

Report to Honourable Donna Cansfield, Minister of Natural Resources

**Expert Report on the Possible Effects of the  
Windsor-Essex Parkway on Butler's Gartersnake**

Honourable Donna Cansfield, Minister of Natural Resources  
**Expert Report on the Possible Effects of the Windsor-  
Essex Parkway on Butler's Gartersnake**

---

Prepared by:

**AECOM Canada Ltd.**

300 – 300 Town Centre Boulevard, Markham, ON, Canada L3R 5Z6  
T 905.477.8400 F 905.477.1456 [www.aecom.com](http://www.aecom.com)

Project Number:

NJN-008

Date:

July, 2009

---

## Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report:

- are subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations")
- represent Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to Consultant which has not been independently verified
- have not been updated since the date of issuance of the Report and their accuracy is limited to the time period and circumstances in which they were collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- were prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

Unless expressly stated to the contrary in the Report or the Agreement, Consultant:

- shall not be responsible for any events or circumstances that may have occurred since the date on which the Report was prepared or for any inaccuracies contained in information that was provided to Consultant
- agrees that the Report represents its professional judgement as described above for the specific purpose described in the Report and the Agreement, but Consultant makes no other representations with respect to the Report or any part thereof
- in the case of subsurface, environmental or geotechnical conditions, is not responsible for variability in such conditions geographically or over time

The Report is to be treated as confidential and may not be used or relied upon by third parties, except:

- as agreed by Consultant and Client
- as required by-law
- for use by governmental reviewing agencies

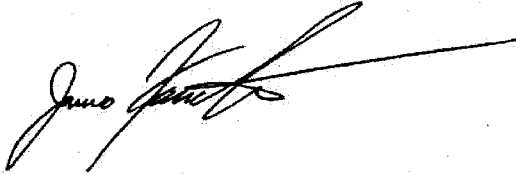
Any use of this Report is subject to this Statement of Qualifications and Limitations. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report.

---

## Signature Page

Report Prepared By:

A handwritten signature in black ink, appearing to read 'James Kamstra', with a long horizontal flourish extending to the right.

James Kamstra, B.Sc., M.E.S.  
Senior Terrestrial Ecologist

---

## Table of Contents

	page
<b>Statement of Qualifications and Limitations</b>	
1.0 Introduction .....	1
2.0 Project / Activity Description .....	1
3.0 Possible Effects of the Proposed Windsor-Essex Parkway on the Butler's Gartersnake .....	2
3.1 General Background on Butler's Gartersnake .....	2
3.2 Summary of Findings of the DRIC Study on Butler's Gartersnake .....	2
3.3 Impact of the Proposed Windsor-Essex Parkway .....	3
3.4 Proposed Mitigation .....	4
3.5 Other Butler Gartersnake Populations in the Vicinity of Windsor-Essex Parkway .....	5
3.6 Summary of Effects of the Proposed Windsor-Essex Parkway to Butler Gartersnake .....	5
4.0 Possible Effect of Windsor-Essex Parkway on Survival or Recovery of Butler's Gartersnake in Ontario .....	6
4.1 Butler's Gartersnake Status in Ontario .....	6
4.2 Expert Opinion on Whether the Proposed Windsor-Essex Parkway will Jeopardize the Survival or Recovery of Butler's Gartersnake in Ontario .....	7
5.0 Assumptions / Limitations .....	7
6.0 References .....	8
7.0 Qualifications .....	9
8.0 Statement of Independence .....	9

## 1.0 Introduction

The Butler's Gartersnake (*Thamnophis butleri*) is one of eight Threatened or Endangered Species that have been documented in the study area of the proposed Windsor-Essex Parkway, part of the Detroit River International Crossing project. Being Threatened, the snake is covered under Ontario's Endangered Species Act, 2007 (ESA 2007), which provides a strong legislative framework for the protection and recovery of Ontario's species at risk and their habitats. A population of Butler's Gartersnake that could be impacted by the Windsor-Essex Parkway has been studied in detail by LGL Limited (2009) to determine the impact of the project and to make appropriate recommendations mitigation that will minimize impacts.

