



Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION

Amphitheatre Replacement, Fundy National Park.

The project site is located near the MacLaren Pond along the Point Wolfe Road in Fundy National Park, Alma, New Brunswick. The project site coordinates are 45.592732°N, 64.953158°W (see Figures 1 and 2 for the project location).

2. PROPONENT INFORMATION

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3. PROPOSED PROJECT DATES

Planned commencement:
 May 2018

Planned completion:
 June 2018

4. INTERNAL PROJECT FILE

NBSouth-2017-EIA-21

5. PROJECT DESCRIPTION

The project site is located at the same location as the existing amphitheatre adjacent to MacLaren Pond, near the East entrance to Fundy National Park (Figures 1-2).

Facilities/attractions in the area include the Headquarters Campground, the Visitor Reception Centre, viewpoints, interpretation panels, a heated salt water swimming pool, playground and a golf course.

The existing amphitheatre is conveniently nestled in the activity hub of the park, in a semi-wooded setting, and is located close to MacLaren Pond which is surrounded by a succession of emergent, floating and submerged plants (Figure 3).

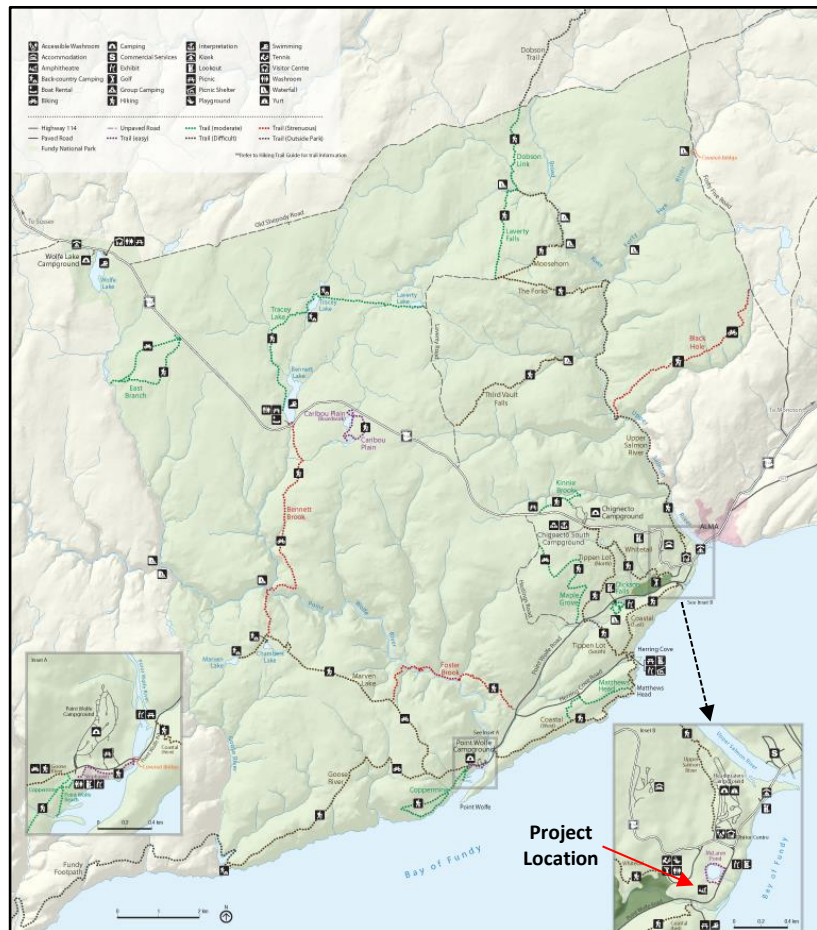
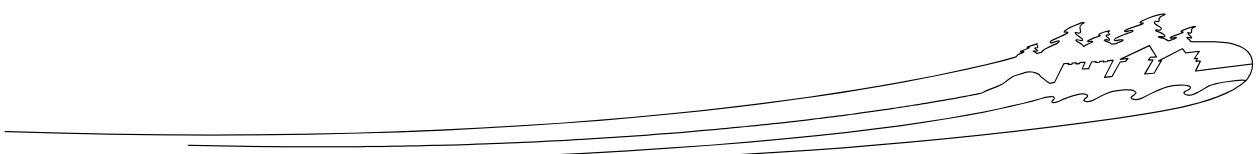


Figure 1. Project Location





Built in 1949 during the initial establishment of Fundy National Park, the amphitheatre is comprised of an open faced dome band shell with an attached back room (Figure 4). The structure is constructed of wood, and covered by a metal roof for the back room and a polyethylene fabric for the stage area (Figure 5-6). The amphitheater provides wooden seating for approximately 1000 people. This seating area was constructed on the natural slope facing the band shell just below the former Fundy Park Chalet facility (Figure 7), and is made entirely of pressure treated wood (Figure 8).



Figure 2. Vertical photography of the project location (SNB)



Figure 3. Panoramic view of the MaLaren Pond

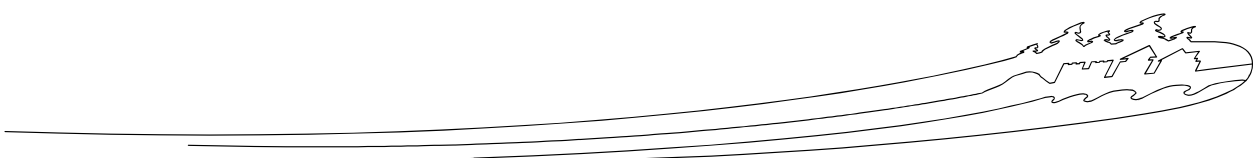




Figure 4. Amphitheatre with chalets in background (early 1950's)



Figure 5. Amphitheatre covered stage

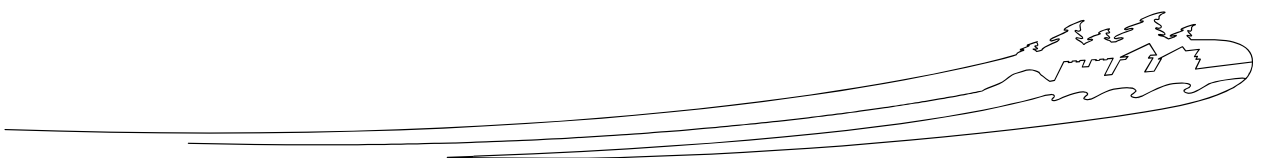




Figure 6. Side view of the amphitheatre covered stage



Figure 7. Panoramic view of the amphitheatre seating area

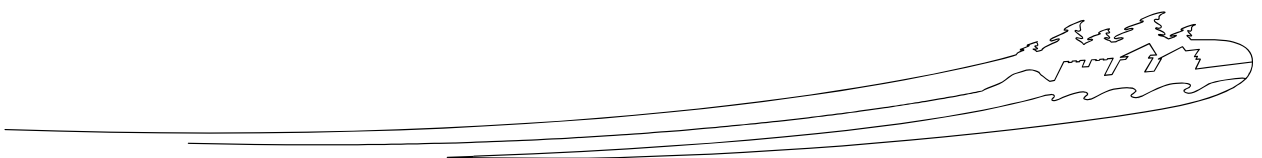
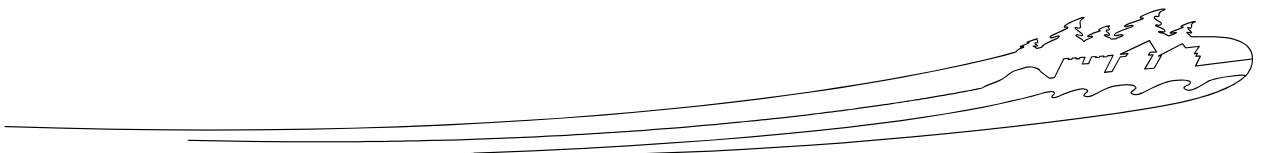




Figure 8. View of the amphitheatre seating area



Figure 9. Amphitheatre floor exterior trim covered by lead paint (green) and creosote timber





During a site visit on July 27, 2017, it was noted that the amphitheatre floor was supported by creosoted timber beams and that the exterior siding of the floor was covered by multiple layers of a green lead paint which has started to peel onto the underneath ground (Figure 9). Analytical test results for three samples extracted from the exterior trims of the amphitheatre revealed that all samples were in compliance with provincial guidelines for disposal of lead paint and lead painted materials with leachable lead values well under the 5,000 µg/L threshold (Table 1). The analytical results from the timber beams confirmed the presence of creosote (Table 2).

Table 1: Analysis of TCLP Leachates

			RPC Sample ID		
			232848-5	232848-6	232848-7
			Exterior Trim	Exterior Trim	Exterior Trim (Brown)
Date Sampled:			21-Apr-17	21-Apr-17	21-Apr-17
Analytes	Units	RL			
Leachable Lead	µg/L	20	560	570	< 20

This report relates only to the sample(s) and information provided to the laboratory.

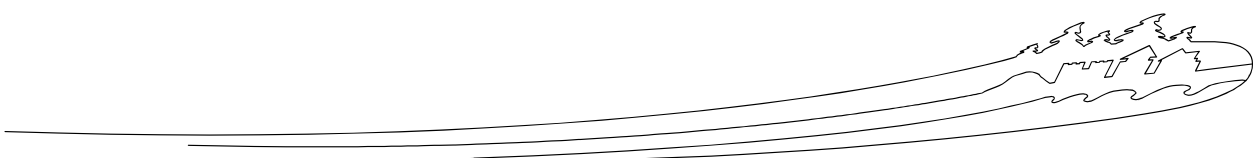
RL = Reporting Limit

Table 2: Analysis of creosote on timber

RPC Sample ID			232848-5
Date Sampled:			21-Apr-17
Analytes	Units	RL	
EPH >C10-C16	mg/kg	12	240
EPH >C16-C21	mg/kg	12	3300
EPH >C21-C32	mg/kg	12	8500
EPH >C16-C32	mg/kg	12	12000
EPH Surrogate (IBB)	%		103
EPH Surrogate (C32)	%		comment
Resemblance			Creosote
Return to Baseline at C32			No
Moisture Content	%		N/A

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit





The replacement of the existing Amphitheatre will be an important element of the redevelopment of the Headquarters area of the park. Parks Canada staff see this project as an opportunity to create a signature event hosting venue for the region, which leverages the compelling location of the venue and the value of the surrounding campgrounds, accommodations and other infrastructure ideally suited for hosting large events. Events hosted at the new Amphitheatre will provide an opportunity to create new types of visitor experiences within Fundy National Park which will connect existing visitors with the Park in new ways, and provide a tool to encourage new types of visitors to experience Fundy National Park. The amphitheatre will need to not only act as a tool to showcase Fundy National Park and its distinct landscape and character, but also serve as a tool for connecting people with the entire Bay of Fundy region.

The proposed project work involves the reconstruction of the amphitheatre seating area and covered stage. The specific scope of work includes, but is not limited to:

- Demolition and disposal off-site for the existing amphitheatre structure, which is a timber framed structure with a copper roof. The existing structure is currently supported by timber cribbing at grade (i.e., no foundation). All materials (including those deemed to contain hazardous materials such as lead paint or creosote) will be disposed of at a provincially approved disposal facility in an environmentally-acceptable manner.
- Construction of a new approximately 1,500 ft², three-season amphitheatre facility consisting of a steel framed super-structure supported by helical piers. The use of helical piers in construction is intended to minimize or avoid the need for excavation or imported fill materials. A timber deck may also be incorporated at the front of the structure, however no creosoted timber will be used in construction. The new amphitheatre will provide wheelchair access, one unisex washroom facility for staff / performers, stage area large enough to accommodate 10 individuals and be accessible by audience, backstage and storage areas, as well as a loading/unloading area accessible by park vehicles.
- Installation of audio, audio-visual, and lighting systems to enhance the visitor experience as well as provide adequate lighting to ensure safety during night-time performances. All lighting is to be dark sky compliant. Existing conduits will be used for the electrical systems, however some trenching may be required based on the final design.

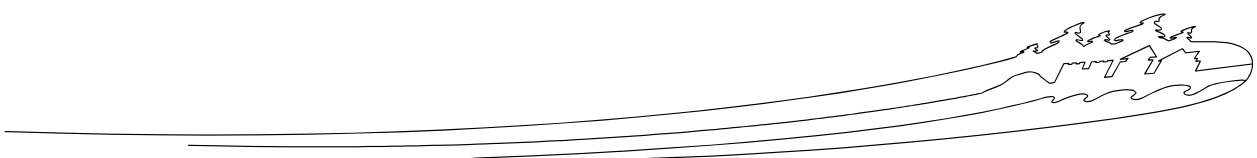
Please see Appendix II and III for an existing condition site plan and a proposed site plan of the works.

Project Timing

The project is expected to go to tender in December 2017. Following the tender period the successful contractor will provide a more detailed construction schedule. The anticipated construction dates will be from May 2018 to June 2018.

Indigenous Setting

Fundy National Park falls within traditional Mi'gmaq territory called Siknikteiwag ("drain-age area"). The Mi'gmaq, Wolastoqiyik (Maliseet) and Passamaquoddy Aboriginal peoples have a long history in Fundy National Park and its greater ecosystem region and consider the area part of their traditional territory. There is currently no documented evidence of Aboriginal presence within the park, possibly due to European settlements being built on top of previously occupied Aboriginal settlements (Parks Canada, 2011).





