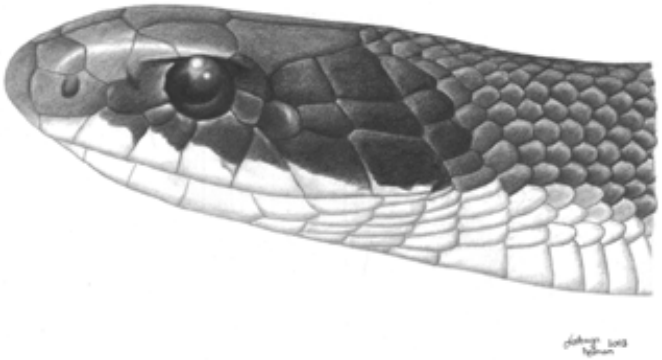
COSEWIC
Assessment and Update Status Report

on the

Blue Racer
Coluber constrictor foxii

in Canada



ENDANGERED
2002

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE IN
CANADA

COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

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COSEWIC 2002. COSEWIC assessment and update status report the blue racer *Coluber constrictor foxii*. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 17 pp.

Willson, R.J. and J.D. Rouse. 2002. Update COSEWIC status report on the blue racer *Coluber constrictor foxii* in Canada, *in* COSEWIC assessment and update status report the blue racer *Coluber constrictor foxii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-17 pp.

Previous Report:

Campbell, C.A. 1991. COSEWIC status report on the blue racer *Coluber constrictor foxii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 77 pp.

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COSEWIC
Assessment Summary

Assessment Summary – May 2002

Common name
Blue Racer

Scientific name
Coluber constrictor foxii

Status
Endangered

Reason for designation
The snake is almost certainly extirpated from mainland Ontario and blue racers are now found only in the eastern two-thirds of Pelee Island. Continued development for cottages, residences and other structures, and in increase in vehicular traffic further reduce and fragment the amount of suitable habitat remaining.

Occurrence
Ontario

Status history
Designated Endangered in April 1991. Status re-examined and confirmed in May 2002. Last assessment based on an update status report.

COSEWIC
Executive Summary

Blue Racer
Coluber constrictor foxii

Species Information

The blue racer is one of Ontario's largest snakes at 90 cm to 152 cm snout to vent length (SVL). They often have dull grey to brilliant blue lateral scales, creamy white ventral scales, and pale brown to dark grey dorsums. They also have characteristic black masks. Juveniles have dorsal blotches that fade completely by the third year; however, juvenile patterning is still visible on the venter until late in the snake's third season.

Distribution

Coluber constrictor is a wide-ranging species in North America. The blue racer subspecies, (*Coluber constrictor foxii*), however, has a distribution limited to south of the Great Lakes from Iowa east to Ohio and north to extreme southwestern Ontario. In Canada, the blue racer is found only on Pelee Island.

Habitat

This snake prefers open to semi-open habitat utilizing the island's alvar-savannas, old fields, and shorelines. Blue racers have extremely large activity ranges on Pelee Island, and this can partly be attributed to the high degree of fragmentation of habitats necessary to fulfill the snake's ecological requirements. In particular, because blue racers are egg-laying snakes, locating suitable nest sites is of extreme importance and often requires gravid females to make long-distance movements. Similarly important for the persistence of blue racers on Pelee Island are suitable hibernation sites for overwintering. These microhabitats are most often associated with upland limestone plains where weathering has produced cracks and fissures in the bedrock.

Biology

The blue racers on Pelee Island have extremely large activity ranges, which may result from their having diverse habitat requirements in an area where suitable habitat is fragmented. Reproduction can be annual; however, biennial cycles are likely more common in this population. The most common nesting microhabitat used by female blue racers on Pelee Island is fallen decaying logs. Blue racers are active foragers and

commonly prey on rodents, small birds, and snakes. Predators include raptorial birds and carnivorous mammals.

Population sizes and trends

Since the previous status designation of Endangered in 1991, intensive research has shown the Pelee Island blue racer population to be numerically larger than previously thought. At the conclusion of an intensive 3-year sampling period from 1993 to 1995, the size of Pelee Island's blue racer population was estimated *via* mark-recapture techniques to be 205 adults. However, the species is still largely restricted to the eastern two thirds of Pelee Island, and appears to have declined in numbers since the 1993-1995 study.

Limiting factors and threats

Compared with eastern fox snakes (*Elaphe gloydi*), which are found in many of the same areas on Pelee Island, the blue racer appears to be relatively intolerant of high levels of human activity. The loss of suitable nesting and hibernating sites, incidental mortality on roads, and killing of the snakes by humans remain the primary threats facing blue racers on Pelee Island.

