



## Parks Canada Basic Impact Analysis Template

### 1. PROJECT TITLE & LOCATION

## Barters Brook Bridge Installation, Gros Morne National Park

**Location:** Lomond campground access road, Gros Morne National Park (49.445833 N x -57.753312 W)

### 2. PROPONENT INFORMATION

Parks Canada – Gros Morne National Park

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### 3. PROPOSED PROJECT DATES

Planned commencement: March 19, 2018

Planned completion: May 25, 2018

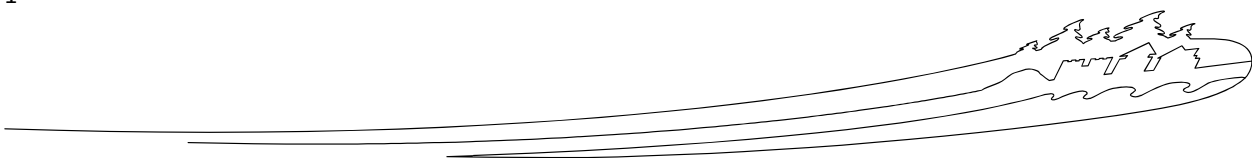
### 4. INTERNAL PROJECT FILE #

GMNP-2018-004

### 5. PROJECT DESCRIPTION

From January 12-14, 2018, western Newfoundland experienced a severe storm that included heavy rainfall, unseasonably mild temperatures (>10° C), and high winds (>100 km/h). In addition to the rainfall, this weather event melted virtually all of the snowpack (>60 cm) in a period of ~24 h, leading to extreme surface runoff that caused substantial damage to roads, bridges, and other infrastructure in Gros Morne National Park. Included in the damage was the bridge that crosses Barter’s Brook along the access road to Killdevil Camp and the Lomond Campground (see Figure 1). As a result there was an urgent need to remove the damaged bridge and replace it as there was a risk that the dislodged bridge deck and / or footings would have fallen into the river, damming it and consequently risking further washouts and damage to the road on either side (see Figure 2); bridge demolition and removal was carried out in February 2018. This bridge was 8.00 m wide x 8.54 m long with a concrete deck and vertical concrete abutments. The span between the abutments was 4.88 m and it sat ~5 m above the stream bed.

Now that the damaged bridge has been removed there is a pressing need to replace the bridge with a new crossing structure, as the Lomond road provides access to two camps that are important for the delivery of park programs during spring and summer. The new bridge will be 24.38 m long and it will sit ~3.5 m above the stream bed with sloped embankments leading up to the footings. The bridge will be fit to the existing road alignment and will be a two lane prefabricated panel bridge with cast-in-place spread footing abutments. Embankments will be protected with rip rap armour stone. All work as a part of the bridge installation should occur outside the wetted perimeter of the stream. However, debris – primarily rock and trees – has redirected the channel (see Figure 3) and created two sharp turns within ~50 m upstream of the bridge location, creating a risk of further damage, washouts and continued bank erosion. Consequently the channel approaching the bridge crossing may need to be cleared and straightened. In stream work may also be required to remove a large buildup of washed out trees in the channel downstream of the bridge. Any in stream work related to bridge installation or channel modification / clearing will require appropriate mitigations.





Components of bridge construction that will be addressed in this BIA include:

- staging of equipment and materials, and snow clearing if required;
- crossing Barter's Brook (equipment and personnel) to access the northern approach;
- removal of an existing, improperly installed culvert on the northern approach;
- excavation, grading of embankments, and placement and compaction of fill to prepare approaches for spread footings;
- installation / casting of spread footings and concrete abutments;
- repair and grading of embankments and ditches on road approaches on either end of the bridge;
- assembly and installation of the panel bridge and fixed bearings;
- installation of armour stone / rip-rap along stream banks and toe of road embankments to prevent erosion;
- placing roadway aggregate and granular material on approaches;
- removal of excavated materials;
- paving the road approaches on either end of the bridge;
- installation of guard rails;
- hydro-seeding of embankments along the road approaches;
- in-stream work may be required to remove trees and other debris that may block the channel upstream or downstream of the bridge, and also to straighten the stream channel approaching the bridge.



Figure 1. Location of bridge installation in Barter's Brook on the Lomond Campground access road in Gros Morne National Park.

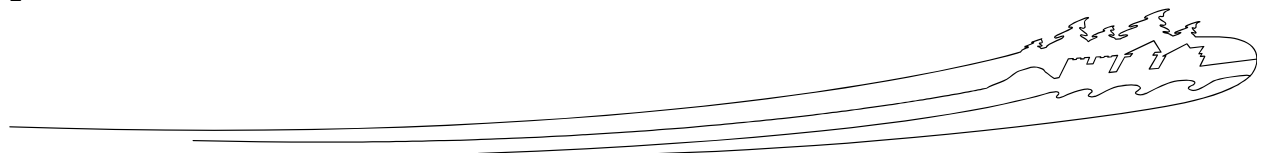
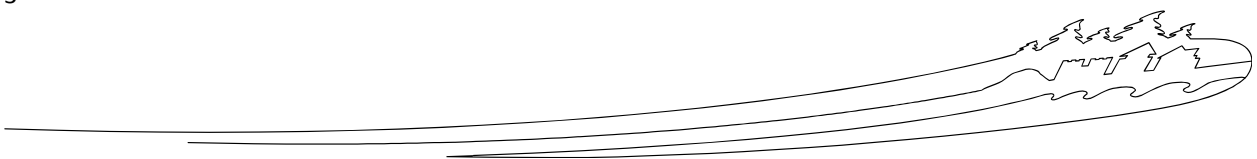




Figure 2. Damaged bridge crossing Barters Brook along the access road to Lomond Campground; this bridge was removed in February 2018.



