



Parks Canada Basic Impact Analysis Template

Instructions for this form are available (see the [Guidance and Tools section](#) of the Parks Canada Impact Assessment intranet site or request from Parks Canada impact assessment staff).

1. PROJECT TITLE & LOCATION

Cyprus Lake Road Recap – Phase II – Bruce Peninsula National Park

2. PROPONENT INFORMATION

Bruce Peninsula National Park & Fathom Five National Marine Park,
120 Chi sin tib dek Road, Tobermory Ontario N0H 2R0
519-596-2233 ext. 237
Brandon.Golden@pc.gc.ca

3. PROPOSED PROJECT DATES

Phase II of Project

Planned commencement: 2016-09-06

Planned completion: 2017-05-31

4. INTERNAL PROJECT FILE

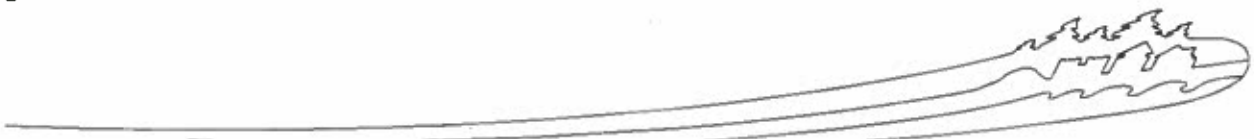
BNP-16-03

5. PROJECT DESCRIPTION

This project is to recapitalize Cyprus Lake Road from the Highway to Cyprus Lake, excluding the recently upgraded sections at the front kiosk and campground office (see Figure 1). Cyprus Lake Road is the access point for BPNPs busiest visitor node, the Grotto, with 150K visitors annually. The length of Cyprus Lake Road being upgraded in this project is approximately 6 km (5.3km from Highway to Cyprus Office, 0.7km from Cyprus Office to Yurts parking area). The current roadway (tar and chip) is in a moderate condition with many sections in a state of disrepair. The function of the roadway is adequate, but has little to no shouldering, short sightlines and services a mix of vehicles and some bicycles traffic. Phase I of this project was the upgrade of the road from the Office to P1.

Work covered under Phase 2 of this project:

- Existing top course (tar & chip) to be removed, resurface using recommended asphalt mix and depth (two lifts with tack coat, mix to be determined).
- Maintain and reuse existing roadbed where reasonable.
- Provide a small shoulder (0.6m) and provide a consistent and safe side slope to existing ground.
- Provide traffic calming measures at specific locations or as applicable (see project specifications document).
- Provide short (~ 100m) paved shoulders (1.2m) to serve as bicycle lanes and provide passing areas (see Figure 1).
- Clearing and grubbing from existing asphalt edge to a distance of 1.8m (6') along roadways (see Figure 2).
 - Exceptions
 - South side of road from Office to Yurts will be cleared and grubbed to a distance of 1.2m (4') to maintain a reasonable visual barrier between the roadway and the multiuse trail.
 - Adjacent to significant wetland habitat no grubbing will occur and only minimal brushing to keep vegetation from encroaching on to shoulder (~1m for edge of asphalt).





- Large rock formations adjacent to the roadway not be removed, but have road built to meet.
- Replace and resize culverts (see project specifications document).
- Add culverts in areas that have seasonal drainage issues (i.e., areas that flood, but have not standing water during the rest of the year).
- Replace and add signage, including pavement markings, as necessary.
- Construction of road is designed to accommodate two (2) eco passage structures at designated locations (i.e., no road crown, raised road, etc.) (see Figure 1).
- Installation of two (2) eco passage structures at designated locations (see Figure 1).
- Create artificial turtle nesting areas at designated locations (see Figure 1).
- All turning radii to accommodate oversized vehicles and vehicles with trailers at trailer pump out and future boat wash station.
- Placement of permanent benchmarks.

The renewed roadway should:

- Provide safe access for visitors by implementing proper road shoulders, appropriate sloping, and clearly delineated the right of way.
- Ensure the environmental integrity of lands surrounding the project are protected.
- Include measures to slow traffic to the design speed based upon the roadway geometry and specific site conditions as the site dictates.
- Maintain the experience of the existing roadway and attempt to incorporate existing natural features where it is safe to do so.
- Decrease road mortality, particularly for herptiles, including several SAR.

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

See appendix 1

7. EFFECTS ANALYSIS

Air: The short-term use of heavy equipment and power tools will generate exhaust that could impact air quality; however, these impacts are temporary and not foreseen to be a threat to the local flora, fauna, or visitor experience. Similarly, the road dust generated by construction activities is considered to be temporary and not significant.

Soil: Localized disturbances and impacts (e.g., compression, erosion, etc.) to the soil from the use of heavy machinery and grubbing (stump pulling). It is thought that these impacts will have a negligible effect on the ecological integrity of the area as this work will occur in an already disturbed area and where any new disturbances will occur the soils are extremely thin or non-existent. Newly created road shoulders without vegetation will be susceptible to erosion. Particular attention must be paid to ensure that no improvised turn-around or parking areas extend beyond the development footprint. Project-related chemicals, wastes, and harmful substances may enter the soil, which may impact soil quality.

Water: Where the work comes within few meters of open water (e.g., stream, wetland, etc.), project related chemicals, wastes, by-products and harmful substances may enter the water impacting quality. In addition, due to the karst process on the peninsula, spills of the aforementioned substances that occur on soils have the potential to affect ground water quality. Water levels could be affected if new culverts are installed below current levels. This would alter habitat availability both upstream and downstream of culvert and impact the species composition.

Flora: This project will result in vegetation removal along the edge of the road. Several mitigations need to be followed to limit the impact of this work. Several species of conservation concern occur within 10m of the road edge including, Hill's Pondweed (*Potamogeton hillii*, Special Concern), Ram's-head Lady's Slipper (*Cypripedium arietinum*, G3), Round-leaved Ragwort (*Packera obovata*, S3), and Cooper's Milkvetch (*Astragalus neglectus*, S3)); however, by following the mitigations outlined in this document it is not expected that this work will impact these species and poses no significant threat to the species' populations. There is the possibility that non-native flora may take advantage of the disturbed conditions or be introduced and spread during the work.