The Project location, New Brunswick, is located in lands governed under the Peace and Friendship Treaties of 1725-1779. On July 15, 1976, the Mi'gmaq and Maliseet Indians of New Brunswick petitioned Her Majesty Queen Elizabeth regarding their traditional Aboriginal rights and lands. At that time, Canada was already funding research for the New Brunswick Indians' asserted claim, but it was not accepted for negotiation until after the 1999 Marshall decision. On September 17, 1999, the Supreme Court of Canada found that the Treaties of 1760-61 affirmed the rights of the Mi'kmaq and Maliseet signatories to hunt, fish and gather to the extent of a "moderate livelihood". Canada subsequently resolved to begin a long-term process that considered both the Aboriginal and treaty rights of the First Nations in New Brunswick (ATRIIS).

The closest First Nation Reserve (Fort Folly Indian Reserve No.1) is located approximately 48 km northeast of the amphitheatre project area. The second closest First Nation Reserve (SOEGAO Indian Reserve No.35) is located approximately 55 km northwest of the project area. The project is not anticipated to have any potential infringement on Aboriginal rights and interest due to its limited scope of work.

Other Departments Involved

There are no other Federal Departments involved in this project.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

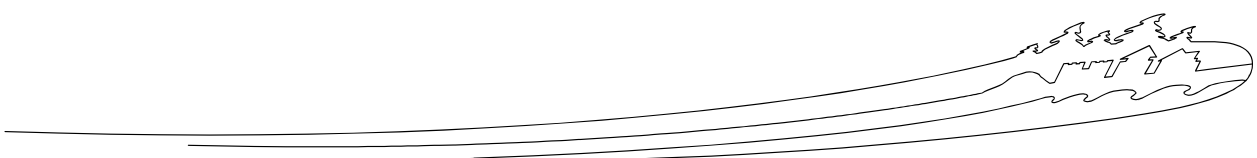
The Effects Identification Matrix located in Appendix I identifies environmental components likely to be affected by this project. The components most likely to be impacted include soil/landforms, water, flora, fauna, cultural resources and visitor experience.

6.1 Soil/Landforms/Physical Environment

Fundy National Park is located within the Atlantic maritime ecozone and extends mostly inside the Southern New Brunswick Uplands ecoregion which forms a 40-km-wide band that runs parallel to the Bay of Fundy and along the United States border to the Saint John River valley (Ecological Stratification Working Group, 1995). Inside this ecoregion, the northern part of Fundy National Park is found inside the Caledonia ecodistrict which is characterized by a broad upland plateau situated along the upper Bay of Fundy. The southern part of Fundy National Park, where the amphitheatre is located, is part of the Fundy Coast ecoregion which covers a narrow coastal strip along the Bay of Fundy in New Brunswick and Nova Scotia (Ecological Stratification Working Group, 1995).

The landscape of the Fundy Coast ecoregion owes much of its scenic diversity to the varied types of bedrock, from seaside salt marshes and estuaries to towering cliffs overlooking the Bay of Fundy (Zelazny, 2007). Mean elevation is under 100 m, although some coastal cliffs can reach over 300 m. All rivers in the ecoregion flow into the Bay of Fundy or one of its subsidiary bays and basins. Some rivers meet the ocean directly as waterfalls or swift streams, whereas others enter more gently through coastal estuaries or marshes before mingling with the salt water (Zelazny, 2007). Its proximity with the Atlantic Ocean strongly influence its climate with high winds, high humidity, and fog. Summers are usually cool and wet while winter are mild and wet with most precipitation falling as rain (Ecological Stratification Working Group, 1995).

Canadian Climate Normals (1981-2010) for nearby Alma weather station (45°36' N; 64°57' W) indicate that the project area receives an average of 1,510.1 mm of precipitation annually and experiences measurable precipitation (≥ 0.2 mm) 171.5 days per year. Extreme precipitation events of up to 179.1





mm have been recorded. The temperatures range from an extreme minimum of -31.0°C to an extreme maximum of 35.5°C with an annual daily mean temperature of 5.7°C (Environment Canada, 2017).

Surficial geology mapping indicates that the study area is covered with mainly stony till deposits (more than 35 % of clasts pebble-sized and larger) of Wisconsinan aged morainal consisting of loamy lodgment till, ablation till, and associated sand and gravel deposited directly by Late Wisconsinan ice or with minor reworking by water (Rampton, 1984). Bedrock in the area consists of Late Carboniferous stratified rocks from the Cumberland Group (NBDTR, 2008).

A geotechnical study was conducted in May 2017 (GEMTEC, 2017). Two boreholes located around the amphitheatre covered stage revealed that the subsurface soil conditions at the site generally consist of surficial topsoil underlain by fill followed by a layer of loose organic silt. Groundwater seepage was observed in both borehole at depths of 0.6 m and 1.4 m below existing surface grade. Groundwater conditions may vary seasonally, or as a consequence of construction activities in the area. Shallow groundwater seepage may also be locally affected by the presence of underground utility corridors, bedrock conditions, and/or fill materials.

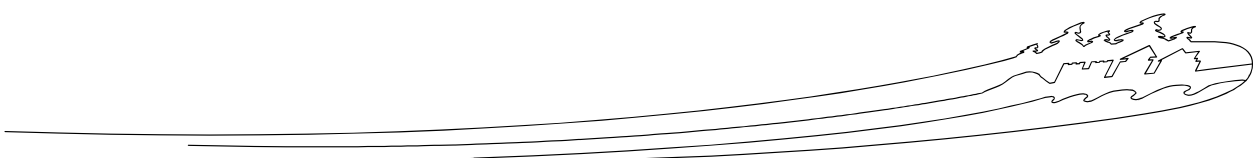
6.2 Water/Hydrology

The amphitheatre is close to MacLaren Pond, which has the smallest surface area (0.67 ha) of all park lakes but is the deepest with a maximum depth of 12.5 m. Although no definite drainage channel flows from the project site into this water body, it is possible that surface or ground water drainage could indirectly impact this area. From many years, storm water from the road system emptied directly into MacLaren Pond however recent modification to the system now collects and disperse storm water away from the pond.

6.3 Flora

Fundy National Park is home to more than 800 species of vascular plants (fern, clubmosses, flowering plants), 270 bryophytes species (mosses and liverworts), and 400 species of lichens.

Within the Fundy Coast ecoregion, the amphitheatre project area is more precisely located inside the Fundy Coastal ecodistrict which comprises the southern coastline of New Brunswick along the Bay of Fundy from east Passamaquoddy Bay to Shepody Bay. It also encompasses the Western Isles, including Campobello, Deer, and Grand Manan islands. The cool and wet climate has created a forest composition with many boreal elements, except for the prominence of red spruce (*Picea rubens*). Forest stands on higher plateaus in the east consist almost solely of pure red spruce. Elsewhere, forests comprise a mixture of red spruce with white spruce (*Picea glauca*) and black spruce (*Picea mariana*), or balsam fir (*Abies balsamea*) with some red maple (*Acer rubrum*), white birch (*Betula papyrifera*), and yellow birch (*Betula alleghaniensis*). Typically, black spruce is associated with the margins of bogs and wet areas; white spruce is the predominant spruce species in a narrow band near the shoreline and on abandoned pastures and fields. Trembling aspen (*Populus tremuloides*), red pine (*Pinus resinosa*) and Jack pine (*Pinus banksiana*), a non-native species, can also be found near the project area (Zelazny, 2007). Understory consist mainly of ground vegetation and a few shrubs. Due to the history of disturbance in the amphitheatre area, the largest number of trembling aspen and white spruce in the park are found here, as well as specimens of grey birch (*Betula populifolia*). Vegetation species found within the local area of the amphitheatre include white spruce, red spruce, trembling aspen, apple tree (*Malus pumila*, a non-native species), red osier dogwood (*Cornus sericea*), spotted touch me not (*Impatiens capensis*), raspberries (*Rubus* sp.), blackberries (*Rubus* sp.), alders (*Alnus* sp.), mugo pine (*Pinus mugo*, a non-native species) and roses





(*Rosa* sp.). Closer to MacLaren pond there is also mountain maple (*Acer spicatum*), striped maple (*Acer pensylvanicum*), white birch, yellow birch, American mountain ash (*Sorbus americana*), and serviceberry (*Amelanchier* sp.). Manicured lawns, consisting of non-native grass species, is located all around the amphitheatre.

No rare plant species have been identified in the area of the proposed works. However, three invasive plant species including reed canary grass (*Phalaris arundinacea*), woodland angelica (*Angelica sylvestris*) and glossy buckthorn (*Frangula alnus*) are found within 10-130 m of the project site. Fundy National Park is currently monitoring the abundance, distribution and spread of these species. All three species are considered highly invasive given their potential treat to spread and outcompete native vegetation (Figure 10).

The proximity of the project with specimens of Woodland angelica, a tall (1-3 m) and robust perennial plant, might be problematic as its sap is rich of an organic chemical compounds, furanocoumarins, that can cause skin rashes and blisters when exposed to ultraviolet light, including sunlight (Figures 11-12). Native to most of Europe and Western Asia, this tall, purple-stemmed herbaceous plant was intentionally introduced as a garden herb in the 18th century. In North America, the species is only known from New Brunswick, Nova Scotia, Quebec and Ontario. Woodland angelica reproduces by seed and also spread by rhizomes. It is in flower from July to September. Woodland angelica is an aggressive species able to establish in natural areas where it can displace native plants and degrade wildlife habitat (NBALA, 2017). See Appendix V for more details on this species.

6.4 Fauna

6.4.1 Mammals

Over 38 species of mammals reside in Fundy National Park. These mammal populations are diverse and are representative of the natural food chain, with animals ranging from top carnivores to lower herbivores and scavengers. The terrestrial animals that are likely to be encountered are described in Table 3.

Scientific literature also confirmed that the project area is potentially inhabited by many micromammals including the cinereus shrew (*Sorex cinereus*), the northern water shrew (*Sorex palustris*), the smoky shrew (*Sorex fumeus*), the arctic shrew (*Sorex arcticus*), the american pygmy shrew (*Sorex hoyi*), the northern short-tailed shrew (*Blarina brevicauda*), the star-nosed mole (*Condylura cristata*), the deer mouse (*Peromyscus maniculatus*), the southern bog lemming (*Synaptomys cooperi*), the Gapper's red-backed vole (*Myodes gapperi*), the meadow vole (*Microtus arvalis*), the norway rat (*Rattus norvegicus*), the house mouse (*Mus musculus*), the meadow jumping mouse (*Zapus hudsonius*) and the Woodland jumping mouse (*Napoeozapus insignis*) (Desrosiers *et al.*, 2002).

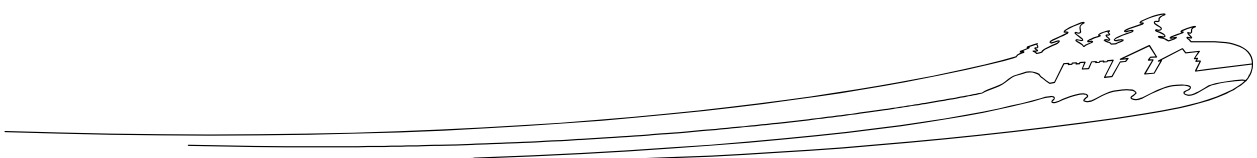




Figure 10: Invasive Plant Species in the vicinity of the amphitheatre



Figures 11-12: Woodland angelica (stems and flowers)

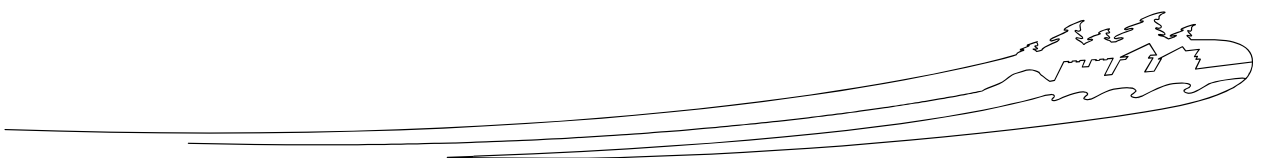
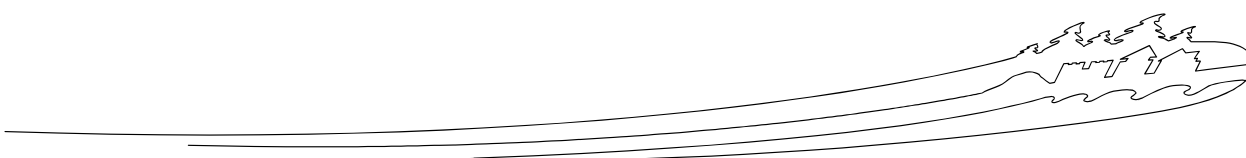




Table 3: List of fauna potentially encountered in the vicinity of the amphitheatre of Fundy National Park

