

COSSARO Candidate Species at Risk Evaluation
for
Riverine Clubtail (*Stylurus amnicola*)

Committee on the Status of Species at Risk in Ontario (COSSARO)

Assessed by COSSARO as ENDANGERED

January 1, 2013

Final

Gomphe riverain (*Stylurus amincola*)

Le gomphe riverain est une petite libellule dont le classement mondial est G4 (apparemment non en péril), mais son occurrence est rare dans la majorité de son aire de répartition en Amérique du Nord. L'espèce a été découverte en Ontario en 1999 et il s'agit probablement d'une espèce indigène passée inaperçue en raison de sa petite taille et de son comportement discret. Le gomphe riverain vit dans les ruisseaux et des petites à grandes rivières ayant des substrats sablonneux ou graveleux, et à proximité de ceux-ci. Les adultes recherchent leurs petites proies dans la végétation riveraine comme les herbes, les carex et les arbres, desquels ils pendent de façon verticale, ce qui les rend difficiles à apercevoir. Les larves se nourrissent de petits animaux dans les cours d'eau. En Ontario, on a repéré l'espèce de façon répétée dans deux cours d'eau se déversant dans le lac Érié, près de la pointe Long et nulle autre part ailleurs en dépit de recherches exhaustives dans le sud-ouest de l'Ontario. Il n'existe aucune donnée sur la taille de la population ni sur ses tendances. Le prélèvement d'eau pour l'irrigation et les barrages qui pourraient changer le débit d'eau sont considérés comme des menaces potentielles dans ces deux cours d'eau. Principalement en raison de sa rareté en Ontario et dans les territoires adjacents dans le nord-est de l'Amérique du Nord, le gomphe riverain est désigné comme étant **en voie de disparition** en Ontario.

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PART 1

CURRENT STATUS AND DISTRIBUTION

Current Designations:

GRANK–G4 (Assessed 16/08/2004) (NatureServe, accessed 18/12/2012)

NRANK Canada –N3 (Assessed 15/01/2012) (NatureServe, accessed 18/12/2012)

COSEWIC– Endangered (COSEWIC, 2012)

SARA – Not Listed

ESA 2007 – Not Listed (Ministry of Natural Resources, 2012)

SRANK –S1 (NHIC assessed in 2000) (NatureServe, accessed 19/12/2012)

Known Distribution in Ontario:

All Ontario records of the Riverine Clubtail are from two streams that run approximately parallel to each other and empty into Lake Erie near Long Point in southwestern Ontario - Big Creek and Big Otter Creek.

Using the NHIC`s Element Occurrences (EOs), COSEWIC (2012) estimated the extent of occurrence of the Riverine Clubtail to be 327 km². This is most likely an overestimate of the true area occupied by the species in Ontario because the two streams are more than 20 km apart at their closest point and there are no records of the species occurring anywhere between the two streams. Targeted surveys of nearby streams have failed to find additional locations (COSEWIC 2012). There have also been surveys for dragonflies outside this zone, such as along the Nottawasaga, Saugeen, Thames, and Grand rivers in southern Ontario, the Goulais and Mississagi rivers in the vicinity of Sudbury, and many others across the province. Because the Riverine Clubtail occurs in Minnesota, a targeted survey for the species was also conducted along the Rainy River in northwestern Ontario at nine sites in 2010 and two sites in 2011 with no observations of the species noted. In all, the NHIC database includes more than 60,000 records of Odonates of all species combined for Ontario, but only 27 records exist for the Riverine Clubtail (COSEWIC 2012).

Distribution and Status Outside Ontario:

The Riverine Clubtail occurs only in North America where it is considered to be globally `apparently secure` and `uncommon but not rare` (G4; NatureServe web site 2013). Its range extends from southern Quebec, west to southeastern Manitoba and Nebraska, and south to Louisiana and Georgia.

PART 2

ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness

Yes. The species is distinct and there are no subspecies (COSEWIC 2012).

Designatable Units

One DU in Ontario. There are three DUs in Canada: (1) the Ottawa River and St. Lawrence River valleys of Quebec; (2) Central north shore of Lake Erie in Ontario and (3) southeastern Manitoba. The three Canadian regions of occupancy were designated separate DUs because the distributions are discrete and they are in different eco-geographic regions. Ontario contains only the central north shore of Lake Erie DU (#2 above) (COSEWIC 2012).