Figure 3. Barters Brook upstream of road crossing, showing new bends in channel and debris from flooding.





## 6. VALUED COMPONENTS LIKELY TO BE AFFECTED

### Natural Resources

- Air quality and noise: In addition to ambient air quality and natural noise levels (e.g. from wind and stream flow), the project area will be subject to emissions and noise from equipment.
- Soil and Landforms: The project area for road approaches and bridge work should remain within the existing road footprint, where soils and landform have been previously disturbed and altered by road construction. The stream channel itself is steep banked and rocky. The channel was heavily disturbed and reshaped by the January 2018 flood so stream banks are often overhung by undercut trees and forest duff that was undercut by bank erosion.
- Surface water (fresh and marine waters). The road crossing spans a ~3-5 m wide stream that flows directly into the Lomond River estuary ~500 m further downstream (see figures 1-3). The stream is fast flowing and follows a relatively steep gradient, and includes riffle, run and some pool habitat with a stream bed characterised by rock, cobble and gravel. Water Quality is likely good, though suspended sediment levels may be somewhat elevated, particularly during runoff events, due to erosion and bed movement that resulted from the January 2018 flood. Due to steep terrain and shallow bedrock watersheds in the Lomond area are prone to flash flooding during runoff events.
- Flora: The area is typified by upland and riparian boreal forest vegetation, with balsam fir, black spruce, white spruce, trembling aspen, red maple and paper birch comprising most of the forest canopy. Existing road embankments support grasses and alders. Riparian vegetation is characterised by alders and other woody shrubs as well as the aforementioned tree species, and was heavily disturbed by the January 2018 flood and in many areas has been undercut by erosion.
- Fauna: Fish surveys have not been conducted in Barters Brook, but adult and juvenile Brook Trout [*Salvelinus fontinalis*] are likely present. In addition, there is the possibility of downstream effects in the Lomond River estuary, which supports various fish species adapted to brackish water such as sticklebacks and also is a migration route for Atlantic Salmon [*Salmo salar*] entering and leaving the Lomond River. Aquatic Invertebrates, including various taxa such as mollusks and arthropods are likely found in the stream but in the Lomond River estuary. Various terrestrial fauna typical of Newfoundland's boreal forests may be in the area, including landbirds (e.g. Red-breasted Nuthatch, Black-capped Chickadee, various woodpeckers, and Belted Kingfisher), and such mammals as moose, mink, and various small mammals. The Lomond River estuary is heavily used by waterfowl such as Red-breasted and Common Merganser, Common Goldeneye, and Canada Goose.
- Species at risk: None known in area and no critical habitat in area.

### Visitor Experience

- The Lomond access road provides the only road access to Lomond Campground and Killdevil Camp.
- A park trail follows the Lomond estuary, ~450 m downstream from the Barter's Brook Bridge crossing.
- Motorized and non-motorized visitors (e.g. pedestrians, cyclists) and staff for the Lomond Campground and Killdevil camp use the Lomond access road.

### Cultural Resources

- None known: Bridge installation will occur in areas that were already disturbed by road construction (see attached Archaeological Overview Assessment).

## 7. EFFECTS ANALYSIS

Effects analysis considers possible interactions between the project infrastructure components and activities and the Valued Components, within the project area. Interactions may be direct or indirect and may cause a positive or negative effect. Potential effects of on the key indicators are identified by comparing the existing conditions to those which are expected to result from the introduction of the project. Note that these effects do not consider the adoption of planned mitigation measures identified in the next section, which will largely control/minimize the possible effects identified here.





## Natural Resources

### Air quality and noise:

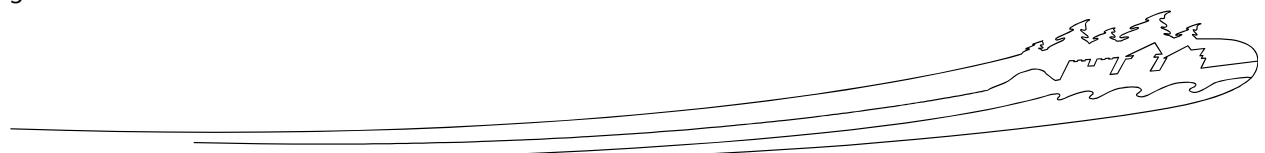
- Construction activities could lead to an increase in noise, dust and vehicle emissions above baseline (i.e., daily highway traffic volume), and a decrease in ambient air quality.
- Dust may come from disturbance of exposed soils by vehicles and wind, as well as construction activities such as excavation and mixing of cement. However the probability of dust being generated from disturbed soils is limited by the fact that work will be conducted during spring, when the ground is typically damp in western Newfoundland.

### Soil and Landforms:

- The current stream channel and bank are unstable. Reshaping and armouring of embankments should greatly reduce the risk of further erosion.
- Bridge and road work will remain within the existing road footprint, so will have a limited effect on undisturbed soils and landforms.
- Road embankments and ditches will be shaped and either re-vegetated with hydro-seed or armoured with rip rap.
- Removal of upland and riparian vegetation, soil disturbance due to construction activity, and decommissioning of old road and bridge structures could destabilise soils and shorelines, increasing the risk of erosion.
- Construction activities can lead to unnatural ground surfaces contours (e.g. rutting).
- Accidental spills and leaks from equipment and construction materials can impact soils.