Species		Habitat description	Home range (km ²)
Common name	Scientific name		
Large fauna			
Moose	<i>Alces alces</i>	Mixed forests, particularly Balsam Fir-White and Yellow forests, recently burned areas, clearcutting, swamps and ponds.	20 to 100
Black bear	<i>Ursus americanus</i>	Dense conifer-broadleaf forests, recently burned areas, shrubs, near wetlands, lakes and streams.	Male: 60 to 173
			Female: 5 to 50
White-tailed deer	<i>Odocoileus virginianus</i>	Abandoned fields, primary-secondary forests with mixed and hardwoods. In winter, coniferous stands.	Year round: 10 to 30
			Winter: 1 to 3
Small fauna - carnivorous			
Eastern coyote	<i>Canis latrans</i>	Rural and suburban areas, fields, bushes, woodlands and marshes	10 to 80
Bobcat	<i>Lynx rufus</i>	Mostly woodlands—deciduous, coniferous, or mixed, marshlands, and areas with abundant hare population.	10 to 200
Marten	<i>Martes americana</i>	Mature coniferous or mixed forests.	2 to 30
Mink	<i>Mustela vison</i>	Along streams and lakes surrounded by forests, brush and urban environments.	1 to 5 km of shoreline
Fisher	<i>Martes pennanti</i>	Forest floor of old-growth forests with continuous overhead cover, extensive conifer forests and also common in mixed hardwood and conifer forests.	5 to 20
Raccoon	<i>Procyon lotor</i>	Mixed and deciduous forests, agricultural regions, fields bordered with hedges, bushes, or large forests, along watercourses and swamps.	Up to 80
Small fauna - rodents			
Beaver	<i>Castor canadensis</i>	Water bodies along woodland and streams.	2.6 to 5.2
Snowshoe hare	<i>Lepus americanus</i>	Young coniferous forests, brush, clearings and along watercourses	0.02 to 0.16
Muskrats	<i>Ondatra zibethicus</i>	Swamps, streams, rivers, ponds, lakes and drainage channels.	0.03 to 0.07
Porcupine	<i>Erethizon dorsatum</i>	Mature coniferous or mixed forests.	0.02 to 0.59
Eastern chipmunk	<i>Tamias striatus</i>	Well-drained broadleaved forests, fields, bushes and hedges.	0.1
Red squirrel	<i>Sciurus vulgaris</i>	Various habitats from coniferous forests to mixed sugar bush.	0.01 to 0.02
Northern flying squirrel	<i>Glaucomys sabrinus</i>	Mature coniferous or mixed forests.	Male: 0.06 to 0.15
			Female: 0.04 to 0.11
Small fauna - chiropter			
Little brown bat	<i>Myotis lucifugus</i>	Day roosts in buildings or trees, under rocks or wood piles and sometimes in caves. Nursery roosts in both natural hollows and in buildings. Night roosts in the similar structures as day roosts and where the bats pack together for warmth.	Up to 0.3
Northern Long-eared Myotis	<i>Myotis septentrionalis</i>	Day roosting in trees or artificial structures during spring and summer, switching to a new roost every other day on average. In the fall, migrate to caves to hibernate.	Up to 1.2





Tri-colored bat	<i>Perimyotis subflavus</i>	Found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	n/a
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6.4.2 Avifauna

Fundy National Park is well positioned on the Atlantic migration route, and over 260 bird species have been identified in the park or on the adjacent bay. The Maritime Breeding Bird Atlas identifies a total of 96 species of birds in the geographical block which contains the amphitheatre (20LR45), 34 of which are listed as confirmed for breeding in the vicinity of the project area (IBA Canada, 2017).

The project site is located less than 10 km southwest of the Shepody Bay West Important Bird Area (IBA), which form a large tidal embayment at the western head of the Bay of Fundy and encompasses an area of 290.63 km² (Birds Studies Canada, 2017). This site has importance due to its mudflats and tidal marshes at the head of the Bay of Fundy which are considered one of the most important stopover sites for shorebirds in eastern North America, especially the semipalmated sandpipers (*Calidris pusilla*) and the endangered piping plover (*melodus* subspecies – *Charadrius melodus melodus*).

6.4.3 Fish

The closest water body from the amphitheatre is MacLaren Pond. This lake is not connected to any drainage channel and is not known to be inhabited by any fish population.

6.4.4 Herpetofauna

Eighteen species of reptiles and amphibians have been identified in the park. Five of these species are considered rare; these include the Leopard frog (*Lithobates pipiens*), the Ring-neck snake (*Diadophis punctatus*), the Four-toed salamander (*Notophthalmus viridescens*), northern Dusky salamander (*Desmognathus fuscus*), and the blue-spotted salamander (*Ambystoma laterale*).

While on site visit on July 27, 2017 one specimen of green frog (*Lithobates clamitans*) and one specimen of American bullfrog (*Lithobates catesbeianus*) could be ear from MacLaren pond.

6.4.5 Species at Risk

A search of the Atlantic Canada Conservation Data Centre database was conducted (ACCDC, 2017). The ACCDC provided a list of nationally and/or provincially rare/unique species (i.e. plants and animals) within a 5 km buffer zone (standard ACCDC procedures) of the site of the proposed work. All species were cross-referenced with Schedule 1 of the *Species at Risk Act* (SARA). Species at risk or of concern are listed in Table 4.

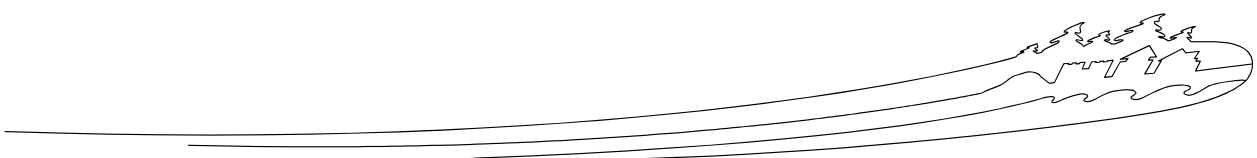
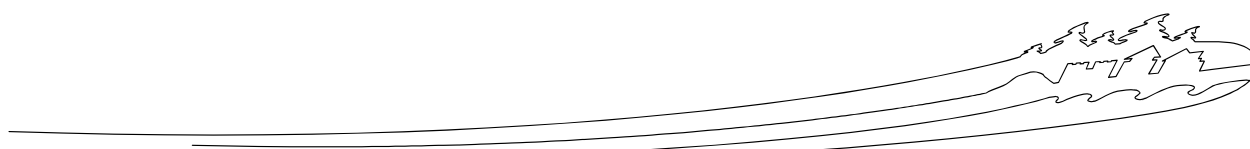




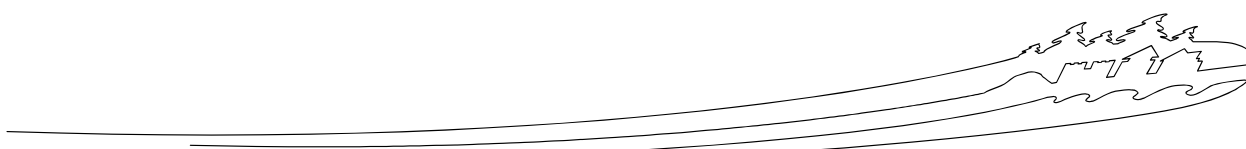
Table 4: Species at risk or of concern around the amphitheatre in Fundy National Park.

Scientific Name	Common Name	ACCDC Species Rank	General Description	Latest observation recorded	Status
Animals					
<i>Riparia riparia</i>	Bank Swallow	S2S3B	Bank swallows can be found in coastal areas, rivers, streams, and reservoirs. They nest in burrows in vertical banks where they form colonies. They are insectivorous, feeding in the air.	2014	COSEWIC: Threatened
<i>Hirundo rustica</i>	Barn Swallow	S3B	Before European settlement, the Barn Swallow's nesting habitat was mainly characterized by natural features such as caves, holes, crevices, and ledges associated with rocky cliff faces. Although Barn Swallows continue to nest in traditional natural situations, they are now most closely associated with human situations in rural areas. Such nesting sites include a variety of artificial structures that provide either a horizontal nesting surface (e.g., a ledge) or a vertical face, often with some sort of overhang that provides shelter.	2014	COSEWIC: Threatened
<i>Catharus bicknelli</i>	Bicknell's Thrush	S2B	The thrush breeds mainly in high elevation, dense and stunted fir/spruce forests. Most populations are confined to altitudes of 914 m to the tree line on rocky peaks, but some scattered pairs breed down to 762 m. The subalpine forests favoured by this species are characterized by a wet, cool, windy climate that increases in severity with elevation. Average canopy height ranges from 3-7 m in New Brunswick. The species is an above-ground nester, building bulky, well-constructed nests in small or medium-sized spruce and fir (and sometimes, in alder, birch or striped maple). Most nests are built relatively close to the ground (1-4.5 m above ground level). Nest construction occurs in early June, shortly after the birds arrive on the breeding grounds. Clutches of 3-4 greenish-blue eggs, lightly spotted with brown, are laid around mid-June and are incubated solely by the females.	2007	COSEWIC: Threatened SARA: Schedule 1, Threatened
<i>Dolichonyx oryzivorus</i>	Bobolink	S3B	Bobolink nest primarily in field of forage crops (e.g., hayfields and pastures) dominated by a variety of species, such as clover, timothy, tall grasses, and broadleaved plants. Hayfields and associated pastures are its preferred habitat due to the plant cover present at the start of the nesting season. The bobolink is also known to use sites that have been restored to grassland habitat.	1977	COSEWIC: Threatened
<i>Wilsonia canadensis</i>	Canada Warbler	S3S4B	The Canada Warbler is found in a variety of forest types, but it is most abundant in wet, mixed deciduous-coniferous forest with a well-developed shrub layer. It is also found in riparian shrub forests on slopes and in ravines and in old-growth forests with canopy openings and a high density of shrubs, as well as in stands regenerating after natural disturbances, such as forest fires, or anthropogenic disturbances, such as logging.	1975	COSEWIC: Threatened SARA: Schedule 1 Threatened



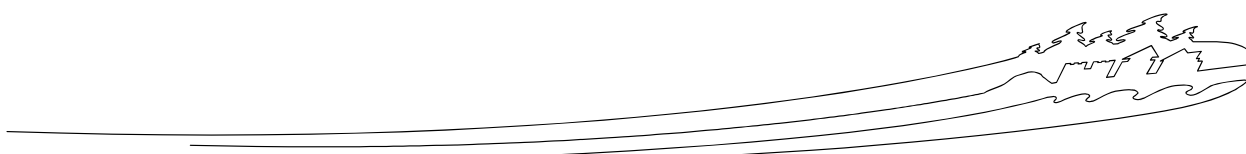


Scientific Name	Common Name	ACCDC Species Rank	General Description	Latest observation recorded	Status
			The Canada Warbler builds its nest on or very close to the ground, often in dense ferns or fallen logs.		
<i>Chaetura pelagica</i>	Chimney Swift	S2S3B	The Maritimes Canadian Chimney Swift population is estimated at 900. The Chimney Swift spends the major part of the day in flight feeding on insects. Flocks can often be seen near bodies of water due to the abundance of insects. Prior to the arrival of European settlers in North America, Chimney Swifts nested mainly in the trunks of large, hollow trees, and occasionally on cave walls or in rocky crevices. However, due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys. However, it is likely that a small portion of the population continues to use hollow trees.	2011	COSEWIC: Threatened SARA: Schedule 1 Threatened
<i>Chordeiles minor</i>	Common Nighthawk	S3B	The Common Nighthawk nests in a wide range of open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. The Common Nighthawk arrives in Canada from early May to mid-June, where it produces one clutch per year. The species migrates to South America between mid-August and mid-September.	1977	COSEWIC: Threatened SARA: Schedule 1, Threatened
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	In the Maritimes, an analysis of breeding bird atlas point count data suggests that pewees are strongly associated with mature poplar and hardwood forest, with weaker associations with older pine, hemlock and other forest. At the landscape scale in the Maritimes, pewees are associated with the presence of marshes, lakes, ponds and rivers, and negatively associated with harvested forest, human-occupied areas and roads. In Canada, adults arrive on the breeding grounds mostly from mid-May to the end of May. Pair formation and nest building start soon after arrival. Nests are usually located on top of a horizontal limb in a living tree at heights between 2 and 21 m. Clutch size averages 3 eggs. Incubation lasts about 12 to 13 days, and nestlings fledge after about 16 to 18 days. Up to two broods can be produced per year. Generation time is estimated to be 2-3 years.	2009	COSEWIC: Special Concern
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	S3B	In the Maritimes, the Evening Grosbeak is generally associated with older coniferous and mixed forests. It is widely distributed across the Maritimes, but its largest areas of abundance are in NB's Northern Uplands and in Western NS, where substantial tracts of mature forests are available, but it can take advantage of many habitats, especially if insects such as beetles and moth larvae are abundant.		COSEWIC: Special Concern