Special significance of the species

The animal's speed and beauty make an encounter with this snake an exhilarating experience for anyone with a sincere interest in natural history. Additionally, the blue racer has become widely recognized as a characteristic faunal component of some of Pelee Island's globally rare habitats—mainly the chinquapin oak (*Quercus muehlenbergii*) and blue ash (*Fraxinus quadrangulata*) savannas growing on the island's alvars.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fish, lepidopterans, molluscs, vascular plants, lichens, and mosses.

COSEWIC MEMBERSHIP

COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership), three nonjurisdictional members and the co-chairs of the species specialist groups. The committee meets to consider status reports on candidate species.

DEFINITIONS

Species	Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora.
Extinct (X)	A species that no longer exists.
Extirpated (XT)	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A species facing imminent extirpation or extinction.
Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)**	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)***	A species for which there is insufficient scientific information to support status designation.

* Formerly described as “Vulnerable” from 1990 to 1999, or “Rare” prior to 1990.
** Formerly described as “Not In Any Category”, or “No Designation Required.”
*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list.

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Canada

The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

Update
COSEWIC Status Report

on the

Blue Racer
Coluber constrictor foxii

in Canada

Robert J. Wilson[1]
Jeremy D. Rouse[2]

2002

[1]The Wilds of Pelee Island
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Parry Sound, ON

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SPECIES INFORMATION

Name and Classification

Class: Reptilia
Order: Squamata
Suborder: Serpentes
Family: Colubridae
Subfamily: Colubrinae
Species: *Coluber constrictor* (Linnaeus, 1758) Racer
Subspecies: *C.c. foxii*; (Baird and Girard 1853) Blue Racer [Couleuvre agile]
Number of subspecies in North America - 13; Number of subspecies in Canada - 3

Description

The blue racer is one of Ontario's largest snakes, reaching lengths of 90 cm to 152 cm snout-to-vent length (SVL; Conant and Collins 1991). The largest documented specimen captured on Pelee Island was 138 cm SVL. Blue racers often have creamy white ventral scales, dull grey to brilliant blue lateral scales, and pale brown to dark grey dorsums (Porchuk 1996). They also have characteristic black masks, relatively large eyes, and often have brownish-orange rostral scales (snouts). Unlike adults, hatchlings and yearlings (first full active season) have dorsal blotches that fade completely by the third year; however, juvenile patterning is still visible on the venter until late in the snake's third season (Porchuk et al. unpubl. data).

Although there has been some controversy regarding the designation of C.c. foxii as a subspecies distinct from C.c. flaviventris (the yellow-bellied racers), most recent authorities (Harding 1997, Crother et al. 2000, Conant & Collins 1991) agree that the subspecies C.c. foxii is valid.

DISTRIBUTION

Global range

The historical distribution of the blue racer lies immediately south of the Great Lakes from southeastern Minnesota and Iowa east to Ohio and north to extreme southwestern Ontario (Figure 1). Ohio, Indiana, Illinois, Michigan, Wisconsin and Iowa are now the only states with extant populations of blue racers (Harding 1997).

Canadian range

Coluber constrictor foxii currently occurs only on Pelee Island (4091 ha) in Canada (Figure 2). Although formerly present in Pelee and Pinery Provincial Parks in extreme southwestern Ontario, the blue racer is almost certainly extirpated from these mainland sites, despite these being protected areas. The last reliable record of the blue racer in mainland Ontario was 1983 (Campbell & Perrin 1991). On Pelee Island, the species is restricted to the eastern two thirds of the island (Figure 3).

