

Parks Canada Agency

763 – Waterton Boundary Fence Environmental Best Management Practices

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1. Project Description

In August 2015, the Government of Canada announced funding initiatives totalling over \$100 million for infrastructure projects within Waterton Lakes National Park (WLNP). Among these initiatives was the rehabilitation of the boundary fence, stretching approximately 46 kilometers from the United States & Canada border north to Yarrow Canyon. The perimeter boundary fence has not been brushed for a number of years and now has a number of overgrown and damaged sections, reducing the effectiveness of the fence. This has led to resource management issues with cattle from neighbouring lands entering the park; thus, Parks Canada is proposing to perform brushing activities and restore the fence to a serviceable condition. Brushing and construction activities are planned to commence in summer/fall of 2016.

In order to minimize the environmental impact of the fence replacement, Best Management Practices (BMP) will be implemented during all project activities. This BMP supplements Environmental Alignment Sheets (EAS), together forming the Construction Guidelines for the fence rehabilitation project.

Project components of concern include work adjacent to archaeologically sensitive areas, vegetation clearing, wetland and watercourse mitigations, erosion and sediment control, wildlife and wildlife habitat, fuel and waste handling, and spill response.

1.1 Definitions

Surveillance Officer (SO):

The Surveillance Officer is responsible for on-site surveillance of the work in accordance with the Parks Canada EIA and environmental regulations and guidelines. The SO will provide direction regarding environmental assessment / environmental infractions or emergencies through the Project Manager unless necessary. As the Parks Canada representative for environmental concerns, the SO may consult with relevant specialists to determine appropriate implementation for mitigation measures. The SO has the authority to stop work for *National Parks Act* violations, however, during normal operations does not give direction to the Contractor.

Right of Way (RoW):

The standard Right of Way is defined as the:

- 4 m wide area along the WLNP boundary for the fenceline (3 m wide inside the fenceline and 1 m wide outside the fenceline)
- 3 m wide area for access routes and shoofly detours within the WLNP boundary
- Material/Equipment stockpile and staging areas, at locations proposed by the Contractor, and subject to approval by the SO.

2. Environmental Considerations

2.1 General Mitigations

Construction activities involve the use of laydown/staging areas, equipment operations, storage and handling of hazardous materials. Potential adverse effects include: alteration of vegetation, erosion and sedimentation, constriction for wildlife movements and introduction/spread of non-native vegetation:

1. All employees must attend an environmental briefing with a SO before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Employees must attend this briefing before beginning their work at this site.
2. All equipment and vehicles will be made available for inspection by the SO on arrival to WLNP. The Prime Contractor will give 48 hours' notice and schedule equipment inspection with the SO. Water trucks require a written restricted activity permit from the SO to operate in the Park. The permit is received at initial inspection.
3. All vegetation clearing or use of off-road equipment requires a written restricted activity permit from the SO to enter the Park.

2.1.1 Construction Timing / Visitor Experience

1. Confine construction activities to periods of low visitation in order to reduce sensory disturbance to wildlife and visitors.
2. Time activities to minimize vehicle conflicts on access roads (i.e., where possible, schedule activities so that equipment operations does not disrupt traffic flow; result in wildlife collisions).
3. All Parks Canada designated speed limits apply to construction vehicles. Additional speed restrictions may be required to protect wildlife and visitor safety.

2.1.2 Timing Windows

Timing windows to reduce erosion, maintain compliance with the *Migratory Birds Convention Act*, *Fisheries Act*, and *Species at Risk Act* may be part of best practices to reduce erosion and environmental effects. See detailed mitigations for timing windows under Erosion and Sediment Control and Vegetation Removal modules where these activities are part of project works. A summary of these restrictions is made below:

1. Migratory Bird Nesting Period – No vegetation removal permitted between April 1 and August 31. See section 2.3 for additional details.
2. Roosting Bat Activity Period – No vegetation removal permitted between April 1 and August 31. See section 2.3 for additional details.
3. Fish Spawning Periods – No in-stream work outside August 15 to September 1. See section 2.4 for additional details.
4. Wetland and Ground Protection – Limit activities to dry or frozen conditions. See section 2.4 for additional details.