### Surface Water:

- The current stream channel and banks are unstable and may be realigned during bridge installation. Reshaping at a 2:1 slope grade and armouring of embankments should greatly reduce the risk of further erosion and consequent runoff of silt and sediment into the stream.
- Disturbance of the stream bed could lead to siltation and increased turbidity in Barter's Brook and possibly also the estuary.
- The period of work (March-May) coincides with spring snowmelt and is also often characterised by persistent spring rains, meaning that flow rates in Barter's Brook may be high and variable, and may even reach flood stages during the course of work. Surface runoff rates may also be high at times, increasing the potential for erosion of disturbed soils. These factors mean that there is potential for increased siltation and turbidity in Barter's Brook and possibly also the estuary, and also increase the risk of construction materials (e.g. temporary crossing structures and unsecured materials) being washed downstream.
- Riparian and upland vegetation may be removed and soils and aggregate may be disturbed, exposed, and stockpiled due to construction activities. This could create the risk of sediment runoff that could impact water quality in Barter's Brook and in the Lomond estuary.
- Toxic spills or leaks from machinery, equipment and construction materials (e.g. concrete) could significantly impact water quality in Barter's Brook and in the Lomond estuary.
- Fuels and materials stored at temporary staging areas have the potential to leak and leach into ground and surface water.
- In order to prevent future washouts and erosion the stream channel may need to be straightened and realigned back to its original route under the bridge, potentially affecting stream channel dynamics. This would also necessitate in-channel work that could cause siltation that could impact water quality in Barter's Brook and in the Lomond estuary.





Flora:

- Some riparian and upland vegetation may be removed in order to accommodate the longer bridge and modified ditches and road embankments. However most work will fall within the existing road footprint and the majority of the riparian zone was scoured in the January flood so this risk is likely limited.
- Improper cleaning of machinery may transfer and spread invasive plant species.
- Accidental fuel or oil spills from construction equipment could contaminate soils and groundwater, with adverse consequences for vegetation.
- Soil disturbance in construction and staging areas may create habitat conducive to the establishment of invasive plant species that would displace or compete with native vegetation.

Fauna:

- Based on DFO self-assessment criteria (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) it was determined that this project does not require a DFO review because:
  - Any debris removal will be necessary to protect the bridge abutments
  - It is a clear span bridge
  - No temporary or permanent fill will be placed below the high water mark
  - Culvert removal will be isolated from flowing water
  - There will be no obstruction of fish passage during critical timing windows or otherwise
  - There will be no impacts to SARA listed species
- Regardless of any requirement for DFO review, recommended measures to avoid causing harm to fish and fish habitat (see: <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html>) are to be followed, as detailed in the mitigations below.
- Work will occur at a time of year when there is little or no migration of fish between the freshwater and marine environments.
- Disturbance of the stream bed and stream banks, as well as erosion from upland areas where soils are disturbed by construction activities, could lead to siltation and increased turbidity in Barbers Brook and possibly also the Lomond estuary. This could adversely affect water quality for aquatic fauna.
- Contamination of Barbers Brook from toxic spills or leaks from machinery, equipment and construction materials (e.g. concrete, runoff sediment) could impact the health and survival of freshwater and marine fauna at or downstream from the construction site.
- Stream realignment could alter freshwater habitat characteristics.
- Work will occur prior to the return of most migratory birds and prior to the breeding season for most birds and small mammals.
- Removal of riparian and upland vegetation could lead to loss of food sources and habitat for terrestrial fauna such as songbirds.
- Construction noise and activities may cause temporary avoidance behaviours, and also disrupt feeding and breeding activity of wildlife in the area.
- Improperly stored construction materials, garbage, and food may act as wildlife attractants, increasing risk of human-wildlife conflict and roadway mortality.
- Accidental fuel or oil spills from construction equipment may negatively affect wildlife and habitat quality through contamination of vegetation or water sources used by wildlife.

Visitor Experience

- The Lomond road will be closed to public access during construction activities, but regardless construction activities could represent a hazard to any unauthorized people in the area.





- The Lomond Campground and Killdevil Camp are currently inaccessible to vehicle traffic as there are no other crossing structures. These areas will remain inaccessible until the new crossing structure is installed.

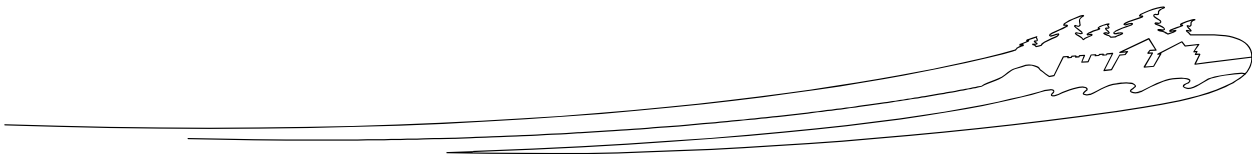
Cultural Resources

- While the Archaeological Overview Assessment did not indicate that there are any known cultural resources in the project area, and most work will be in previously disturbed sites, there is always some chance that previously unknown cultural resources may be found during construction activities.

