

May 16, 2011

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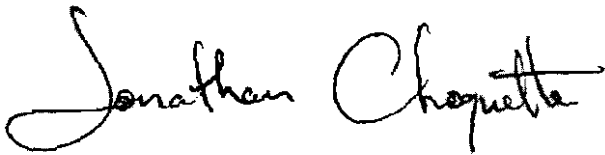
RE: Written report to the Minister of Natural Resources on impacts to Butler's Gartersnake (*Thamnophis butleri*) from the Windsor Essex Parkway portion of the Detroit River International Crossing project in Windsor, Ontario

Dear Honourable Linda Jeffrey,

Included is a report assessing the possible effects of the activities authorized by the proposed permit under Section 17 (2)(d) of the Endangered Species Act, 2007 on Butler's Gartersnake and an opinion on whether the project will jeopardize the survival or recovery of this species in Ontario.

Thank you,

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Executive Summary

Expert report on the possible effects of the Windsor-Essex Parkway on Butler's Gartersnake (*Thamnophis butleri*)

The effects of the Windsor Essex Parkway on Butler's Gartersnake (*Thamnophis butleri*) are the loss of habitat due to construction activities and the isolation of habitat due to the widening of an existing highway corridor. These effects are consistent with the greatest threats to the survival of this species in Ontario.

I estimated the potential Butler's Gartersnake habitat to be impacted is much more than was previously identified and despite the proposed mitigation an overall decline in habitat will occur as a result of construction activities. Also, widening an existing highway corridor and building associated service roads will effectively increase the overall isolation of Butler's Gartersnake locations. The impacts will occur on the [REDACTED] and surrounding natural areas, one of the most important areas for the survival and recovery of this species in Ontario. As a result, the principal actions for the recovery of this species, to protect habitat and to reconnect populations, are not being achieved.

This project, as proposed, will result in an overall loss and isolation of habitat in one of the most important areas for the survival and recovery of this species in the province. It is my opinion that the Windsor Essex Parkway, taking into consideration proposed mitigation, will jeopardize the survival and recovery of Butler's Gartersnake in Ontario.

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Expert report on the possible effects of the Windsor-Essex Parkway on Butler's Gartersnake (*Thamnophis butleri*)

Project/Activity Description

The activities associated with the Windsor Essex Parkway (WEP) that will affect Butler's Gartersnake (*Thamnophis butleri*) are as follows:

- Construction activities in the Endangered Species Act (ESA) footprint¹. These include vegetation removal, grubbing, soil cut/fill and other associated construction activities that involve the disturbance of soil and vegetation.
- Widening of an existing highway corridor to create an operational six-lane urban freeway and associated four-lane service road.

Possible effects on Butler's Gartersnake

Although a number of possible effects of the project activities have been identified during the preparation of this report, the discussion will focus on those effects which are believed to have the greatest impact on Butler's Gartersnake: habitat loss and isolation.

Habitat loss

Construction activities, such as removal of vegetation, grubbing and site grading (see above) will result in the direct loss of occupied and potential Butler's Gartersnake (BUGA) habitat and the associated mortality of individual snakes using that habitat. This effect has been acknowledged by LGL (2010) "the loss of [BUGA] habitat through the

¹ Refer to page 5 of Appendix B (LGL 2011) for a complete definition of 'construction' and 'ESA footprint'.

construction of the WEP”, and LGL (2011) “Some [BUGA] habitat will either be physically destroyed or rendered non-functional” (p89). The loss of habitat due to urbanization and vegetation removal (i.e., bulldozing) has resulted in the documented loss of BUGA locations² in Michigan and Ontario (COSEWIC 2010). Construction of the WEP will result in the loss of habitat in at least four locations (Appendix 1) identified by COSEWIC (2010).