2.1.3 Work Site Conditions/Staging/Laydown

1. Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.
2. A detailed survey must accurately delineate the work zone; clearly mark the limits to the RoW, sensitive features indicated on alignment sheets and the access and egress routes to the fenceline.
3. The Prime Contractor is responsible for security and safety of the work site.
4. Strong winds are a regular occurrence in WLNP. Prevent materials from blowing off of work site.
5. If contamination is found, cease work immediately and if necessary, implement Emergency Response Plan.

2.1.4 Wildlife Observations and Encounters

1. Prior to beginning work, the contractor should check with Parks Canada staff to be aware of any wildlife sightings in the vicinity of the work. Recorded wildlife sightings and appropriate responses should be discussed during on-site safety meetings.
2. Notify the SO immediately of any dens, litters, nests, carcasses (road kills or other), wildlife encounters, or carnivore (bears, wolves or cougars) observations on or around the worksite.
3. If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area to the surrounding habitat and away from areas of potential conflict.
4. If potentially dangerous wildlife (e.g., bear, cougar, wolf, deer, sheep) persistently enter the work area or display aggressive behaviour, the contractor will immediately stop work, notify 9-1-1 or Banff Dispatch (403-762-1473), and safely evacuate the area.
5. Contractor will make bear spray, bear spray training, and wildlife awareness training mandatory to all workers on site and appropriate measures are taken for working alone.
6. Secure all materials that might attract wildlife (e.g. petroleum products, human food, recyclable food and drink containers and garbage).
7. No feeding, baiting or luring of any wildlife (including bears, small mammals, birds); do not approach or harass wildlife in any way. Notify the SO immediately if wildlife obtain garbage or human food. If wildlife get into attractants that have been intentionally or accidentally left out, individuals or the contractor could be charged under the *Canada National Parks Act* Regulations.

2.1.5 Equipment Operations & Fuelling

1. Equipment movements and workers' private vehicles shall be restricted to the designated footprint of the construction area.
2. Protective measures, including using appropriately sized equipment, or protective access matting must be employed if entry into wet areas is required.
3. Due to the importance of fescue grassland within WLNP, vehicles must not be driven onto any open grassland areas unless it has been designated by the SO as a parking area prior to construction activities.
4. Machinery must arrive on site in a clean and dry condition and be maintained free of fluid leaks, vegetative material (i.e., invasive species, noxious weeds) and soils from off-site. All construction equipment, including fencing materials, from outside WLNP will be washed prior to arrival to minimize the risk of introducing weeds or aquatic invasive species. Additional weed-cleaning stations may be designated by the SO depending on project activities and locations (see environmental alignment sheets).

2.1.6 Small Equipment

1. All small equipment (e.g., chainsaws, mowers, etc.) should be kept in good working condition and free of oil and fuel leaks.
2. Where possible, chain oil should be vegetable-based.
3. Fuelling of chainsaws will take place outside of riparian areas and sensitive features.

2.1.7 Site Clean Up/Waste Disposal

1. Clean tools and equipment at an appropriate off-site facility to prevent the release of wash water that may contain deleterious substances.
2. Sweep up loose material or debris. Any material that may pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.
3. No construction waste (sawdust, soil, vegetation, debris, pumped water, hydrocarbon, chemicals, cement, asphalt, etc.) shall be allowed to enter an aquatic habitat or be deposited on undisturbed lands unless the said lands are part of the project works and approved for temporary waste storage.
4. Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in WLNP. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside WLNP.
5. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if containing attractants, and waste loads shall be covered while being transported.
6. Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition. Sanitary facilities must be in good condition, and located away from sensitive resources including water bodies.
7. Camping and other recreational activities at the work site by contractors is not permitted without prior approval from the SO.

2.1.8 Air Quality Mitigations

1. Minimize idling of engines at all times.
2. Schedule dust generating activities during periods with lower wind speeds.
3. Ensure fine materials being transported are covered and protected.

