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Basic Impact Analysis (BIA)

Deer Arm Bridge Replacement

Gros Morne National Park

GMNP-2017-004

February 2017

Parks Canada Parcs Canada

Canada

1. PROJECT TITLE	Deer Arm Bridge Replacement	
2. PROJECT LOCATION (Park, Site, Canal, NMCA)	Gros Morne National Park	
3. PROJECT SITE(S)	Deer Arm Brook – highway 430	
4. PROPONENT	Parks Canada	
5. PROPONENT CONTACT INFORMATION	Debra Hickey Transportation Engineer Highway Engineering Services - East Parks Canada 1869 Upper Water Street Suite AH201 Halifax, NS B3J 1S9 Email: Debra.Hickey@pc.gc.ca Telephone: (902) 407-7812 Facsimile: (902) 426-1547	
6. PROJECT DATES	Planned Commencement 2017 05 01	Planned Completion 2018 06 30
7. INTERNAL PROJECT FILE #	GMNP-2017-004	

8. PROJECT DESCRIPTION

Parks Canada is replacing Deer Arm Bridge on highway 430. A new bridge will be located immediately downstream from the existing (old) bridge. Two-way traffic will be maintained on the old bridge during construction and new highway realignments for the new bridge. Demolition and restoration of the old bridge site and highway approaches will then follow.

9. VALUED COMPONENTS LIKLEY TO BE AFFECTED

Environmental

- upstream migration of adult Atlantic salmon *(Salmo salar)* and sea-run brook trout *(Salvelinus fontinalis)*
- downstream migration of Atlantic salmon smolt
- water quality, fresh and marine waters
- stream shoreline stability
- feeding waterfowl such as Common merganzer and Bald eagle

Visitor Experience

- highway traffic safety
- sportfishing for Atlantic salmon and sea-run brook trout

Cultural Resources

- none known

10. EFFECTS ANALYSIS

Environmental

- Research has shown that hydroacoustic pressures resulting from pile driving can have physiological effects upon fish. Buehler et al. 2015 reported that exposure to these high levels of sound can result in auditory tissue damage, causing fish hearing loss which may increase the animal's vulnerability to predators and result in the reduction or elimination of their ability to locate prey, communicate with conspecifics and a reduced sense of their physical environment. Moreover, excessive pile driving sound has potential to produce longer term impacts on fish behavior, such as an inability to reach valuable habitat upstream and difficulty in locating mates or food. However, these longer term impacts on behavior have not been sufficiently studied.
- This project will occur at the head of the tidal estuary of Deer Arm Brook where migrating adult Atlantic salmon and sea trout accumulate on their upstream spawning migration. Atlantic salmon parr and smolt will be present at the work site during the construction season, and release of deleterious substances into the stream could risk fish health or mortality.
- Contamination of Deer Arm estuarine waters from toxic spills or leaks from machinery, equipment and construction materials (e.g. concrete, runoff sediment) could significantly impact benthic fauna.
- Removal of stream riparian vegetation habitat will occur when constructing the new highway realignment.
- Construction noise and activities may disrupt feeding and nesting activity of terrestrial wildlife on site.

Visitor Experience

- Highway traffic safety.
- The area around Deer Arm Bridge is a popular fishing site to Atlantic salmon anglers.

11. MITIGATION MEASURES

Environmental

1. To avoid disturbing migrating fish, pile driving for installation of the new bridge abutments should be completed before July 1.
2. Pile driving must occur during daylight hours only, when migrating salmon and trout are less likely to be passing through the work site.
3. No part of the old bridge, equipment or demolition debris must enter the stream. Measures must in place to prevent demolition materials from entering the stream (e.g. tarps, scaffolding, etc.) and they must be inspected regularly and repaired as needed.
4. Timing for removal of the below-water portions of the old bridge pier must not begin until after September 15, when most of the Atlantic salmon upstream migration has ended. However, demolition to above-water portions of the piers may be done before this date if suitable mitigations are in place to prevent bridge materials, demolition debris and machinery from entering the stream.
5. Cofferdams (or Aqua Dams) must be in place before any in-water work can take place. De-watering will be necessary to prevent suspended sediments, construction debris and other foreign materials from entering the stream.
6. To maintain substrate stability to the "naturalized" stream bed, the old pier foundation slab must not be removed below grade, unless it can be done without undue disturbance to the stream's water quality from excessive silts and suspended sediments.
7. 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.
8. All construction and demolition materials must be securely contained at the work site and kept from entering the stream. If necessary, a floating boom may be required to capture materials from being swept downstream and away from the work site.
9. Heavy machinery or equipment will not be permitted in the stream.
10. Erosion and runoff silts from exposed soils must be prevented from entering the stream, and all silt trap structures (e.g. silt fence, rock check dams, cofferdams) must be regularly monitored and maintained to ensure they are functioning effectively.
11. Fueling heavy equipment and fuel storage is prohibited within 100m of the stream or open water.