Butler’s Gartersnake habitat in the WEP study area consists of [REDACTED]
[REDACTED]
[REDACTED] type vegetation communities (LGL 2011). This species was also found using [REDACTED] (LGL 2010b). Furthermore, BUGA are abundant in areas dominated by un-mowed non-native grasses (i.e., CUM vegetation communities) at many other locations in Windsor-Essex County (J. Choquette pers. obs. 2009). BUGA habitat includes important features such as foraging areas, hibernacula, thermoregulatory sites, and birthing sites [REDACTED]
[REDACTED] have been the preferred foraging habitats for this species within the study area (LGL 2010 as cited by LGL 2011). Hibernacula in the study area are suspected to consist of crayfish burrows, ant hills and small mammal burrows (LGL 2011).

A total of 11.84 ha of BUGA habitat to be impacted have been identified by LGL (2011): 9.69 ha will be impacted along [REDACTED] and 2.15 ha will be impacted at the [REDACTED] location. The impact sites include five areas of suitable habitat where BUGA have been found (p16, LGL 2010). Construction will result in the direct

² A ‘location’ is defined by the International Union for the Conservation of Nature (IUCN 2010) as a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present.

loss of hibernacula/early emergence sites, thermoregulatory sites, and birthing areas within the impact sites (most of which have been identified at the [REDACTED] Site:

[REDACTED]

I have estimated that construction activities will result in the loss of potential BUGA habitat in addition to the 11.84 ha of habitat currently identified. The latter value appears to be an underestimate of potential BUGA habitat that exists within the WEP parkway footprint. The absence of records within areas of potential habitat does not necessarily imply the absence of this species. Since the first identified occurrence of Butler's Gartersnakes in the footprint, this species has continuously been found in new areas of potential habitat. For example, BUGA was first confirmed in the [REDACTED] site (2006?), and not confirmed at the [REDACTED] site until 2009 (LGL 2010). Just recently, two individuals of this species were found in a new area during targeted salvage operations (S. Marks pers. comm. 2011). This parcel contains potential BUGA habitat ([REDACTED] vegetation communities) but was not previously identified as a BUGA impact zone. It is likely that further search efforts will continue to uncover the presence of BUGA in additional areas of potential habitat within the project footprint. For this reason, a more accurate estimate of the amount of habitat lost due to construction should take into account both occupied and unoccupied (or unverified) areas of potential habitat. Based on a preliminary GIS analysis, I estimated the potential BUGA habitat within the WEP footprint to be roughly 41.5 ha (Appendix 1). This suggests a much greater amount of habitat will be impacted from construction activities (roughly 3.5x more) than was previously identified.

Mitigation for habitat loss

Habitat creation, enhancement and restoration and long term protection of habitat through acquisition of land outside the WEP footprint are proposed to mitigate the loss of BUGA habitat ([REDACTED], LGL 2011). A 16 ha site is to be acquired by the Ministry of Transportation of Ontario (MTO) in the [REDACTED] location (LGL 2011), of which 10.75 ha of habitat are to be restored to a suitable state for BUGA [REDACTED] [REDACTED]. Also, an additional 16.33 ha site is to be acquired by MTO ([REDACTED] adjacent [REDACTED] road in the [REDACTED] area [REDACTED] of which 9.34 ha has been identified as suitable BUGA habitat [REDACTED]. The long term protection of these sites [REDACTED] will play an important role in addressing the issue of habitat loss because much of the (roughly) 32 ha appears to be zoned as residential and subject to future development (City of Windsor 2000).

Habitat acquisition will only account for roughly half (20 ha suitable habitat compared to 41.5 ha potential habitat) of the estimated BUGA habitat to be lost during construction activities. Furthermore, DRIC (2009) recognizes that “the creation of new prairie sites is not equivalent to retaining existing prairie sites” (p35) and it must not be assumed that all restoration activities will be entirely successful and that acquired habitat is directly equivalent to lost habitat. In spite of proposed activities to mitigate the effect of habitat loss, it appears an overall decline in BUGA habitat will occur as a result of construction activities for the WEP.

