COSSARO Candidate Species at Risk Evaluation

for

Bank Swallow (*Riparia riparia*)

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

Assessed by COSSARO as Threatened

June 2013

Final

Hirondelle de rivage *(Riparia riparia)*

L'hirondelle de rivage est un petit oiseau insectivore dont la répartition est mondiale qui niche en colonies dans des terriers de nidification dans des talus verticaux de limon et de sable. Il existe une seule unité désignable en Ontario. L'hirondelle des sables niche dans une variété de talus verticaux naturels et de création humaine, qui s'érodent souvent et se transforment avec le temps; beaucoup de nids se trouvent dans des puits d'agrégats exploités ou fermés. L'espèce est bien répartie dans le sud de l'Ontario et a une répartition large, mais éparpillée dans le nord de l'Ontario. Les colonies les plus nombreuses et naturelles de l'Ontario se trouvent le long des rives du lac Érié et du lac Ontario, et des rivières Saugeen et Albany (la dernière étant située dans une région très éloignée du nord-ouest de l'Ontario, près de la baie d'Hudson). Bien qu'elle soit toujours répandue en Ontario, l'espèce a décliné en abondance et en répartition. Les données de l'Atlas révèlent un déclin de 45 % de la probabilité d'observation dans l'ensemble de la province et le centre de la répartition de l'espèce s'est déplacé vers le sud au cours des deux dernières décennies. Des données du bureau de Relevé des oiseaux nicheurs provincial indiquent que les nombres de l'espèce ont baissé de 40 % au cours de la dernière décennie et de 96 % au cours d'une période de 45 ans. On pense que les effets des menaces sont cumulatifs, dont la perte d'habitat de reproduction et d'alimentation, la destruction lors du prélèvement d'agrégats, la collision avec les véhicules, l'utilisation généralisée de pesticides ayant des répercussions sur l'abondance des proies et l'impact du changement climatique. Les activités de l'exploitation d'agrégats et d'autres activités humaines ont créé beaucoup d'habitats de nidification avec le temps, mais elles ont aussi le potentiel de détruire beaucoup de nids et d'aires de reproduction. Le déclin important de la population et de la répartition de l'espèce, jumelés à des menaces continues et mal comprises, font en sorte qu'elle est désignée en tant qu'espèce **menacée**.

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PART 1

CURRENT STATUS AND DISTRIBUTION

Current Designations:

GRANK – **G5** Last reviewed May 20 2009 (NatureServe 2013).
NRANK Canada – N5B. Last reviewed Sept. 9 2011 (NatureServe 2013).
COSEWIC – **Threatened** (April 2013)(COSEWIC, 2013a)
SARA – **No Schedule, No Status.** (Not on Schedule 1) (Environment Canada, 2013)
ESA 2007 – **Not Assessed**. Not listed on the provincial SARO List (Ontario Ministry of Natural Resources, 2013)
SRANK – **S4B** (NatureServe, 2013)

Distribution in Ontario:

In Ontario, the Bank Swallow is associated primarily with the lower Great Lakes, being more sparsely distributed across the Canadian Shield and Hudson Bay Lowlands usually in association with larger rivers (Sandilands 2007, COSEWIC 2013b). The Bank Swallow is distributed almost continuously across southern Ontario south of the Canadian Shield (Sandilands 2007). From the Canadian Shield northward It is more patchily distributed, although it is distributed across the province with scattered records in northeastern Ontario, the Hudson Bay Lowlands, the Lake of the Woods area and the Thunder Bay area (Sandilands 2007). Largest concentrations of Bank Swallow in Ontario (and Canada) occur along the north shore of Lake Erie (Sandilands 2007, COSEWIC 2013b), the north shore of Lake Ontario, and the Saugeen and Albany rivers (the latter in far northwestern Ontario near Hudson Bay) (Sandilands 2007).