Fauna: There is the potential for direct mortality to wildlife during construction operations (i.e., heavy equipment operation, grubbing, and tree removal). The removal of vegetation could harm or kill wildlife living in/on it (e.g., invertebrates, salamanders). There will be a short-term impact as a result of the noise, fumes and activity levels associated with the work that could disturb nearby wildlife, although given the level of development in the area, scale of the project, and the timing windows for the work to be completed in there should be minimal impacts to fauna. Any required handling to remove fauna from the work area would result in short-term disturbance. Several species at risk do occur in the area, such as Massasauga (*Sistrurus catenatus*, Threatened), Eastern Milksnake (*Lampropeltis Triangulum*, Special Concern), Eastern Ribbon Snake (*Thamnophis sauritus sauritus*, Special Concern), Snapping Turtle (*Chelydra serpentina*, Special Concern) and could be impacted; however, the project will install measures to address road kill, which is a concern for these species along Cyprus Lake Road.

Species at Risk: The recovery strategies for Massasauga (Parks Canada 2012) and Eastern Whip-poor-will (*Antrostomus vociferous*, Threatened) (Environment Canada 2015) identify the area where the project will occur as possible critical habitat; however, the area is heavily disturbed (i.e., a road and road shoulder) and would not be consider critical habitat for either species. Therefore, no critical habitat will be negatively impacted by this project.

Cultural Resources: Given the scope of work, an Archaeological Overview Assessment (AOA) will be completed as part of this Basic Impact Analysis (BIA). The AOA will determine whether an Archaeological Impact Assessment (AIA) such as shovel testing or alternate mitigation measures will be required; the findings from the AOA, and subsequent AIA if required, will be attached as appendix 4 and any mitigations added to the mitigations section prior to project commencement.

Visitor Experience: There may be some minor impacts to the visitor experience during this phase of the project, such as minor traffic delays and the site aesthetics during construction, but the work will have a net positive effect on visitor experience by reducing safety risks and improving road conditions (i.e., less pot-holes that area damaging to vehicles, emergency by-passes, proper road shoulder sloping, etc.).

Public Safety: There are some minor inherent risks associated with the project (e.g., heavy machinery on the road, felling trees, etc.), but longer-term the work will improved the road design and safety standards. A traffic control plan will be created and followed by the contractor.

Cumulative Effects: This project is not expected to significantly impact the ecological integrity of Bruce Peninsula National Park. Although and the terms and conditions governing the activities planned for Phase II of the project will serve to prevent, to the greatest extent possible, the activities from jeopardizing the survival or recovery of the SARA *Schedule I* species in the park. In addition, several improvements to the road design (e.g., addition of ecopassages, roadkill prevention signs and speed reduction measures) should improve the quality of habitat for some species, including several listed under *Schedule I* of SARA.

8. MITIGATION MEASURES

Demolition/Construction

1. Use silt screen and erosion control around open water areas prior to any physical work.
2. Ensure heavy machinery is maintained within the project footprint.
3. Limit all vegetation removal and impacts to the identified footprint.
4. Use clean fill (i.e., fresh crushed) to mitigate introduction of invasive plants.
5. Pressure wash equipment, including heavy assets, prior to deployment to work in area (i.e., to remove invasive seeds).
6. Install signage to warn the public about construction and traffic control measures where appropriate.
7. Fuel all machinery ensuring no spills or leakage. Ensure spill containment equipment is used (e.g., impermeable spill pad), spill kit at hand and personnel are trained in their use.
8. Refuel all handheld equipment on a hardened area at least 100 m from all waterbodies using appropriate spill containment equipment (e.g., impermeable spill pad) and a spill kit is at hand.





9. Use maintenance compound for fueling and turning around all large/heavy machinery and as the project staging area (see Figure 2).
10. Environmental spill response equipment must be available and used as needed (i.e., absorbent spill blankets, fuel spill kits, etc.).
11. Ensure machinery is in good working order and free of leaks. Identify and handle all toxic/hazardous materials as required under the Canadian Environmental Protection Act, Transportation of Dangerous Goods Act and Workplace Hazardous Materials Information Service.
12. Report any fuel spills immediately to the surveillance officer and the Ontario Ministry of the Environment, Ontario Spills Action Center (1-800-268-6060), Environment Canada at 613-239-6065, and to Parks Canada Dispatch at 519-596-2702.
13. Clean the construction site daily, with a complete site cleanup upon project completion.
14. Cover or use water to wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
15. New culverts installed at same level in road. This includes those culverts increased in size. If road cannot accommodate increase in culvert size then a second culvert of equal size will be installed at the same level in the road.
16. Culverts end treatments will be constructed 1m in all directions using 4" - 6" clean stone, complete with geotextile underlay.

Water:

17. Install effective sediment control measures (e.g., turbidity curtain, silt fences, sediment bags, etc.) before starting work to prevent sediment from entering any watercourse.
18. All culvert will be installed at same level in road so standing water levels and associated habitats will remain consistent with present.
19. Sediment controls need to be inspected on a daily basis during project and deficiencies must be rectified immediately upon detection.
20. Control measures to prevent soil erosion into watercourses will need to remain in place until area has sufficient vegetation coverage (60%) to stabilize the site. If erosion controls need to be left on site beyond project work they are to be made of biodegradable material (e.g., straw, coir, wood fibre, etc.).
21. Avoid in water work from March 15th to July 15th to protect fishes.
22. Dispose of all debris and waste appropriately, and none in drains, ditches and waterways.
23. Where rock material is used at culverts inlets and outlets it will be:
 - Appropriately sized and clean;
 - Do not obtain rock from below the ordinary high water mark of any waterbody;
 - Do not use rock that is acid generating or fractures and deteriorates quickly when exposed to the elements;
 - Install rock at similar slope to maintain natural stream alignment and bank;
 - Ensure the rock does not comprise the ability for fish to pass through the channel.