**8. MITIGATION MEASURES**

General Mitigations

1. The contractor will prepare an Environmental Protection Plan (EPP) in accordance with Parks Canada Environmental Procedures, a minimum of 10-15 business days before construction. This EPP should address all mitigations listed here, and prior to work beginning the EPP must be approved by the Parks Canada. The EPP will include, but not be limited to:
  - A Work Area Plan showing proposed activity in each portion of area and including details on how the work limits will be marked and procedures to keep operations within the clearing boundaries to minimize damage to peripheral vegetation and soil.
  - An overall site Erosion and Sedimentation Control (ESC) Plan which outlines areas where erosion and sedimentation are likely to occur and the means by which the Contractor proposes to control these issues. In addition, a localised ESC plan which directs specific mitigation for working in close proximity to Barters Brook may be required at the discretion of the Parks Canada Environmental Officer (EO). The ESC plan must also include methods and mitigations for the long term stability of slopes within the construction footprint at the interface of the bridge abutments and the river.
  - A Hazardous Materials and Spill Contingency Plan (HMSCP) that details the containment and storage, handling, use and disposal of empty containers, surplus fuels, or other hydrocarbon products to the satisfaction of the Parks Canada and in accordance with all applicable federal and provincial legislation. The HMSCP will include a list of products and materials to be used or brought on site that are considered or defined as hazardous or toxic to the environment. Such products may include, but are not limited to, fuels and lubricants. The Safety Data Sheets (SDS) for all chemicals used will be made available onsite. Appropriately sized and stocked spill kits will be on site capable of handling 125% of the largest potential spill. All contractor's staff will be made aware of their location(s) on site and will be trained on spill response procedures.
  - A waste management plan (including industrial waste, domestic waste, and human waste), which among other things identifies methods and locations for solid waste disposal.
  - Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
  - Note that though this Basic Impact Analysis (BIA) specifies that the contractor must prepare an Environmental Protection Plan, if these two documents are not consistent the most rigorous with regard to environmental stewardship shall be followed.
2. All relevant mitigation measures outlined in the Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure (BMPs; PCA, 2015) will be followed. These allow an identified suite of well-understood project activities to proceed such that there will not be resulting significant adverse environmental effects. The BMPs are applicable when the project activities are routine and repetitive with well-understood and predictable effects. If the mitigations listed in this BIA or the Contractor's EPP





conflict with the PCA Highways BMPs, the most rigorous with regard to environmental stewardship shall be followed.

3. Prior to starting work on site all contractor personnel working on site will be required to attend an on-site environmental briefing conducted by Parks Canada's Environmental Officer (EO) and project manager to review the mitigation measures required in this BIA. Though it has not yet been determined who may be serving as the EO, general contacts for Parks Canada include:

**Darroch Whitaker**, Ecologist, Parks Canada, Rocky Harbour.

Email: [darroch.whitaker@pc.gc.ca](mailto:darroch.whitaker@pc.gc.ca) Office: 709-458-3464

**Trevor Rendell**, Resource Conservation Manager, Parks Canada, Rocky Harbour.

Email: [trevor.rendell@pc.gc.ca](mailto:trevor.rendell@pc.gc.ca) Office: 709-458-3542, Cell: 709-636-4679

#### Equipment

4. Prior to arrival on site equipment must be properly tuned, cleaned and free of contaminants, in good operating order, free of leaks (e.g., fuel, hydraulic fluid, coolant, oil or grease), and fitted with standard air emission control devices, spill pans, and spark arrestors. It should also be maintained free of invasive species, noxious weeds, and soils.
5. Equipment will be inspected daily for fuel, hydraulic fluid, and other leaks, and for structural integrity, and inspections will be recorded. Detected leaks will be addressed immediately.
6. Equipment maintenance is not permitted within the Park boundaries.
7. Equipment operators must be fully trained and experienced.
8. Fueling heavy equipment is prohibited within 100 m of the stream or open water, and must be carried out in a level area on either an impermeable roadside or at a staging area with spill catchment countermeasures in place. Fueling sites should not drain towards water bodies or wetlands.
9. Fueling of small engines (e.g. generators, chainsaws) will not be permitted within 30 m of open water and portable containment pads must be used to prevent ground contact by accidental fuel spills.
10. Storage and movements of heavy equipment and workers' private vehicles shall be restricted to the 'footprint' of the construction and staging area only. Further, machinery (e.g., excavators, bobcats, chainsaws, and generators) must be stored and maintained on a flat surface at least 100 meters from the shoreline.
11. To prevent materials (e.g. soil, rock, construction material, etc.) from escaping from trucks, all loads must be covered or tarped during transport through the park.
12. It is recognized that machinery, building materials, and personnel will have to cross Barter's Brook to gain access to the north side to undertake work on this project. Any stream crossings will be made using an environmentally friendly, safe approach that is pre-approved by Parks Canada. Further, any crossing structures must be structurally sound and also must be able to be removed quickly if at risk due to high runoff (floods).

#### Hazardous materials and contaminants

13. As part of the Environmental Protection Plan, the Contractor must submit and then comply with a Hazardous Materials Management and Spill Contingency Plan.
14. Handle and store hazardous materials as per applicable federal legislation/regulations. The contractor must have all relevant and current Material Safety Data Sheets available onsite.
15. Hazardous or toxic products (fuels, lubricants, paint, sealants, etc.) must be (i) securely stored, (ii) shall not be stored within 200 m from any stream, wetland, or water body, and (iii) shall not be disposed of in the national park.
16. Storage of large amounts of fuel (more than 900 L) in the Park is not permitted.