The primary purpose of the current report to provide a second expert opinion by someone familiar with the ecology of the Butler's Gartersnake to address the two following questions:

- a) What are the possible effects of the proposed Windsor-Essex Parkway on the local population of Butler's Gartersnake? and,
- b) Will the proposed Windsor-Essex Parkway jeopardize the survival and recovery of Butler's Gartersnake in Ontario?

The anticipated impacts of the proposed Windsor-Essex Parkway to the Butler's Gartersnake subpopulation located between [REDACTED] in Windsor are discussed.

## 2.0 Project / Activity Description

The Windsor-Essex Parkway is a new multilane limited access highway that is being proposed as part of the Detroit River International Crossing (DRIC). It would connect existing Highway 401 with a new inspection plaza and bridge crossing of the Detroit River to improve international transportation and trade between the United States and Canada. A summary of the project is provided in sections 1.2 and 1.3 in URS (2009), and a more detailed description in URS (2008).

Background Environmental studies identified eight Endangered or Threatened species within the DRIC study area that could be affected by the proposed Windsor-Essex Parkway. These species are protected by the *Endangered Species Act* (ESA), 2007. The Ministry of Transportation is applying for a Permit under Clause 17(2)(d) of the ESA, to allow for construction within habitat of Threatened or Endangered Species 2007.

One of the species identified was the Butler's Gartersnake. Intensive and detailed studies have been conducted on this species in the Windsor-Essex Parkway study area by LGL Limited (2009) to document details of the population, determine possible impacts and to propose mitigation to minimize impacts.

### 3.0 Possible Effects of the Proposed Windsor-Essex Parkway on the Butler's Gartersnake

#### 3.1 General Background on Butler's Gartersnake

Butler's Gartersnake is a small, inoffensive striped snake that occurs in open, prairie-like habitats and feeds primarily on earthworms (Planck and Planck 1977). It is similar in appearance to the widespread Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) but is smaller with a proportionately thicker neck and a difference in the lateral stripe pattern: the first lateral stripe up from the belly scales is on scale rows 2, 3 and 4 on Butler's Gartersnake, and on scale rows 2 and 3 on Eastern Gartersnake (Conant and Collins 1991).

Within Canada, Butler's Gartersnake has an extremely limited range. It is essentially confined to a narrow band along the St. Clair and Detroit Rivers with disjunct populations at Luther Marsh in Dufferin and Wellington Counties; and at Skunk's Misery in the tri-county area of Chatham-Kent, Lambton and Middlesex (Sandilands 2001, and records compiled by the Natural Heritage Information Centre). The global range is also small as, in addition to Ontario, it only occurs in the states of Michigan, Indiana and Ohio with a small disjunct population in Wisconsin (Conant and Collins 1991), which coincides with the original oak savannah - tallgrass prairie biome of the Midwest.

The Butler's Gartersnake occurs chiefly in open grassy habitats such as prairies, old fields, borders of marshes, and even vacant lots in urban areas. It prefers dense grass in open sunny habitat and readily hides under almost any cover that is available in its habitat including logs, boards, metal sheets, and assorted rubbish. It occurs along forest edges but generally avoids the shaded forest interior. In fact the natural process of succession from old field to thicket to forest degrades and eventually eliminates suitable Butler's Gartersnake habitat. The presence of a large earthworm population is also critical to sustaining a Butler's Gartersnake population. Given that the earthworm population is entirely non-native, and introductions are much more abundant in urban areas, this species occupies an intriguing ecotone between urban and natural sites. In other words, they benefit from proximity to urban sites due to their food source, but require open, less urban to rural sites for shelter and breeding.

#### 3.2 Summary of Findings of the DRIC Study on Butler's Gartersnake

LGL Limited (2009) conducted an intensive study of the Butler's Gartersnake in 2008 and 2009 within a 40 ha contiguous block of natural habitat bordered by [REDACTED]. This natural area contains a mosaic of different habitats at various stages of succession that includes tall grass savanna, old field, cultural thickets, deciduous forest and some thicket swamps. The vegetation types have been mapped by LGL (2009a) as part of the environmental assessment.

