displacement due to sensory disturbance during construction activities. This effect is expected to be highly localized, short-term, intermittent during construction, reversible and negligible in magnitude.

Black Swifts

Black Swift's are the largest swift in North America and the only subspecies to occur in Canada. In the past 40 years, Black Swift population has declined over 50% (COSEWIC, 2015). In 2015, Black Swifts were federally listed under the SARA, as endangered under schedule 1.

Most recently, 7 nesting areas were identified within the Johnston Canyon through drone surveillance, camera data, and surveys (Figure 4.0 and Table 6.0).

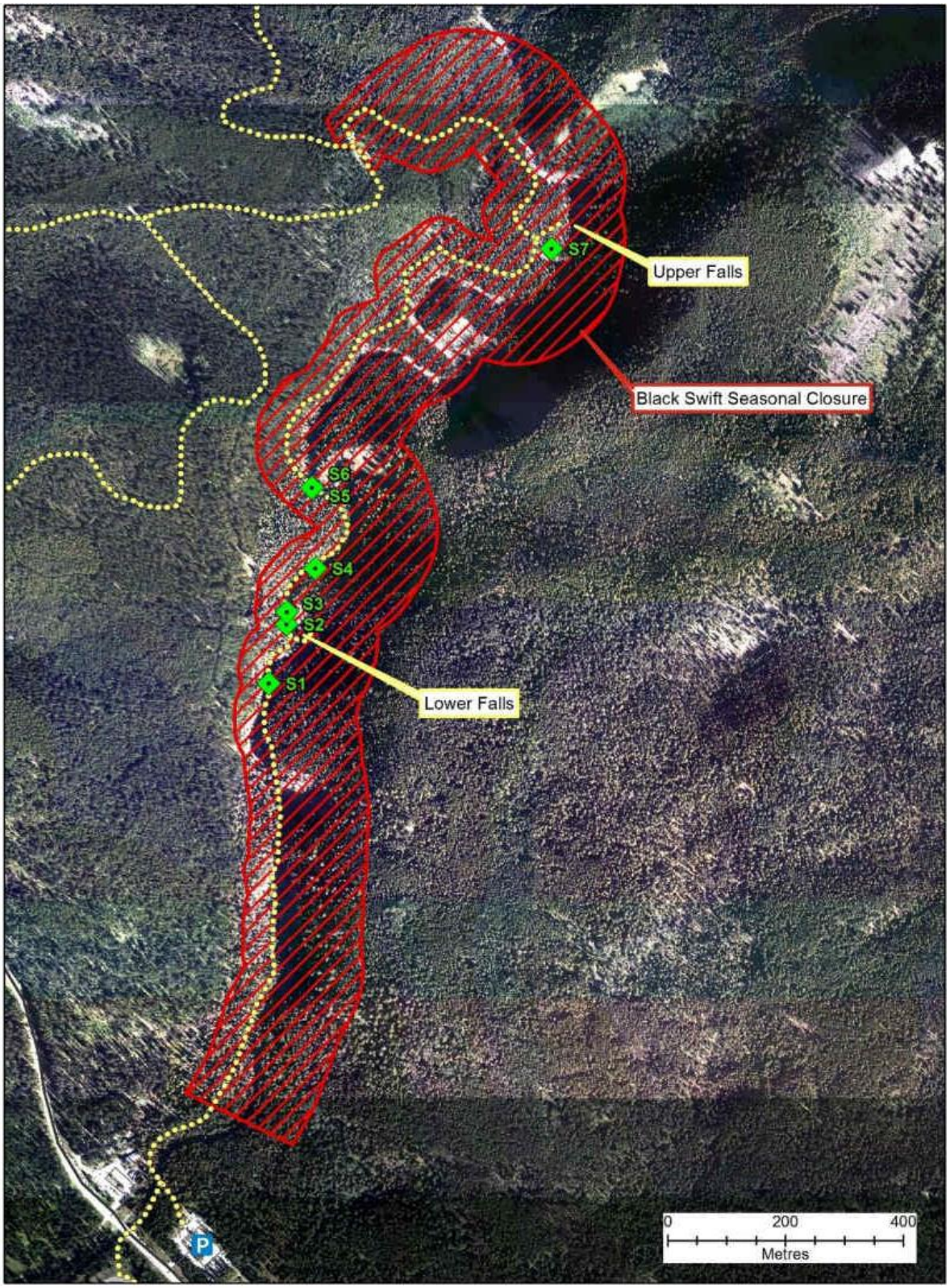

Figure 4.0 Depicting know black swift nest locations in Johnston Canyon. The green diamond indicates nesting locations, with the red slash the restricted activity order for Black Swifts to prevent off trail use, and yellow dots are official trails.