Isolation

The widening of an existing highway corridor to accommodate the operation of a six lane highway and associated service roads will contribute to increasing the isolation of, and reducing potential landscape connectivity between, BUGA localities. This effect is acknowledged on page 63 of Section 6.8.1.4 of the DRIC Environmental Assessment Report: 'Obstruction of Wildlife Movements' (as cited on page 27, DRIC 2009). A well connected landscape is one that allows or promotes the dispersal of individuals and genetic material between populations of a particular species (Bennet 2003). Conversely, roads have been shown to act as barriers to dispersal (Andrews and Gibbons 2005) and genetic exchange in snakes (Row et al 2010), effectively isolating populations and making them more susceptible to local extinctions.

Roads limit dispersal in snakes through active avoidance of roads and direct mortality by road traffic. In the study landscape existing roads are likely contributing to the isolation of BUGA populations due to the presence of an extensive and busy urban road network. For example, Andrews and Gibbons (2005) found small snakes avoided crossing roads or crossed partway before retreating. Also, a 2010 road mortality study on roads in west [REDACTED] found multiple Butler's Gartersnakes killed on roads (J. Choquette unpub. data). Finally, dispersal of radiotracked Butler's Gartersnakes at the [REDACTED] site appeared to be limited by existing roads [REDACTED]

A review of the WEP footprint in comparison to known BUGA localities (COSEWIC 2011, LGL 2011, J. Choquette, unpub. data 2010) identified the following localities which will be further isolated by the construction and operation of the WEP: 1)

[REDACTED], 2) [REDACTED], and 3) [REDACTED]. The widening of an existing barrier [REDACTED] and addition of associated service roads will further reduce the ability for successful dispersal/migration and gene flow (connectivity) between localities. This will increase the isolation of those localities and effectively increase the extinction risk of BUGA within those localities.

Mitigation for isolation

The design and construction of one of the tunnel tops to function as an ecopassage is a strategy to mitigate the isolating effect of widening an existing highway corridor. This is a commendable addition to the project, and if it is designed and planned properly, it may result in increased connectivity for BUGA between [REDACTED] and [REDACTED]. There are still many considerations surrounding this mitigation strategy that do not appear finalized and the actual functioning of the structure is tentative (e.g., MNR concerns: p44, DRIC 2009). Also, this tunnel top appears to be only one with the potential to increase connectivity between BUGA locations, despite the following statements: “*Several* [my italics] of the tunnels will be designed to facilitate wildlife passage between natural areas.” (p44, DRIC 2009), and “all opportunities for habitat...connectivity will be pursued in the near-term as well as in the long-term” (p28, LGL 2011). If the ecopassage becomes a successful strategy to mitigate the effects of isolation on [REDACTED] the WEP will still contribute to the further isolation of two other locations [REDACTED] and [REDACTED].

[REDACTED]

Another mitigation strategy was aimed to address isolation at the site level, within the [REDACTED] site. These efforts, however, seem misguided and fail to address the actual barriers to connectivity in this landscape: roads and urban development. Furthermore, the movement data that was collected at the [REDACTED] site does not support the notion that there is isolation occurring within the site itself. For example, mark recapture and radiotelemetry data suggest that BUGA within the site are dispersing across [REDACTED] through [REDACTED] and across [REDACTED]. This data appear to contradict claims that the [REDACTED] site itself is fragmented for BUGA (LGL 2011). Conversely, movement data suggest BUGA dispersal is limited by existing roads at the periphery of the Site [REDACTED]. Mitigating was not proposed to address the widening of the existing highway corridor [REDACTED] which will further reduce connectivity between the [REDACTED] site and adjacent [REDACTED].

Mitigation activities may potentially reduce the isolation of [REDACTED] and increase connectivity for BUGA between this location and the [REDACTED]. Regardless, widening the existing highway corridor and building associated service roads will effectively increase the overall isolation of BUGA locations.