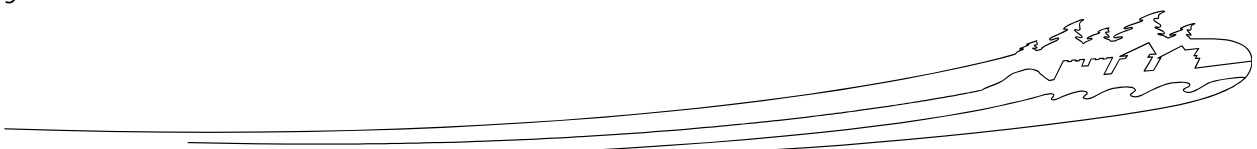
17. Fuels, gases, or other deleterious substances will be contained within the appropriate and approved containers, and tanks, hoses and connections will be inspected prior to use.
18. Secondary containment and spill kits must be available on site during all periods of work. These must be able to handle 125% of the largest potential spill, and workers must be trained in their use and aware of their location.
19. Spills (e.g. hydraulic fluids) will be responded to immediately according to the Contractor's Spill Response Plan. In the event of any fluid spills or leaks, the Spill Response Plan will be followed, including immediate containment, cleanup/mitigation, and immediate reporting to Parks Canada. Any absorbent materials used in the clean-up or soils contaminated by the spill will be disposed of in the appropriate facilities and transported in accordance with the federal Transportation of Dangerous Goods Regulations. All spills will be reported to Parks Canada's EO.
20. Following the cleanup of any spill larger than 5 L the spill site will be inspected to ensure there is complete containment and disposal to the satisfaction of Parks Canada.

#### Waste

21. Burning of any vegetation or worksite materials is prohibited in the park.
22. Dumping leftover asphalt off the worksite is prohibited. A temporary onsite location may be permitted for clearing small amounts from trucks, but only with prior approval from the park's environmental officer.
23. Excess mixed cement should be disposed of at an approved landfill or equivalent facility outside the park. Straw bales, wood stakes, and sandbag materials can be used to construct temporary containment walls or "barriers", and these must be sufficient in size to contain all liquid and concrete waste with a minimum of 10 cm (4 inches) freeboard. Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material. Collected wastewater must then be removed from the site and hardened concrete shall be broken up, removed, and disposed of outside the park at an approved landfill or equivalent facility.
24. Sanitary facilities, such as a portable container toilet, shall be provided at the work site, maintained in good working order, and emptied outside the park at an approved waste treatment facility.
25. To prevent habituation of wildlife, human wildlife conflict, and risk of wildlife being struck by vehicles, garbage that includes food waste or other wildlife attractants must be securely stored so that it is not accessible to wildlife, and should be disposed of daily.
26. Disposal of treated wood wastes including saw-dust must be outside of the Park, and in accordance with all applicable Provincial and Municipal regulations. Similar attention must be given to disposal of the replaced guiderail posts which have been treated with creosote.
27. All construction waste shall be disposed outside of the park at the appropriate waste management facility.

#### Erosion and sediment control

28. As indicated above, as part of the EPP the contractor must prepare an Erosion and Sedimentation Control (ESC) Management Plan and submit this to Parks Canada's EO for approval prior to the start of earthworks activities.
29. Excavated material and debris must be stored in a stable area, above the high water mark or active floodplain and 15m from drainage features and/or the top of steep slopes. Protect excavated material from re-entering the water body (e.g., cover with erosion blankets, seed or plant with native vegetation).
30. All surplus excavated material must be removed from the Park as soon as possible and disposed of at an approved location and in an approved manner.
31. Erosion and sedimentation controls must be installed prior to earthworks activities commencing. Regularly inspect and maintain erosion and sediment control structures during all phases of the project and modify or enhance measures as necessary. Particular attention must be paid to activities in areas draining into Barter's





Brook or other wetlands or water bodies; erosion and runoff silts from exposed soils must be prevented from entering the stream.

32. Whenever possible use erosion and sediment control products made of 100% biodegradable materials (e.g., jute, sisal or coir fiber). Ensure backing materials are also biodegradable.
33. Stockpiled aggregates and construction materials must be stored at an approved site far enough away from open water to prevent runoff of sediment or potential contaminants from entering the stream and nearby wetlands.
34. To reduce erosion and sediment runoff, grubbing and stripping of topsoil should be carried out under dry conditions (i.e. no surface runoff) whenever possible.
35. Construction and equipment travel will be minimized during periods of heavy precipitation and excavation activities halted during heavy rainfall events (50 mm or more in 1 hour).
36. Erosion- and sediment-control materials will be readily available on-site. Materials may include but are not limited to rock, gravel, mulch, straw, straw bales, grass seed (seed mixture of 70% annual rye and 30% creeping red fescue), bio-degradable erosion control blankets, sediment fencing, staking, and polyethylene sheeting.
37. Prior to removal of sediment and erosion control measures, all disturbed surfaces and shorelines shall be stabilized and/or re-vegetated as soon as possible. Remove accumulated sediments prior to removing erosion control products.

#### Additional environmental mitigations

Note that the mitigations listed above will address many potential impacts on valued components of the environment, visitor experiences, and cultural resources. The following additional mitigations are required to further protect specific elements of these resources.