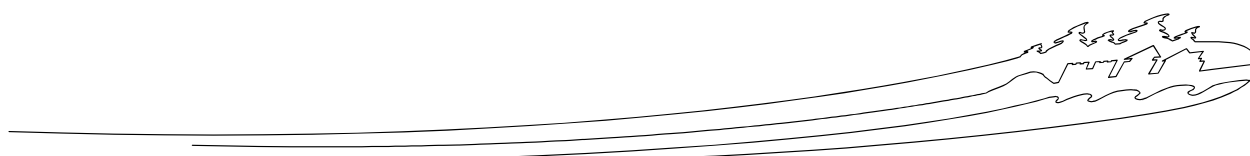


Scientific Name	Common Name	ACCDC Species Rank	General Description	Latest observation recorded	Status
<i>Myotis lucifugus</i>	Little Brown Myotis	S1	Little brown myotis is the most widely distributed Canadian bat species. They roost in buildings, tree cavities, or any other dark, warm area they can find. They forage at night on flying insects and roost during the day. The population of little brown myotis in Canada has been reduced by over 75% in the last number of years as a result of White Nose Syndrome, caused by a fungus likely from Europe. Bats hibernate between October and May.	1983	COSEWIC: Endangered SARA: Schedule 1, Endangered
<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	S1	They are found primarily in forested habitats, especially boreal forests, since they typically roost in hardwood trees during the summer. During the spring and summer, northern long-eared bats spend the day roosting in trees or artificial structures, switching to a new roost every other day on average. In the fall, northern long-eared bats migrate to caves to hibernate. Depending on the latitude, this may occur at any time between September and November, and the bats emerge between March and May.	1983	COSEWIC: Endangered SARA: Schedule 1, Endangered
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3S4B	The Olive-sided Flycatcher is most often associated with open areas containing tall live trees or snags for perching. These vantage points are required for foraging. In the boreal forest, suitable habitat is more likely to be in or near wetland areas. Olive-sided Flycatchers arrive in Canada to breed between April and June, predominantly in mid- to late May. Females choose the nest site, construct the nest (usually in a conifer) from twigs and rootlets, and lay one egg per day for an average clutch size of three (range of two to five). A single brood is raised each year. The fall migration begins in late July, with most birds travelling to the wintering grounds between mid-August and early September.	1997	COSEWIC: Threatened SARA: Schedule 1 Threatened
<i>Falco peregrinus anatum/tundrius</i>	Peregrine Falcon - anatum/tundrius	S1B	The Peregrine Falcon is found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. It usually nests alone on cliff ledges or crevices, preferably 50 to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas. In addition, structures built by humans in both rural and urban areas provide the Peregrine Falcon with other potential nesting sites. In the fall, most Peregrine Falcons migrate to the southern United States, Mexico, Central America and South America. However, some couples in coastal and northern areas may remain at the nesting site all winter if there is an abundant supply of food. This is particularly true for anatum Peregrine Falcons that nest in urban areas in Eastern Canada.	2014	COSEWIC: Special Concern SARA: Schedule 1, Special Concern
<i>Calidris canutus rufa</i>	Red Knot rufa ssp	S2M	Red Knots use different habitats during the breeding, wintering, and migration seasons.	1971	COSEWIC: Endangered





Scientific Name	Common Name	ACCDC Species Rank	General Description	Latest observation recorded	Status
			Nesting sites are usually located in dry, south-facing locations, near wetlands or lakes, where the young are led after hatching. Red Knots generally feed in damp or barren areas that can be as far as 10 km from the nest. Migratory stopovers and wintering grounds are vast coastal zones swept by tides twice a day, usually sandflats but sometimes mudflats. In these areas, the birds feed on molluscs, crustaceans, and other invertebrates. The species also frequents peat-rich banks, salt marshes, brackish lagoons, mangrove areas, and mussel beds.		SARA: Schedule 1, Endangered
<i>Phalaropus lobatus</i>	Red-necked Phalarope	S3M	Red-necked Phalaropes spend up to nine months at a time at sea. They nest in the low Arctic, on tundra ponds with marshy shores and bogs. During migration, large numbers gather at hyper-saline lakes before heading south. Many migrate over the open ocean, often within sight of land. Some migrate over land and can be seen on reservoirs, lakes, and coastal marshes. At sea, they gather at upwellings and convergence zones where food is brought to the surface. They are sometimes blown onshore by storms and during these times can be found anywhere, especially at sewage ponds.	1971	COSEWIC: Special Concern
<i>Euphagus carolinus</i>	Rusty Blackbird	S3B	The Rusty Blackbird nests in the boreal forest and favours the shores of wetlands such as slow-moving streams, peat bogs, marshes, swamps, beaver ponds and pasture edges. In wooded areas, the Rusty Blackbird only rarely enters the forest interior. During the winter, the Rusty Blackbird mainly frequents damp forests and, to a lesser extent, cultivated fields. Migration begins in late August and lasts until early October.	1998	COSEWIC: Special Concern SARA: Schedule 1, Special Concern
<i>Hylocichla mustelina</i>	Wood Thrush	S1	In Canada, the Wood Thrush nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. This species prefers large forest mosaics, but may also nest in small forest fragments. Wintering habitat is characterized primarily by undisturbed to moderately disturbed wet primary lowland forests. In Canada, most breeding adults arrive on the breeding grounds from mid-late May. Fledglings remain on their natal home range for 24-33 days before departing to the wintering range between mid-August and mid-September.	2003	COSEWIC: Threatened
Invertebrates					
<i>Danaus plexippus</i>	Monarch	S3B	Monarchs in Canada exist primarily wherever milkweed (<i>Asclepius</i>) and wildflowers (such as Goldenrod, asters, and Purple Loosestrife) exist. This includes abandoned farmland, along roadsides, and other open spaces where these plants grow. The eastern and western populations of the Monarch annually migrate	2015	COSEWIC: Endangered SARA: Schedule 1, Special Concern





Scientific Name	Common Name	ACCDC Species Rank	General Description	Latest observation recorded	Status
			south, beginning in August and continuing until mid-October.		

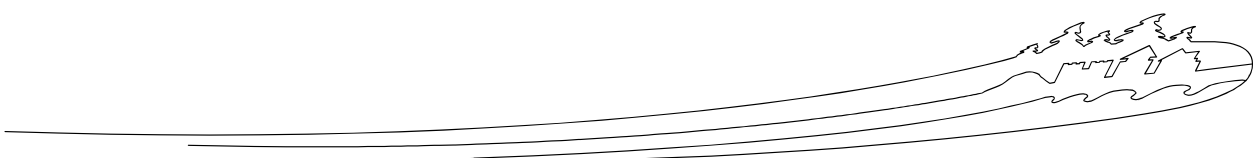
6.5 Cultural/Aboriginal Resources

Although Fundy National Park falls within the traditional territory of both the Mi'kmaq and Wolastoqiyik (Maliseet) people, no physical evidence related to their use or occupation of the park has been found. The Mi'kmaq, Wolastoqiyik (Maliseet), and Passamaquoddy Aboriginal peoples have a long history in Fundy NP and its greater ecosystem (Fundy Biosphere) region and consider the area as part of their traditional territory, a landscape woven by a labyrinth of water, over which they travelled extensively on its rivers, lakes and coastlines. These people co-occupied the region in permanent villages and semi-permanent, seasonal encampments, for purposes such as salmon fishing. To date, little archaeological evidence of past aboriginal use has been found in the park perhaps largely due to the fact that the sites preferred for traditional encampments in this rugged landscape were also the same sites appropriated for construction of logging mills and modern communities whose activities have obliterated the archaeological record. In addition, other nearby locations, known to have been used until well within living memory, such as Indian Island near Mary's Point, are slowly being lost to coastal erosion and sea-level rise (Cook and McKay, 2010).

An Archaeology Overview Assessment (AOA) was specifically conducted by PCA in 2017 for the amphitheatre project (Appendix IV). The AOA mentioned that there is no known archaeological resources situated at proximity to be impacted by the new Amphitheatre and related works. However, there is low to none potential that excavation activities may yield Aboriginal and/or historical artifacts, particularly in the footprint of the Amphitheatre. The area was largely disturbed presumably, and the surrounding area of the Amphitheatre would have already been disturbed with the construction of the frame, seating sections, roads and access to the original one. Therefore, an Archaeological Impact Assessment (AIA) was not required for this project. Mitigations measures identified in the AOA are included in this BIA to minimize potential impacts to archeological resources.

6.6 Visitor experience

Fundy National Park receives approximately 250 000 visitors each year. Centrally located in the hub of the Headquarters area of the park the amphitheatre is located adjacent to the new Cannontown Campground, playground, soccer field, Salt and Fir Centre, golf course pro shop and number 1 tee. These facilities accommodate many scheduled as well as spontaneous activities. Construction activities have the potential to impact or interfere with scheduled activities, create noise disturbance or interrupt the flow of traffic, however the project will benefit overall visitor's experience in the future following construction.





7. EFFECTS ANALYSIS

Described below is a list of effects that could potentially impact the identified components at risk.

Soil/Landforms

- Potential runoff, erosion, sedimentation and soil compaction from movement of machinery
- Potential impact to landscape and visual aesthetic
- Introduction of building materials potentially harmful to the environment
- Potential contamination of soil and/or water

Water/Hydrology

- Potential for dust particles, debris and toxic substances to enter and affect the nearby freshwater environment and impact water quality
- Potential for suspended solid/sediments to enter adjacent freshwater environment
- Potential contamination of water
- Potential disturbance or destruction to aquatic habitat

Flora

- Potential loss or damage of native flora from stockpiling, vehicle and machinery travel, further erosion if site not stabilized
- Potential decrease in flora diversity
- Possible disturbance, destruction or fragmentation to habitat
- Introduction or spread of non-native or invasive species
- Introduction of building materials that could be potentially deleterious to flora habitat

Fauna

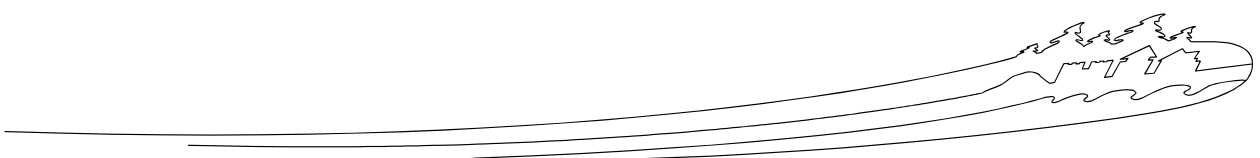
- Possible damage or loss of native fauna during construction
- Potential decrease in fauna diversity
- Possible disturbance, destruction or fragmentation to aquatic and terrestrial habitat
- Possible loss of food supply
- Noise disturbance
- Wildlife corridor disruption
- Introduction of building materials that could be potentially deleterious to fauna habitat

Cultural/Aboriginal Resources

- Unidentified cultural/aboriginal resources could be directly impacted by construction activities

Visitor Experience

- Construction activities, especially during peak season can have an adverse effect on visitor experience.





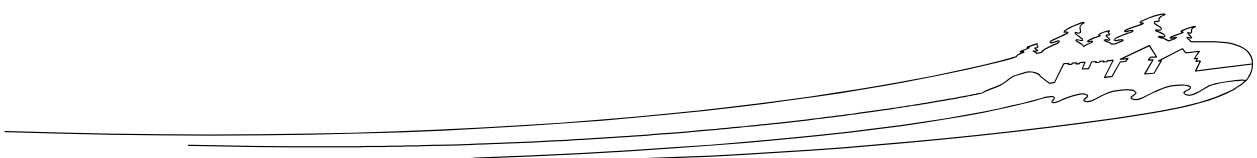
- Inadequate signage, alerting visitors of construction activities, can affect visitor experience and create safety concerns. Without barriers, visitors may wander into an active construction site without knowing the dangers and safety concerns.
- Potential increase in use rate of upgraded amphitheatre facilities and improved visitor experience following construction.

8. MITIGATION MEASURES

The following mitigation measures are to be followed in order to reduce or eliminate potential negative impacts resulting from the work:

General

- The Project Manager is responsible to ensure all parties (i.e. Park Staff, Contractor, etc.) receive a copy of this Basic Impact Analysis (BIA) prior to project start up.
- The conditions presented in this BIA will be considered part of the project. Failure to comply may result in work being suspended pending rectification of problem(s).
- All activities must conform to relevant Occupational Health and Safety Guidelines and to all relevant Municipal, Provincial and Federal regulations.
- All activities pursuant to the project shall be governed by and carried out in accordance with the Canada National Parks Act and Regulations and with all other laws of Canada and the Province of New Brunswick.
- Before commencing construction activities or delivery of materials to site, the contractor must submit an Environmental Protection Plan (EPP) for review and approval by PSPC and Parks Canada. The EPP must include a comprehensive overview of known or potential environmental issues to be addressed during construction.
- The Contractor is required to provide for approval ten (10) working days before start-up to PSPC and Parks Canada an erosion and sedimentation control plan, as part of the Environmental Protection Plan. The plan shall incorporate all necessary silt fences, silt traps, plastic lined trenches and ditches as approved by PSPC and Parks Canada.
- The Contractor/Project Lead is required to notify the Project Manager of the proposed work schedule at least one week in advance of potential start up.
- A pre-construction meeting will be held on-site and attended by the Contractor/Project Lead, Project Manager, and the PC Environmental Assessment Officer. The meeting is to ensure construction personnel are aware of the environmental concerns, laws, rules and regulations in Fundy National Park.
- Emergency contact list with phone numbers to be compiled and posted in a conspicuous location at the construction/project site.
- A designated PC Environmental Assessment Officer shall be kept informed of project scheduling and will be notified of changes at all times.

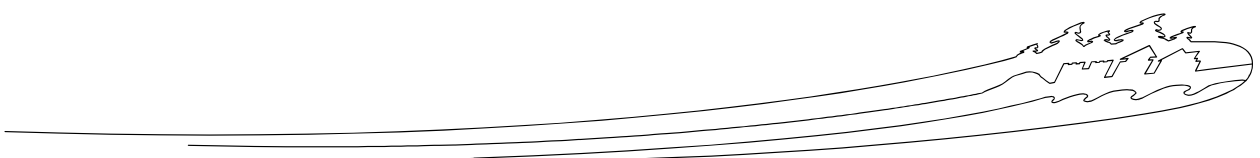




- The Contractor must be aware that they are working in a National Park whose emphasis is on ecological/cultural integrity and resource protection.