Expert opinion on jeopardizing survival or recovery

In the following section I will address whether activities associated with the construction of the Windsor-Essex Parkway, taking into account the proposed mitigation, will jeopardize the survival or recovery of Butler's Gartersnake (*Thamnophis butleri*) in Ontario. I will begin by discussing the greatest threats to this species and the trends associated with those threats; next I will define the recovery of this species in Ontario and the importance of the [REDACTED] to this species; finally I will conclude with my opinion on whether the WEP project will jeopardize Butler's Gartersnake survival or recovery.

Threats to Butler's Gartersnakes in Ontario

Currently, the long term survival of BUGA in Ontario is uncertain. As of June 2011, BUGA was uplisted from Threatened to Endangered due to the following (COSEWIC 2010):

1. Small overall distribution in Canada,
2. Decline and downward trend in number of known localities,
3. Ongoing habitat loss, fragmentation and proposed development at many locations,
4. Most localities exist as small and or isolated habitat fragments and are therefore threatened by negative genetic effects of small population size and demographic stochasticity

Trends in habitat loss

Habitat loss, from urbanization and other activities, remains the single biggest ongoing threat jeopardizing BUGA survival in the near and long term in Ontario

(COSEWIC 2010). [REDACTED] an important habitat used by BUGA, is continuing to decline in extent and quality (Rodger and Woodlife 2010). In Ontario, although [REDACTED] and [REDACTED] once covered 1000 km² they have been reduced to 3% of their historic extent largely due to urbanization, agriculture, and mismanagement (Rodger and Woodlife 2010, Tallgrass Ontario 2009). In south-western Ontario, remnant [REDACTED] and [REDACTED] habitat have been increasingly replaced or isolated by residential development over the last 3 decades, providing evidence for a decline in the quantity and quality of BUGA habitat since the mid 1970's (COSEWIC 2010).

Butler's Gartersnake habitat is in decline in the Windsor-Sarnia region. For example, a recent survey (2009) of historically occupied BUGA localities found that 32% of locations in this region have either been developed, are proposed for development or produced no specimens (Table 1, COSEWIC 2010). Results also suggest the loss and projected loss of 34% of known Lambton County locations and 46% of known Essex County locations within the next 5-20 years (COSEWIC 2010). These data indicate an overall decline in the number of BUGA localities in the Windsor-Sarnia region, in comparison to historic localities, and also suggest the decline will continue into the coming decades. This has important implications for the continued survival of BUGA in Ontario as the the majority of its Canadian range lies in the Windsor-Sarnia region (81% of Index Area of Occurrence, COSEWIC 2010).

Isolation and loss of connectivity

Another major threat to the survival of BUGA in Ontario is that it exists in many small and isolated localities in urban landscapes (COSEWIC 2010). Populations of urban

reptiles are at particular risk of extinction in comparison to non-urban populations due to a number of direct threats including increased disturbance and mortality from roads, domestic animals and people. These threats also contribute indirectly to changes in demographics (Row et al 2007), dispersal (Kwiatkowski et al 2008) and behaviour (Parent and Weatherhead 2000) that reduce connectivity among neighbouring populations and increase the risk of extirpation.

Butler's Gartersnake localities are currently fragmented and many within the Windsor-Sarnia region are small, isolated and threatened by ongoing development activities (industrial, urban or agricultural). During the 2009 surveys (COSEWIC 2010), almost half of the Windsor-Sarnia localities (9/19, 47%) where BUGA was found are considered industrial/urban (vacant industrial lands, quarry operations and waste storage sites, vacant/active rail corridors, or dredging sites). The long term persistence of BUGA at these locations is questionable and unpredictable due to their small size, potential to be developed and exposure to a multitude of threats associated with urban landscapes. Survival of this species in Ontario is more likely to depend on larger protected areas, such as [REDACTED]

Importance of the [REDACTED] to Butler's Gartersnake

The [REDACTED] is a group of five closely situated protected natural areas in [REDACTED]

[REDACTED]

[REDACTED] BUGA habitat is present throughout the complex and

also exists in additional protected and unprotected natural parcels in the surrounding Windsor/LaSalle area.