Native Status

Yes. The Riverine Clubtail was first discovered in southwestern Ontario in 1999 (Catling *et al.* 1999; COSEWIC 2012), but since then 27 records have accumulated from two locations - along Big Otter Creek and Big Creek just north of the shores of Lake Erie. For a variety of reasons, it is reasonable to believe the species was present as a native species in Ontario long before its first discovery, and that it escaped detection until 1999. Dragonflies can be very difficult to identify and this species is relatively small (47-49 mm total length, the smallest member of its genus; Jones *et al.* 2008). The species is reported to spend much of its time foraging in the forest canopy (COSEWIC 2012) and perching on the top surfaces of leaves in the canopy (MDFW 2008) where it would be relatively difficult to spot. Also, throughout its range, the Riverine Clubtail is very sparsely and locally distributed (Appendix 1), being found in only one or two counties in some of the states in which it occurs. The nearest known location to the Big Creek and Big Otter Creek occurrences outside Ontario is estimated to be 300 km away in northwestern Ohio (COSEWIC 2012). As adult Riverine Clubtails have been found from 1999 through to 2012 in Ontario, the species' status as a permanent resident in two reproducing populations has been confirmed.

Presence/Absence

Present. COSEWIC (2012) noted 27 occurrences in Ontario since 1999, including six occurrences in 2012.

2.2 ELIGIBILITY RESULTS

1. The putative taxon or DU is valid. **Yes.** The Riverine Clubtail (*Stylurus amnicola*) was originally classified as *Gomphus amnicola* (in 1862), then *Gomphus abditus* (in 1914), but the genus *Stylurus* was recognized as a full genus in 1932 and again in 1986

(COSEWIC 2012). According to COSEWIC, the three DUs identified in Canada are `disjunct from each other by hundreds of kilometres and occur in three different ecological areas`. The nearest known location for the species outside Ontario is estimated to be 300 km away in northwestern Ohio (COSEWIC 2012). There are no known subspecies of the Riverine Clubtail in Ontario.

2. The taxon or DU is native to Ontario. **Yes.**

3. The taxon or DU is present in Ontario, extirpated from Ontario or extinct? **Present.**

PART 3

ONTARIO STATUS BASED ON COSSARO EVALUATION CRITERIA

3.1 APPLICATION OF PRIMARY CRITERIA (Rarity and Declines)

1. Global Rank

Not in Any category. G4 (apparently secure; uncommon but not rare; NatureServe December 2012) <http://www.natureserve.org/explorer/>

2. Global Decline

Insufficient information– see the detailed discussion below under Northeastern North America Decline.

3. Northeastern North America Ranks

Endangered - The Riverine Clubtail is listed as a native species in 19 of 29 (66%) of the jurisdictions in northeastern North America and an S-Rank is available for 17 (90%) of the jurisdictions (Appendix 1).

The species is listed as S1, S2, SH, or SX in 13 of 17 jurisdictions (77%; Appendix 1), qualifying it for endangered status under this criterion.

4. Northeastern North America Decline

Insufficient information. Appendix 1 lists the provinces and states of northeastern North America and the status of the Riverine Clubtail in those jurisdictions, with some information on range changes.

There is little information on population trends for the Riverine Clubtail in northeastern North America. The species was only recently discovered in Manitoba (2004) and Ontario (1999). Although it was first found in Quebec in 1928, there were no subsequent reports until 1995 (COSEWIC 2012). Population estimates for dragonflies are difficult to make, and surveys for the Riverine Clubtail have been too infrequent and incomplete to establish population trends. The focus has been on collecting presence/absence information.

COSEWIC (2012) data show that the Riverine Clubtail has persisted at all of the sites in Canada where it was observed, including the site in Quebec that was first documented in 1928. Information on the list of counties where the species was recorded in the USA does not suggest major declines, except for two states from which the species has been extirpated (NY and PA, Appendix 1), but this is not enough information on which to base a judgement about changes in range.

5. Ontario Occurrences

Endangered MNR's NHIC database for Ontario (accessed Dec. 19, 2012) includes 27 records of the Riverine Clubtail organized into five element occurrences. COSEWIC (2012) considers these to consist of two "locations" (Big Creek and Big Otter Creek). Since there are five occurrences (and only two locations), the Riverine Clubtail qualifies for endangered status under this criterion.