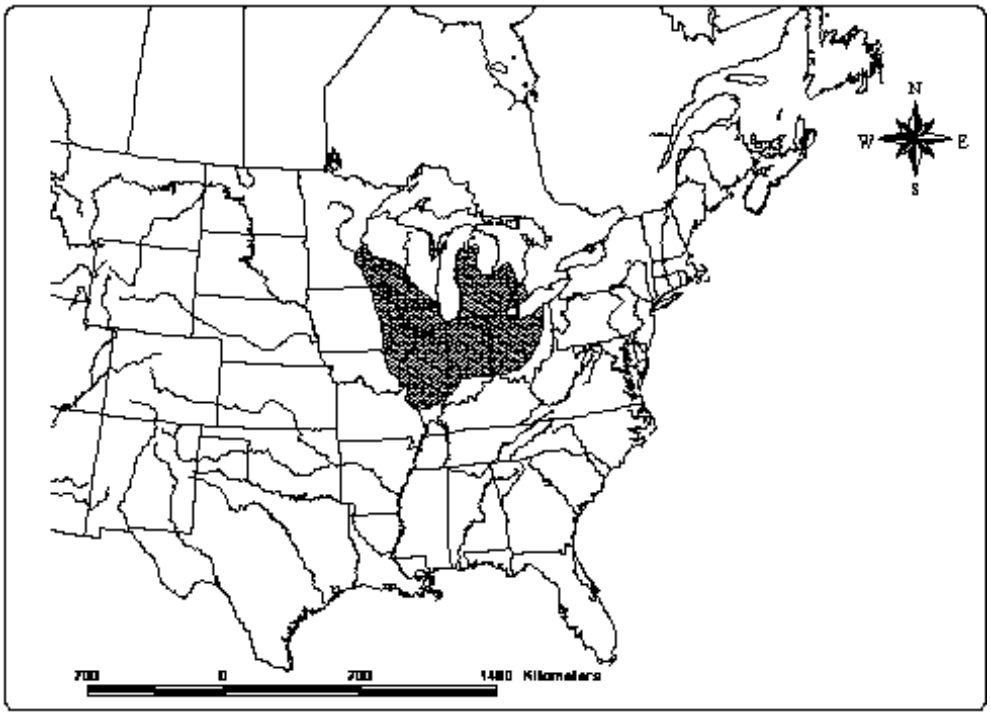

Figure 1. Historical distribution of the blue racer (*Coluber constrictor foxii*) in North America (Conant and Collins 1991 Field Guide).

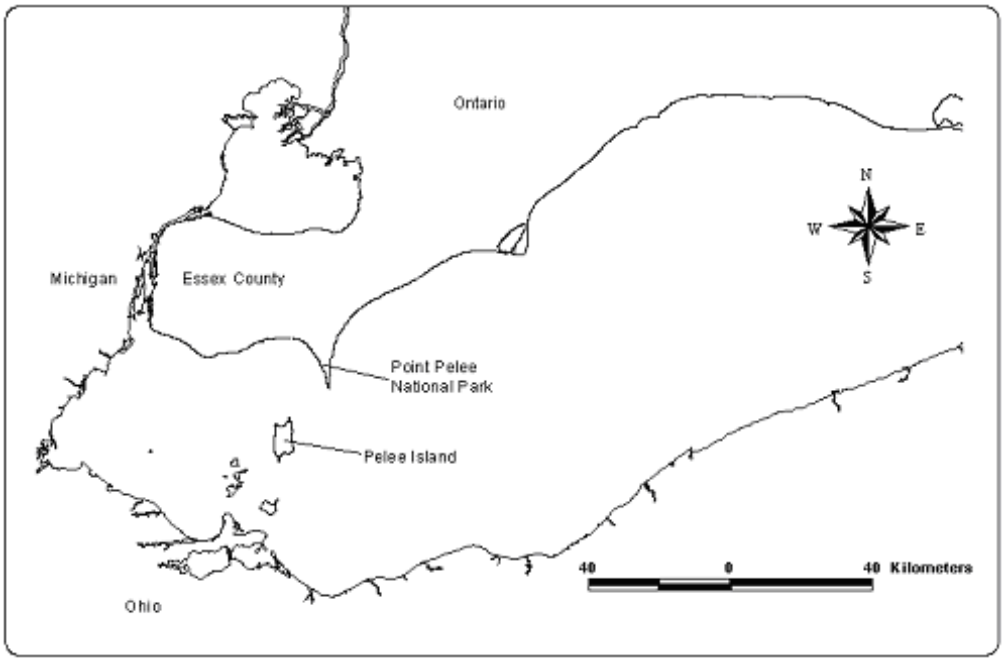

Figure 2. The Canadian distribution of *Coluber constrictor foxii* is restricted to Pelee Island (Willson and Rouse, unpubl. data).