Vegetation:

24. Conduct vegetation clearing in the late summer (after August), fall, winter or early spring months (prior April 5th) to prevent impacts to nesting birds. Trees must be inspected by Resource Conservation staff prior to cutting
25. Parks staff will survey the area to be cleared for
 - Small seedlings/trees (~2m or less in height) that can be transplanted elsewhere in the park (i.e., campsites to be restored, multi-use trail access points, old amphitheatre, disturbed area restoration projects).
 - Herbaceous plants to collect seed from to sow either adjacent to the disturbed area, in the disturbed area following the project work, or suitable habitat elsewhere in the park.
 - Tree not to be cut will be flagged using pink tape.
26. Where culvert replacement/upgrades are required, Resource Conservation staff will survey the area for the presence of Hill's Pondweed and notify the contractor so as to avoid unintentional impacts (i.e., trampling) during the installation of culvert upgrade structures (e.g., barrier to funnel/guide wildlife). If





necessary (i.e., plant found growing within 5m of culvert replacement or eco-passage installation), temporary fencing will be installed to protect the plant and the area where it found.

27. Uprooted stumps will be taken off site for disposal (e.g., dump).
28. Dispose of vegetation debris:
 - a) Chipping – The majority of forest material removed for this project (< 8" dbh) can be processed through a mechanical wood chipper and dispersed uniformly throughout and adjacent to the disturbed area. Do not piling debris as it not only provides an undesired visual for visitors, but poses a wildfire fuel risk and suppress plant growth.
 - b) Scattering – Larger materials (> 8" dbh) will be scattered adjacent to the project footprint. Vegetation will be cut into manageable sections and drag a minimum 3m into the nearby forest and placed so as to minimize the impact to the visitor experience (i.e., parallel to road, no fresh cut ends sticking out)
 - c) Removal – In addition to stumps, other vegetation material can be taken offsite for disposal (e.g., dump) to prevent high fuel loadings, negative impacts to visitor experience, or in areas with sensitive habitat (i.e., wetlands on both side of road).
29. Disturbed areas (e.g., gravel shoulders) are to be planted using a seed mixture identified by park staff (see Appendix 2), as soon as possible to prevent erosion and limit the potential for invasive to become established.
 - If there is insufficient time remaining in the growing season, or work done outside the growing season, ensure erosion controls will last until vegetation can be established the following year (i.e., last a winter).
 - If there is enough growing season remaining, a nurse crop may be planted to establish some root structure and help prevent erosion until native seed occurs the following spring.
 - Native seed mix sown will depend on the habitat (i.e., wetland or forest, shade or sunny) adjacent to the disturbed portion of road.
 - All seed will be hand sown.

Wildlife

30. Report any wildlife mortality during construction to the surveillance officer.
31. Complete grubbing between May 15th and October 15th to limit the potential to disturbed hibernating snakes.
32. Install ecopassages at locations determined by the Resource Conservation team (see Figure 1 for approximate locations- exact locations will be benchmarked and staked - See Project Specifications Document).
33. Avoid direct impacts to fauna during construction by halting work and relocating any encountered animals a safe distance away. If a snake or turtle is encountered, because of the potential for the species to be a species at risk (i.e., Massasauga, Eastern Milksnake, Eastern Ribbon Snake, or Snapping Turtle), notify the surveillance officer and halt work until advised otherwise.
34. Install wildlife crossing/roadkill prevention signage and other traffic calming measures (i.e., reduce speed signs, speed bumps, etc.) to inform visitors to reduce speed and mitigate the potential for roadkill. See project specifications for more details on those measures being installed.
35. Create turtle nesting mounds at location selected by park staff (see Figure 1 for approximate locations- exact locations will be staked). See appendix 3 for nesting material specifications and construction.

Health and Safety

36. Ensure public safety at all times including off hours.
37. The "Traffic Control Plan" and the installation of all devices should be continuously reviewed and updated to reflect the current stage of construction. The departmental representative may review minor changes; the Parks Canada project monitor shall review major changes. The construction foreman shall provide the current "Traffic Control Plan" to the departmental representative upon request on the site at any time during the construction of the project.
38. The Contractor shall provide a minimum of 24 hours notification for any lane closures.





39. The Traffic Controls shall be implemented in conformance to the Ministry of Transportation's Book 7: Ontario Traffic Manual – Temporary Condition. The Contractor shall provide a minimum of two flagmen to direct vehicles for all lane closures.
40. Maintain access to property including overhead clearances for use by emergency response vehicles.
41. Provide measures for protection and diversion of traffic including provision of flagpersons, erection of barricades, erection of warning and directional signage (i.e., posted speed limits, speed bumps, etc.).
42. Wear the appropriate personal protective equipment (PPE).
43. Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator.

Cultural Resources

44. Keep all machinery within the disturbed footprint (i.e., on the former road).
45. If significant features (e.g., high artifact concentrations, special finds, pit features, cairns) are encountered, work should cease in the immediate area, the work area in relation to the findings photo documented and geo-referenced, and Parks Canada's Terrestrial Archaeology (PCTAR) section informed. The PCTAR will provide advice and assessment of significance that will in turn determine what will be required to mitigate the chance find.

9. PUBLIC/STAKEHOLDER ENGAGEMENT & ABORIGINAL CONSULTATION

- 9 a) 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).

- 9 b) 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).

- The project has been discussed at several meetings with the SON's Park Team. Furthermore the project and the basic impact analysis have been reviewed by independent consults hired by SON.

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

No residual adverse effects are expected from this project. Once all phases of this project are completed it should improve the safety of the road for the visitor and reduce the risk of roadkill, particularly for herpetofauna.

11. SURVEILLANCE

☐ Surveillance is not required

☒ Surveillance is required (provide details such as the proposed schedule and the focus of inspections) - *See attached surveillance schedule for details.*

12. FOLLOW-UP MONITORING

Follow-up monitoring is:

☒ not required

Although not required, some follow up monitoring will be conducted by the Resource Conservation staff to assess the effectiveness of the mitigations and determine if any improvements are needed and to provide data to determine if similar mitigations could be effective elsewhere in the park.





- ☐ legally required (e.g. under the *Species at Risk Act* or *Fisheries Act*)
☐ required in accordance with the *Parks Canada Cultural Resource Management Policy*

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

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

Department/Agency/Institution: Parks Canada	Date of Request: February 10 th , 2016
Expert's Name & Contact Information: Mark Yeates Natural Resource Conservation Branch Parks Canada 1800 Walkley Road, Ottawa, Ontario. K1H 8K3 Tel. (613) 993-2125, ext 280 Mark.Yeates@pc.gc.ca	Title: Environmental Assessment Specialist
Expertise Requested: Review of the draft BIA	
Response: Looks good. May want to just double check the mitigations of BMPs for roadways, highways, parkways and related infrastructure.	