It seems unlikely that major occurrences of the Riverine Clubtail could have been overlooked in southern Ontario up to this time. Dragonflies have become of increasing interest to naturalists and others and COSEWIC (2012, pages 25-26) notes that the Ontario Odonate Atlas contains over 60,000 records that encompass "all potentially suitable [for the Riverine Clubtail] rivers in southwestern Ontario and many in southern Ontario". Also major rivers draining into Lake Huron have been "visited by experienced Odonatists on more than 50 occasions over the past decade without any good evidence of the Riverine Clubtail" (COSEWIC 2012, p. 26).

6. Ontario Decline

Insufficient information—There have been targeted surveys for the Riverine Clubtail, which was recently (1999) discovered in Ontario, but the surveys have focused on confirming presence and absence, rather than estimating population size. There is too little information available on the species abundance to evaluate it under this criterion.

7. Ontario's Conservation Responsibility

Not in any category —The extent of occurrence of the Riverine Clubtail is estimated by COSEWIC (2012) to be 327 km² in Ontario. This is most likely an overestimate of the area occupied by the species in Ontario because of the large unoccupied area between the two rivers where the species is known to occur. (COSEWIC 2012). Comparing this to the range maps provided by COSEWIC (2012), Ontario would therefore account for much less than 10% of the species global geographic range. For this reason, the Riverine Clubtail would qualify as `not in any category` under this criterion.

3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)

8. Population Sustainability

Insufficient information— COSEWIC (2012, Tables 2 and 4) summarized all observations of the Riverine Clubtail in Ontario, and the total counts of individuals that had been made. Individual Riverine Clubtail had been observed three times on Big Creek (maximum five individual dragonflies at once) and six times on Big Otter Creek (maximum nine individuals at once). Adults had been observed each time, suggesting that reproductive failure has not occurred, and numbers do not appear to show a declining trend. However, there are too few observations on which to reach conclusions about population sustainability.

9. Lack of Regulatory Protection for Exploited Wild Populations

Not in any category —The species was assessed by COSEWIC as `endangered` in the Great Lakes Plains DU in November, 2012. At the time of COSSARO's review, it was

not listed in the schedules of the federal Species at Risk Act (SARA). The Riverine Clubtail is not protected under Ontario's ESA, and it is not protected under the provincial Fish and Wildlife Conservation Act. However, since the Riverine Clubtail is not known to be exploited in Ontario it qualifies as "not in any category" under this criterion.

10. Direct Threats

Special Concern– COSEWIC (2012) provides a list of potential threats to survival of the Riverine Clubtail in Ontario and beyond. There is no direct evidence of impacts on the Riverine Clubtail in Ontario. Potential threats listed by COSEWIC include: (i) invasive species such as the Round Goby (*Neogobius melanostomus*) that have been introduced into the waterways occupied by the Riverine Clubtail in Ontario and could feed on young dragonflies, (ii) water pollution from nearby agriculture and withdrawal of water for irrigation that could threaten the supply or quality of the water on which the Riverine Clubtail depends, and (iii) dams that could influence water supply or water flow. COSEWIC (2012) notes that the Riverine Clubtail can tolerate turbid water with elevated concentrations of nitrogen and phosphorous elsewhere in its range (e.g., the Red and Assiniboine Rivers in Manitoba). However, the potential threats to the species in the two streams it inhabits are considered significant enough to warrant a classification of "special concern" under this criterion.

11. Specialized Life History or Habitat-use Characteristics

Not in any category - Habitat of the Riverine Clubtail includes medium to large rivers (as large as the St. Lawrence River) with sandy, gravelly, or muddy bottoms (Jones *et al.* 2008), as well as small creeks (COSEWIC 2012). Dunkle (2000) stated that a rapid current is also a habitat feature, but rapids are absent in Big Creek and Big Otter Creek.

The Riverine Clubtail is a member of the group of 'hanging clubtails' which hang from vegetation with their tails pointing downward (Dunkle 2000). The species is thought to exist in the sediments of waterways as a larva or nymph for two years where it is a 'voracious predator' (COSEWIC 2012) that feeds on a variety of small aquatic animals (NHESP 2008). Adults forage among grasses and sedges as well as among adjacent trees near the water (Dunkle 2000, COSEWIC 2012, NHESP 2008).