Table 6.0 Describes Black Swift site ID, GPS location, relative location to the project area, and last known observation of activity. Data provided from Parks Canada Wildlife Department.

Site ID	GPS location of Nest	Proximity to Project (m)*	Last Active
S1	11 U *581098 5678688*	~210m (to closest lay down area)	2004
S2	11 U *581128 5678823*	~100m (to closest lay down area)	2021
S3-a	11 U 581143 5678835	~100m (to closest lay down area)	2021
S3-b	11 U 581142 5678831	~100m (to closest lay down area)	2021
S3-c	11 U 581143 5678837	~100m (to closest lay down area)	2021
S4	11 U 581178 5678892	~95m (to closest lay down area)	2021
S5-a	11 U 581181 5679055	~105m (to closest lay down area)	Unknown
S5-b	11 U 581167 581167	~105m (to closest lay down area)	2009
S6	11 U 581174 5679040	~15m from project area	2021
S7-a	11 U 581562 5679457	~25m from project area	2021
S7-b	11 U 581587 5679447	~25m from project area	Unknown
S7-c	11 U 581577 5679451	~25m from project area	Unknown

*Proximity to the project area was completed via desktop review on ArcGIS; therefore, values are approximations and do not consider topographic relief.

Historically Black Swifts fledge late season, with data showing fledging anywhere from September 9th to September 18th (Personal Communications, J. Reimer, January 10th 2022). As the work intends commence during the nesting season, potential disturbance to Black Swifts, through sound, vibration and helicopter use is possible.

Helicopter Downwash

Nests located in open forests or cliffs are more susceptible to helicopter downwash, as wind from the helicopter can more debris and damage a small nest (Chillbourne Environmental, 2003). During a low hover maneuver a Bell 212 downwash is approximately ~38km/hr., with a longline speed of ~28km/hr. (Chillbourne Environmental, 2003). Using the general rule that velocity displacement of downwash dissipates around 2 to 3 times the rotor blade, it would create a 44m buffer around a Bell 212 helicopter, which has a main rotor of 14.68m (Helicopter Rotor Downwash – Excessive wind, FOD and brownouts, what are the risks? - JJ Ryan Consulting, 2022). Whereas, a Bell 407 has a 10.67m main rotor diameter; therefore, the buffer would be approximately 30m, using the same principles as above. This means that any nest within that 44m or 30m range, could be impacted by the helicopter downwash.

Effects Analysis

The following is a summarized list of the anticipated effects, as a result of the project:

- Potential disturbance to nesting black swifts, as a result increase in noise levels and intermittent frequency.
- Potential damage or destruction of back swift nests, as a result of downwash from helicopter use.
- Positive effect on post-construction disturbance to Black Swift nesting areas, as installation of fence will provide physical barrier and deter visitors from leaving the official trail.

Mitigation Measures

The following are mitigations are required to address the anticipated effects:

- To reduce disturbance and downwash effects helicopter flights will not laterally fly/hover over known nesting locations and will apply at minimum a 75m buffer as per the flight paths in Figure 5. Buffer zones may be adjusted according to type of helicopter used.