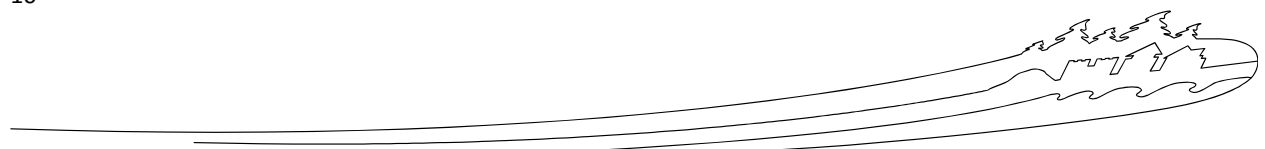
#### Air quality and noise

38. Should dust control be required on the construction site or roadbed, only fresh water will be permitted.
39. Burning of waste (organic or industrial) is not permitted in the park.
40. All equipment, vehicles and stationary emission sources will be well maintained and used at optimal loads for minimal noise and air emissions.
41. Minimize idling of engines, contingent on operating instructions and temperature considerations.

Soils and Landforms (Note that many mitigations listed elsewhere will also mitigate impacts on soils and landforms, especially those for erosion and sediment control and also for vegetation impacts)

42. Borrow areas are not permitted in the project area.
43. Any topsoil that is being removed should be salvaged and stockpiled to be used for site landscaping and restoration throughout the course of the project.
44. When earthworks activities are complete in any area that will not form part of the finished bridge, armoured embankments, or road approaches, loosened soils should be shaped to match the local terrain and ensure noticeable construction impacts (e.g., ruts, holes, depressions, compacted areas) are appropriately re-graded, back-filled with topsoil, re-contoured and capped. Salvaged topsoil should be spread in areas lacking sufficient soil for plant growth; topsoil should be spread evenly and should not be compacted. Hydro-seeding or bio-degradable erosion control blankets may be required to stabilize exposed soils along some back slopes. If restoration occurs during the growing season a seed mixture of 70% annual rye and 30% creeping red fescue should be applied.

Surface water (fresh and marine waters) (Note that many mitigations listed elsewhere will also mitigate impacts on surface water, especially those for erosion and sediment control and hazardous materials and contaminants)





45. Construction equipment is not permitted to operate in water.
46. Any in water work or work in de-watered sections of the stream channel, including mitigations, must be discussed with and pre-approved by Parks Canada's EO.
47. Where in-water activity is necessary, functioning site isolation measures to contain suspended sediment (e.g., sandbags, coffer dams, silt curtains, or silt booms) must be in place for the duration of the work, and then removed once the work is complete. Further, in-water work must be timed to avoid periods of high flow, and must cease if heavy precipitation or rapid snowmelt occurs or is forecast.
48. Turbidity curtains must be used when constructing or removing cofferdams, and these should be placed at the shoreline and moved into the desired location to prevent fish from being trapped inside; ensure the edges are tight to the shoreline to reduce the risk of sediment getting out or fish getting in. Where rock is used to build a coffer dam it must be clean an installation of a water tight membrane should be prioritized. Silt or debris accumulated around a temporary cofferdam must be removed prior to withdrawal of cofferdam.
49. Measures must be in place to prevent wastewater pumped from the worksite from directly or indirectly entering the stream. Excess water must be discharged well away from the stream and filtered either naturally over the forest floor or pumped onto filter fabric or straw spread on the forest floor.
50. All construction materials and forming residue materials (e.g. packaging, concrete form parting oils, solvents or curing compounds) must be securely contained at the work site and kept from entering the stream.
51. Excavated material and debris must be stored in a stable area, above the high water mark or active floodplain and at least 15 m from drainage features and/or the top of steep slopes, and removed from the Park prior to project completion.
52. Concrete mixing must take place at least 30 m from streams, wetlands or water bodies. Fresh, wet, uncured concrete, concrete dust, and wastewater is toxic to the aquatic environment and must not come into contact with any water body.
53. To protect stream water quality when cutting riparian vegetation (i.e. within 30 m of a watercourse), regular chainsaw bar lubricant oils must be replaced with BioLube or a similar non-toxic, vegetable-based chain oil.
54. Do not clean or drain equipment in waterways.

Vegetation (Note that many mitigations listed elsewhere will also mitigate impacts on vegetation, especially those for erosion and sediment control)

55. Clearing of vegetation requires a Restricted Activity Permit from Gros Morne National Park. This can be obtained in communication with Park's Canada's EO.
56. Vegetation clearing and soil grubbing and removal should be limited to the minimum necessary for the completion of the project. Wherever possible vegetation cover should be maintained to prevent erosion. The area to be cleared must be clearly delineated with highly visible materials such as flagging tape to inform cutters and equipment operators of the area they are to work in to avoid unnecessary vegetation removal.
57. Cut vegetation must be either removed from the worksite to a location outside the park boundaries, mechanically chipped onsite, or dragged out of sight into forest edges. Any mechanically chipped woody vegetation must be dispersed evenly on site to a surface depth not greater than 5 cm.
58. Logs from newly cut trees or washed out trees salvaged from Barters Brook may be stockpiled on already disturbed areas >50 m away from the stream bank, and opportunities to make these available to local domestic wood cutters should be discussed with Parks Canada's EO.

Fauna: Fish and fish habitat (Note that many mitigations listed elsewhere will also mitigate impacts on fish and fish habitat, especially those for erosion and sediment control and also for surface water)

59. Shorelines and banks that might be disturbed by the work will be stabilized immediately and if the original gradient of channel banks cannot be restored, a stable gradient will be restored.