12. Fueling of small engines (e.g. generators, chainsaws) will not be permitted within 30 metres of open water and portable containment pads must be used to prevent ground contact by accidental fuel spills.
13. Containment spill kits must be available on site, along with workers trained in their use.
14. Contractors are required to stop work and contact Parks Canada immediately if a contaminant spill occurs.
15. 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. The spill site will then be inspected to ensure there is complete containment and disposal to the satisfaction of Parks Canada.
16. Stock piled aggregates and construction materials must be stored at an approved site far enough away from open water to prevent runoff of potential contaminants from entering the stream and nearby wetlands.
17. All construction debris and forming residue materials (e.g. concrete form parting oils, solvents or curing compounds) must be prevented from entering the watercourse.
18. To avoid soil and water contamination, all equipment must be clean of debris and contaminants prior to entering the park and the work site, and they must be checked regularly to ensure there are no fuel or hydraulic fluid leaks.
19. To prevent invasive plants and/or seeds from being transported onto the worksite, all construction equipment, heavy machinery and vehicles must be clean of any soil and mud before entering the park.
20. Should dust control be required on the construction site or roadbed, only freshwater will be permitted.
21. To avoid destroying bird nests and nestlings, all vegetation cutting and grubbing must be completed either before or after the songbird nesting season. Therefore, this work must not occur between June 1 and July 20.
22. 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.
23. To protect stream water quality when cutting riparian vegetation, regular chainsaw bar lubricant oils must be replaced with BioLube or a similar non-toxic vegetable-based chain oil.
24. All bridge demolition materials and excavated highway pavement must be removed from the site and disposed of at an approved facility/location outside the national park.
25. Burning of any vegetation or worksite materials is prohibited in the park.
26. Dumping leftover asphalt off the worksite is prohibited. A temporary onsite location may be permitted for clearing small amounts from trucks, but only with preapproval from the park's environmental protection officer.
27. Excess mixed cement should be disposed of outside the park and where there is no potential for contact with any wetlands or open water. However, small amounts of excess concrete may be temporarily dumped in designated structures such as onsite pits or berm areas, located a minimum of 30m from watercourses, wetlands and any drainages. Collected wastewater must then be removed from the site and hardened concrete shall be broken up, removed, and disposed of outside the park as per federal and provincial regulations.
28. To prevent materials (e.g. soil, rock, demolition debris, etc.) from escaping from trucks, all loads must be covered or tarped during transport through the park.
29. Storage and movements of heavy equipment and workers' private vehicles shall be restricted to the 'footprint' of the construction and staging area only.
30. Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands and waterbodies.
31. The contractor(s) must immediately report to Parks Canada, any wildlife discovered nesting or denning on or near the worksite.
32. If any historic or prehistoric archaeological artifacts are discovered during any stage of this project, all work must cease and Parks Canada contacted immediately.
33. To stabilize exposed soils and prevent sediment runoff, site rehabilitation will be required to restore natural vegetation cover once the old highway is removed. Hydro-seeding may be required to stabilize exposed soils along some back slopes. A seed mixture of 70% annual rye and 30% creeping red fescue will be required at these sites during the growing season.
34. Site restoration will require effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

<u>Visitor Experience / Public Safety</u>

35. Onsite stockpiling areas for construction materials must be barricaded from public access.

36. Traffic disruption during construction must be kept to a minimum.
37. Highway traffic must be controlled when work trucks, other vehicles and heavy machinery are turning on the public highway.
38. For the safety of anglers, Parks Canada will prohibit sportfishing around the worksite during the construction season.
39. Safe access for hikers and vehicles to the James Callaghan (Gros Morne Trail) trailhead parking lot must be maintained throughout the project. Way-finding signage may be required.

12. CONSIDERATION OF THE NEED FOR PUBLIC PARPITICATION & ABORIGINAL CONSULTATION

12 a) Need for public participation? NO __X__ YES ____
12 b) Aboriginal consultations required? NO __X__ YES ____

13. 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

Parks Canada will regularly monitor the work site and areas downstream to ensure that the measures to mitigate environmental impacts are being adhered to and functioning.

14. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

Deer Arm Brook is fed by Ten Mile Pond (fjord) in the park's Long Range Mountains. Healthy populations of Atlantic salmon and sea-run brook trout are sustained by Deer Arm Brook. Any residual effects resulting from bridge construction or demolition will not go unseen by park visitors, sportfish anglers and commercial fishers in Bonne Bay. Therefore, it is paramount that this bridge project not result in any significant adverse or long term environmental impacts.

15. SITE INSPECTION

☒	Site inspection required
☐	Site inspection not required

- Parks Canada will monitor for possible sediment runoff and demolition debris in to the stream and estuary, plus examine for any adverse effects toward fish and other wildlife during this project.