Vegetation and Soil

- Equipment operators shall take extreme caution to avoid striking vegetation, including trees and tree bark that is outside of the construction corridor. Efforts will also be taken to minimize damage to tree roots. Equipment shall be stored within the project limits.
- The contractor must set project limits prior to the start of construction. No trees and vegetation will be cut or removed outside these limits. Tree removal will be limited to individuals within the construction site that have been identified by the park representative.
- Measures shall be taken to protect vegetation remaining on the site and not intended for removal. The park representative must be informed if there is a requirement to remove unmarked vegetation. Removal shall only commence with the approval of the park representative. Root systems shall be left intact whenever possible.
- Disturbance of soil and vegetation must be kept to an absolute minimum. This will minimize disturbance and disruption to plants and wildlife communities and habitat.
- All exposed soils must be stabilized as soon as possible in order to control sediment runoff during and after construction.
- Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
- Trim trees designated to be left standing within cleared areas of dead branches 4 cm or more in diameter. Prune limbs close to the tree trunk. For a clean cut, make a shallow undercut first, then follow with the top cut. This prevents the limb from peeling bark off the tree as it falls. Do not use an ax for pruning. Cut limbs and branches to be trimmed close to bole of tree or main branches.
- If over half of a tree needs pruning, it is recommended to cut it down. Trees should be cut at ground level and do not leave pointed stumps.
- Any required re-planting for landscaping purposes must utilize native species approved by park representative.
- Minimize equipment travel outside of construction corridor.
- Slash generated from vegetation removal shall be disposed of in an appropriate manner. All work will be done with the goal of having a low aesthetic impact on the landscape.
- All salvageable wood is the property of Parks Canada and must be removed to a pre-determined location. The remaining non-salvageable woody material (e.g. stumps, etc) will be removed by the contractor from the National Park and disposed of at a provincially approved site.
- Cover devegetated areas if heavy rains are expected in erosion prone locations.
- Keep excavation to a minimum and reduce disturbance to ground surface and vegetation.
- Organic materials removed during project construction activities must be removed from the project site.





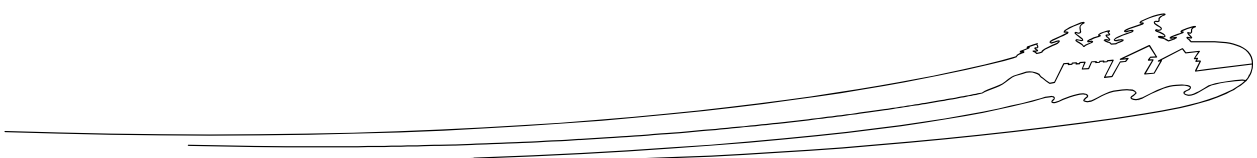
- If soil becomes saturated during extreme wet weather, operations shall be suspended until soil conditions are more favourable.
- To minimize the introduction of invasive species, all construction material must be clean and free of any contaminants and non-native species (refer to invasive plant section below).
- Excavated soil that is suspected of or known to be contaminated (i.e. fuel, oil) is to be placed in covered bins or stockpiled and covered with plastic until the material can be transported to a provincially approved waste management facility.
- All soils brought on site from an outside source must be pre-approved by Parks Canada through inspection at the source location to ensure there are no invasive plants.
- All topsoil material removed during the project and that is not reused in the project will be disposed of outside the National Park at a provincially approved site.
- The use of chemical vegetation control is not permitted.
- Fires and burning of rubbish on site is not permitted.

Hydrology / Water Quality

- No rock, silt, cement, grout, asphalt, petroleum product, lumber, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, wetland, lake or other water course.
- Mitigation measures must be in place to reduce the introduction of sediment into any drainage channels.

Mammals / Birds / Fish / Bats

- Feeding wildlife is not permitted. All work sites must be kept free of edible and other garbage that could attract or harm wildlife.
- To avoid the risk of nest destruction, the proponent shall avoid vegetation clearing during the most critical period of the migratory bird breeding season, which is May 1st through August 31st.
- In the event that vegetation clearing is to take place inside the May 1st to August 31st window, a qualified biologist must inspect the area prior to potential disturbance or loss of habitat activities to ensure there will be no adverse impacts to birds and wildlife.
- Before cutting of trees, rap their trunks repeatedly with a stick (or similar object) to awaken hibernating mammals.
- All construction activities shall be designed to have minimum effect on fish and fish habitat.
- Develop and implement an Erosion and Sediment Control Plan, as part of the Environmental Protection Plan for the site. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized. The plan should, where applicable, include:
 - Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering any water body.
 - Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For

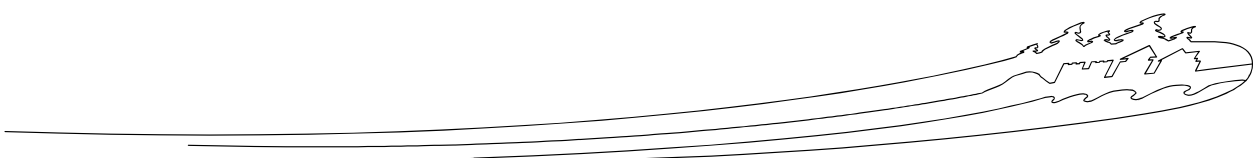




- example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
- Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
 - Repairs to erosion and sediment control measures and structures if damage occurs.
 - Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
 - The contractor will maintain a stockpile of appropriate erosion and environmental protection materials (e.g. silt fences, straw bales, wood chips, clean rock fill and aggregate base course) on site at all times.
 - Remove all construction materials from site upon project completion.
 - Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
 - Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
 - The following measures for bat activity / inspection should be strictly followed:
 - All work must conform to the mitigation measures outlined in Parks Canada Best Management Practice (BMP) for Management of Bats in Built Assets, Fundy National Park and the National Best Management Practice for Management of Bat Maternity Roosts in Built Assets.
 - In Fundy National Park maternity roosts may be active until the end of summer and into early fall. If possible, construction activities should be scheduled outside of this timeframe.
 - The amphitheatre must be checked for bat activity by Resource Conservation staff prior to start of project. Inspections must follow the guidelines set out in “Fundy National Park Guidance for Inspecting Built Assets for Bats”.
 - If bat activity is observed during construction, cease work and contact the Project Manager or Environmental Surveillance Officer as soon as possible.

Invasive Plants

- Construction equipment may facilitate the movement and spread of invasive plants by moving invasive plant seeds from infested areas. Contractors/construction operators are responsible to pressure wash equipment before entering the park or moving from an infested area within the park.
- Hand tools and footwear should be cleaned between work sites to prevent cross contamination and reduce the risk of invasive species introduction.
- Materials to be used on construction projects should be stored in areas free of invasive plant species.
- Freshly disturbed ground created by construction equipment during construction activities provide suitable habitat for invasive plants. Ensure that exposed soil is planted with native vegetation species as soon as feasible to reduce the risk of invasive species invasion.





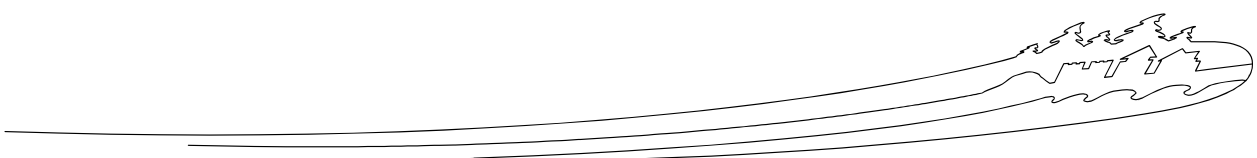
- Reduce the spread of invasive plants by prohibiting the movement of soil, vegetation and materials from infested areas.

Machinery / Storage and Handling of Fuels and Dangerous Fluids

- For all contractors, a Spill Response Kit (absorbent materials, etc.) must be on site at all times and the employees trained in its use. In the event of any spill, the offending party (Parks Canada or Contractor) is responsible for containing and cleaning up the spill. The offending party is required by law to report all toxic spills and petroleum spills >20 litres to Environmental Emergency 1-800-565-1633. In addition, for any spill, the Project Manager (506-887-6386) and/or the Environmental Assessment Officer (506-227-7428 (cell)) must be notified immediately. If unavailable contact Jasper Dispatch (1-877-852-3100).
- All mechanical construction equipment should be properly maintained, in good operating order, and fitted with standard air emission control devices. Detection of leaks or exhaust issues shall be fixed immediately or work is suspended until repairs can be made.
- Daylight operation of all mechanized equipment will be respected.
- Gas or diesel operated equipment shall be shut down if not needed for a period greater than 5 minutes to reduce noise and emissions.
- Cleanup, repair and rehabilitation resulting from any spill shall be to the satisfaction of the PC Environmental Assessment Officer.
- The refuelling or parking of equipment, if required, shall be at a location pre-approved by the Project Manager/Parks Canada and will not take place within 30m of a waterway or critical habitat.
- Refueling shall not take place in locations where runoff could carry contaminants into drainage pathways. An absorbent pad should be placed beneath the machine to capture small spills.
- Minimize quantity of hazardous materials on site to that absolutely necessary to perform the work.
- Disposal of debris or waste into any drain, and/or waterway, is strictly prohibited.
- Any hazardous material/waste is to be stored, handled, transported and disposed of in compliance with Transportation of Dangerous Goods legislation and WHMIS labeling. Disposal shall be at an approved provincial waste management site and proof of disposal provided to the Project Manager.
- Dispose of all waste materials at an appropriate provincial waste/recycle facility.

Cultural Resources

- If there are any changes to the proposed plans, all additional information and construction drawings must be submitted to Parks Canada's Terrestrial Branch for further review.
- The 100% design concept plans for the project must be submitted to Parks Canada's Terrestrial Branch for further review.
- Vehicular access routes and staging areas will be restricted to present-day roadways, parking lots, and significantly disturbed areas. If this is not possible, the use of protective covering such as





geotextile protective mats with a wood chip lift or granular “A” gravel is required. All protective measures employed must be removed following construction and the area restored to a pre-construction state. Excavation is not permitted during installation or removal of protective covering.

- If significant features (i.e., structural remains and/or high artifact concentrations) are encountered during construction activities, excavation should cease in the immediate area, and the Parks Canada project manager will be informed. The project manager will contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine the requirements to mitigate the find.

Erosion Control

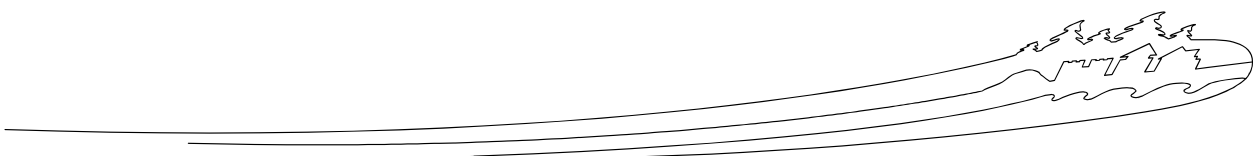
- If there is a requirement to excavate, install sediment and erosion control structures to reduce the introduction of sediment into the waterway or adjacent vegetation.
- Regularly inspect sediment and erosion control structures and repair as required. Remove accumulated sediment at regular intervals and dispose of the sediment at an approved location.
- Minimize the amount of dust created by construction activities on adjacent vegetation and reduce the impact to air quality.
- Ensure an Environmental Protection Plan that highlights procedures is in place before the project begins and have materials readily available for use in the event of a silt release.
- Remove non-biodegradable erosion and sediment control materials once site is stabilized.

Access

- Access for emergency response, fire suppression and site maintenance should be reflected in safety plan for the site.
- Whenever possible, only existing roadways or disturbed areas shall be used for site access.

Facilities

- Leave No Trace wilderness ethic principles shall be communicated to/observed by all of the construction crew.
- During the construction phase, store food, garbage and other smelling products in sealed containers. Pack all garbage out from the site daily, unless permanent garbage facilities exist at the site. Garbage structures shall minimize the opportunity for wildlife to feed from the garbage.
- Daily maintenance of the site shall be done to ensure that it is free from accumulations of waste, debris and garbage.
- Remove all construction materials from site upon project completion.
- A complete site cleanup including restoration of exposed and damaged areas, shall be required to the satisfaction of the park representative, before the site is vacated after project completion.
- Fires are only permitted in approved structures at designated sites within the park.





Safety

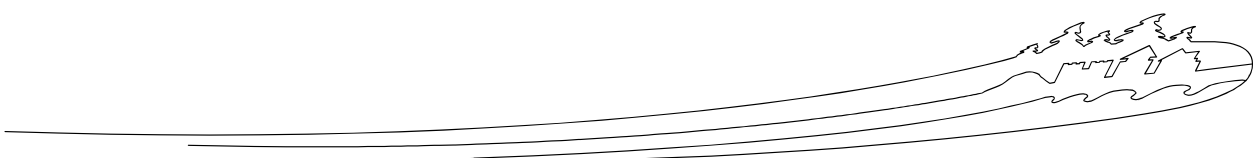
- Work crews on site must comply with all applicable health/safety regulations, including use of appropriate protective equipment.
- A project safety plan must be in place before project commences.
- The Project Manager is responsible to take all necessary precautions to ensure there is no safety concerns related to visitors of the Park.
- The contractor shall determine the exact location of all existing buried utilities before commencing work.
- The contractor must provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from the Project.
- Blasting is not permitted.
- Care and appropriate measures must be taken to ensure dust and other air borne particulates do not reach a level that would compromise air quality or impact vegetation/wildlife.