The [REDACTED] and surrounding habitat is important for the survival of BUGA in Ontario for many reasons. First, this complex of protected and unprotected lands is one of the largest [REDACTED] remnants in Ontario (Rodger 1998), one of the most endangered ecological communities in Canada (Rodger and Woodlife 2010) and an important habitat for BUGA (COSEWIC 2010). Second, the Windsor-Sarnia region contains the majority of BUGA range in Canada (Appendix 2), yet only 18% of localities in region are protected (COSEWIC 2010). Considering the trend of habitat loss and decline in number of localities, the protected areas in this region, such as the [REDACTED] will play an important role in the future survival of this species in Canada. Third, BUGA densities at two localities in the area are some of the greatest witnessed in the province (COSEWIC 2010, LGL 2010b), suggesting a high population density here. Finally, the [REDACTED] and surrounding protected natural areas in West Windsor and LaSalle collectively constitute one of the largest groupings of protected areas for this species in the region (many have been identified as BUGA localities in COSEWIC 2010).

The WEP is occurring adjacent the [REDACTED] and will result in the loss of surrounding natural areas. Despite existing protection of habitat, the long term survival of BUGA is threatened in this area due to extensive habitat fragmentation by roads and ongoing development in unprotected habitat (COSEWIC 2010). Due to the importance of the [REDACTED] and surrounding natural areas for Butler's Gartersnake, negative impacts on this area have important consequences for the long term the survival of this

species in the province. Recovery efforts should be focused here in order to increase the chances for survival and recovery of BUGA in Ontario.

Survival and recovery of Butler's Gartersnake in Ontario

Recovery of species at risk has been defined as “the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed, and threats are removed or reduced to improve the likelihood of a species’ persistence in the wild” (EFRT 2010). Recovery efforts for Butler’s Gartersnake are necessary to increase the probability that this species survives in the Province of Ontario in the short and long term. Despite the shortcoming of not having a recovery strategy for BUGA, recovery of this species is most likely dependant upon the recovery of its associated habitat (e.g., [REDACTED] Rodger and Woodlife 2010) and is probably similar to that of a species experiencing similar threats, associated with similar habitat types and distributed in the region and localities (e.g., Eastern Foxsnake). For the purpose of this report I will assume the recovery of BUGA is synonymous with the recovery of both the [REDACTED] ecosystem and the Eastern Foxsnake (EAFO) in Ontario.

The [REDACTED] Recovery Plan (Rodger 1998) is guided by eight goals, three of which are most relevant to this discussion:

1. to establish and expand a network of protected [REDACTED] community remnants
2. to encourage basic and applied research relevant to [REDACTED] community conservation
3. to encourage restoration and habitat creation initiatives where appropriate to enlarge existing remnants, make linkages and create new habitat. This includes “...enlarge and connect remnants...” (p23) and “proposing specific expansions and linkages...” (p24)

The Recovery Strategy for EAFO identifies the following goals (EFRT 2010)

which are relevant to this discussion:

1. Improve knowledge of populations, habitat use and threats
2. Identify and protect habitat and habitat connections within the current distribution, which includes the sub goal: “describe and map habitat corridors” (p19)
3. Reduce mortality by minimizing threats
4. Enhance, restore and reconnect populations, which includes the sub goal: “explore opportunities to restore habitat linkages between isolated population in southwestern Ontario” (p23)

Important recovery themes appear in both strategies and I have adapted them to apply to BUGA. These are 1) to improve knowledge and encourage research on BUGA, 2) Identify and protect BUGA habitat, 3) restore, enhance and create BUGA habitat, 4) reconnect BUGA habitat, 5) reduce BUGA mortality. The recovery themes that relate directly to the greatest threats to BUGA, as explained above, are: 2) identify and protect BUGA habitat, 3) restore, enhance and create BUGA habitat and 4) Reconnect BUGA habitat. Based on the discussion on the effects of the project on this species (overall loss of habitat and overall loss of connectivity) and despite attempts through proposed mitigation, the most important recovery actions are not being achieved.

Will the WEP jeopardize the survival and recovery of Butler’s Gartersnake in Ontario?