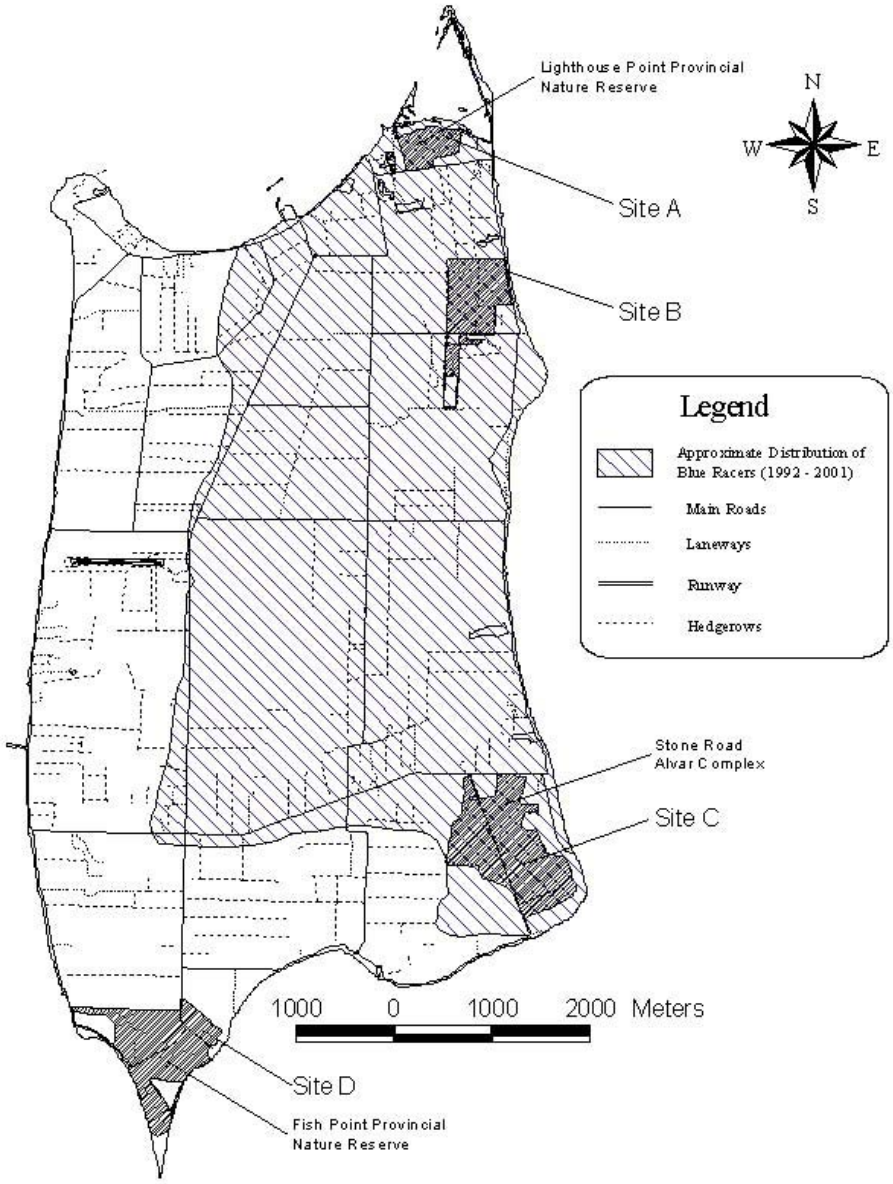

Figure 3. Location of 2000 and 2001 survey sites on Pelee Island. Sites A, B, and C correspond to study areas described by Porchuk (1996) except that they have been reduced in size for the purposes of the recent studies. Site D was added for the more recent surveys.

HABITAT

Habitat requirements

Pelee Island racers prefer open and semi-open habitat, utilizing the island's alvar-savanna, old field shoreline, and edge habitats (Porchuk 1996). Given the extremely fragmented habitat that currently exists on the island, it is likely that a mosaic of these habitats is required to fulfill the ecological needs of *C. c. foxii*. Supporting this notion are the extremely large activity ranges documented for this species on Pelee Island (see Activity Range and Movements).

Trends

Compared to other areas of southwestern Ontario, habitat alteration and/or destruction has been relatively slow on Pelee Island and has likely contributed to the blue racer's persistence there. Regardless of the reasons behind this relatively "modest" pace of development in the past, habitat destruction continues at a steady rate, and it is probable that the cumulative impact of this habitat loss is currently having a detrimental effect on the blue racer population. Fortunately, efforts have been underway to increase the quantity and quality of protected habitat on the island, *via* land acquisitions by groups such as the Nature Conservancy of Canada, and by artificial creation of microhabitats important for the snakes. Several Pelee Island landowners are particularly sympathetic to the blue racer's situation and are allowing enhancement of certain portions of their property for the species.

Protection/ownership

The blue racer has been on Ontario's Endangered Species List since 1971 (see Existing Protection or Other Status below); consequently, habitat determined to be critical to the snake's persistence is protected (from destruction or significant alteration) under Ontario's Endangered Species Act (ESA). In 1998, blue racer "habitat" on Pelee Island was spatially delineated (primarily utilizing mark-recapture and radiotelemetry data collected from 1990-1998), and formally identified for the Conservation Land Tax Incentive Program, Ontario Ministry of Natural Resources (OMNR). Subsequent to the spatial delineation (or mapping) of this habitat, the OMNR determined that these lands should be protected from destruction or human interference as is required under the ESA. The habitat protection afforded by the ESA has significant land use implications, particularly because a substantial percentage of blue racer habitat identified occurs on private lands. Unfortunately, implementing a program to effectively protect endangered species habitat on private lands has been extremely difficult.