2.1.9 Cultural Resources

1. Areas with known archaeological sites on or near the boundary fence are indicated on EAS.
2. To limit accidental damage, all known archaeological sites and a 30 m buffer around them will be staked and marked by surveyors prior to project activities.
3. The SO will be notified 48 hours in advance of any activities within these 30 m buffers.
4. Do not locate laydown or staging areas on known archaeological sites indicated on the EAS. Take extra care to avoid ground disturbance, using hand brushing methods only through these areas. No earthworks may occur in these areas. Where necessary and feasible, the SO may require protective access matting be placed to reduce unnecessary ground disturbance.

5. To protect unknown sites, follow all mitigations in this BMP to reduce and prevent ground disturbance during fencing activities.
6. All work in WLNP is subject to the accidental finds clause whereby on finding any unexpected Cultural Resources, workers shall stop work in the immediate area and notify the SO. Parks Canada's Terrestrial Archaeology section will provide advice and assessment of significance and determine requirements to mitigate the chance find. Examples of archaeological artefacts encountered in WLNP include buried bison bones, stone tools, above ground cairns, and artefacts from the original road and fenceline construction.

2.2 Use, Handling, and Disposal of Pressure Treated Wood

Construction design of the planned fence-line replacement incorporates the usage of Alkaline Copper Quaternary (ACQ) Pressure Treated Timber posts for the majority of its length. Parks Canada has specific guidelines for using treated wood with the purpose of reducing environmental impacts and health risks to employees and visitors. (Parks Canada 2009)

2.2.1 Usage of Treated Wood in Aquatic Environments

Particular attention should be given to the environmental risks associated with all structures placed in aquatic environments. Since the long-term impacts of treated wood on aquatic environments are relatively unknown and may vary depending on many factors, a preventive approach is essential. Best practices for usage of treated wood are as follows:

1. Treated wood should not be used under water or where it has contact with a body of water.
2. Proponents must conduct a thorough evaluation of the receiving environment before choosing the most appropriate construction material.
3. If appropriate, after having demonstrated the need to use treated wood in an aquatic environment, proponents must identify the most suitable type of wood treatment in regard to the characteristics of the receiving environment.
4. The use of treated wood should always be managed so that the resulting water and sediment concentrations of preservative active ingredients (including background concentrations) remain below water quality criteria and sediment benchmarks or quality criteria, where they exist.
5. Restrictions may be placed on the period when work can be carried out in order to protect sensitive aquatic species and reduce the risk of exposure to toxic elements during particularly sensitive life stages.
6. Polyethylene (PE) wear strips should be used to prevent abrasion of treated wood structures in aquatic environments.

2.2.2 Safe Handling of Treated Wood

1. Project managers should ensure that the treated wood to be used has been certified according to the standards of the treated wood industry.
2. Treated wood must be visually inspected before use to ensure that it appears clean and its surface is free of preservative residues, otherwise the lumber should not be used and should be disposed of in accordance with the manufacturer's guidelines and with local and provincial regulations.

3. Anyone who handles treated wood should wear gloves and a long-sleeved shirt. When sawing, sanding and shaping treated wood, workers should also wear dust masks and goggles to avoid touching or inhaling sawdust.
4. Workers must always cut and work with treated wood outdoors or in an adequately ventilated area.
5. Anyone who works with treated wood should wash their hands immediately after finishing their work, and especially before eating, drinking or smoking.
6. During and after construction, all remaining scraps, cuttings, wood chips and sawdust must be collected efficiently and in a timely manner. All wood waste must be disposed of in accordance with the manufacturer's guidelines and with local and provincial regulations.

2.2.3 Disposal of Treated Wood

1. **Never** dispose of treated wood by burning.
2. Do not compost scraps, wood chips or sawdust from treated wood.
3. Treated wood must be disposed of at an approved facility.
4. Re-use treated wood to the most reasonable extent possible.