Department/Agency/Institution: Parks Canada	Date of Request: June 20 th , 2016
Expert's Name & Contact Information: Joanne Tuckwell Species Conservation and Management, Natural Resource Conservation Parks Canada Agency 145 McDermot Ave, Winnipeg, Manitoba R3B 0R9 Tel. (204) 984-2416 Joanne.Tuckwell@pc.gc.ca	Title: Species Conservation Specialist
Expertise Requested: SAR advice- Massasauga, Hill's Pondweed, Eastern Whip-poor-will, Snapping Turtle, etc.	
Response: Phone call to confirm a few details and suggested wording, but good with the project and mitigations.	

Department/Agency/Institution: Parks Canada	Date of Request: February 4 th , 2016
Expert's Name & Contact Information: Lynda Villeneuve 30 rue Victoria/ Street, 3rd floor/ 3e étage, Room/ pièce 110 (Destination Code/ code de destination PC-03-P) Gatineau (Québec) Te. (819) 420-9210 Lynda.Vileneuve@pc.gc.ca	Title: Policy Advisor, Cultural Resources / Conseillère en politiques, ressources culturelles Cultural Heritage Policies Branch / Direction des politiques sur le patrimoine culturel Conservation and Commemoration Directorate/ Direction générale de la conservation et de la commémoration du patrimoine
Expertise Requested: Need for archeological assessment	
Response: See appendix 4.	

Department/Agency/Institution:	Date of Request: February 10 th , 2016
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Parks Canada Expert's Name & Contact Information: Barbara Leskovec 30 rue Victoria/ Street, 3rd floor/ 3e étage, Room/ pièce 121 (Destination Code/ code de destination PC-03-P) Gatineau (Québec) Telephone (819) 420-4815 Barbara.Leskovec@pc.gc.ca	Title: Federal Infrastructure Investments Archaeologist/ Archéologue - Investissement pour les infrastructures fédérales Archaeology and History Branch/ Direction de l'archéologie et l'histoire Conservation and Commemoration Directorate/ Direction générale de la conservation et de la commémoration du patrimoine
Expertise Requested: Mitigation measures for archaeological resources	
Response: See appendix 4.	

Department/Agency/Institution: Parks Canada	Date of Request: February 10 th , 2016 (AOA) June 13 th , 2016 (AIA)
Expert's Name & Contact Information: Stacey Taylor Archaeology and History Branch, Heritage Conservation and Commemoration Directorate, Parks Canada 111 Water St E, Cornwall ON K6H 6S3 Tel. 613-938-5794 Stacey.Taylor@pc.gc.ca	Title: Archaeologist Indigenous Affairs and Cultural Heritage Directorate Parks Canada, Government of Canada
Expertise Requested: Archaeological overview and initial assessment.	
Response: See appendix 4.	

Department/Agency/Institution: William Fitzgerald Consulting	Date of Request: February 10 th , 2016 (AOA) June 13 th , 2016 (AIA)
Expert's Name & Contact Information: William Fitzgerald, Ph.D. 2207 Bruce Road 20 RR2 Tiverton, ON N0G 2T0 Tel. 519-368-5899 dr_dig@xplornet.com	Title: Archaeological Consultant for SON
Expertise Requested: Archaeological overview and initial assessment.	
Response: See appendix 4.	

15. DECISION

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

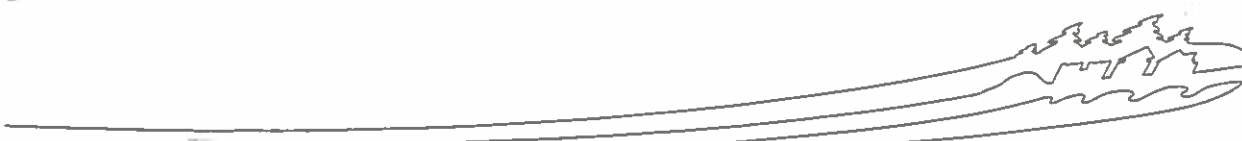
- ☒ not likely to cause significant adverse environmental effects.
☐ likely to cause significant adverse environmental effects.

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

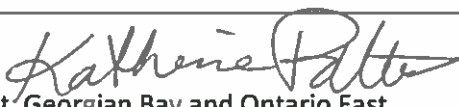




☐ Project activities contravene a SARA prohibition and CANNOT be authorized

16. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: Cavan Harpur EA Specialist BPNP/FFNMP	Date: 2016-06-29
Recommended by: Brandon Golden FII Project Manager	Date: 2016-07-04
Approved by Katherine Patterson Field Unit Superintendent, Georgian Bay and Ontario East	Date: 2016-07-06
Signature: 	

17. REFERENCES

Environment Canada. 2015. Recovery Strategy for the Eastern Whip-poor-will (*Antrostomus vociferus*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. v + 59 pp

Parks Canada Agency. 2012. Recovery Strategy for the Massasauga (*Sistrurus catenatus*) in Canada [Draft]. Species at Risk Act Recovery Strategy Series. Parks Canada Agency. Ottawa. vii + 35pp.

Stinnissen, T. 2015. Factors affecting road mortality of reptiles and amphibians on the Bruce Peninsula (Master's thesis). Trent University, Peterborough, Ontario, Canada.

18. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

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

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



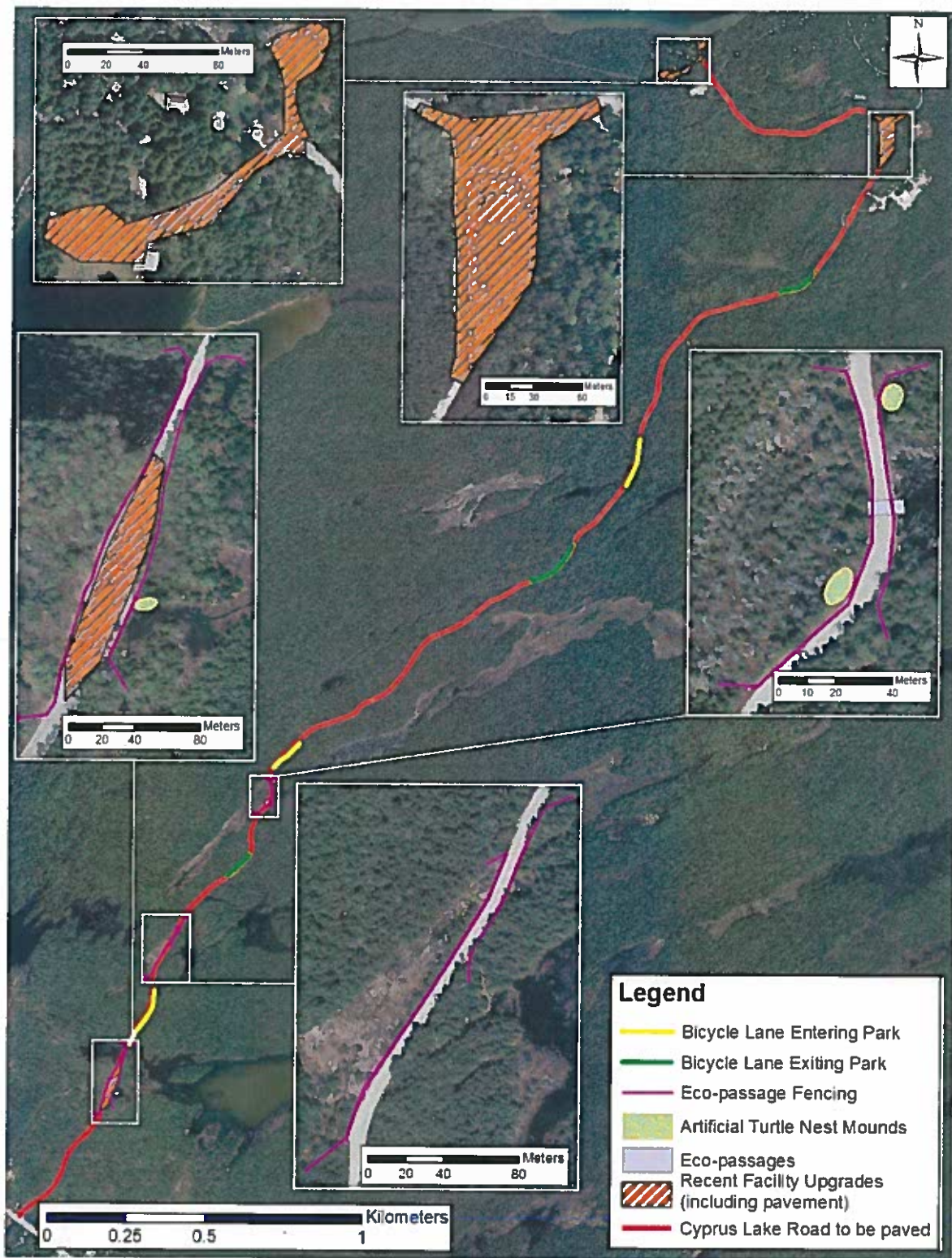
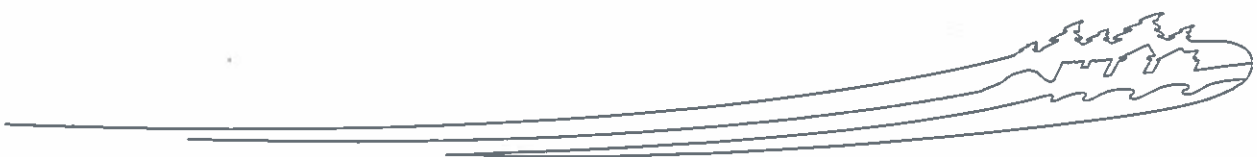


Figure 1: Project overview map showing the portion of Cyprus road to be paved, recent facility upgrades (no paving required) and the approximate locations of eco-passages, fencing, artificial turtle nesting mounds and bicycle lanes.