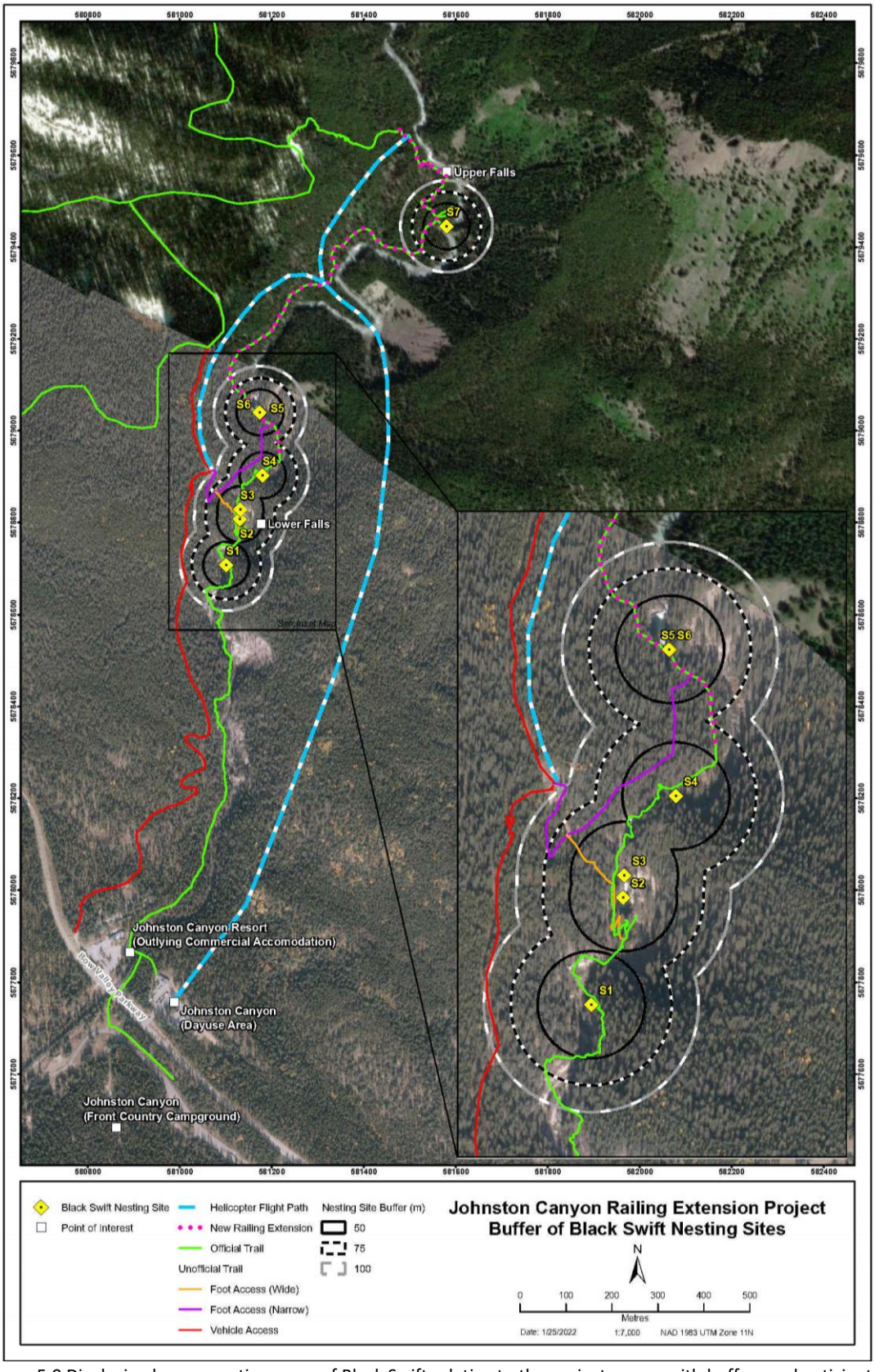

Figure 5.0 Displaying known nesting areas of Black Swift relative to the project scope, with buffers and anticipated helicopter flight path.

- In April 2022 a drone flight will be completed by Parks Canada Wildlife department to determine if there are additional nesting locations, different than in figure 5.0 above. If additional nesting locations are detected, map will be updated with appropriate buffers.
- By June 15th Park Canada Wildlife department will provide the project an update regarding which nests are occupied, the map will be updated with buffers, as required.
- The following table outlines the permissible flight periods and restrictions associated:

Date	Helicopter Use
August 16th to September 1st 2022	Helicopter use will be restricted to a maximum of 6 days total with flight times between 9:00am to 12:00pm.*
September 6th to 18th 2022	No helicopter use, until Black Swifts have fledged (dates may vary). Historical fledging period occurred from September 9th to 18th.
September 19th to November 30th 2022	Number of helicopter flights unrestricted. Flights only to occur during daylight hours, as per wildlife mitigation (table 5.0, above).

*Hours of helicopter flights may vary depending on data collected in summer of 2022, see bullet below.

- To avoid critical foraging periods helicopter flights will be permitted between 09:00 to 12:00. Flight hours may change as a result of additional data gathered in season of 2022 and will be updated accordingly.
- Additional surveys by Parks Canada Wildlife staff will be conducted between mid-August to time of fledging to provide the project with accurate update on post fledging flights.

Visitor Experience

Effects Analysis

- Increased disturbance as a result of construction activities through noise (drilling, helicopter use etc.)
- Inaccessibility to trail use and parking during construction, which may impact overall visitor experience.
- Temporary aesthetic impacts, as a result of ground disturbance.
- Decreased permanent aesthetic impacts, as a result of fencing. Metal fencing does not have natural feel and is more obtrusive and industrialized than other types of Parks Canada fencing (e.g. lower fences, with wood details).
- Increased public safety, as a result of the permanent fencing.
- Increased trail crowding due to permanent fencing preventing people from off trail use.

Mitigations

- Reduce the number of flights required during busier periods (e.g. before Labour day long weekend) or weekends (Saturday, Sunday)
- Ensure adequate communication plan and signage is implemented to inform trail users of closures and detours.
- Ensure flaggers are employed during helicopter use.
- Ensure staging areas are clearly defined and secure.
- Fence finish shall match existing green colour in order to be less obtrusive and blend into the backdrop.