- 60. If replacement rock reinforcement/armouring or rip-rap is required to stabilize eroding or exposed areas, appropriately-sized, clean rock will be used. Such rock will be installed at a similar slope to maintain a uniform bank/shoreline and natural shoreline alignment.
- 61. The movements of fish through the project site will be unimpeded at all times.
- 62. Waterway beds are not to be used for borrow material.

Fauna: Terrestrial fauna

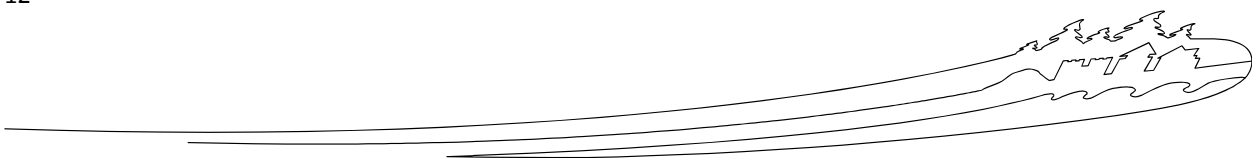
- 63. Construction vehicles travelling on public roads must respect posted speed limits and yield to wildlife.
- 64. To prevent incidental destruction of bird nests and nestlings, all vegetation cutting and grubbing must be completed before the primary songbird nesting season, i.e. before May 1.
- 65. The contractor(s) must immediately report to Parks Canada any wildlife discovered nesting, roosting, or denning on or near the worksite. If an active wildlife nest, roost, or den is found, the vegetated area will be left intact and a suitable sized buffer of shrubs/trees around it will be clearly marked until the nest, roost, or den is no longer in use. The appropriate size of buffer is species dependent, and will be determined in consultation with Parks Canada's Environmental Officer.
- 66. To prevent habituation of wildlife, human wildlife conflict, and risk of wildlife being struck by vehicles, feeding of wildlife is strictly prohibited and all potential wildlife attractants, including gasoline, garbage, and food, must be securely stored so that they are not accessible to wildlife. Particular vigilance is required when workers are leaving at the end of the work day so that attractants are not accessible during the night.
- 67. The contractor(s) must immediately report to Parks Canada any instances of potential problem wildlife (e.g., foxes, coyotes, bears) becoming habituated to people in the vicinity of the worksite. A written record of any problem wildlife encounter must be submitted to the Parks Canada EO within 24 hours of the incident.
- 68. If wildlife is observed during work, give animals the opportunity to escape the work area to the surrounding forest or elsewhere to seek new shelter.

Visitor Experience / Public Safety

- 69. Onsite stockpiling areas for construction materials must be barricaded from public access.
- 70. Maintain the project area in as tidy a condition as is practical for the duration of work.
- 71. During bridge construction the access road to Lomond campground will be closed to public access at the junction with Route 431. Appropriate signage warning the public that the road is closed and that construction is underway should be in place at the junction with Route 431 and along the road ~150 m Barter's Brook from both directions. This would include a "trucks turning" sign at the junction with Route 431. Further, all such signage and associated materials (e.g. sandbags used to ballast signs) must be removed from the park after the completion of work.
- 72. Human wildlife interactions should be promptly reported to Parks Canada. Workers are prohibited from feeding or disrespecting wildlife.

Cultural Resources

- 73. If cultural resources, features, or artifacts (e.g., stone tools, historic artifacts such as pipes, ceramics, iron stove parts, etc.) are encountered within the project area, work should cease and the Parks Canada project manager should be contacted immediately. The Parks Canada project manager will then pass information concerning the find to a Parks Canada archaeologist for advice and assessment of significance. This will in turn determine what will be required to mitigate the chance find.





**9. OTHER Considerations**

Check all that apply

- Public/stakeholder engagement
- Aboriginal engagement or consultation
- Surveillance
- Follow-up monitoring, required to evaluate effectiveness of mitigation measures and/or assess restoration success
- Follow-up monitoring, required by legislation or policy (indicate basis of requirement e.g. required by the *Species at Risk Act*)
- SARA Notification

For any of the boxes checked above, briefly describe what was done, how the results were incorporated into the BIA and/or outline plans for what is needed.

**10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS**

**11. EXPERTS CONSULTED**

*Include Parks Canada experts. Add as many entries as necessary for the project.*

Department/Agency/Institution:	Date of Request: YYYY-MM-DD
Expert's Name & Contact Information:	Title:
Expertise Requested:	
Response: Summarize, append correspondence as required and add to attachment list (Section 14).	

**12. DECISION**

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

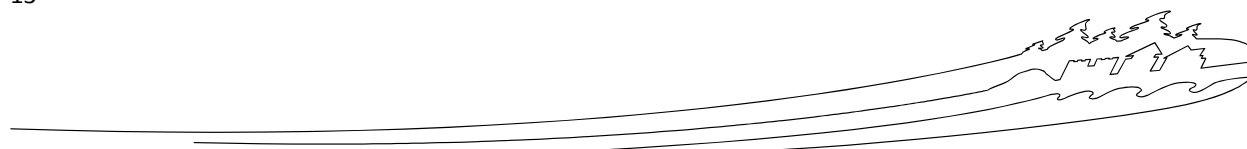
- not likely to cause significant adverse environmental effects.
- likely to cause significant adverse environmental effects.