9. PUBLIC/STAKEHOLDER ENGAGEMENT & ABORIGINAL CONSULTATION

- Indicate whether public/stakeholder engagement was undertaken in relation to potential adverse effects of the proposed project:
 - No
 - Yes (describe the process to involve relevant parties and indicate how comments were taken into consideration).
- Indicate whether Aboriginal consultation was undertaken in relation to potential adverse effects of the proposed project:
 - No
 - Yes (describe the process to involve relevant parties and how the results were taken into consideration).

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

All effects are likely not significant or are able to be mitigated. If appropriate mitigating measures described in this report are followed and carried out, the environmental effects should be reduced to minor or insignificant levels. Thus, the level of disturbance is considered to be localized and of low magnitude. The project is not likely to cause significant adverse environmental effects in the short or long term. Impact to visitor experience can be expected during the construction period. These impacts are expected to be short term and all efforts will be taken to mitigate the issues.





11. SURVEILLANCE

- Surveillance is not required
- Surveillance is required (An Environmental Surveillance Officer will conduct daily site inspections to determine if construction activities comply with the mitigation measures, set out in this report, to reduce negative impacts to the site. Items to be monitored during the inspection include transportation of materials, fuel management, erosion and sediment control, work adjacent to a waterway, waste management and general condition of the site)

12. FOLLOW-UP MONITORING

Follow-up monitoring is:

- Not required
- Required by legislation or policy (indicate basis of requirement – e.g. required by the *Species at Risk Act*; *Fisheries Act*, or the *Parks Canada Cultural Resource Management Policy*)
- Required to evaluate effectiveness of mitigation measures and/or assess restoration success

13. SARA NOTIFICATION

Notification is:

- Not required
- Required under the *Species at Risk Act* (outline the nature of and response to any notification)

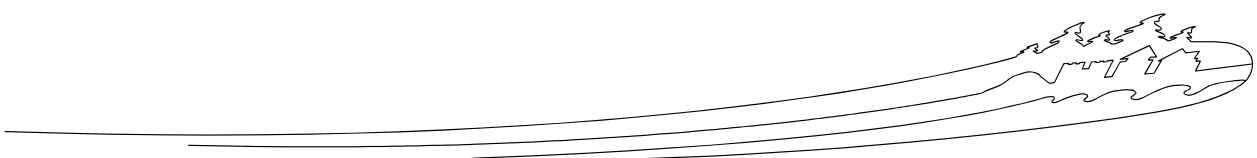
14. EXPERTS CONSULTED

Department/Agency/Institution: Parks Canada Agency	Date of Request: Various times throughout July and August 2017
Expert's Name & Contact Information: Shirley Butland	Title: A/ Environmental Assessment Officer
Department/Agency/Institution: Public Services and Procurement Canada	Date of Request: Various times throughout July and August 2017
Expert's Name & Contact Information: Matt Walsh	Title: Project Manager
Expertise Requested: 1) Historical Information, 2) Environmental Information 3) Building Details	
Response: 1) Historical Information by SB, 2) Environmental Information by SB 3) Building Detail by MW	

15. ATTACHMENTS

The following is a list of attachments to this BIA:

- Appendix I:** Environmental Impact Analysis Tool: Effects Identification Matrix
- Appendix II:** Existing condition site plan
- Appendix III:** Proposed site plan





Appendix IV: Archaeology Overview Assessment (AOA)

Appendix V: Hazard Information Sheet - Woodland Angelica

16. AUTHOR

<p>Prepared by: Nicolas Rolland, Ph.D. Water Sciences Environmental Specialist, PSPC nicolas.rolland@pwgsc-tpsgc.gc.ca / 506-961-2344</p>	<p>Date: October 05, 2017</p>
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17. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM (Parks Canada Responsibility)

The project must be registered in the Parks Canada National Impact Assessment Tracking System within the fiscal year the project took place. If the project is on hold, was cancelled, or was determined to be likely to cause significant adverse effects and did not proceed, please indicate this information in the tracking system (see selections in the *Assessment Status/Decision* field).

- 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*)

18. 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

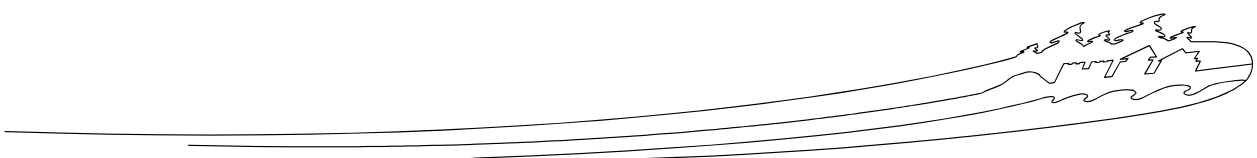
NOTE: If the project is identified as likely to cause significant adverse effects, CEAA 2012 prohibits approval of the project unless the Governor in Council (Cabinet) determines that the effects are justified in the circumstances. A finding of significant effects therefore means the project CANNOT go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

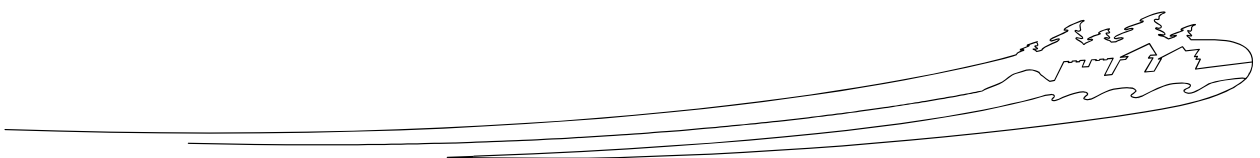
- There is no contravention of SARA prohibitions
- Project activities contravene a SARA prohibition and CAN be authorized under SARA
- Project activities contravene a SARA prohibition and CANNOT be authorized





19. RECOMMENDATION AND APPROVAL (Parks Canada Responsibility)

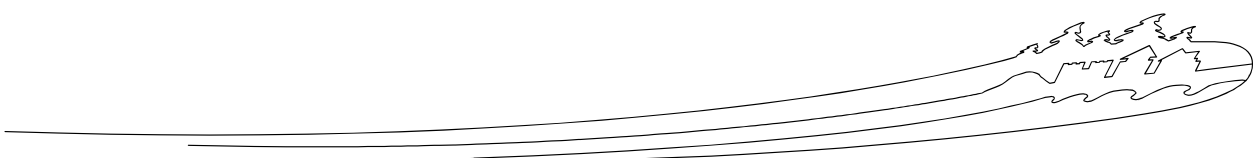
Reviewed by:	Date:
EIA Specialist Comments:	
Recommended by:	Date:
Approved by:	Date:
Signature:	





20. REFERENCES

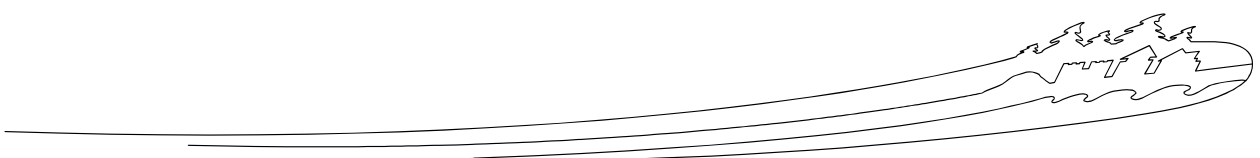
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<http://www.ibacanada.ca/mapviewer.jsp?lang=en>
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- Zelazny V.F. (2007) Our Landscape Heritage: The Story of Ecological Land Classification in New Brunswick. New Brunswick, Dept. of Natural Resources, 359 p.





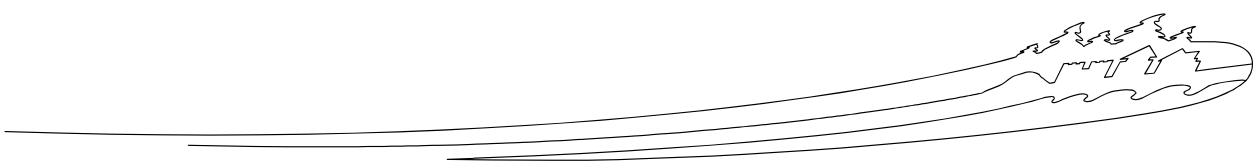
APPENDIX I

Effects Identification Matrix



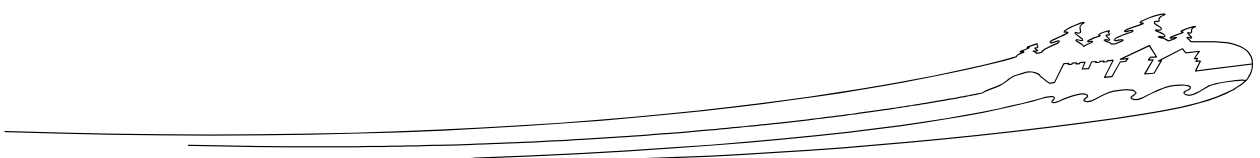


Direct Effects											
		Valued components potentially directly affected by the proposed project									
		Natural Resources					Cultural Resources	Visitor Experience			
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (trees and shrubs)	Fauna (mammals, Birds and fish)	Cultural Resources of Local Value	Recreational opportunities	Viewscapes and soundscapes	Visitor Safety	
Phases	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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Grading	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Backfilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Set up of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		



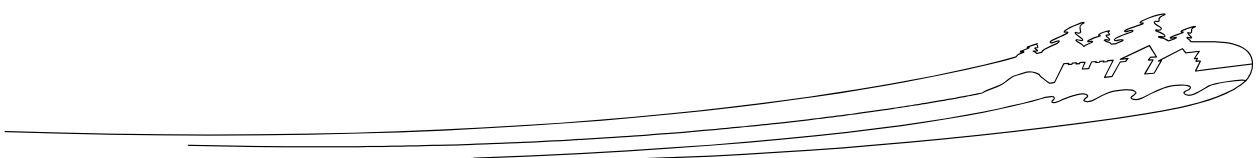


Direct Effects (continued)											
		Valued components potentially affected by the proposed project									
		Natural Resources					Cultural Resources	Visitor Experience			
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (trees and shrubs)	Fauna (mammals, Birds and fish)	Cultural Resources of Local Value	Recreational opportunities	Viewscapes and soundscapes	Visitor Safety	
Phases	Examples of Associated Activities										
Project Components	Preparation / Construction / Operation / Decommissioning	Waste disposal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Wastewater disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maintenance	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use/Removal of temporary facilities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Active fire stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Prescribed burn cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Planting	<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"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Culling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Vehicle Traffic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		





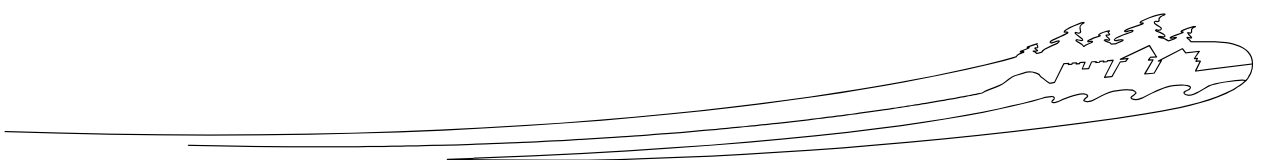
Indirect Effects (all phases)							
		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:			With respect to visitor experience	
Phases	Natural resource components affected by the project	Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommodation opportunities	Safety
Preparation / Construction / Operation / 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 type="checkbox"/>	<input type="checkbox"/>
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





APPENDIX II

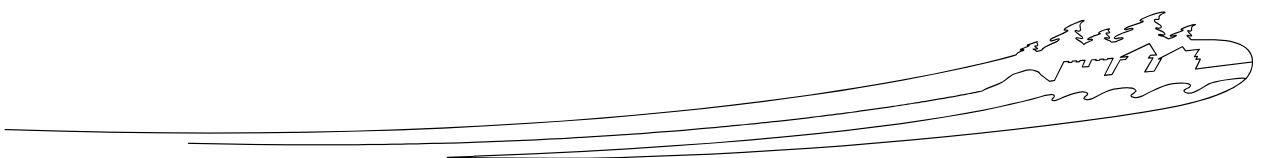
Existing Site Conditions





APPENDIX III

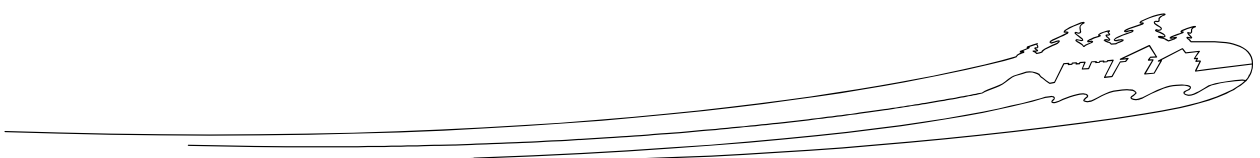
Proposed Site Plan





APPENDIX IV

Archaeology Overview Assessment





**PARKS CANADA AGENCY
ARCHAEOLOGY AND HISTORY BRANCH
INDIGENOUS AFFAIRS AND CULTURAL HERITAGE DIRECTORATE**

**ARCHAEOLOGICAL OVERVIEW ASSESSMENT (AOA)
FUNDY NATIONAL PARK - AMPHITHEATRE PROJECT
FII PROJECT RPA n° 651**

André MILLER
FII Project Archaeologist, IAHCD
National Office, Gatineau

ABSTRACT

Parks Canada Agency (PCA) has proposed the demolition and reconstruction of the Amphitheatre at Fundy National Park. The current project involves the Amphitheatre and Electrical System. This Archaeological Overview Assessment (AOA) will evaluate the archaeological potential of the project area and the potential impacts of the proposed work on known or potential archaeological resources. This AOA will determine if an Archaeological Impact Assessment and/or mitigation measures are required.