2.3 Vegetation Brushing/Clearing

To mitigate potential impacts to Species at Risk (SAR) and breeding birds, it is best for clearing to occur after September 1st and should be planned accordingly. In accordance the *Migratory Bird Convention Act* (1994), Environment Canada provides guidelines to keep construction activities between April 1st and August 31st to a minimum whenever possible. In the event construction activities need to occur within this time period, Parks Canada will be notified and a qualified biologist/SO will report to the site to assess the area. If breeding/nesting activity is observed, mitigations and appropriate set-back distances will be implemented.

Brushing for fenceline installation must be scheduled outside the restricted migratory bird nesting period of **April 1 to August 31**. See timing windows section 2.1.2. For fenceline maintenance, if total vegetation removal is <0.5ha or <1 linear km of the fenceline, then the risk **may** be low enough to permit nest surveys and vegetation removal in the nesting window. Note that:

- The SO may determine the habitat is not suitable to complete nesting surveys and the project activities must be delayed until after August 31.
- Nest surveys must be completed by qualified individuals and the SO must approve all nest survey crew members.
- Nesting surveys must be completed within 7 days of project activities.
- There is a risk of delays to project activities due to the presence of nesting migratory birds.
- If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized protected buffer until the young have left the nest and vicinity. Size of buffer is species dependent, to be determined by the SO in consultation with federal regulatory guidance. Be aware that buffers can be as large as 1 km, and are not subject to debate or discussion.

Vegetation clearing can negatively impact bats in spring and summer. The timing windows for avoidance of vegetation removal activities in WLNP is April 1 to August 31 for vegetation likely to support roosting bats. If vegetation removal is scheduled to occur within this period, the SO may complete pre-work surveys for bat roosts.

- Roosting surveys must be completed within 7 days of project activities.

- There is a risk of delays to project activities due to the presence of bat roosts.
- If a potential bat roost is located, a site-specific mitigation strategy must be developed dependent on the type of roost and species present, to be determined by the SO in consultation with federal regulatory guidance.

Vegetation removal can negatively impact amphibians and reptiles, especially during breeding, transformation and important movement periods within and close to wetlands.

1. If vegetation removal is to occur within 300 m from a confirmed or potential amphibian breeding wetland, or within 500 m from a confirmed SAR amphibian breeding wetland, additional impact analysis is required and site-specific mitigations developed.
2. If vegetation removal is scheduled to occur during non-frozen conditions, the SO may complete an amphibian and reptile ground search immediately prior to equipment activities.
3. If ground disturbance activities are scheduled to occur in frozen conditions, amphibian exclusion fencing may be required in the preceding fall season at the discretion of the SO.

Other mitigations regarding brushing/clearing activities include the following:

1. The limits of the clearing are a maximum of 3 m within the park boundary and 1 m outside of the boundary. This RoW will be marked by surveyors prior to initiation of project activities.
2. Vegetation clearing should occur during when vegetation is dormant in the fall and winter seasons in order to reduce ground and tree root disturbance.
3. If previously unidentified sensitive features are found during construction, work will be stopped and the SO will be notified to determine how best to proceed.
4. All trees must be cut as closely to ground surface as possible, with stumps not exceeding 10 cm (preferably < 3 cm) in height from soil surface.
5. Where material is mulched, keep mulched materials within the construction footprint. The quantity and distribution of mulch must not impede wildlife movement, create a significant fire hazard or cause excessive nutrient flush to adjacent undisturbed vegetation. Do not place mulch in water bodies or sensitive areas indicated on EAS.
6. Where practicable, coarse woody debris from the clearing activities should remain on-site and scattered evenly adjacent to the RoW. The quantity and distribution of slash remaining must not impede wildlife movement, choke out native vegetation, create a significant fire hazard, or cause excessive nutrient flush.
7. In order to minimize the disturbance area, all vegetation planned for off-site removal will be stored on already disturbed areas until time of proper disposal.
8. Mechanical falling may be preferable at sites with numerous hazard trees to be retained for their habitat values, or where mechanical falling equipment can be used to minimize soil disturbance and better direct fallen trees away from environmentally sensitive areas.
9. Do not deposit any debris in water bodies or sensitive areas indicated on EAS. Debris, particularly chipped debris must NOT be placed through seasonally wet areas. This can lead to acidification and habitat degradation of these communities.
10. The safety of workers and the public is the first priority for all tree removal operations. In consultation with the SO, felling of snags or hazard trees outside the designated work area may be permitted. No work outside the RoW may occur without approval from the SO.
11. In some cases, logs from newly cut trees may be set aside for use elsewhere as directed by Parks Canada.
12. If applicable, logs and other salvage materials are to be conveyed to and placed at a storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways, or water bodies.