LGL Limited (2009) determined that seven fields comprising about 7 ha of this mosaic constituted the significant habitat for the species. They laid out a pattern of 130 chipboard sheets, 20 m apart and sampled

them weekly through most of the active season. They attempted to determine movement patterns and estimate population size using mark-recapture formulas. They only found snakes in one field (Field A) early in the field season (April) and deduced that they were likely hibernating in or very close to that field. They also identified a second probable hibernating area (Field C). There was a concentration of burrows by Burrowing Crayfish around Field A. Butler's Gartersnakes are known to hibernate in crayfish burrows as well as anthills (Sandilands 2001). The snakes are generally unable to dig in firm ground and therefore are dependent on existing holes that will allow them to get below the frost line for winter. The presence of suitable hibernation sites is critical to their survival on a given site. As such the relationship between snakes hibernacula and the concentration of crayfish burrows is important. Later in the spring LGL Limited found that Butler's Gartersnakes had dispersed and were found throughout the seven prairie or old field sites (Fields A through G).

A total of 106 Butler's Gartersnakes were recorded, of which 58% were young of the year (YOY) in 2008. Using three mark-recapture formulas, they were able to derive a population estimate of 143 to 160 adults and another 100 juveniles. In 2009, 160 new Butler's Gartersnakes were marked consisting of 117 YOY born the previous autumn and 43 adults. Of these, only 13 were recaptures of snakes that were first marked in 2008 (LGL Limited 2009b).

Their study determined that the Butler's Gartersnakes remained within the 40 ha block of contiguous habitat. Although a few individuals were found to make movements of several hundred m, they avoided crossing roads. Most individuals were sedentary, remaining in much smaller home ranges. These results were similar to findings of a study undertaken at Sarnia (AECOM 2008). At the Sarnia site, Butler's Gartersnakes survive in small home ranges in blocks of habitat comprising only 2 to 5 ha. They generally avoided crossing roads even where habitat patches were present on both sides of the road. This behaviour allows them to avoid the high incidence of road mortality that afflicts other more mobile species of snakes, and therefore able to persist in small blocks of habitat. This behaviour may also limit their ability to colonize new habitats that become available and make them prone to inbreeding depression.

It is probably their sedentary nature in combination with their reliance on earthworms, a very common food resource, that allows them to survive on surprisingly small parcels of habitat within urban areas. Earthworms can thrive in rather degraded habitat as long as there are moist soils.

### 3.3 Impact of the Proposed Windsor-Essex Parkway

The proposed footprint of the Windsor-Essex Parkway would remove about 3 ha of Butler's Gartersnake significant habitat, which encompasses most of three of the seven fields (Fields B, E and F), and encroaches on Field A (42% of available significant habitat). In addition approximately 10 ha or 25% of the contiguous block of natural vegetation that contains the habitat would be removed. Field A which had most of the crayfish burrows believed to provide most of the hibernation sites would remain but the snakes could be subjected to ground vibration and/or a change in hydrologic function during adjacent road construction, since this area would be immediately adjacent to the new right-of-way. The presence of Burrowing Crayfish



indicates a high water table, and since the snakes depend on crayfish for suitable hibernation sites, a physical change that affects the crayfish, would also affect Butler's Gartersnakes.

Although LGL Limited (2009) did not extrapolate from the amount of habitat loss, one could assume that a loss of 42% of the habitat could lead to a reduction of approximately 40% of the population which would reduce the population to about 80 to 90 adults, which may still be sufficiently large to be viable. Such a relationship is not certain and depends on a variety of factors such as makeup of the landscape mosaic, continuation of suitable hibernation sites and food. At some point the amount of habitat would become too small to support a viable subpopulation.