Several areas known to harbour blue racers and the important microhabitats used by them (e.g., hibernacula) are formally protected on Pelee Island. Lighthouse Point Provincial Nature Reserve and the Stone Road Alvar Complex (owned and managed by the Federation of Ontario Naturalists, Essex Region Conservation Authority, and Nature Conservancy Canada) are the two most important protected areas for the blue racer.

Fish Point Provincial Nature Reserve does not appear to provide suitable blue racer habitat, and the last recorded observation for the Fish Point area occurred in 1971.

BIOLOGY

Activity range and movements

Compared to other *Coluber constrictor* populations studied in North America, blue racers on Pelee Island have extremely large activity ranges. Twenty-two females and 12 males had average activity range sizes of 75 ha and 140 ha respectively (Porchuk 1996). It is probable that the extremely fragmented habitat on Pelee Island partially accounts for these large activity ranges, as snakes must travel large distances during their active season to obtain necessary resources.

Reproduction

The blue racer is oviparous and average clutch size on Pelee Island for seven females was 14.7 $\pm$ 2.53 (SD; Porchuk 1996). Females can reproduce annually, but biennial cycles are likely more common. Males can mature physiologically at 11 months but do not have the opportunity to mate until their second full year; similarly, females may mature at 24 months but are not be able to reproduce until the following year (Porchuk 1996). Mating begins in April and continues throughout May. Females oviposit in late June and eggs hatch from mid-August to late-September. The most common nesting microhabitats used by female blue racers on Pelee Island are fallen decaying logs; however, eggs are also laid under large rocks, and in mounds of decaying organic matter (Porchuk and Brooks 1995, Porchuk 1996). Intra- and interspecific (with eastern fox snake) communal nest sites have been documented on Pelee Island and appear to be relatively common (Porchuk and Brooks 1995).

Hibernation

Hibernacula are often associated with areas of limestone bedrock close to the surface. Most adult snakes hibernate communally and occasionally dens are shared with eastern fox snakes, Lake Erie watersnakes (*Nerodia sipedon insularum*), and eastern gartersnakes (*Thamnophis sirtalis sirtalis*). Although intraspecific communal den sites are common, the number of snakes in each hibernaculum is lower on Pelee Island than reported for racers elsewhere (mean = 2.72 $\pm$ 3.25 [SD], Range = 1-15, N = 18; Porchuk 1996). Individuals do not usually arrive at the communal dens until their third year, and it is unknown where younger blue racers hibernate.

Food and feeding

Blue Racers are active foragers. Young snakes may consume crickets and other insects, whereas adults feed primarily on rodents, songbirds, and snakes (Porchuk 1996; Porchuk unpubl. data). Adults engage in both terrestrial and arboreal foraging. Blue racers are diurnally active.

Survival

Probable natural predators of adult blue racers on Pelee Island include the larger birds of prey (e.g., red-tailed hawk, *Buteo jamaicensis*; northern harrier, *Circus cyaneus*; great horned owl, *Bubo virginianus*) and carnivorous mammals such as raccoons (*Procyon lotor*), foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*), and coyotes (*Canis latrans*). Dogs (*Canis familiaris*) and feral house cats (*Felis catus*) are known to kill and/or harass juvenile blue racers. The eggs and young are likely vulnerable to a wider variety of avian and mammalian predators.

Behaviour/adaptability

Blue racers seem to be relatively intolerant of high levels of human activity and for most of the active season they remain in areas of low human density (Porchuk 1996). Evidence to suggest this comes largely from radiotelemetry data from both blue racers and eastern fox snakes that inhabited the same general areas on Pelee Island (although studies were not conducted concurrently). In contrast to blue racers, fox snakes were often found under front porches, in barns/garages, and in the foundations of houses; whereas, most (but not all) blue racers were observed in more "natural" settings. Therefore, blue racers are more confined to areas with minimal anthropogenic activity (R. Willson unpubl. data and report). Campbell and Perrin (1991; citing Minton 1968) also noted that racers were among the first snakes to disappear from suburban areas.