13. Equipment must be pressure-washed outside the park prior to the commencement of construction activities. The SO will inspect the equipment to ensure it is clean and free of any leaks before it is authorized for use.

2.4 Wetlands and Watercourses

All work in or within 30 m of wetlands and/or watercourses will be kept to a minimum and all applicable mitigations will be adhered to in order to reduce impact to aquatic and wetland habitat.

Time work in water to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. No in-stream work should occur during the period September 1 to August 15. All identified wetlands and watercourses should be considered fish-bearing and subject to in-stream work restrictions, until such a time that the SO can conduct an assessment of current conditions. The SO will be on-site to provide advice regarding changing site conditions and mitigation requirements on a day-to-day basis. Parks Canada will be available to review any additional proposed mitigations by the contractor.

Mitigations to be implemented starting with the least impactful method are detailed below in Subsections 2.4.1 and 2.4.2.

2.4.1 Wetlands

1. Diversion of fence-line and equipment in order to avoid difficult wetlands (create shoofly). Refer to guidelines in Section 2.4.3.
2. Delay work until dry/frozen conditions prevail (typically after October 1).
3. Hand work only.
4. Use of steel posts in wetland areas with a span greater than 3 metres.
5. Installing temporary crossing structures (e.g., rubber access matting or approved equivalent).
6. Use of tracked equipment to reduce impact on ground surface.

2.4.2 Watercourses

Watercourses are to be considered all dried/seasonal and/or actively flowing water areas (e.g., springs, streams, creeks, rivers, etc.). Required mitigations for these watercourses are dependent on their size as well as on the surrounding habitat. The below sections indicate the necessary considerations involved in determining how to approach each watercourse.

2.4.2.1 Less than 1 m Across

1. Hand work only.
2. Delay work until dry/frozen conditions prevail.
3. No crossing with equipment is permitted. In the event that crossing is concluded to be the **ONLY** option, a once in/once out approach will be used and only after approval by the Parks Canada SO. Any timing windows applicable to that waterbody must be respected.
4. Repeated crossings require structures to be implemented to reduce impact (engineered bridges).

5. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
6. Use of tracked equipment (e.g., argo, tracked UTV's etc.) to reduce impact.
7. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.

2.4.2.2 1 to 3 m Across

1. Hand work only.
2. Delay work until dry/frozen conditions prevail.
3. No crossing with equipment is permitted. In the event crossing is concluded to be the **ONLY** option, a once in/once out approach will be used and only after approval by the SO and Parks Canada.
4. Repeated crossings require structures to be implemented to reduce impact (engineered bridges).
5. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
6. Use of light duty tracked equipment (e.g., argos, tracked UTV's etc.) to reduce impact.
7. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
8. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, through re-vegetation with native species suitable for the site. A restoration plan must be developed and approved prior to disturbance of the banks.

2.4.2.3 Greater than 3 m Across

1. No crossing of watercourses > 3 m across is permitted. None are expected or identified on EAS. If such a watercourse is encountered, notify Parks Canada immediately.