There is no evidence of extremely narrow biological or ecological tolerances, and therefore the species qualifies as 'not in any category' under this criterion.

3.3 COSSARO EVALUATION RESULTS

Criteria satisfied in each status category

ENDANGERED – [2/0]
THREATENED – [0/0]
SPECIAL CONCERN – [0/1]

List the Number of Ontario-specific criteria met in each status category: (These are primary criteria numbers 5, 6 and 7.)

ENDANGERED – [1]
THREATENED – [0]
SPECIAL CONCERN – [0]

2. Data Deficiency

No. The number of criteria assessed as “insufficient information” is four (out of 11 criteria). There was sufficient information to assign a status to the species for 7 of 11 COSSARO criteria. “Not in Any Category” was assigned to four criteria because the species is G4 (globally apparently secure; uncommon but not rare), Ontario accounts for <10% of the species global geographic range, the species is not known to be exploited despite a lack of current regulatory protection, and it does not appear to have life history or habitat use characteristics that could be described as “extremely narrow biological or ecological tolerances”. Because of the difficulty in estimating population size for the species and the fact that surveys have therefore focused on establishing presence or absence, there were insufficient data on population sizes and trends to reach conclusions for criteria that focus on degree of decline (global decline, northeastern North American decline, Ontario decline) or population sustainability. There was also insufficient information on the species reaction (positive or negative) to potential “threats” for a conclusion to be reached.

However, COSSARO's evaluation criteria indicate that only two primary endangered criteria, including one for Ontario, need to be assigned for the species to merit endangered status. This has been met in the criteria for northeastern North American ranks and Ontario occurrences. “Endangered” status was assigned to two criteria that reflect its local rarity (northeastern North American ranks, and Ontario occurrences). Thus, the fact that the species tends to be rare in Ontario and elsewhere in the northeast suggests it should be classified as endangered, despite having a G4 status overall.

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that the **Riverine Clubtail** is **Endangered** in Ontario.

PART 4

ONTARIO STATUS BASED ON COSEWIC EVALUATION CRITERIA

4.1 APPLICATION OF COSEWIC CRITERIA

Regional (Ontario) COSEWIC Criteria Assessment

Criterion A – Decline in Total Number of Mature Individuals

Insufficient information – As explained above, there are too few observations of too few individuals to enable population trends to be estimated for the Riverine Clubtail in Ontario. COSEWIC (2012) hypothesized that there may be a population decline in the future based on potential threats, and assigned "endangered" status to the Riverine Clubtail under this criterion for that reason. However without estimates of past or current population size and no quantitative information on the direct effects of potential threats on the Riverine Clubtail, an outcome of "insufficient information" is warranted under this category.

Criterion B – Small Distribution Range and Decline or Fluctuation

Endangered (B1, a, ii) - COSEWIC (2012) estimated the extent of occurrence of the Riverine Clubtail DU in Ontario to be 327-333 km². This is well below the threshold of 5,000 km² necessary for endangered status. The species is also known to exist at less than five locations and the COSEWIC (2012) assessment projected a decline in habitat quality for a variety of reasons. Therefore, the species meets COSEWIC criteria B1, a, and iii under this criterion, qualifying for endangered status.

Criterion C – Small and Declining Number of Mature Individuals

Insufficient Information – The total number of mature individuals has not been estimated, nor has population trend.

Criterion D – Very Small or Restricted Total Population

Threatened- The species is known to occupy only two streams in southern Ontario, which represent two locations. This meets the COSEWIC threshold of less than or equal to five locations for the species and qualifies it for threatened status under this criterion.

Criterion E – Quantitative Analysis

Insufficient information. No quantitative analysis has been performed.

Rescue Effect

No. According to COSEWIC (2012), more than 300 km separates the Ontario population of Riverine Clubtail from the nearest known population in the U.S. The species is considered to be non-migratory (COSEWIC 2012), suggesting that a rescue effect from populations outside Ontario would be unlikely.

Special Concern Status

No. As the species meets endangered or threatened status for at least one COSEWIC criterion, an evaluation for special concern status is not required.

4.2 COSEWIC EVALUATION RESULTS

1. Criteria satisfied in each status category

ENDANGERED – [yes]
THREATENED – [yes]
SPECIAL CONCERN – [no]

2. Data Deficiency

No. There were sufficient data to assess three criteria.