POPULATION SIZES AND TRENDS

Population Size

At the conclusion of an intensive 3-year sampling period from 1993 to 1995, the size of Pelee Island's blue racer population was estimated *via* mark-recapture techniques to be 205 adults (Porchuk 1996; as reported in the 1997 version of the status report). Population parameters estimated by both Triple-Catch and Peterson methods indicated a monotonic decline in the adult population over the 3-year period. From the conclusion of the 1995 field season to the 2000 field season, monitoring of the blue racer population *via* mark-recapture has been sporadic (see Table 1 for a summary of blue racer research on Pelee Island). Consequently, more recent population estimates are not available. It is anticipated, however, that an updated estimate will be derived from the fieldwork to be conducted in the spring of 2002. Systematic surveys along standardized transects and within defined areas were conducted from roughly 13 April to 12 May in the springs of 2000 and 2001 (see Willson 2000 for methodology used). Four areas that were historically known to harbour blue racers were rigorously searched during this period (see Figure 3 for survey areas). Since 1992, research teams working on Pelee Island have marked approximately 320 juvenile and adult blue racers (Table 2).

Table 1. Significant investigations or reports on the distribution, ecology and behaviour of blue racers on Pelee Island, 1970-2001. Field work dates are approximate and are based on data contained in documents cited.

Year(s)	Researcher(s)	Nature of Investigation (Objectives)	Methods	Field Work Dates	Notable Records or Results
1976	Campbell[a]	determine status of racer on Pelee Island	intensive searching, road cruising	2-12 May, 30 May-4 Jun, 9-13 Jun, 16-19 Jul, 24-27 Sept	4 racers captured & 5 observed; in addition to this study, Campbell had been intermittently conducting field work on Pelee Island since 1970; May 1971 - female racer found near old cistern at Fish Point (last reported racer from this location)
1978	Ecologistics LTD[b]	determine whether proposed pit sites (3 & 4) on Browns Rd are significant habitat for racers	intensive searching, & set out shelter boards (shingles)	Jun - Nov 284.25 person-hours	confirmed that racers were extremely difficult to locate during summer months as no racers were encountered
1984	Oldham[c]	document presence of racers in the Mill Pt Area	intensive searching	6 intermittent trips (21.5 days) from 5 Apr - 24 Sept	5 racers captured, 1 racer found dead on road adjacent to Mill Pt area; author also plotted 61 reliable blue racer encounters from 1969 to 1984 (shown on Figure 1; 46 records provided by C. Campbell)
1985	Oldham[d]	document presence of racers in the Mill Pt Area	intensive searching	8 - 14 May 40 person-hours	failed to find racers at Mill Pt, however, 3 individuals encountered elsewhere
1991	Campbell & Perrin[e]	recommend national status based on all available information	literature & data review	NA	Endangered status recommended; COSEWIC formally designates blue racer Endangered in Canada
1991	Kamstra[f]	formulate racer recovery plan for Ontario	literature & data review	NA	given the difficulty of locating racers via regular searching, author recommends shelter board, road survey & radiotelemetry studies
1992	Blue Racer Recovery Team	determine feasibility of radiotelemetry study	intensive searching, mark-recapture	2 May, 21 Sept, 4 Oct	2 May - 16 individuals captured indicating radiotelemetry study possible

Table 1. (cont'd)

Year(s)	Researcher(s)	Nature of Investigation (Objectives)	Methods	Field Work Dates	Notable Records or Results
1992	Kraus[g]	document road mortality, set out & monitor shelter boards	road survey & set out shelter boards	2 May - 15 July (intermittent)	2 racers found dead on the road
1993 1994 1995	Guelph Team led by Porchuk & Brooks[h]	document distribution, ecology & behaviour	intensive searching, mark-recapture, radiotelemetry, road survey	20 Apr - 16 Oct 31 March - 22 Oct 14 Apr - 27 Sept	detailed spatial, ecological, & behavioural data obtained, critical nesting & hibernating microhabitats identified
1996	Porchuk	determine effectiveness of erecting hibernacula traps & continue mark-recapture	mark-recapture, hibernacula traps	19 Apr - 30 May	individual racers show significant fidelity to hibernacula
1997 1998 1999	Guelph Team led by Willson & Brooks[i]	continue monitoring racer population at Browns Rd savanna	mark-recapture, hibernacula traps, road survey	1 Apr - 5 Jun 1 Apr - 13 Sept 1 Apr - 1 Jun	long term recapture data from individuals dating back to 1992
1999	Porchuk[j]	formulate official RENEW recovery plan	literature & data review	NA	proactive recovery actions necessary to ensure persistence of racers on Pelee Island
2000 2001	Spring Survey Team led by Willson[k]	conduct systematic survey to document population trend & size	intensive searching along standardized transects & within defined areas mark-recapture	13 Apr - 14 May 13 Apr - 12 May	systematic survey techniques can produce capture rates suitable for population estimation

[a]Campbell (1976)
[b]Ecologistics Ltd. (1979)
[c,d]Oldham (1984, 1985)
[e]Campbell and Perrin (1991)
[f]Kamstra (1991)
[g]Kraus (1992)
[h]Porchuk (1996), Brooks and Porchuk (1997)
[i]Brooks *et al.* (2000)
[j]Porchuk (1999)
[k]Willson (2000)

COSEWIC – Committee on The Status of Endangered Wildlife in Canada

RENEW – Recovery of Nationally Endangered Wildlife

Table 2. Blue racers captured, found dead on the road, or found dead away from the road by the blue racer recovery team (1992) and Guelph research team (1993-2001) on Pelee Island.