2.4.3 Shoofly Creation

1. Avoidance of sensitive features may provide a simple solution to reduce ground disturbance and move equipment around sensitive features. Shooflies are permitted where they result in a reduction of overall severity of the disturbance footprint.
2. Shooflies can be utilized where other temporary crossing structures are not appropriate or will cause more harm (e.g. wetlands that are too deep, shrubby swamps, etc.).
3. All shooflies must be proposed and discussed with PCA prior to their creation.
4. Minimize the length and width of the shoofly around sensitive features.
5. Route shooflies through more commonly occurring habitats or those habitats that are known to be more resilient to disturbance (e.g., aspen woodlands, upland conifer forests).
6. A GPS track of the shoefly must be provided to PCA for inclusion in EAS updates.
7. Shooflies can be used during maintenance operations and brushed as part of those operations.
8. The fenceline will remain on the RoW, with hand tools used, however equipment may move around the area following the shoofly.
9. Shooflies must remain inside the WLNP boundary.
10. All mitigation measures and timing restrictions that are implemented for the RoW also apply to the creation of shooflies.

2.5 Erosion and Sediment Control

Once a construction contractor is awarded and the equipment requirements are clearly defined, an erosion and sediment control plan shall be prepared by the contractor to reflect the needs of the project. Before commencement of work, the plan will be reviewed by Parks Canada representatives to ensure it is considered sufficient for the task. The following minimum requirements must be addressed in the ESCP:

1. Delaying work until periods of dry/frozen conditions.
2. Project design and spatial concept of environmental sensitivities (e.g. watercourses, wetlands, steep slopes, etc.).
3. Erosion prevention procedures (e.g., project schedule, minimization of work area, site management, ground cover measures and their locations).
4. Sediment control measures (e.g. sediment fences, check dams, sediment traps, etc.) including locations of application, specifications and Typical Drawings of sediment control structures;
5. Retain a 30 m vegetated buffer around wetlands/waterbodies or install runoff management structures.
6. During grade construction (only if necessary and approved by SO) conducted close to any watercourse, waterbody or wetland, ensure that materials are not pushed, do not fall, or are in any way eroded into the waters or wetlands.
7. Do not schedule work for areas with high potential for sediment release (slopes, waterbodies, watercourse) during rainy/windy weather conditions.
8. In the event of work occurring during rainy conditions, appropriate control measures (e.g., silt fencing, landscape fabrics) in areas of potential sediment release must be implemented. Outline what activities will be suspended during rain and snowfall.
9. Outline the training that workers will receive in being aware of the location of erosion and sediment control measure application.
10. Workers will keep up-to-date records of all prevention, control measures and corrective actions.
11. Outline the inspection and maintenance schedule for any erosion and sediment control measures and structures during the course of construction.
12. Use shooflies (in consultation with SO) to bypass steep areas or difficult wetland/watercourse crossings and clearly identify locations of shooflies in the EAS.
13. Keep overall equipment movement to a minimum in order to reduce soil compaction and impact to exposed soil areas.
14. Address how the workplan will keep vegetation removal in order to maintain soil stability. For example, use of hand brushing to maintain low growing vegetation and maintain soil stability on slopes.
15. Address how the workplan will reduce travel across sloped areas wherever possible to reduce potential erosion and sediment migration. Identify equipment that will be restricted from slopes steeper than 5H:1V, and what tracked equipment will be restricted on slopes steeper than 2H:1V.

2.6 Vegetation Restoration

1. Where ground has been disturbed, use topsoil seedbank in small areas where there is no risk of erosion or competition from invasive species (i.e., natural regeneration).
2. Implement restoration plan for the disturbed area immediately following completion of construction.

2.6.1 Topsoil Replacement

1. Minimize soil movement and handling to protect the existing native seed bank.
2. Replace topsoil to all areas immediately following fine grading.
3. Do not compact topsoil.
4. Where insufficient topsoil is available, the SO may approve moving soil from different projects or areas of WLNP. Imported soil may be used as a last resort and must be from a supplier that has been inspected and approved by the Park Vegetation Ecologist. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.
5. Slopes to be seeded should be no steeper than 2 horizontal to 1 vertical (2:1) and covered with a minimum of 5 cm (2 inch) of topsoil. Finish grading should always follow top soil placement. Maintain structure (i.e., rocks, roots, woody debris) in topsoil.
6. Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or other erosion control is required.
7. Methods of bioengineering such as terracing, willow staking and live pole drain systems should be assessed as solutions where soils are steeper or remain unstable.