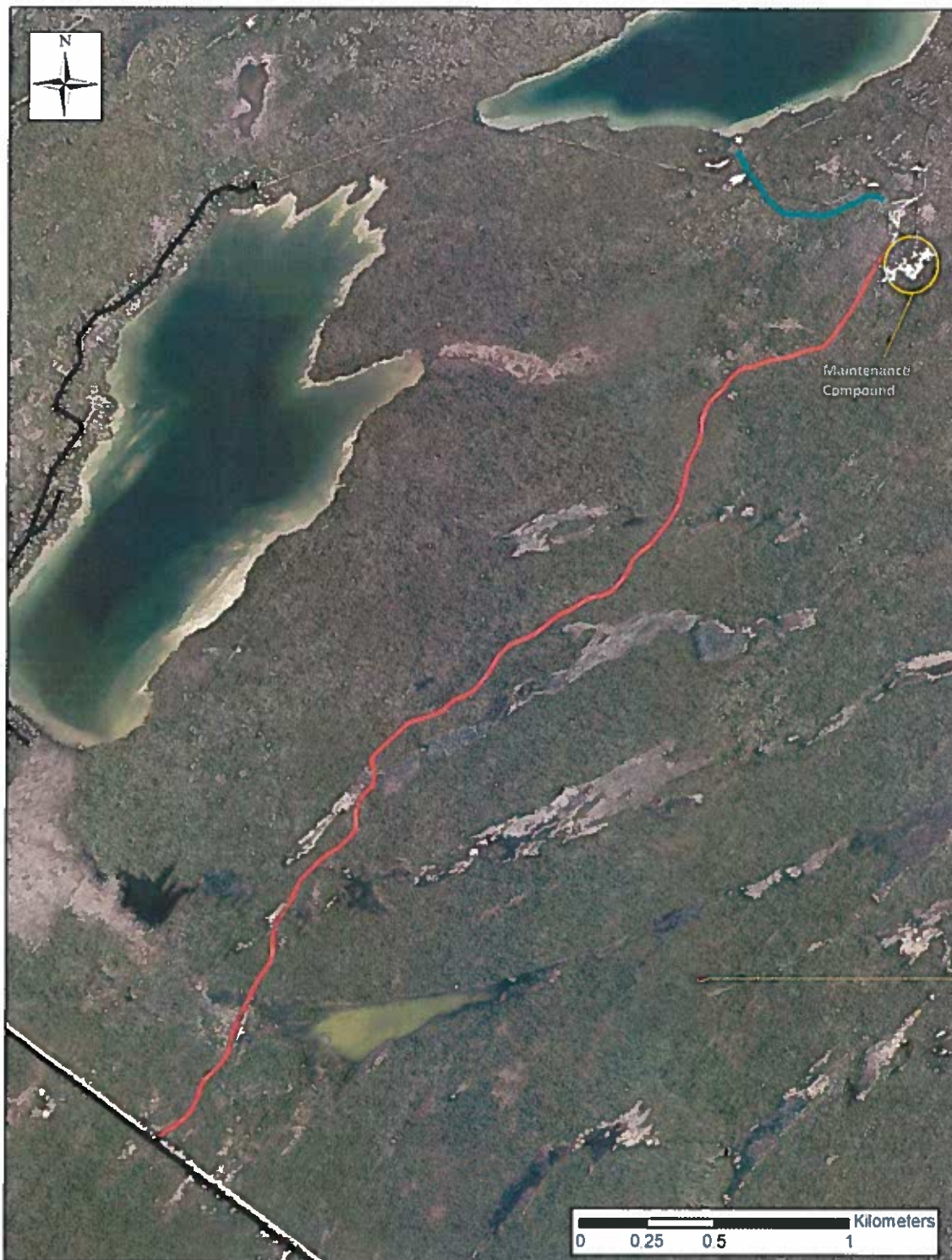


Figure 2: Map showing the section of road to be brushed and grubbed to the standard 1.8m (6ft) and from edge of the existing asphalt (-) and where the modified brushing is to occur (-). Modified brushing is to be 1.2m (4ft) from existing edge of asphalt along south side of road and to the 1.8m (6ft) standard along north side. Map also indicates the location of Maintenance Compound where large vehicles can turn around and serve as the project staging and storage area.





Appendix 1 Environmental Impact Analysis Tools: Effects Identification Matrix

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

A. Direct Effects								
	<i>You may wish to change the components listed under the headings to specify the natural or cultural resources that are priority considerations for your PCA site or for the specific project being reviewed.</i>		Valued components potentially directly affected by the proposed project					
			Natural Resources				Cultural Resources	
			Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Archaeological Resources
	Phase	Examples of Associated Activities						Insert heritage values
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials				X		X
		Burning						
		Clearing				X	X	X
		Demolition			X	X	X	X
		Disposal of waste						
		Blasting/ Drilling						X
		Dredging						
		Drainage						
		Excavation		X		X	X	X
		Grading		X			X	X
		Backfilling						
		Use of machinery	X	X		X	X	X
		Transport of materials/ equipment						
		Building of fire breaks						
		Use of Chemicals						
		Set up of temporary facilities						
		Other...						





A. Direct effects continued								
	<p><i>You may wish to change the components listed under the headings to specify the natural or cultural resources that are priority considerations for your PCA site or for the specific project being reviewed.</i></p>		Valued components potentially affected by the proposed project					
			Natural Resources				Cultural Resources	
			Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Archaeological Resources Insert heritage values
Phase	Examples of Associated Activities							
Project Components	Preparation / Construction / Operation / Decommissioning	Waste disposal						
		Wastewater disposal						
		Maintenance						
		Use						
		Use/Removal of temporary facilities		X	X	X	X	
		Use of Chemicals						
		Active fire stage						
		Prescribed burn cleanup						
		Planting				X		X
		Culling						
		Vehicle Traffic					X	
		Other...						





Section B of the matrix should be used to identify potential indirect effects that may result from impacts of the project to components of the environment you have identified on the preceding pages (see Section A - direct effects to natural resources). Consideration of indirect effects is required under CEAA 2012 Sections 5(1)(c) and 5(2)(b), and by the PCA mandate. For example:

- if the proposed project could lead to adverse effects to water quality and quantity, could this then effect the quantity and quality of water resources (e.g. potable water) used by an Aboriginal community?
- could there also be adverse socio-economic effects to a community that relies on recreational fishing tourism?
- could changes to the environment (e.g. digging, clearing) affect visitor access, opportunities, or safety?

B. Indirect Effects (all phases)							
You may wish to change the components listed under the headings to specify the natural or resources that are priority considerations for your PCA site or for the specific project being reviewed.		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	Natural resource components affected by the project						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...						
	Could impacts to <u>soils</u> and <u>landforms</u> lead to adverse effects on...						
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...						
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...						
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...				X		X
	Other...						





Appendix 2 Vegetating and Stabilizing Disturbed Road Shoulder

This method follows what was done for Emmett Lake Road; however, at the time this report was written only the initial results from this work were available. The seed mixture and application technique may be modified as more results from the Emmett Lake Road vegetation work come in.

Bruce Peninsula, Custom Native Seed Mix For Cyprus Lake Road

Road Length- 6.0km

Shoulder average width- 1.8m

Total Area- ~2 h

Seed Type	Scientific Name	Common Name	Weight (g)	Total Weight (g)
Coarse Seed Mix- Native grasses				
	Schizachyrium scoparium	Little Bluestem	n/a	
	Elymus canadensis	Canada wild rye	n/a	1,352
	Andropogon gerrardia	Big Bluestem	n/a	
	Elymus trachycaulus	Slender wheatgrass	n/a	
Fine Seed Mix- Native Wildflowers				
	Onothera biennis	Evening Primrose	364	
	Solidago nemoralis	Grey Goldenrod	752	
	Aquilegia canadensis	Wild Columbine	180	
	Symphyotrichum laeve	Smooth Aster	109	
	Asclepius syriaca	Common Milkweed	109	1,921
	Fragaria vesca	Woodland Strawberry	128	
	Solidago juncea	Early Goldenrod	20	
	Solidago ptermicoides	Upland Goldenrod	203	
	Panicum virgatum	Switch Grass	416	
	Symphotrichum ericoides	Heath Aster	25	
Other Fine Seed - Wildflower				
	Sisyrinchium montanum	Blue Eyed Grass	162	162
Fine Seed Mix - Facultative wet wildflowers				
	Eupatorium perfoliatum	Boneset	202	
	Verbena hastata	Blue Vervain	687	1,096
	Dollengeria umbellata	Flat topped Aster	207	
Nurse Crop				
	Lolium multiflorum	Annual Wild Rye	12,255	12,255

Recommendations

- If possible, and where there is room to seed, scarify the top edge of the sloped roadside to improve infiltration limiting runoff and help seed settle at the top of the slope.