Natural Resources: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to natural resources.

Visitor Experience: Given the magnitude of effects and application of mitigation measures, the project is unlikely to result in significant residual adverse effects to visitor experience.

Cultural Resources: Given the magnitude of effects, the low potential for archaeological resources, and application of the mitigation measures the project is unlikely to result in significant residual adverse effects to cultural resources.

*NOTE: If the project is identified as likely to cause significant adverse effects, CEAA 2012 prohibits approval of the project unless the Governor in Council (Cabinet) determines that the effects are justified in the circumstances. A finding of significant effects therefore means the project CANNOT go ahead as proposed.*





**FOR SARA REQUIREMENTS:**

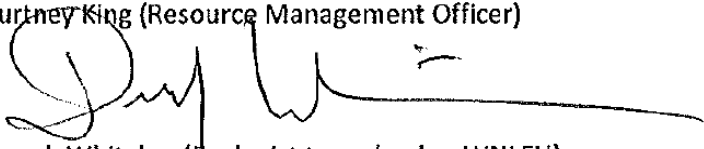
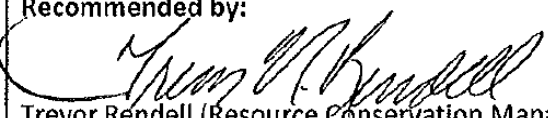
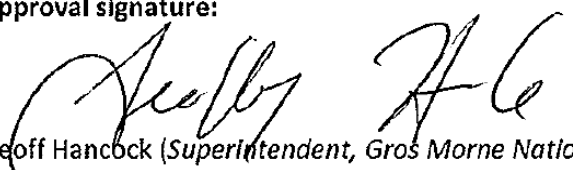
There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

OR, the SARA-Compliant Authorization Decision Tool ([Appendix 2](#)) was used and determined:

- There is no contravention of SARA prohibitions
- Project activities contravene a SARA prohibition and CAN be authorized under SARA
- Project activities contravene a SARA prohibition and CANNOT be authorized

**13. RECOMMENDATION AND APPROVAL**

*(Add additional blocks as required)*

<p><b>Prepared by:</b></p> <p>Courtney King (Resource Management Officer)</p>  <p>Darroch Whitaker (Ecologist team leader, WNLFU)</p>	<p><b>Date:</b></p> <p>February 23, 2018</p>
<p><b>Recommended by:</b></p>  <p>Trevor Rendell (Resource Conservation Manager, WNLFU)</p>	<p><b>Date:</b></p> <p>Feb. 25, 2018</p>
<p><b>Approval signature:</b></p>  <p>Geoff Hancock (Superintendent, Gros Morne National Park)</p>	<p><b>Date:</b></p> <p>Feb 25/18</p>

**14. ATTACHMENTS**

Higdon, J. 2018. Archaeological Overview Assessment (AOA), Barter's Brook Bridge Replacement at Gros Morne National Park, Newfoundland.

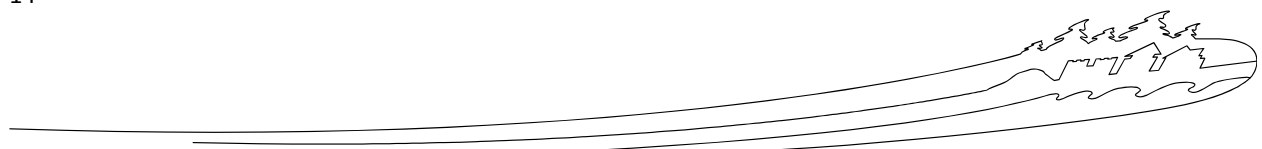
**14.1. BMPS**

Parks Canada 2015. Parks Canada National Best Management Practices, Roadway, Highway, Parkway and Related Infrastructures.

**15. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM**

- Project registered in [tracking system](#)
- Not yet registered (*CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system **by the end of April** to enable reporting.*)

**\*\*\*Ensure that all required mitigation measures and conditions (e.g. follow-up monitoring requirements) are included in project permits and authorizations\*\*\***

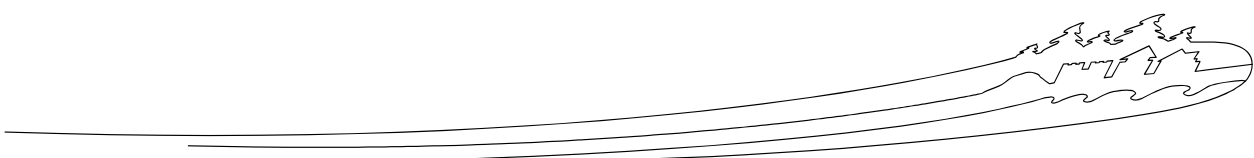




## Appendix 1 : Effects Identification Matrix (optional)

**Section A** focuses on direct effects of the project and **Section B** on indirect effects that are caused by changes to the environment.

A. Direct Effects									
		Valued components potentially directly affected by the proposed project							
		Natural Resources					Visitor Experience	Cultural Resources	
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Visitor Safety		
Phase	Examples of Associated Activities								
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Clearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Disposal of waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Site remediation/ restoration	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Blasting/ Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Dredging	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Grading	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Backfilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of machinery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Transport of materials/ equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Use/Removal of temporary facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Concrete	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Visitor Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Vehicle Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		





B. Indirect Effects (all phases)							
		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	Natural resource components affected by the project						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>soils and landforms</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