### 3.4 Proposed Mitigation

Mitigation proposed by LGL Limited (2009) includes restoring habitat or creating habitat at a ratio of 2:1 to compensate for loss of the significant habitat. This could result in a no net loss or even a gain in the amount of habitat and population. Butler's Gartersnake needs open habitat with an abundance of worms. Most of the block of contiguous habitat between [REDACTED] is now in successional stages with closed canopies such as woodlands and cultural thickets that are no longer favoured by Butler's Gartersnake. Habitat management by cutting canopies, controlled burns or other methods would restore a favourable open vegetation structure that could also provide better conditions for significant tallgrass prairie flora. At Sarnia, a large thriving population of Butler's Gartersnake inhabits a rather degraded, disturbed habitat, which is largely dominated by non-native plant species. The vegetation structure, however, mimicked prairie conditions and the presence of a large worm population makes suitable conditions for the snake (AECOM 2008). At the Sarnia site there are no Burrowing Crayfish, and the snakes are believed to be hibernating among dumped rubble and debris. Consequently I believe that restoring suitable habitat for Butler's Gartersnake would be a fairly simple process, since the vegetation structure appears to be much more important than the plant species composition. It will be important that the Burrowing Crayfish are maintained, but artificial hibernacula can also be created. LGL Limited (2009) recommends that both short term and long term strategies will be needed to ensure that a sufficient area of suitable Butler's Gartersnake habitat is maintained in the long term. Any created habitat would eventually grow up; therefore succession will need to be arrested periodically through a management plan and a responsible authority.

LGL Limited (2009) also recommends erecting snake proof fencing between remaining habitat and the manicured road right-of-way. Temporary fencing should be erected to keep snakes out of the working area during the construction period, and more permanent fencing to keep them off the highway thereby preventing road mortality. During habitat clearing snakes will need to be moved to remaining habitat areas.

### 3.5 Other Butler Gartersnake Populations in the Vicinity of Windsor-Essex Parkway

The studied Butler's Gartersnake subpopulation between [REDACTED] is one of several known to be in the Windsor Area. LGL Limited (2009) show that eight local occurrences have been identified in the Windsor area by the Natural Heritage Information Centre (NHIC). In 2009 another population was found in the DRIC study area by LGL Limited (2009b) along [REDACTED], approximately 2 km east of the [REDACTED] subpopulation.

### 3.6 Summary of Effects of the Proposed Windsor-Essex Parkway to Butler Gartersnake

The Butler's Gartersnake subpopulation between [REDACTED] appears to be essentially isolated and confined by the surrounding roads but the population size and area of habitat appears to be sufficiently large to be able to sustain itself. The proposed Windsor-Essex Parkway will reduce the overall block of natural habitat by 25% and the significant habitat by 42%. However, with the proposed mitigation, the amount of 'significant' habitat would increase by restoring the vegetation to an open earlier stage of succession. If the contiguous natural area can be retained as a 30 ha block with a mixed vegetation mosaic that continually includes at least 10 ha of open habitat (through management as recommended by LGL), it should continue to support a Butler's Gartersnake population.

The Sarnia site has been fragmented into three isolated blocks of habitat separated by roads that range from 2 to 5 ha in area. These areas were probably contiguous 10 years ago before isolated by development. Nevertheless each of the three areas still support a high density of snakes, and there appear to be three viable subpopulations (AECOM 2008). Inbreeding may become a problem in the longer term, but the areas have been isolated for several generations and the snakes show good reproduction. The block of habitat between [REDACTED] is considerably larger suggesting that it should be sufficiently large to support a population with habitat management.

In addition, the Butler's Gartersnakes at the Sarnia site are thriving in a highly disturbed and rather degraded habitat, but it does provide three essential elements: open vegetation structure, abundance of food (earthworms) and suitable hibernating sites. At that site the maintenance of suitable or 'significant' habitat has been purely accidental. With a planned approach to habitat management, restoring habitat should be feasible as long as all three of the essential elements are incorporated into habitat restoration. Since it is assumed that crayfish burrows are an important requirement for hibernation at the [REDACTED] site, this feature needs to be maintained.

In conclusion, it is my professional opinion that if the mitigations recommended by LGL Limited (2009) are fully implemented, construction of the Windsor-Essex Parkway will not result in a significant impact to the Butler's Gartersnake subpopulation between [REDACTED]. My experience at Sarnia shows that the species can adapt to moderate levels of habitat disturbance that promote open conditions. In addition their avoidance of roads allow them to persist near roads with busy traffic as long as their habitat contains the key features they need to survive.