Distribution and Status Outside Ontario:

The Bank Swallow has an extensive global distribution, occurring on every continent except Antarctica and Australia. In North America, it occurs across most of Canada and Alaska south of the tree-line, and the northern two-thirds of the United States (COSEWIC 2013b). North American populations winter primarily in South America.

PART 2

ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness
Yes. Bank Swallow is clearly recognized as a valid taxon. The only subspecies to regularly occur in Canada is *R. r. riparia,* which is the same subspecies that occurs across much of Europe, Asia and Africa (COSEWC 2013b). In Europe and Africa, it is known as the Sand Martin.

Designatable Units
In Canada, only one subspecies of Bank Swallow occurs and there are no data suggesting there are distinctions that warrant assessment below the species level (COSEWIC 2013b). This report therefore deals with a single Designatable Unit, *R. r. riparia*.

Native Status
Yes. Bank Swallow is clearly recognized as a native species, although its distribution may have initially increased after European settlement (COSEWIC 2013b).

Presence/Absence
Present. Currently occurs in Ontario.

2.2 ELIGIBILITY RESULTS

1. The putative taxon or DU is valid. **Yes**

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. Ranked G5 globally (NatureServe 2013).

2. Global Decline
Not in any category. BBS data indicate a 56% decline in North America between 1966 and 2011, although the trend appears relatively stable after the mid-1980s (NatureServe 2013). Recent declines have been noted in Europe (Turner and Rose 1989, cited in NatureServe 2013). NatureServe (2013) noted that "this species does not appear to warrant significant range-wide conservation concern at this time". Although the global population is believed to be declining, Bank Swallow has been designated Least Concern on the IUCN Red List because of its extremely large range, large population and a population decline that "is not believed to be sufficiently rapid to approach the thresholds for Vulnerable under the population trend criterion" (IUCN 2012). .

3. Northeastern North America Ranks
Not in any category. Occurs in all 29 jurisdictions, ranked in 28 of those, and S1, S2, SH or SX in only one (3.6%) of those jurisdictions. It appears that local jurisdictional ranks are not current and do not recognize recent trends in populations. Some jurisdictions have recorded 40-year declines >99% (Appendix 1), but still have the species ranked as S3.

4. Northeastern North America Decline
Endangered. Of 26 northeastern North American jurisdictions where BBS data are available, 25 (96%) of them showed a population decline and declines were significant in 12 (46%) of these (Appendix 1). This category thus meets both criteria for endangered status - noncyclical decline in ≥ 50% of Northeastern North American range (abundance or aerial extent) and an unquantified (in this case it is quantified) but generally recognized drastic population decline/range contraction.

5. Ontario Occurrences
Not in any category. Bank Swallow has only recently been tracked by NHIC, and there are no Element Occurrence data available currently (Mike Oldham, pers. comm. 2013). It is presumed that the potential number of EOs exceeds existing thresholds in this category, given that the species is distributed across the province.

Currently there are no EO's in Biotics, however data are being extracted from BSC

Nature Counts (Point Count and Rare/Colonial Waterbird data). eBird data are also being extracted but many records are likely not of conservation value (i.e. no burrow or colony data). The NHIC is also attempting to obtain data for the Saugeen River and Lake Erie bluffs surveys (Mike Oldham and Don Sutherland, pers. comm. 2013).