The following statements were made in relation to the impacts of the project on the survival or recovery of BUGA: “Butler’s Gartersnake...populations may be more secure at the end of the project than they are currently.” (p107, LGL 2011), “proposed mitigation and restoration will maintain the survival and recovery of [BUGA]” (p1, LGL

2011), “The planned habitat management and restoration activities will not result in threatening the survival or recovery of ...BUGA” (p28, LGL 2011) and, “The Ministry of Transportation is committed to using adaptive management strategies in order to ensure the protection, and not jeopardize the survival and recovery of the Butler’s Gartersnake populations...” (p90, LGL 2011).

Despite the proposed mitigation efforts, it appears the WEP project will result in an overall loss of habitat and an overall decline in connectivity for Butler’s Gartersnake. The mitigation for habitat loss does not address the entirety of occupied and potential habitat that will be impacted. In addition, the mitigation for isolation does not address all the locations that will be further isolated. Both these effects (habitat loss and increased isolation of localities) will contribute to the most significant threats to the survival of this species and compromise one of the most important areas for its recovery in the province. This is unfortunate because the WEP project has the potential to contribute to the overall recovery of the Butler’s Gartersnake, if additional opportunities to increase habitat protection and connectivity between isolated habitat patches are pursued and achieved. As proposed, the project and mitigation do not take full advantage of these opportunities. It is my opinion that the Windsor Essex Parkway, taking into consideration proposed mitigation, will jeopardize the survival and recovery of Butler’s Gartersnake in Ontario.

Assumptions/Limitations

The preparation of this report was not completed without a number of assumptions and limitations. These are discussed in point form below:

1. The main limitation in the preparation of the report was the short time frame under which it had to be completed (one week). It was impossible to thoroughly review every important document and discuss every possible effect of the project activities in such a timeframe. It is possible that some important pieces of information or project details were overlooked or missed. In spite of this limitation, for the last three years, I have invested numerous hours on BUGA-related projects and I have been following the DRIC project quite closely (refer to 'Qualifications'). It is my belief that my previous experience with, and knowledge of, this species and the DRIC project has reduced the limitations imposed by the short time frame on my ability to fully understand the potential impacts on BUGA.
2. There were additional potential effects of project activities on BUGA identified during the preparation of this report. Due to the timeframe of this contract, it was decided to scope the discussion to those activities and effects which were judged to have the strongest impacts on BUGA and most likely to have implications for the survival and recovery of this species in Ontario.

3. Some of the arguments (and subsequent conclusions) made in this report are dependant on the accuracy of the information collected and/or provided by LGL biologists in their reports as well as my proper interpretation of that information.

4. There is the possibility that ecological landscapes created within the WEP footprint will provide future BUGA habitat. These include landscaping and vegetation associated with [REDACTED], [REDACTED] (in addition to the discussed ecopassage), [REDACTED] and [REDACTED], [REDACTED] and [REDACTED]. Potential use of some of these features is evidenced through personal observations of this species in similar landscape types (COSEWIC 2010). The potential contribution of these areas to mitigate habitat loss was not included in the discussion as their total area, vegetation structure, location, maintenance regime etc. were unknown. Furthermore, these areas did not appear to be included as part of the proposed mitigation for this species.

5. The opportunity to acquire additional lands for BUGA habitat restoration/enhancement within an area of approximately 51.85 ha and “already protected within [REDACTED] was identified by LGL (2011). It was assumed this site will not contribute to the proposed mitigation for habitat loss as details were not provided on the suitability of BUGA habitat within the site and the site is apparently already afforded protection from development.

6. Estimates of potential BUGA habitat to be impacted are approximate and should be used with caution. The short time frame of this report precluded a more in depth, accurate analysis. These are not intended to be used as a specific estimate, but a ballpark figure to demonstrate an apparently large underestimate of impacted habitat. I recommend a more detailed analysis be conducted before this conclusion is fully accepted.