PROJECT INTRODUCTION

The Amphitheatre is located in Fundy National Park, Southern New-Brunswick (Figure 1). The project entail the design and construction of a new Amphitheatre, electrical service and lighting system to replace the existing wood framed structure and electrical system (Figures 2-3). Existing Amphitheatre is scheduled to be demolished and replaced with a new one in Fall 2017. Design and construction of the new Amphitheatre, electrical service and lightning system are to replace the existing deteriorated wood frame structure, and outdated electrical system. (Figures 4-5). The current project involves the demolition and reconstruction of the Amphitheatre, a new access ramp to the stage, removal of the upper seating section and improvements to the remaining built seats section.

ASSESSMENT METHODOLOGY

This assessment is based on a review of documentation provided by the Fundy NP Field Unit, online resources and existing documentation at the PCA Terrestrial Archaeology Branch, National Office, Gatineau, Quebec. The documentation includes Archaeological Resource Evaluation mapping, reports, and digital files.

HISTORICAL BACKGROUND

The Fundy Park Amphitheatre was constructed in 1951 - *within the headquarters area and overlooking a small lake, McLaren's Pond, the outdoor amphitheatre was developed, capable of seating 800. The plans incorporated a combination bandshell and motion picture screen permitting the staging of a variety of outdoor entertainments* - (Parks Canada 1976). It was renovated around 1978 and in 1995 a canopy was installed in front end and the stage was slightly expanded. The Amphitheatre and “agora” are a very good example of the development of Fundy National Park as a recreation and tourism destination. The establishment of the park marks a major turning point in the history of Alma, as tourism became the main economic generator and helped revive the declining community.



PREVIOUS ARCHAEOLOGICAL WORK AT FUNDY NATIONAL PARK

Although physical evidence of Indigenous use or occupation within Fundy NP has not been located to date, the area is within traditional territory of the Mi'kmaq, Wolastokiyik (Maliseet), and Passamaquoddy peoples. Archaeological and historical research has identified many cultural resources related to European settlement and use of the park area. These resources include:

- Features and contexts associated with human settlement such as abandoned farms and homesteads that include foundations, remnant fields and roads, stone fences and culverts, cemeteries, and archaeological artifacts,
- Features associated with resource harvesting within FNP that include remnants of saw mill sites and dams, the “Harry McManus” submerged canal, logging roads and lumber camps, and an abandoned copper mine,
- Features associated with Public works including the original Howe-truss covered bridge, circa 1914; a reconstructed replica Howe-truss covered bridge (1992) recognized by FHBRO for its form and function, and the associated dam and abutments of the original bridge; and lighthouse foundations. (PCA 2005).

Interesting mementoes of the former inhabitation remain in the form of small cemeteries, dams and picturesque covered bridges. Vestiges of the once expansive wharves at Point Wolfe also remain below the dam as well as the covered bridge which now provides access to the Point Wolfe Campground. A number of early roads have been retained as fire or secondary roads and others are maintained as trails (Parks Canada 1976).

There is limited knowledge of the condition of the park's cultural resources (further evaluations and inventories are required) and that cultural resource research and information has not been consolidated yet. The park has a fair understanding of the inventory of the cultural resources; however, a cultural resource management strategy and monitoring program for cultural resources in Fundy NP has not been developed to date. (PCA 2011)

ARCHAEOLOGICAL POTENTIAL

Previously there was no archaeological investigations in the immediate area of this project at Fundy National Park. There is no known archaeological resources situated at proximity to be impacted by the new Amphitheatre and related works. However, there is low to none potential that excavation activities may yield Aboriginal and/or historical artifacts, particularly in the footprint of the Amphitheatre. The area was largely disturbed presumably, and the surrounding area of the Amphitheatre would have already been disturbed with the construction of the frame, seating sections, roads and access to the original one.

ASSESSMENT OF PROPOSED DEVELOPMENT IMPACT ON POTENTIAL ARCHAEOLOGICAL RESOURCES

The present AOA is based on a review of the sketch drawings and designs provided. There is no archaeological concern with the design concept for Amphitheatre and related works (Figure 6). Therefore, an Archaeological Impact Assessment (AIA) is not required for this project. Proposed reconstruction of the Amphitheatre will not result in unearthing or digging.

ARCHAEOLOGICAL REQUIREMENTS

The following mitigation measures have been identified to ensure the construction activities, as outlined in the sketch drawings, will not have an impact on archaeological resources:



1. If there are any changes to the plans, all additional information and construction drawings must be submitted to Parks Canada's Terrestrial Branch for further review.
2. The 100% design concept plans for the project must be submitted to Parks Canada's Terrestrial Branch for further review.
3. Vehicular access routes and staging areas will be restricted to present-day roadways, parking lots, exposed bedrock areas and significantly disturbed areas. If this is not possible, the use of protective covering such as geotextile protective mats with a wood chip lift or granular "A" gravel is required. All protective measures employed must be removed following construction and the area restored to a pre-construction state. Excavation is not permitted during installation or removal of protective covering.
4. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered during construction activities, excavation should cease in the immediate area, and the Parks Canada project manager will be informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine the requirements to mitigate the find.

REFERENCES

Parks Canada Agency (PCA)

2005 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.

2011 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.

1976 History of the National Parks of Canada, Vol. 1, p. 104-110





Figure 1. Location of Fundy NP Amphitheatre (PCA Digital Files).



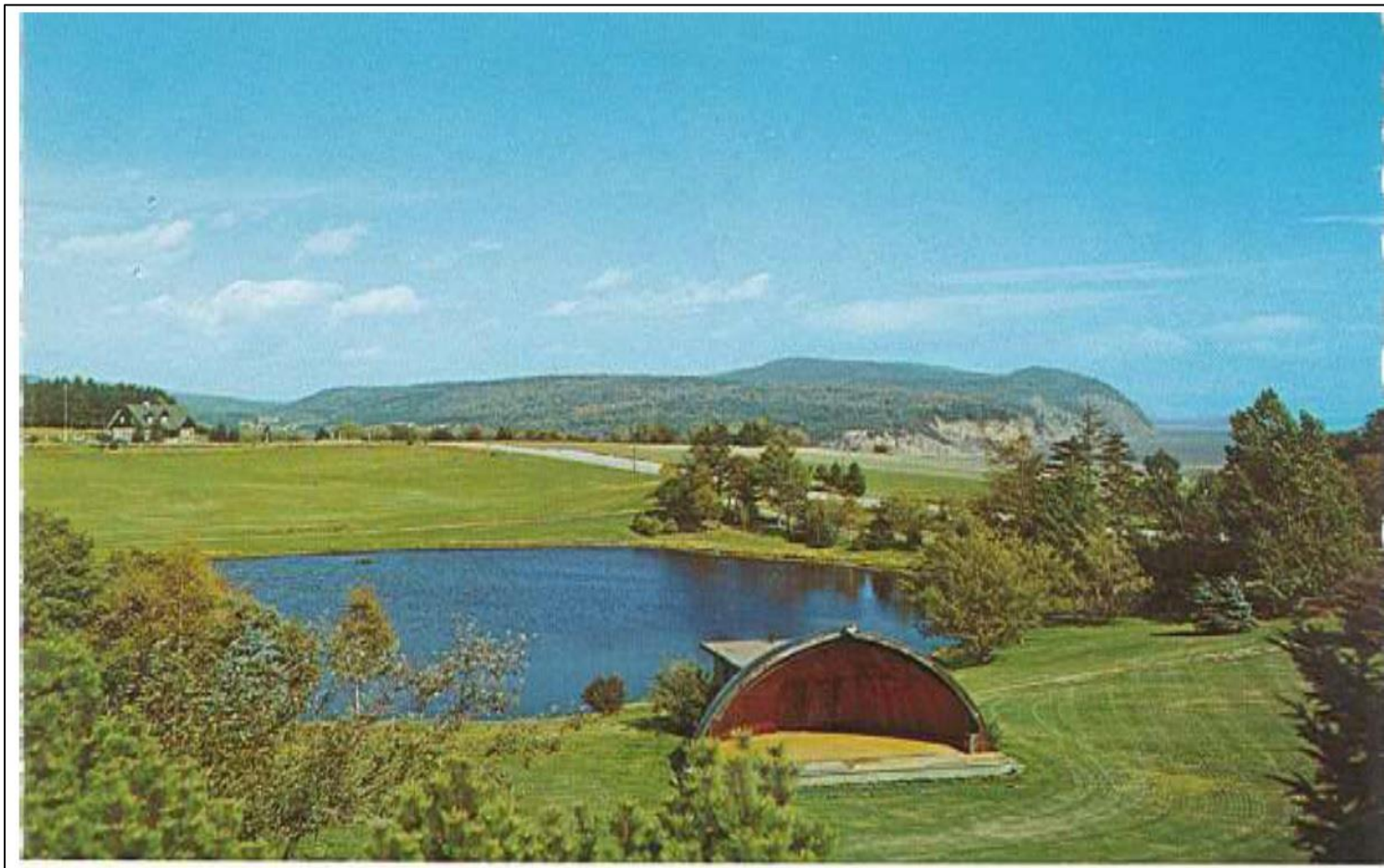


Figure 2. Fundy Amphitheatre in early 1950s. *Note open band shell and enclosed porch-like structure at the back (which still exist today)* (PCA Digital Files).





Figure 3. Current Amphitheatre to be demolished and replaced by a new one (PCA Digital Files).



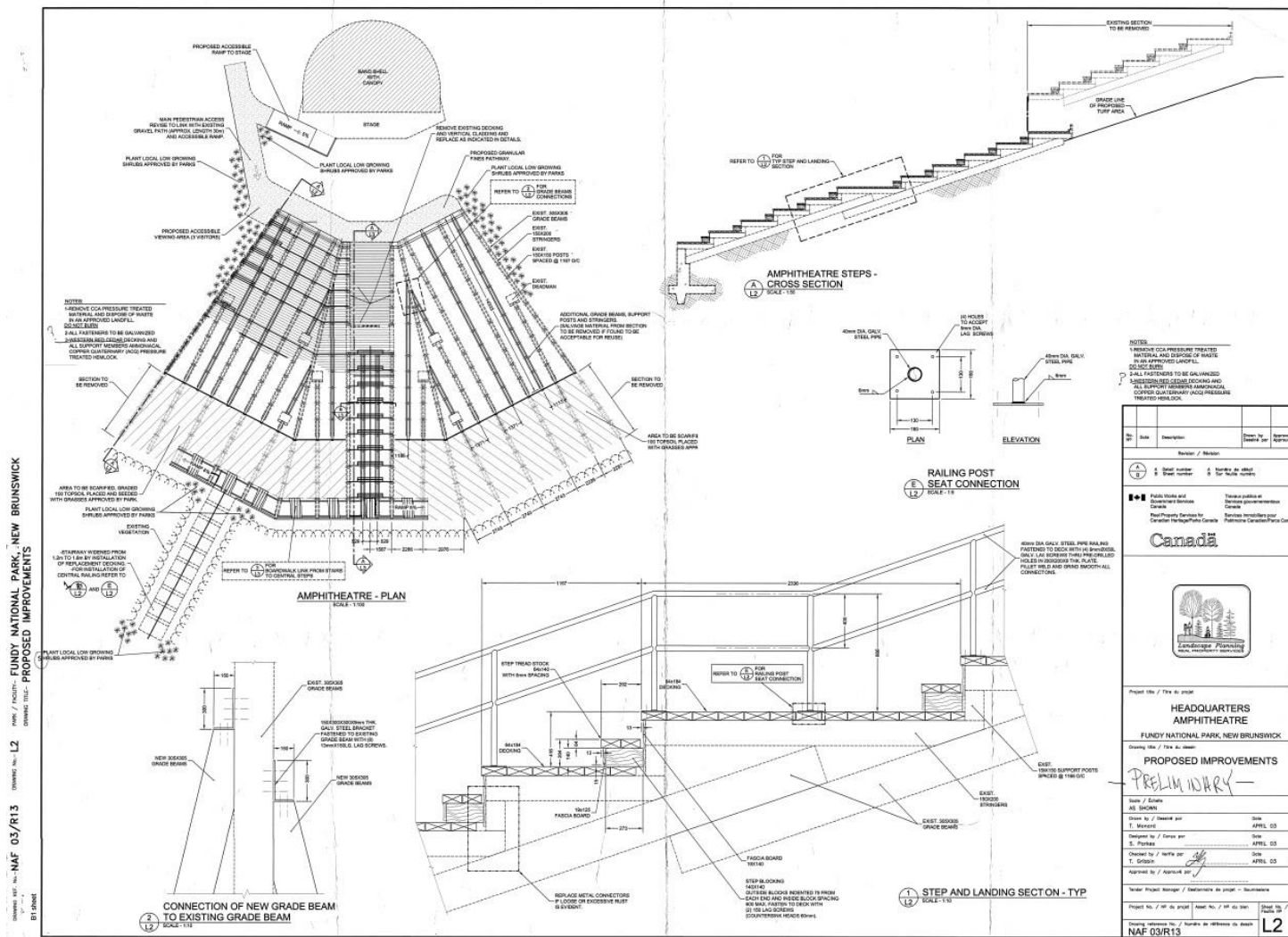


Figure 4. Preliminary proposed improvements to seating section (PWGSC 2003 - PCA Digital Files).