6. Ontario Decline

Endangered. Breeding Bird Survey (BBS) data indicate that Bank Swallow populations in Ontario have declined significantly from 1966 to 2011, with an annual rate of change of -6.9% per year (Sauer *et al.* 2013), equating to a long-term decline of 96.0%. Although the negative decline is continuing in recent decades, the mean annual rate of population decline appears to have slowed across Canada; in Ontario the annual rate of change for the period 2001 to 2011 was -4.99% (COSEWIC 2013b), for an overall Ontario 10-year decline of 40.1%. Breeding Bird Atlas data indicate that there was a 45% decline in the provincial probability of observation from the early 1980s to the early 2000's (Sandilands 2007). Greatest declines were in the Southern Shield (69%), Northern Shield (65%) and Lake-Simcoe – Rideau (31%) regions. These declines resulted in a significant southward shift in the species' southern Ontario range (Sandilands 2007). Short-term fall migration monitoring data recorded significant annual declines at Bruce Peninsula (-69%), Ruthven (-27%); and Rock Point (-56%), whereas spring migration counts increased at Long Point (+ 41%). There were non-significant trends at the remainder of the migration monitoring stations (COSEWIC 2013b, citing T. Crewe, BSC, unpubl. data). There has been some speculation that the BBS data may be showing a decline as a result of a sampling bias resulting from a shift of colonies from more numerous but smaller roadside colonies to fewer but larger colonies further from roads on the banks of waterbodies and aggregate pits (V. Brownell, pers. comm. C,. Risley pers. comm.), but evidence to support this is not available (J. McCracken pers. comm.), particularly there is no available evidence relating rates of decline to changes in quarry size and location. COSEWIC (2013b) has a thorough discussion of the biases in the BBS data which may over or under represent abundance. The BBS trends in this report are based on the results of the Bayesian hierarchal modeling approach which provides a better representation of population change patterns over time compared to previous analyses (Sauer and Link 2011; COSEWIC 2013b). Breeding Bird Atlas data are less dependent on roadside sampling and also show a significant declining trend.

7. Ontario's Conservation Responsibility

Not in any category. Given a global range of over 2.5 million km^2 for this species (NatureServe 2013), Ontario represents a small proportion of the global range.

3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)

8. Population Sustainability

Insufficient information. No formal PVAs have been conducted, although the population trend data clearly show a consistent negative population trend.

9. Lack of Regulatory Protection for Exploited Wild Populations
Not in any category. Protected under the Migratory Birds Convention Act

10. Direct Threats
Threatened. The reasons for the long-term population decline are poorly understood, but are believed to result from the cumulative effects of several threats, including loss of breeding and foraging habitat, destruction of nests from the practice of contouring the banks of aggregate pits (rather than the excavation itself), collision with vehicles, widespread pesticide use affecting prey abundance, and impacts of climate change (COSEWIC 2013c). Stream flow regulation is a threat to natural nesting habitat in many areas (NatureServe 2013). Probably the most limiting habitat requirement for nesting Bank Swallows is the availability of eroding, vertical banks composed of fine, silty sands (COSEWIC 2013b). These most often occur naturally along watercourses and lakeshores, and are vulnerable to effects of dams and water level regulation. Damming rivers removes the suitable habitat along river banks, so many of southern Ontario rivers provide less habitat than in the past. Good examples would be the modern states of the Grand and Speed Rivers, although there is no direct evidence of the number of Bank Swallow colonies were on these rivers before European settlement or even before damming occurred (M. Cadman pers. comm. 2013). NatureServe (2013) identified human habitat alteration as the only major known threat; conversely considerable suitable nesting habitat has also been created by sand and gravel mining.

Incidental destruction of birds and nests during aggregate operations is a confirmed threat (COSEWIC 2013b). Of 72 Bank Swallow colonies containing more than 100 nests that were reported in the Ontario Breeding Bird Atlas, only eight were in natural banks (Sandilands 2007), suggesting the potential for both positive and negative influence of anthropogenic activities. Most records of breeding Bank Swallow in northeastern Ontario are associated with both active and inactive aggregate (sand) pits, indicating the potential for significant impact of aggregate operations and rehabilitation plans on nesting colonies (Cobb 2013). In the Hearst area, there are 10 known, active sites in aggregate pits and one in a quarry (John Sadowsky, OMNR data). An unconfirmed anecdotal report indicated that one colony with an estimated 100 active nests was reduced to 5 nests as a result of aggregate activity (Cobb 2013). However, it is unlikely that aggregate operations are the sole or primary factor in the Bank Swallow's population decline. Currently, the aggregate industry has posted a factsheet with guidance on ways to reduce mortality of Bank Swallows in aggregate pits; https://www.ossga.com/multimedia/38/fs_bank_swallows-ossga.pdf.