- Mix the fine and coarse seed separately. The nurse crop may be applied separately or mixed with the fine wildflower seed.
- To thin the fix seed mixtures add coarse sand to help spread the small seed.
- Ensure that no seed is planted more than one inch under the soil. The seed will germinate best within the top quarter inch of soil, with some grasses prefer to germinate on the soil surface.
- Mix all the upland species together and divide into even amounts.
- Divide the entire length of road into the same number of sections. So one bag of coarse and one bag of fine seed mix per section.
- Keep about 5-10% of the mix separate for touch-ups at the end.
- Mix wetland species together and sow separately only in wet areas. Use seed sparingly, it's better to have a little left over than to run out before the end.
- Hand broadcasting is likely best for applying seed to the steeply sloped sides.
- Sow a small, golf-ball sized handful of coarse seed across approximately six paces. Sow about an almond-sized handful of fine *native* seed over the same area. If you thin the seed with nurse crop, double the amount, if you thin it further with sand, triple the amount (depending on the ratio of sand:seed).
- Future over-seeding may be considered, particularly of those species that established well through the first round of seeding; that is likely to be the community that you want to focus on creating medium to long term.

Potential Concerns

- Though it is still early in the spring, some species (Asters and Goldenrods) may not receive adequate cold temperatures for a long enough period to trigger germination. Ideally they would experience at least 30 days of nighttime temperatures between 0 and +5 degrees Celsius. Seeds that do not germinate will remain dormant until they are stratified next winter. Substantial loss of dormant seed can occur during the summer months through pathogens and seed predators. The ideal time to sow these species is in the late fall, just before the ground freezes
- Some portions of the roadside are steeply sloped. Larger seeded species, or those that require more moisture to germinate, may not establish well on these slopes. Large seed is likely to be washed down during a heavy rain. Only a few species may establish on these steep sides, and that most species will establish where the gravel and sand road meet the leaf litter for the adjacent forest.
- Because the road cuts through a forest, the dense canopy in some sections of the road may prevent certain species from establishing well. Unfortunately we could not include more shade tolerant species this spring, but we recommend over-seeding the heavily shaded areas with species that are more shade tolerant.





Appendix 3 Artificial Turtle Nesting Mounds

To limit the impact of road mortality on small fauna, especially herptiles, the park will be installing eco-passages with a barrier fence to guide individuals to the passage; however, some additional mitigations will be installed to address some of the underlying reasons why some of these species use roads. Female turtles suffer particularly high levels of road mortality when migrating to a nesting location, which sometime is the road shoulder, and likewise when the hatchlings emerge. Artificial turtle nesting mounds will be created in areas where:

- 1) It was common of turtle nest to be found in the road shoulder and will no longer have access to do so due to the barrier fencing;
- 2) Historic routes to nesting areas have a barrier (i.e., barrier fencing to prevent road mortality in high traffic areas that are not safe to cross) and individuals may be challenged to find the eco-passage to gain access to the traditional nesting habitat.

The two turtle species targeted through this work at the park are Midland Painted Turtle (*Chrysemys picta marginata*) and Snapping Turtle (*Chelydra serpentina*). Although, high nest-site fidelity is common in freshwater turtles (Freedberg *et al.*, 2005; COSEWIC 2008), many species have shown flexibility in nest-site selection (Schwarzkopf and Brooks 1987; Spencer and Thompson 2003) and have been found to use artificial nest mounds in other studies, including the two target species (Patterson *et al.*, 2013). Nesting habitat is critical to the conservation of turtles and the creation of additional habitat in suitable locations, without the risk of road mortality, can only increase hatching success. It should be considered that as a result of certain life traits (i.e., late age of maturity and nest site fidelity), it may take several years for nest site to be used (Rowe *et al.*, 2005; Patterson *et al.*, 2013).

Nest Mound Specifications: The following recommendations are from MA Division of Fisheries and Wildlife 2007, Patterson *et al.*, 2013; and Toronto Zoo 2015.

Location: South to south-west facing
Minimal vegetation cover
Nearby ground vegetation for hatchling protection
If possible, mounds should be created near existing/confirmed nesting sites.
Mounds to be within 300m of wetland edge.
If possible construct more than one mound per location

Materials and Specifications:

Material Mix: All material will be 'clean' fill (i.e., fresh crushed) to limit the introduction of weeds in to the area.

Dimensions: Minimum 2m x 2m and 40 cm high. Site will be assessed prior to gravel order to see what size is most appropriate.

Construction: Mounds will be constructed from the road way by using a mechanic hoist to lift prefilled gravel bags into location. All work must adhere to the timing windows identified in this BIA and the appropriate mitigations applied. The nesting mound composition was selected to mimic the texture, drainage, and friability of the road shoulders as turtle nests are commonly found in this material throughout the park. Once suitable locations have been selected:

1. Vegetation cleared and stumps removed. This work will be minimal given that one of the criteria for a site to be suitable is minimal vegetation cover. Small shrubs and herbaceous cover may be transplanted to the area adjacent to the mound to provide cover for the gravid females and newly emerged hatchlings. Small tree suitable of transplanting should be taken off site and used elsewhere in the park.





2. Install landscape fabric/filter cloth over the area where the mound will be created. This will prevent/delay the growth of vegetation on the site.
3. Using a mechanical hoist arm, take prefilled gravel bags and lower them over the site and release from the bottom. Continue until landscape fabric/filter cloth is covered with at least ≥50cm material. The area of the nest mound will vary depending on site, but each should provide a minimum 2m x 2m, relatively level, surface at the top of the mound.
4. Site cleanup.

Nest Monitoring and Protection: Nest monitoring will occur; however, the exact protocol has not yet been determined. It is hoped that this could be part of a citizen science project, as well as, involving SON environmental monitors.

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Appendix 4 Archaeological Assessment

Archaeological Overview Assessment for Cyprus Lake Road Recap – Phase II – F.I.I. 781.

Bruce Peninsula N.P.