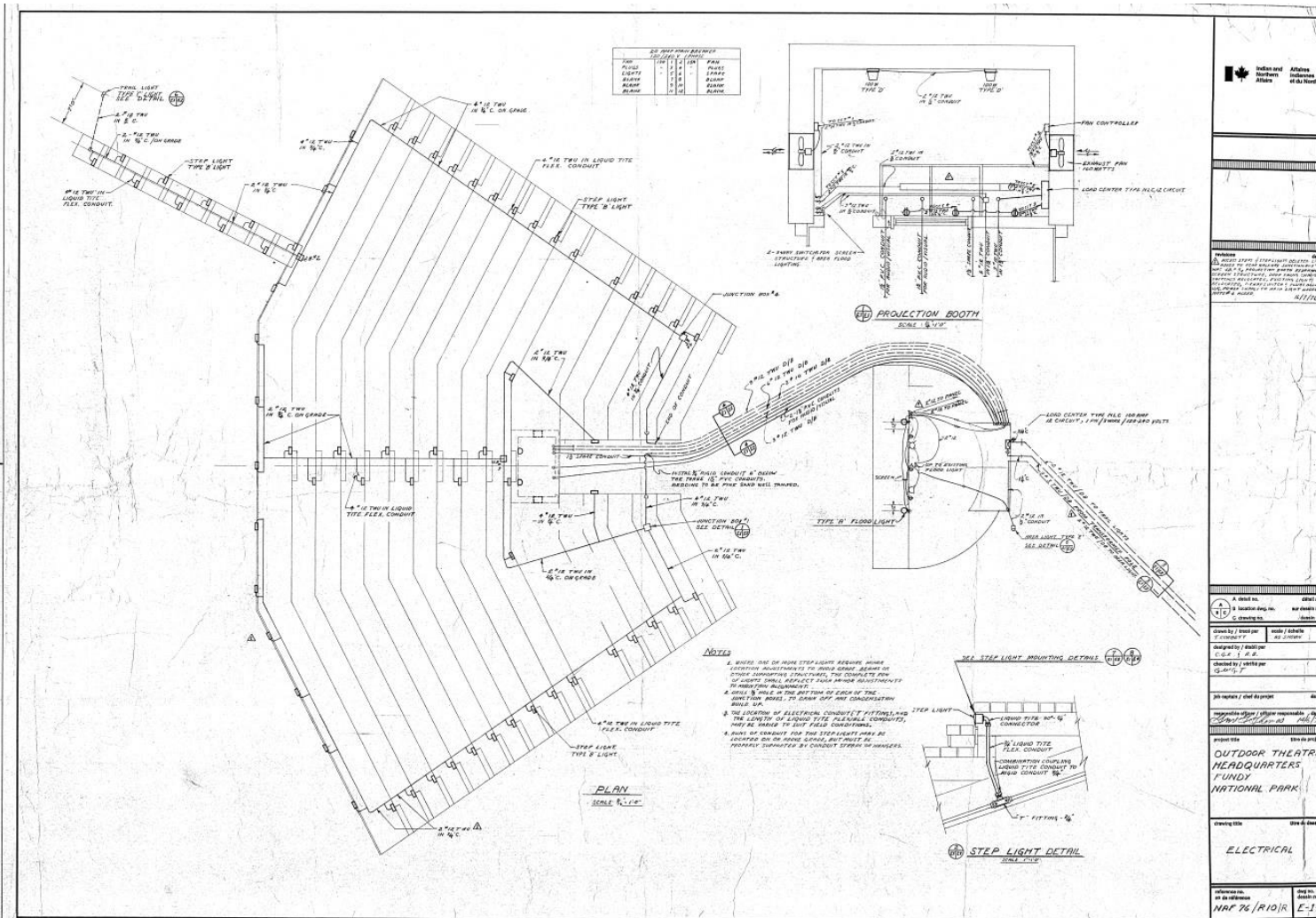
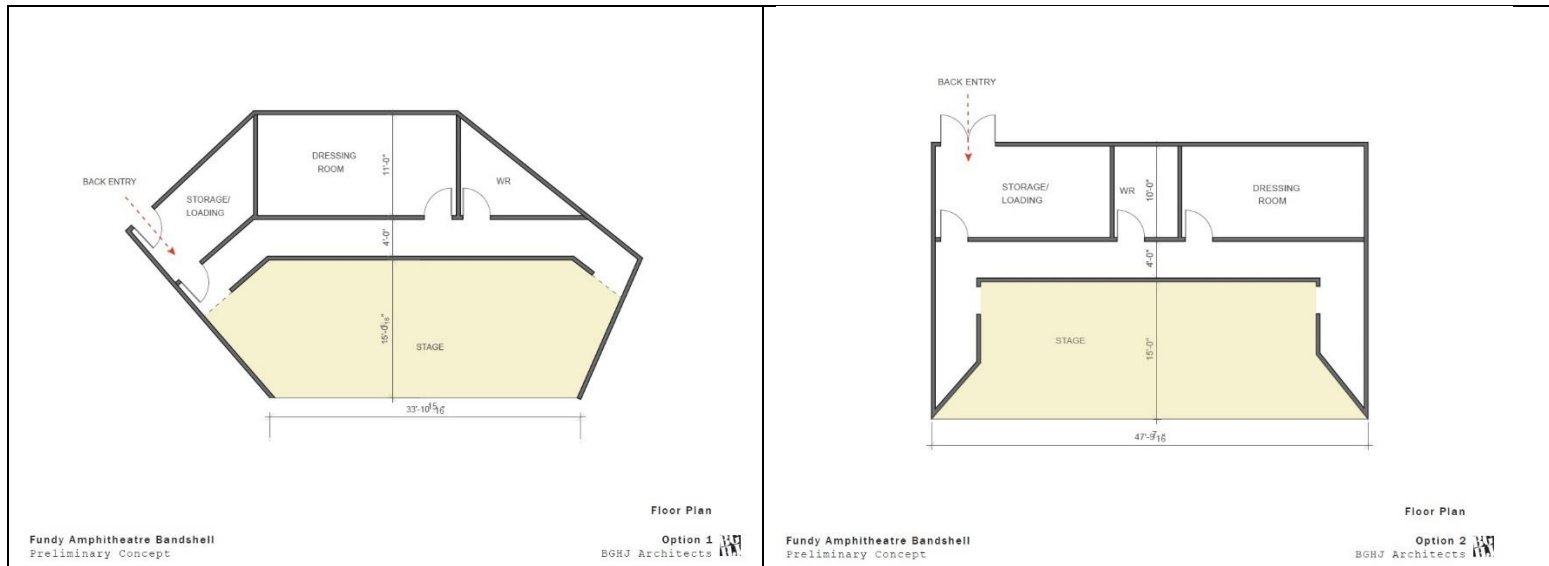


Figure 5. Preliminary proposed electrical improvements (PWGSC 2003 - PCA Digital Files).



Fundy Amphitheatre Bandshell - Preliminary Concept Design - Option 1

Fundy Amphitheatre Bandshell - Preliminary Concept Design - Option 2

Figure 6. Preliminary Concept Design Options for the new Amphitheatre (BGHJ architects - PCA Digital Files).

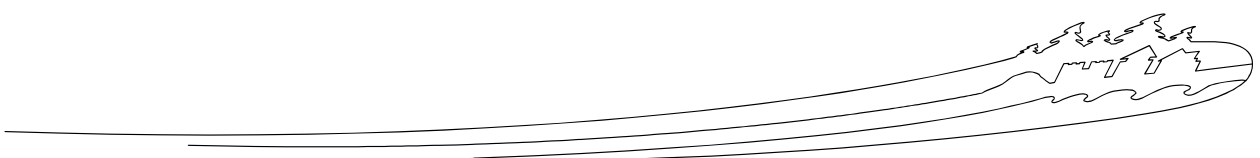




APPENDIX V

Hazard Information Sheet

Woodland Angelica





Hazard Information Sheet

Woodland angelica

EMERGENCY PHONE NUMBER: 911



SECTION 1. ACTIVE INGREDIENTS IN SAP

Composition information: **Furanocoumarins**

The furanocoumarins, or furocoumarins, are a class of organic chemical compounds found in the sap of a variety of plants.

SECTION 2. HAZARDS IDENTIFICATION

Routes of entry:

Primary: Skin **Secondary:** Ingestion **Tertiary:** n/a

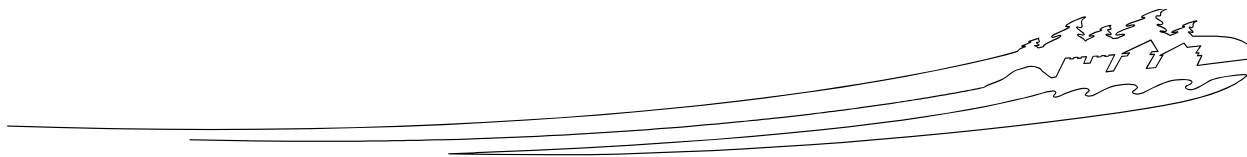
The furanocoumarins react in the presence of ultraviolet light (UV-A) to produce a phototoxic effect, resulting in burns or erythema.

The visible signs can last for weeks, and might be one or more of the following:

- severe redness (sunburn)
- darkening of skin
- edema (swelling)
- in some cases, blistering

CAUTION:

A chemical component of the Woodland angelica's sap may cause painful skin irritations (rash and blisters) when exposed to ultraviolet light, including sunlight.





SECTION 3. PERSONAL PROTECTION

Personal Protective Equipment (PPE):

Skin Protection: Water-proof gloves are mandatory, long sleeve work gloves are recommended.

Eye Protection: Use proper protection – safety glasses as a minimum.

Other: Long sleeve work shirts, work pants and protective boots.

SECTION 4. FIRST AID MEASURES

Have this information sheet with you when seeking treatment.

Skin Contact: Rinse skin immediately with plenty of water and gentle soap and **do not expose your skin to UV light for 12-18 hours.** Call a poison control center or doctor if irritation persists.

Eye Contact: Hold eyes open and rinse slowly and gently for a minimum of 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. **Do not expose your eyes to UV light for 12-18 hours.** Call a poison control center or doctor if irritation persists.

Ingestion: Call a poison control center or doctor. Do not induce vomiting unless told to do so by the poison control center or doctor.

SECTION 5. SPECIES CLASSIFICATION

Rank	Scientific Name - Common Name
Kingdom	Plantae – Plants
Subkingdom	Tracheobionta – Vascular plants
Superdivision	Spermatophyta – Seed plants
Division	Magnoliophyta – Flowering plants
Class	Magnoliopsida – Dicotyledons
Subclass	Rosidae
Order	Apiales
Family	Apiaceae / Umbelliferae – Carrot family
Genus	<i>Angelica</i> L. – angelica
Species	<i>Angelica sylvestris</i> L. – woodland angelica

SECTION 6. BIOLOGY

Reference: New Brunswick Alliance of Lake Association <http://www.nbala.ca/>

Habitat: Woodland angelica can be found in the floodplain plant community. It is found mainly in riparian habitats, open woods, marshes and fields, mostly on richer non-acidic soils.

Description: Woodland angelica is a tall (1-3 m), robust, biennial or short-lived perennial plant. The stems are 2-5 cm in diameter, hollow, ridged, often branched and purplish. The leaves are large and leaf stalks are long. The leaves (often over 50 cm in length) are divided into many, oval finely toothed leaflets (3-8 cm long) and the lower leaf surface is hairy along the veins. The leaves gradually decrease in size towards the top of the stem. Stems are topped by a large, rounded, umbrella-shaped inflorescence, which contains clusters of small white flowers. The branches of the flower clusters are densely covered in fine hairs. The fruits are flattened, oval and winged, and 4-6 mm in diameter.

Origin and Range: Native to most of Europe and Western Asia, this tall, purple-stemmed herbaceous plant was intentionally introduced as a garden herb in the 18th century. In North America, the species is only known from New Brunswick, Nova Scotia, Quebec and Ontario. Woodland Angelica has been in New Brunswick and Nova Scotia for a long time, and has spread aggressively in recent decades. It is particularly common along the mid-and lower Saint John River.

Annual Cycle: Woodland angelica is a perennial that reproduces by seed and may also spread by rhizomes (root-like underground stems). Woodland angelica is in flower from July to September.

Look Alikes: It may be confused with: cow parsnip (*Heracleum maximum*), which has large coarsely toothed leaves that are not divided into small leaflets and hairy stems that are mainly green; Queen-Anne's lace (*Daucus carota*), which is a much shorter plant with much smaller finely-divided leaves (only reaching a length of 15 cm) and purple alexanders (*Angelica atropurpurea*) which is extremely similar but is a native species of wild habitats, mostly found along river shores in the northern interior rather than disturbed habitats in the south of the province.

Impacts: Woodland angelica is an aggressive species able to establish in natural areas where it can displace native plants and degrade wildlife habitat.