2.6.2 Seeding Disturbed Areas

1. In areas where there is risk of erosion or invasion from native species, complete initial seeding as soon as possible.
2. The seedbed will be scarified by hand or, with the approval of the SO, by machine on large areas (i.e., roadbeds) where it is accessible and appropriate.
3. The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.
4. The cleats of a tracked vehicle or a harrow device will be used, where possible, to prepare an adequate seedbed with seedling safe-sites (microsites) substantially free of soil crusts.
5. Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.
6. Supplemental planting should be timed for the species and location. Seeding in the fall allows for full scarification of the seed over the winter. Consider using seed that requires shorter scarification times for spring and summer applications. Transplants may do best in the spring and summer and can require watering or other maintenance.
7. Time weed control measures to prevent seed propagation.

2.6.2.1 Species Selection

1. When selecting species and varieties:
2. Use species of local native plant communities.
3. Avoid use of cultivars.
4. Species viability in proposed environment and climatic conditions.
5. Capability to effectively control erosion, where required.
6. Adaptation to the variable site conditions of undulating topography.
7. Consider palatability of some species to herbivores and avoid growing attractants in areas of increased risk to wildlife and visitors.

8. Variable life expectancy to produce variable, delayed die-out of seeded species and replacement with indigenous native plants.

2.6.2.2 Seed Mix Selection

1. The SO will contact the Park Vegetation Ecologist to determine an appropriate mix for the disturbed area.
2. Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used conditional upon availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.
3. Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.
4. Do **NOT** purchase seed until written approval is obtained.
5. Certificates of Analysis must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.
6. All seed is subject to testing by PCA prior to use.

2.6.2.3 Seeding

1. Use only seed purchased after written approval is obtained.
2. Seed and stabilize (e.g. mulch/tackifier) bare areas as soon as possible after disturbance, preferably as soon as a significant area is graded and finished and before the next rain event. If there is a risk of seedling mortality as a result of fall frost stabilize until appropriate growing conditions exist.
3. Use temporary seeding when outside the seeding dates for permanent vegetation.
4. Apply a seed mixture which is appropriate for the climate, soil, and drainage conditions of the site.
5. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions.
6. Conduct broadcast seeding under calm wind conditions. Hydro-seeding is acceptable where access is available.
7. Do not increase the seeding rate to compensate for poor seedbed conditions.
8. Monitor temporary erosion control measures to prevent seed loss.
9. Supplemental seeding may be required in subsequent years.

2.7 Fuel Storage/Spill Response

1. A Spill Response Plan should be prepared and should detail the containment and storage, security, handling, use, and disposal of empty containers, surplus product, or waste generated in the application of these products as approved by the Parks Canada Impact Assessment Office.
2. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on-site receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.
3. All fuel products must be transported, stored and handled according to TDG requirements and manufacturer directions.
4. All fuel containers must be inspected prior to storage to ensure they are in good condition with no apparent leaks or corrosion.

5. Fuels should be stored in previously disturbed areas with easy access routes, wherever possible. If damage to soils or vegetation occurs from storage and access activities, restoration may be required.
6. Where adequate containment for the full volume of fuel at a single site is impractical, drums or containers should be stored in a manner that facilitates mobilization in the event of an accident or emergency, such as a fire or explosion.
7. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels.
8. Spill kits capable of containing 110% of the fuel volume must be kept at storage and refuelling sites at all times.
9. Spill kits shall be provided at re-fuelling, lubrication, and repair locations.
10. Absorbent booms must be immediately available on-site during works in and near water.
11. Equipment will be fueled on hardened surfaces wherever possible.
12. Refueling areas must be a minimum of 100 m from any water body, source of flame or spark, or sensitive visitor or ecological area.
13. Timely and effective action shall be taken to stop, contain and clean up all spills.
14. All gas generators require secondary containment
15. Hazardous or toxic products shall be stored no closer than 100m from any water body.
16. The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the contractor.
17. The SO shall be notified immediately of any spill.