S. Taylor
Parks Canada Terrestrial Archaeology (PCTAR)
Feb. 2016

Cyprus Lake Road Recap

The Cyprus Lake Road connects the county highway (main road through the park) to the popular Cyprus Lake Campground and Grotto. The current tar and chip roadway is 5.3 km long with limited shouldering and short sightlines. The recap project is multi-component and intends to:

- Removing the existing top course of tar & chip and resurfacing
- Adding small shoulder (0.6m) with safe side slope (addition of gravel fill)
- Creating short (75m long) paved shoulders at 1 km intervals (addition of gravel fill)
- Reusing existing roadbeds where reasonable
- Replace culverts as needed
- Create 2 eco passage structure (under road)
- Replace existing signage
- Creating artificial turtle nesting areas – with added fill
- Run power cable from pole in maintenance yard to pump out area – According to the map provided in the BIA the route of the power cable will follow the exist road's footprint

All these components of the project cause very little CRM concern as they are (re)constructing in already disturbed areas (i.e., road bed) or are adding fill (no excavation).

However, the rest of the project components do cause CRM concerns. These components include:

- Clearing & grubbing (tree removal) 1.2 to 1.8 m from the road edge
- Turning radii to accommodate oversized vehicles at trailer pump out and future boat wash station

Recent Archaeology

In 2010 PCTAR conducted limited archaeological testing at the entrance traffic divider (93H20P), and the main parking lot (93H20Q & 20R) of the Cyprus Lake Campground. Despite the overall rocky character of the terrain (e.g., exposed bedrock, fractured slabs) soil accumulations were adequate for test pit assessments. Nothing of cultural significance was recovered but undisturbed soils were reported (93H20P).

In 2015, the park conducted a similar road recap on the Emmett Lake Road. The Emmett Lake Road is of a similar length, in a similar geological and topographic area, and only a short distance from the Cyprus Lake Road. Prior to that work, an archaeological assessment of the entire length of Emmett Lake Road was conducted by William Fitzgerald. No cultural resources were found during that assessment.

Though generally described as having a rocky terrain, with exposed bedrock and limited soil development, numerous pre-contact and historic sites are known on the peninsula.

Indeed, the Cyprus Lake Road is close to an ancient portage route, identified as an "Indian Trail" on a historic map (Figure 2). As well, Fitzgerald confirmed areas of soil accumulation sufficient for test pit assessment.





Figure 2: Historical map identifying “Indian Trail”, an ancient portage route utilizing Cyprus Lake.

After a review of the project details, historical maps, and previous archaeological assessments, an archaeological impact assessment (AIA) is required for the Cyprus Lake Road rehabilitation work area. An AIA is recommended to determine/confirm the presence and extent of archaeological resources, their heritage value, and to assess the project's impacts on these resources.

The AIA is specifically required for the entire length and both sides of the Cyprus Lake Road using the following methods:

- Raking off the forest duff to expose the ground for a visual examination at an interval of every 10 m along both sides of the road (depending on terrain), at areas with archaeological potential, and at specific areas scheduled for the construction of turtle nests and the 75m paved shoulders (scheduled for ca. 1 km intervals)
- If soil accumulation is present at these locations then test pits will be excavated to bedrock or sterile soil

The results of these AIA methods may result in the need for additional mitigations measures including further testing, controlled excavations and/or ongoing monitoring.

In addition to the above AIA work, the following mitigation measures are required for the Cyprus Lake Road project:

- Keep all heavy equipment (e.g., trucks, asphalt machines) within the current compound footprint





- Staging and parking areas should be confined to already disturbed areas (e.g., parking lots)
- The entire length and both sides of Cyprus Lake Road should be subjected to archaeological testing (methodology follows)

Archaeological testing is by its nature “sampling” (i.e., not 100% coverage). There is a chance, however low, that features and/or artifact concentrations may be encountered post-archaeological-testing. If significant features (e.g., structural remains and/or high artifact concentrations) are encountered, development work should stop in this immediate area, photographs taken, and the Parks Canada project manager informed. The project manager will then contact Parks Canada’s Terrestrial Archaeology section for advice. An assessment of the significance will determine what will be required to mitigate the chance find.

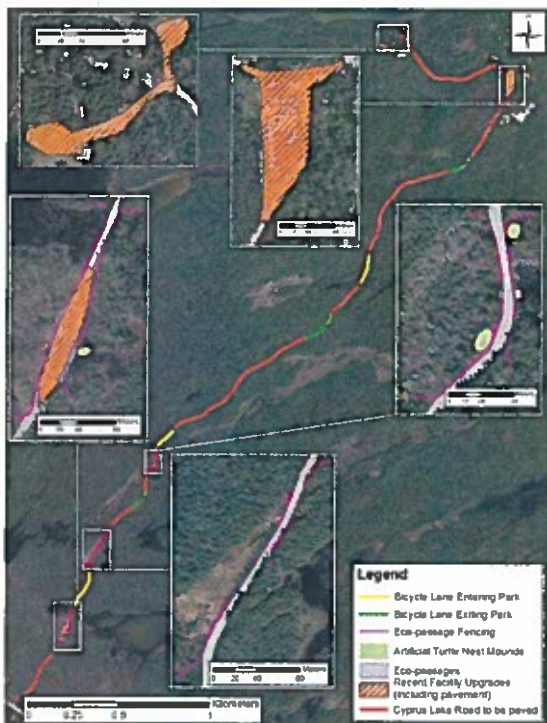


Figure 3: The photo in the top centre shows the current turning radius and proposed boat wash station.

Addendum

During the week of June 13 to 17, PCTAR conducted a site visit to reassess the Cyprus Lake Road. Exposed dolostone, minimal soil accumulation and low-lying wet areas were noted along the road. The archaeological potential for this area is low. As such there are no further archaeological concerns with the resurfacing of the Cyprus Lake Road and the park may proceed with their project.

References:

2016 Parks Canada
Basic Impact Analysis – Cyprus Lake Road Recap – Phase II

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Archaeological Assessments: Emmett Lake Road/Halfway Log Dump Road, Cyprus Lake Trail, Beachy Cove (Flowerpot Island)





2016 Taylor, Stacey

Archaeological Overview Assessment of Various Infrastructure Projects at Bruce Peninsula and Fathom Five National Parks

2010 Teal, Michael

Notes for Cyprus Lake Campground Improvements – BPNP: Overflow Parking and Waste Water Treatment