3. Status Based on COSEWIC Evaluation Criteria

The application of COSEWIC evaluation criteria suggests that the **Riverine Clubtail** is **Endangered** in Ontario.

PART 5

ONTARIO STATUS DETERMINATION

5.1 APPLICATION OF COSSARO AND COSEWIC CRITERIA

COSSARO and COSEWIC criteria give the same result. **Yes**

5.2 SUMMARY OF STATUS EVALUATION

The Riverine Clubtail is classified as **Endangered** in Ontario.

The Riverine Clubtail is a small dragonfly that is ranked as globally apparently secure (G4) but is uncommon throughout much of its range in eastern North America. It was first discovered in Ontario in 1999 and was most likely a native species that had been overlooked owing to its small size and inconspicuous behaviour. It is found in and near streams and small to large rivers with sandy or gravelly substrates. Adults forage for small prey in streamside vegetation such as grasses, sedges, and trees where they hang vertically, making them difficult for observers to detect. Larvae prey on small animals in streams. In Ontario, the species has been found repeatedly at two streams (Big Creek and Big Otter Creek) emptying into Lake Erie near Long Point, and nowhere else despite considerable search effort in southwestern Ontario. There is no information on population size or trends. Water drawdown for irrigation and dams that could change water flow are considered potential threats in these two streams. Owing primarily to its rarity in Ontario and in adjacent jurisdictions in northeastern North America, the Riverine Clubtail is designated as endangered in Ontario.

Information Sources

1. Literature Cited

COSEWIC. 2012. COSEWIC status report on Riverine Clubtail *Stylurus amnicola* in Canada. Committee on the Status of Endangered Wildlife in Canada.

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2. Community and Aboriginal Traditional Knowledge Sources

There was no community or aboriginal traditional knowledge available on this inconspicuous species.

3. Acknowledgements

Provide any additional acknowledgements as appropriate.

APPENDIX 1
NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE for *Stylurus*
annicola

	Subnational Rank *	Sources	Decline <i>Give percent decline in abundance or areal extent in each jurisdiction or indicate that there has been an unquantified but generally recognized population decline/range contraction by writing "Yes, unquantified."</i> NLN = no loss noted	Sources
CT	S2	NatureServe		
DE	---NP---	NatureServe		
IL	S2	NatureServe	Present in 7 counties; no loss noted (NLN)	Odonata of Illinois
IN	S1S2	NatureServe	Present in 3 counties (NLN)	NatureServe
IA	S3	NatureServe		
LB	---NP---	NatureServe		
KY	S2	NatureServe		Odonata of Kentucky
MA	S2	NatureServe	Present in 10 counties (NLN). Recently downlisted from S1 (COSEWIC 2012)	Mass. Division of Fisheries & Wildlife web site
MB	---SNR---	NatureServe	Known from the Red River at Winnipeg and west along the Assiniboine River to Portage La Prairie	COSEWIC 2012
MD	SH	NatureServe		
ME	---NP---	NatureServe		
MI	S1S2	NatureServe	Present in 3 counties (NLN)	NatureServe
MN	---SNR---	NatureServe	Widespread across the state but apparently not common anywhere	COSEWIC 2012
NB	---NP---	NatureServe		
NF	---NP---	NatureServe		
NH	S3	NatureServe		
NJ	---NP---	NatureServe		
NS	---NP---	NatureServe		
NY	SH	NatureServe	100% - Was present in 2 counties (NLN)	
OH	S2	NatureServe	Present in 3 counties (NLN)	Odonata of Ohio
ON	S1	NHIC web site		
PA	SX	NatureServe	100% - Was present in 2 counties (NLN)	NatureServe
PE	---NP---	NatureServe		
QC	S3	NatureServe		
RI	---NP---	NatureServe		
VA	S1	NatureServe	Present in 2 counties (NLN)	NatureServe

VT	S1	NatureServe		
WI	S3S4	NatureServe	Present in 1 county (NLN)	Odonata of Wisconsin
WV	---NP---	NatureServe		

**SH=historical, SX=extirpated, SNR=species not ranked, NP=not present*

Occurs as a native species in 19 of 29 northeastern jurisdictions

Srank or equivalent information available for 17 of 19 jurisdictions = (90%)

S1, S2, SH, or SX in 13 of 17 = (77%)