16. 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

17. EXPERTS CONSULTED

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

Department/Agency/Institution: Fisheries Protection Division, Fisheries and Oceans Canada.	Date of Request: 2016-01-19
Expert's Name and Contact Information: John M. O'Rourke, B.Sc. Fisheries Protection Division, Fisheries and Oceans Canada P.O. Box 5667, St. John's, NL A1C 5X1 Ph: (709) 772-2508, Cell: (709) 725-1286, Fax: 772-5562 Email: john.orourke@dfo-mpo.gc.ca	Title: (A) Team Leader – Triage and Planning. Fisheries Protection Division.
Expertise Requested: Consultation focused on whether there could be potential for any adverse effects toward anadromous fishes by onshore pile driving and in-water bridge demolition work during adult spawning and smolt migrations.	
Response: Fisheries and Oceans Canada informed that hydroacoustic effects from pile driving near the stream would have significant negative impacts upon fish eggs and therefore should not be permitted where spawning occurs. However, based on findings at similar bridge projects elsewhere in this province, pile driving should have negligible effect on migrating adult and juvenile fish. Fish will generally avoid the site during pile driving and continue to migrate through an area when hydroacoustic vibrations have ceased. However, no in-water demolition or construction work should be permitted during fish migrations.	

18. DECISION

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 that the project CANNOT go ahead.

	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.

19. REFERENCE LIST

- D. Buehler, Oestman R., James R., Pommerenck K., and Mitchell B. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. California Department of Transportation 1120 N Street Sacramento, CA 95814. Report No. CTHWANP-RT-15-306.01.01
- Measures to Avoid Causing Harm to Fish and Fish Habitat – Timing Newfoundland and Labrador Region
- Projects near water. Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html
- Parks Canada National Best Management Practices, Roadway, Highway, Parkway and Related Infrastructures, 2015.
- Deer Arm Brook Bridge Replacement. Gros Morne National Park, Newfoundland. HEC File #16113.02 Report. Prepared by: Harbourside Engineering Consultants. 219 Waverley Road, Suite 200 Dartmouth, NS. B2X 2C3

- Parks Canada Agency Deer Arm Brook Bridge Replacement Specification. Project No. 111. Prepared by: Harbourside Engineering Consultants. 219 Waverley Road, Suite 200 Dartmouth, NS. B2X 2C3

20. ATTACHMENT LIST (e.g., BMPs, project area diagrams, sensitive area maps, project execution plan, previous analysis, relevant permits)

21. **NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM** *(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.)*

☐ Project registered in tracking system
☒ Project not yet registered

REOMMENDATION AND APPROVAL *(Add additional blocks as required.)*

Prepared by: Randy G. Thompson Resource Management Officer II / Environmental Impact Assessment Practitioner	Randy G. Thompson **Date:** 22/02/2017
Recommended by: Trevor Rendell Western Newfoundland and Labrador Field Unit Resource Conservation Manager	Trevor N. Rendell **Date:** February 22nd, 2017
Approval signature: Geoffrey Hancock Western Newfoundland and Labrador Field Unit Superintendent	Trevor N. Rendell for Geoffrey Hancock **Date:** February 22nd, 2017

Appendix 1 : Effects Identification Matrix

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
	Phase	Associated Activities	Air	Soil & landforms	Water (freshwater stream, coastal marine)	Flora (stream riparian vegetation)	Fauna (fishes, nesting birds, small mammals)	Visitor Safety	
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	☐	☒	☒	☐	☒	☐	☐
		Burning	☐	☐	☐	☐	☐	☐	☐
		Clearing	☐	☒	☐	☒	☒	☐	☐
		Demolition	☐	☒	☒	☐	☒	☐	☐
		Disposal of demolition materials	☐	☒	☒	☒	☒	☒	☐
		Site remediation/ restoration	☐	☒	☒	☒	☒	☒	☐
		Wastewater disposal	☐	☒	☒	☒	☒	☐	☐
		Drainage	☐	☒	☒	☐	☒	☐	☐
		Excavation	☐	☒	☒	☒	☒	☐	☐
		Backfilling	☐	☒	☒	☐	☒	☐	☐
		Use of machinery	☒	☒	☒	☒	☒	☐	☐
		Transport of materials/ equipment	☒	☐	☐	☐	☐	☐	☐
		Use/Removal of temporary facilities	☐	☐	☒	☐	☒	☐	☐
		Use of Concrete	☐	☐	☒	☐	☒	☐	☐
		Visitor Access	☐	☐	☐	☐	☐	☒	☐
		Vehicle Traffic	☐	☐	☐	☐	☐	☒	☐

B. Indirect Effects (all phases)							
		Impacts as a result of changes to the environment					
		With respect to non-Indigenous peoples:	With respect to Indigenous 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 & accommodation opportunities	Safety
Phase	**Natural resource components affected by the project**						
Preparation /construction operation/implementation/decommissioning	Could impacts to air lead to adverse effects?	☐	☐	☐	☐	☐	☐
	Could impacts to soils and landforms lead to adverse effects?	☐	☐	☐	☐	☐	☐
	Could impacts to water (e.g. surface, ground water and marine) lead to adverse effects?	☒	☐	☐	☒	☒	☐
	Could impacts to flora lead to adverse effects?	☐	☐	☐	☒	☒	☐
	Could impacts to fauna lead to adverse effects?	☐	☐	☐	☐	☒	☐
	Other...	☐	☐	☐	☐	☐	☐