7. Identification of locations to be further isolated by project activities are preliminary and based on the assumption that a local access road on the tunnel tops will be an impediment to BUGA dispersal and connectivity.

8. It is important that I acknowledge the extensive mitigation efforts put forth to reduce direct mortality of Butler's Gartersnakes from construction activities (e.g., targeted salvage and exclusion fencing) and to gain knowledge of the effects of relocation and restoration efforts (e.g., long-term monitoring and radio telemetry). These are commendable actions and are important contributions to recovery efforts (e.g., reducing BUGA mortality and improving knowledge of BUGA). In spite of this, I am making the assumption that these mitigation efforts are not addressing the most important actions necessary to the recovery of this species in Ontario (refer to **'Expert opinion on jeopardizing survival or recovery'**).

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Qualifications

Experience with and knowledge of the species

- SCC Ecological, Research and Design. Ecological Consultant (2009-Present)
 - Provided advice on Butler's Gartersnake and other SAR and conducted field surveys for a proponent in an OMB case (2009-Present)
 - Conducted a road mortality survey in the Windsor area to identify Butler's Gartersnake road mortality locations and impact (2010)

- Environment Canada, Canadian Wildlife Service. Co-author of the COSEWIC Updated Status Report on Butler's Gartersnake in Canada (2009-10)
 - Invested 154 hours of field work (317 person-hours collectively) surveying for this species throughout its Ontario range
 - Encountered and sampled 180 Butler's Gartersnakes
 - Researched, reviewed and summarized the available literature on the species (including historical information)
 - Contacted 110 persons in order to compile sighting, habitat and general information on the species
 - Used the above effort to compile a summary of the presence/absence of Butler's Gartersnake and its habitat throughout its current and historical range in Ontario
 - Participated in the COSEWIC Reptile and Amphibian Species Sub-Committee meeting in Wolfville, Nova Scotia (Sept 2010) in order to provide information and answer questions regarding the Status Report Update

- AECOM Canada. Field Technician for a capture-mark-recapture study of the Butler's Gartersnake in ██████████ Ontario (2009)
 - Invested a total of 55 hours of field work and processed 128 Butler's Gartersnakes

- LGL LTD. Environmental Research Associates. Field technician for a capture-mark-recapture study of the Butler's Gartersnake in Windsor, Ontario (2008).
 - Provided assistance with field research for the Windsor-Essex Parkway Project.

- Provided information and advice on the Butler's Gartersnake to various academic, private and public parties (2009 – present):
 - Provided information on distribution in Lambton County to Joe Crowley, MNR Herpetology Species at Risk Specialist (2011)
 - Provided distribution maps to Dr. Ron Brooks for COSEWIC meeting (2010)
 - Provided information on distribution, decline and abundance to Wayne King, technician with LGL Consulting working on the DRIC Project, (2010)
 - Provided information on occurrence and search-effort in Essex County to Ron Gould, Aylmer MNR (2010).

- Provided information on occurrence in Essex County to Al Sandilands of Grey Owl Environmental (2010)
- Provided mitigation recommendations to Tom Preney, local ecological consultant (2009, 2010)
- Provided information on Lambton County and Ontario distribution to James Kamstra of AECOM Canada (2009)
- Provided information on Ontario distribution to Dr. Ron Brooks (2009)

Publications related to the species

- Choquette, J.D., Noble, D.W.A., Brooks, R. *in review*. Genetic structure of the Butler's Gartersnake in Canada.
- Choquette, J.D., Noble, D.W.A. 2010. COSEWIC status report on the Butler's Gartersnake *Thamnophis butleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-52 pp.