Year	Live Captures	DOR		DAR[a]	Total	New	Recaptures		Marked[b]	Date of First Capture
		Adults & Juveniles	Hatchlings				From Previous Years	From Same Year		
1992[c]	23	3	-	-	**26**	25	-	1	22	2-May
1993	74	15	10	-	**99**	78	5	16	53	20-Apr
1994	80	7	20	1	**108**	86	9	13	54	31-Mar
1995	71	9	11	4	**95**	58	32	5	40	14-Apr
1996	38	3	-	-	**41**	16	22	3	13	19-Apr
1997	55	1	-	1	**57**	38	19	-	37	6-Apr
1998	35	3	2	-	**40**	24	14	2	22	4-Apr
1999	43	3	6	1	**53**	26	24	3	17	2-Apr
2000	33 (31)	-	1 (0)	1 (1)	**35** **(32)**	28 (23)	7 (7)	-	25 (24)	13-Apr
2001	61 (60)	1 (0)	-	-	**62** **(60)**	37 (37)	24 (23)	1	37 (37)	8-Apr
Totals	513	45	50	8	**616**	416	156	44	320	

[a]Presumed causes of death included depredation by raptors, canids, lawnmowers, and hunters.
[b]In some years, not all new live captures were marked because of size restrictions imposed by the marking technique (e.g., hatchlings were not marked).
[c]One individual found DOR in the spring of 1993 was determined to have died in 1992 and therefore is included here.

Population Persistence

Recent surveys in 2000 (Willson 2000) and 2001 confirmed the presence of blue racers at the three study sites identified by Porchuk (1996). Unfortunately, recent land-use controversy has resulted in significantly less cooperation from private landowners and this has restricted examination and sampling at "traditional" hibernacula. Thus, the continued use of several den sites on the island remains unconfirmed. It is hoped that the design of the present systematic population survey (year two of three now concluded) will enable researchers to sample the same areas as the current study in future years (i.e., current survey areas are within protected lands and landowner cooperation is relatively secure – at least for the present time).

Since Porchuk (1996) determined that the blue racer distribution was restricted to the eastern two thirds of the island, evidence has continued to corroborate this finding. Two blue racers were located (one captured, one observed) by reliable sources further west than any during the 1993-1995 study; however, both were observed during mid-summer and, thus, may have been individuals dispersing far from hibernacula as Porchuk (1996) documented extremely large activity ranges for these snakes on Pelee Island. The number of road-killed blue racers located on the eastern half of Pelee Island from 1998-1999 was significantly less than the number located during an earlier sampling period from 1993-1995 (Willson et al. in preparation). The decrease in the number of blue racers killed on the roads by motorized vehicles may be indicative of a decline in the blue racer population, or may be a result of more drivers avoiding snakes on the road. During the same sampling periods, however, the number of eastern fox snakes found as roadkills remained constant (Willson et al. in preparation); suggesting that drivers had not modified their driving habits but that, instead, fewer blue racers were on the roads to be killed.

LIMITING FACTORS AND THREATS

The loss of suitable nesting and hibernating sites, incidental mortality on roads, and killing of the snakes by humans remain the primary threats facing blue racers on Pelee Island. Despite the precarious state of the blue racer in Canada, the identification of critical habitat *via* intensive field effort, and the legislated protection of that habitat under Ontario's Endangered Species Act (ESA), individuals and organizations are currently proposing developments that must be considered detrimental to the species' persistence on Pelee Island. Continued loss of nesting habitat *via* cottage construction along the eastern shoreline is probably one of the most significant threats, as little habitat will remain once all of the private lots have been developed (many have already been marked off and are awaiting construction). Evidence suggests that vehicular traffic will continue to increase on the island in conjunction with the growing tourist industry; thus, increased impacts of road mortality seem inevitable. Finally, recent events on Pelee Island (1998-2001) have resulted in significant levels of animosity between those studying the island's rare snakes and those wishing to further the island's economy through more intensive and destructive land uses.