## 4.0 Possible Effect of Windsor-Essex Parkway on Survival or Recovery of Butler's Gartersnake in Ontario

### 4.1 Butler's Gartersnake Status in Ontario

A status report has been completed for COSEWIC on Butler's Gartersnake which examined the number of known populations and attempted to determine whether the population is changing (Sandilands 2001). Currently an updated status report is in progress. Field surveys are being conducted to confirm whether previously reported populations of Butler's Gartersnake are still extant (Jonathan Choquette, *pers. comm.*).

The NHIC has tracked Butler's Gartersnake and is attempting to compile all records in the province. NHIC database listed 19 Element Occurrences (EO) in Ontario. Each EO may consist of several nearby locations believed to represent one general population area. The South Windsor EO (#1352) which encompasses the Windsor-Essex Parkway, includes observations from at least 10 different locations. With the current road network combined with Butler's Gartersnake's reluctance to cross roads, nearby subpopulations may no longer be able to interbreed, eventually resulting in inbreeding depression. Ten of the 19 EOs are listed as "historical" (no observations for >20 years) but NHIC does not have records from the 2009 surveys, and other recent records may not yet be incorporated into their database. Therefore the "historical" designation is not an indication that these populations are no longer extant. One of the EOs was only discovered in 2009.

The 2009 surveys by Noble and Choquette (*pers. comm.*) have confirmed the continual presence of Butler's Gartersnake at most locations in Ontario where they had been previously reported, including many of the EOs considered to be "historical" by NHIC. Butler's Gartersnakes were found at seven locations around Windsor (of 12 investigated), five locations near Lasalle (south of Windsor), two locations at Amherstburg, and one at Tecumseh (all in the Detroit River corridor). Butler's Gartersnake has apparently disappeared from the Windsor Airport where there formerly was a large population (Plank and Plank 1977) because the entire habitat has been removed (Choquette *pers. comm.*). The species' continued presence could not be confirmed at the Belle River EO.

Butler's Gartersnakes were also found or reported at three locations around Sarnia, as well as Luther Marsh, Skunk's Misery and near Courtright in Lambton County. The snakes were apparently no longer present in some areas within Sarnia where residential development had displaced habitat. Noble and Choquette's surveys did not assess population size but only presence. However detailed studies at Sarnia (*pers. obs.*), near Courtright (Ron Gould, *pers. comm.*) as well as Windsor-Essex Parkway indicate that Butler's Gartersnake can occur in high densities in relatively small patches of habitat. Choquette (*pers. comm.*) reports they are also locally abundant at the disjunct Luther Lake location.

In summary, recent surveys indicate that a few populations have disappeared but the majority of known locations are still extant. The Butler's Gartersnake has a very restricted range within the province but it can be locally abundant at some localities within this range. Populations seem to be able to persist in surprisingly small and isolated blocks of habitat. This probably relates to their reliance on an abundant food source that occurs in near-urban disturbed areas, their low mobility and reluctance to venture onto roads.

## 4.2 Expert Opinion on Whether the Proposed Windsor-Essex Parkway will Jeopardize the Survival or Recovery of Butler's Gartersnake in Ontario

The Butler's Gartersnake subpopulation between [REDACTED] is only one of a number of locations in the Windsor area where the species is known to occur. Several other subpopulations are known to occur within several km, including one found in the DRIC study area in 2009. Consequently even if the subpopulation were lost entirely, it would not lead to elimination or near-elimination of Butler's Gartersnake in the Windsor area. In the broader context of the entire range of the Butler's Gartersnake in Ontario, the Windsor-Essex Parkway is only a small part of one EO and therefore it forms a very small portion of the entire Butler's Gartersnake range in Ontario.

Although there would be a loss of some 'significant' Butler's Gartersnake habitat, development of the Windsor-Essex Parkway could actually contribute to the recovery for this species if the mitigation methods proposed by LGL Limited (2009) are carefully planned and implemented and the sites secured. In particular a long term commitment to habitat management is needed to ensure that a sufficient area of favourable successional stages is always present. This project has already resulted in MTO purchasing a proposed residential development along [REDACTED] (adjacent to the Windsor-Essex Parkway) that would have eliminated some of the Butler's Gartersnake habitat. This contributes to the recovery if MTO is now committed to protecting the site for Butler's Gartersnake and other species at risk in the long term.