Experience with and knowledge of the WEP Project and the DRIC study

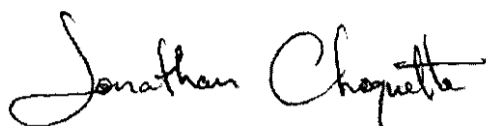
- Attended a Public Information Open House, Windsor ON (2011)
- Provided a cost estimate to conduct the snake mitigation work for the WE Parkway for one of the unsuccessful bidders on the project (2010).
- Shared Butler's Gartersnake and Eastern Foxsnake occurrence information with field biologists contracted by LGL Environmental (2010)
- Participated in a volunteer design charrette with the Essex County Field Naturalists regarding WEP and opportunities for increasing landscape connectivity for Species at Risk (2010).
- Participated in the Stakeholder Dialogue Session RE: DRIC and ESA, Windsor ON (2009).
- Contracted by LGL to assist with the DRIC Butler's Gartersnake study on [REDACTED] (2008, see above)
- Attended a Public Information Open House, Windsor ON (2008)

Statement of Independence

I confirm that I am free of any influence, interest or relationship with the proponent (MTO) that would impair my professional judgment or objectivity with respect to this project.

Name: Jonathan Choquette

signed: May 14, 2011

A handwritten signature in black ink that reads "Jonathan Choquette". The signature is written in a cursive style with a large initial 'J' and a long horizontal stroke at the end.

Appendices

Appendix 1

The following are detailed examples of potential BUGA habitat not included in current estimate of habitat within the WEP footprint to be impacted/lost due to construction activities. These estimates are preliminary GIS area calculations based on an overlay of the WEP footprint on vegetation communities mapped using ecological land classification (CUSOM 2008) and aerial imagery (SWOOP 2006). When additional potential habitat is added to the current figure of 11.84 ha of BUGA habitat to be impacted, I estimated roughly 41.5 ha of potential and occupied habitat will be impacted.

1. [REDACTED] location: 2.15 ha of occupied BUGA habitat at the [REDACTED] Site within 'BGS Impact Site 1' was identified as being impacted [REDACTED]. This appears to be calculated based solely on losses to fields F, B and E, however, potential habitat exists outside these fields and BUGA have been radiotracked outside these fields (LGL 2010c). Preliminary GIS calculation based on figure 13 A (LGL 2011) and aerial imagery identified roughly 9.3 ha of potential BUGA habitat within impact site 1, to be lost to construction activities [REDACTED] and [REDACTED] vegetation).
2. [REDACTED] location: 9.69 ha of BUGA habitat were identified as being impacted along [REDACTED]. Potential BUGA habitat [REDACTED] vegetation type) exists adjacent [REDACTED] north of [REDACTED] Creek and south of [REDACTED] Road. This patch of habitat is continuous with the [REDACTED]. This area adds roughly 3.2 ha of potential habitat within the WEP footprint that was not included as an impact site, for a total of roughly 12.9 ha to be impacted along [REDACTED] Road.
3. [REDACTED] location: Potential habitat exists in the form of [REDACTED] and [REDACTED] vegetation communities in the parcel south of [REDACTED] Road, north of [REDACTED] Road and west of [REDACTED]. This area was identified as a specific location for this species based on historic BUGA records (COSEWIC 2010). Roughly 11.4 ha of potential habitat are within the WEP Parkway footprint but were not identified as an impact zone [REDACTED].
4. [REDACTED] location: No additional potential habitat was identified here beyond impacted habitat identified by LGL (2011).
5. [REDACTED] location (not identified by COSEWIC 2010): There is a patch of [REDACTED] vegetation adjacent to the north side of [REDACTED] and continuous with the vegetation of [REDACTED] that is within the WEP footprint. This is not included as an impact zone for BUGA despite the fact that this species is known to exist in [REDACTED] (pers. obs. DOR on [REDACTED] Road adjacent

6. [REDACTED] (not identified by COSEWIC 2010): Two BUGA were recently found as part of targeted salvage in the parcel bound by [REDACTED] Road (south), [REDACTED] Road (east), [REDACTED] north and west) (S. Marks pers. comm. 2011). This area was not previously identified as an impact site and was not included in the final calculation of BUGA habitat to be impacted. This parcel contains [REDACTED] and [REDACTED] communities and roadside vegetation (unclassified) within the WEP footprint. Roughly 5.3 ha of potential habitat will be impacted within this parcel