SPECIAL SIGNIFICANCE OF THE SPECIES

The blue racer has already disappeared from the Ontario mainland and maintains a tenuous hold on Pelee Island. The animal's speed and beauty make an encounter with this snake an exhilarating experience for anyone with a sincere interest in natural history. Additionally, the blue racer has become widely recognized as a characteristic faunal component of some of Pelee Island's globally rare habitats—mainly the chinquapin oak (*Quercus muehlenbergii*) and blue ash (*Fraxinus quadrangulata*) savannas growing on the island's alvars. These habitats, and the flora and fauna found therein, are valuable in and of themselves. Finally, the blue racer's provincial Endangered status designation, concomitant with the legislated protection of habitat determined to be critical to the snake's persistence (under regulations of Ontario's ESA), undoubtedly contributes to the protection of several of Pelee Island's rare species and habitats (*via* an "umbrella effect").

EXISTING PROTECTION OR OTHER STATUS

Coluber constrictor foxii and its habitat are protected under regulations of Ontario's ESA (the taxon was designated **Endangered** by the province in 1971) and the blue racer is also a “specially protected reptile" under the Fish and Wildlife Conservation Act (January 1999), the latter act making it illegal to harass, possess (without a permit), or kill the species. The blue racer was designated **Endangered** by COSEWIC in 1991. Using the Nature Conservancy's system the blue racer is ranked G5T5 globally (1996-10-31) and S1 provincially (1999-10-31).

SUMMARY OF STATUS REPORT

Coluber constrictor foxii’s **Endangered** status designation (last reviewed by COSEWIC in 1991) should be retained. At least four factors warrant a continuation of the **Endangered** status for the blue racer in Canada. First, the snake is almost certainly extirpated from the Canadian mainland, as Pelee Island remains the only Canadian locality where the snake can be found. Second, blue racers were once more widespread on Pelee Island than they are currently. They were formerly found in both the extreme southern and western parts of the island. Third, vehicular traffic will continue to increase on Pelee Island’s roads leading to higher levels of road mortality. Finally, continued development for cottages, residential lots, etc., will further reduce the amount of suitable habitat remaining. In the absence of proactive recovery actions to ensure sufficient habitat remains relatively intact (minor disturbance is tolerable and occasionally beneficial), it is doubtful that blue racers will persist in Canada.

TECHNICAL SUMMARY

Coluber constrictor foxii
Blue Racer Couleuvre agile bleue
Ontario

Extent and Area Information	
• *extent of occurrence (EO)(km²)*	40.91 (Pelee Island entire)
• *specify trend (decline, stable, increasing, unknown)*	Stable
• *are there extreme fluctuations in EO (> 1 order of magnitude)?*	No
• *area of occupancy (AO) (km²)*	23.60 (see Figure 3)
• *specify trend (decline, stable, increasing, unknown)*	Stable
• *are there extreme fluctuations in AO (> 1 order magnitude)?*	No
• *number of extant locations*	1
• *specify trend in # locations (decline, stable, increasing, unknown)*	Stable
• *are there extreme fluctuations in # locations (> 1 order of magnitude)?*	No
• *habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat*	Extent of habitat is declining and increasing simultaneously (via restorative efforts). Net trend is unknown. Quality of habitat increasing.
Population information	
• *generation time (average age of parents in the population) (indicate years, months, days, etc.)*	7 yrs.
• *number of mature individuals (capable of reproduction) in the Canadian population (or, specify a range of plausible values)*	200-300
• *total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals*	Evidence suggests decline between 1993 and 2000
• *if decline, % decline over the last/next 10 years or 3 generations, whichever is greater (or specify if for shorter time period)*	Unknown
• *are there extreme fluctuations in number of mature individuals (> 1 order of magnitude)?*	No
• *is the total population severely fragmented (most individuals found within small and relatively isolated (geographically or otherwise) populations between which there is little exchange, i.e., ≤ 1 successful migrant / year)?*	No
• *list each population and the number of mature individuals in each*	NA
• *specify trend in number of populations (decline, stable, increasing, unknown)*	NA
• *are there extreme fluctuations in number of populations (>1 order of magnitude)?*	NA
Threats	
- increased levels of road mortality	
- loss of nesting habitat due to cottage construction along shorelines	
- aggregate extraction on limestone plains identified as blue racer habitat	
- intentional destruction of communal hibernacula	

Rescue Effect (immigration from an outside source)	
• *does species exist elsewhere (in Canada or outside)?*	Populations exist in 5 American states
• *status of the outside population(s)?*	Some declining while others are Not at Risk
• *is immigration known or possible?*	No
• *would immigrants be adapted to survive here?*	NA
• *is there sufficient habitat for immigrants here?*	NA
Quantitative Analysis	

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