Minimum Requirements:

1. List of products and materials that are considered or defined as hazardous or toxic to the environment.
2. Fueling procedures, fuel storage.
3. Spill response (i.e., containment, clean-up, disposal of contaminated materials, etc.).
4. Spill reporting procedure; and,
5. Up-to-date emergency response contact list including contact information for reporting spills.

The site will be inspected to ensure completion to the expected standard and to the satisfaction of Parks Canada.

2.7.1 Spill Reporting Requirements

Immediate spill reports are verbal notifications and must include all available information. Follow-up written spill reports must include the following:

- Prime Contractor name
- Name and contact number
- Location and time the spill occurred
- Type and quantity of the substance spilled
- Cause of the spill
- Size of area the spill spread to
- Was the spill in water or on land
- Does the spill have potential to enter a water body
- Detail of immediate action taken to control the spill
- Additional actions required or ongoing to control the spill
- Any restoration required at the spill site
- Names of SO that was present at the spill site

2.8 Fire Contingency Plan

1. An emergency fire contingency plan is required for projects where risk of fire exists (e.g. for operations on dry grassland habitats) as requested by the SO in consultation with the Fire Management Officer.
2. Fires or burning of waste materials is not permitted.
3. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on-site receive a briefing about the Fire Contingency Plan and are aware of the location of emergency equipment, such as fire extinguishers.
4. The fire contingency plan will include, at minimum, the required equipment as defined in **Table 1**, adapted from the of *The Forest and Prairie Protection Regulations, Part 1* (Province of Alberta 1972).
5. The fire contingency plan must at minimum contain the following information:
 - Required equipment on-site
 - Fire prevention procedures
 - Initial response; fire reporting procedure
 - Up-to-date emergency response contact list

Table 1. Adapted Alberta Forest and Prairie Fire Protection Regulations AR 135/72

Required Equipment for Fire Control	People Employed at the Site of Operations									
	1	2	3	4	5	6-10	11-20	21-30	31-40	41+
Shovels	1	1	2	2	3	5	10	15	20	Same as 31-40 plus increase as required by SO
Back Pack with Pump	0	0	1	2	3	5	10	15	20	
Axe or Pulaski	0	1	1	1	2	5	10	15	20	
Fire Pump	0	0	0	0	0	0	0	1	1	
Fire Hose (metres)	0	0	0	0	0	0	0	450	450	
Power Saw	0	0	0	0	0	0	0	1	1	

2.9 Waste Disposal

1. No construction waste (sawdust, soil, vegetation, debris, pumped water, hydrocarbon, chemicals, cement, asphalt, etc.) shall be allowed to enter an aquatic habitat or be deposited on undisturbed lands unless the said lands are part of the project works and approved for temporary waste storage.
2. Waste will not be discarded, burned or buried along the fence line work area or anywhere else within the park.
3. Any material with the potential to cause contamination to soil, waterbodies or ground water will be disposed of off-site in the appropriate manner.
4. All other miscellaneous waste material will be bagged and removed from site daily.

3. References

Government of Canada. 1994. Migratory Birds Convention Act, 1994. Available at: <http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>. Accessed May 2016.

Parks Canada. 2009. Guidelines for the Use, Handling, and Disposal of Treated Wood. Available online at: https://buyandsell.gc.ca/cds/public/2013/08/13/859712001dd972216e852781f34d28fe/annex_e_treated_wood_guidelines_-_eng.pdf. Accessed May 2016.

Parks Canada. 2015. Archaeological Overview Assessment, Boundary Fence Brush Clearing, Waterton Lakes National Park. Prepared for: Parks Canada Agency. Prepared by: Gwyn Langemann from the Heritage Conservation and Commemoration Directorate of Parks Canada.

Province of Alberta. 1972. The Forest and Prairie Protection Regulations, Part 1. Forest and Prairie Protection Act. Available online at http://www.qp.alberta.ca/documents/Regs/1972_135.pdf. Accessed May 2016

Parks Canada Agency. 2016. Waterton Lakes National Park General Best Management Practices ver. 1.1., Waterton Lakes National Park.

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