In conclusion it is my expert opinion that development of the proposed Windsor-Essex Parkway will not jeopardize the survival or recovery of Butler's Gartersnake in Ontario.

## 5.0 Assumptions / Limitations

It was not clear from the LGL Limited (2009), how comprehensive Butler's Gartersnake surveys were in the DRIC study area prior to the intensive surveys. The presence of Butler's Gartersnakes can be difficult to detect if there are no cover objects present that can be easily lifted. Cover objects greatly facilitate finding Butler's Gartersnake. For example of over 300 snakes found during the Sarnia study, all but about 10 were found under cover. If casual surveys were conducted in areas where no or few cover objects are available, the snakes could easily be missed, even if present. For example The [REDACTED] location had not been found until 2009, so it had been missed by previous surveys.

The vegetation maps and orthophotos show areas of old field or open habitats that appear to provide suitable Butler's Gartersnake habitat in the DRIC Study Area. Consequently Butler's Gartersnake may occur at more locations around Windsor including in the DRIC study area.

---

## 6.0 References

- AECOM 2008:  
Assessment of Butler's Garter Snake and other Natural Environment Features on Cantaqueigh Lands, Point Edward. Prepared for Cantaqueigh Investments Ltd.
- Choquette, Jonathan pers. comm.:  
Herpetologist contracted to complete update COSEWIC Status Report on Butler's Gartersnake. Pers. comm. to James Kamstra July 15, 2009
- Conant, R. and Collins. 1991:  
A Field Guide to Reptiles and Amphibians of Eastern and Central North America. Houghton Mifflin Company, Boston.
- Gould, Ron pers. comm.:  
Biologist at Aylmer District of MNR. Pers. comm. to James Kamstra June 15, 2009
- LGL Limited. 2009:  
Impact Assessment Report for the Detroit River International Crossing Study – Butler's Gartersnake. Prepared for the Canada-United States-Ontario-Michigan Border Partnership
- LGL Limited. 2009b:  
Butler's Gartersnake Survey – 2009 Field Report
- Natural Heritage Information Centre. 2009:  
Records of Butler's Gartersnake in NHIC Database
- Planck, R.J and J.T. Planck, 1977:  
Ecology and Status of the Butler's Garter Snake in southwestern Ontario. Manuscript report, Department of Supply and Services Canada. 139 pp.
- Sandilands, A.P., 1998:  
COSEWIC Status Report on the Butler's Garter Snake *Thamnophis butleri*. Committee on the Status of Endangered Wildlife in Canada. 16 pp.
- URS Canada Inc. 2009:  
Application for a Permit Under 17(2)(d) of the Endangered Species Act, 2007; Detroit River International Crossing. March 2009. Prepared for the Canada-United States-Ontario-Michigan Border Partnership
- URS Canada Inc. 2008:  
Detroit River International Crossing Environmental Assessment Report - W.O. 04-33-002: Detroit River International Crossing Study, City of Windsor, County of Essex, Town of LaSalle, Town of Tecumseh. December 2008. Prepared for the Canada-United States-Ontario-Michigan Border Partnership. <http://www.partnershipborderstudy.com/>

---

## 7.0 Qualifications

James Kamstra, is a Senior Ecologist with AECOM Canada who has first hand field experience with many of the reptiles and amphibians of Ontario. He has been involved with many environmental impact studies that had the potential to affect reptile species at risk. He has conducted an intensive two year mark-recapture study on a large population Butler's Gartersnakes near Sarnia, Ontario and has become intimately familiar with the habits and habitat of the species through that study. James is also a member of the Committee on the Status of Species at Risk in Ontario (COSSARO) and sits on the Eastern Foxsnake and Eastern Hog-nosed Snake Recovery Team.

## 8.0 Statement of Independence

I hereby declare that I have no financial or working relationship with the Ontario Ministry of Transportation in connection with the Detroit River International Crossing study. I have however, worked on some projects for the Ontario Ministry of Transportation at other locations in Ontario. I also am completely independent from any connections to LGL Limited