Climate change threatens Bank Swallows in many ways, including changes in the timing of insect emergence, higher mortality of migrants caused by changes in the number and frequency of hurricanes, and increased nestling mortality due to an increase in inclement weather events (COSEWIC 2013b). Road mortality is an ongoing

threat to Bank Swallows – in one study Bank Swallows were the most frequently encountered road mortality carcass, although estimated total mortality was considered biologically insignificant (COSEWIC 2013b). A note of interest – road mortality risk is increased due to a unique social behaviour whereby individuals are attracted to and attempt to mate with intra-specific carcasses – removal of road-killed Bank Swallow carcasses helped to reduce large mortality events (COSEWIC 2013b).

The decline of this species is similar to declines in several other aerial insectivores including Barn Swallow, Common Nighthawk, Whippoorwill and Purple Martin. None of these is threatened by aggregate activities, and the main sources of the Bank Swallow's precipitous declines are presently unknown.

11. Specialized Life History or Habitat-use Characteristics

Threatened. Considered at high level of risk locally from disturbance due to specialized reliance upon sand and gravel banks, although other factors are no doubt also involved in the long-term decline. Because the largest colonies are in gravel pits, the species is at very high risk due to this habitat-use characteristic and this criterion could apply at the Threatened or Endangered level. Paradoxically, aggregate activity, also creates nesting habitat.

3.3 COSSARO EVALUATION RESULTS

1. Criteria satisfied in each status category

Number of primary and secondary criteria met in each status category:

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

Number of Ontario-specific criteria met in each status category:

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

2. Data Deficiency

No. The number of criteria assessed as "insufficient information" is 1. There is no PVA, but otherwise there is sufficient information for all criteria.

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that **Bank Swallow** 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
Threatened. Meets Threatened A2b because the population has declined by more than 30% over the last 10 years based upon an appropriate index of abundance (Breeding Bird Survey, Ontario Breeding Bird Atlas).

Criterion B – Small Distribution Range and Decline or Fluctuation
Not in any category. Current range exceeds thresholds.

Criterion C – Small and Declining Number of Mature Individuals
Not in any category. Although declining, population size exceeds thresholds.

Criterion D – Very Small or Restricted Total Population
Not in any category. Both population size and distribution exceed thresholds.

Criterion E – Quantitative Analysis
Insufficient information. No PVAs have been conducted, although the population trend data show a clear and consistent negative population trend

Rescue Effect
Yes?. Although COSEWIC (2013b) suggests that rescue effect is possible, there are some limitations; many jurisdictions adjacent to Ontario also show negative population trends, while some adjacent jurisdictions do not show statistically significant declines (Appendix 1). Of 13 states bordering Canada, 8 are declining and 50% of these show a significant decline; of the others only one shows a significant population increase. The decline in the U.S.A. is primarily in the northern part of the range. Recent Breeding Bird Atlas results from Michigan, New York, Vermont, and Pennsylvania consistently show evidence of substantial reductions in area of occupancy for Bank Swallows (McGowan and Corwin 2008, Pennsylvania Breeding Bird Atlas 2009, Wolinski 2011, COSEWIC 2013b). Breeding adults are generally philopatric, typically returning to their natal area to breed, rather than dispersing widely.

Special Concern Status
No. Meets COSEWIC criterion for Threatened.

4.2 COSEWIC EVALUATION RESULTS

1. Criteria satisfied in each status category

Indicate whether or not a criterion is satisfied in each of the status categories.

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

2. Data Deficiency

No. Sufficient data are available.

3. Status Based on COSEWIC Evaluation Criteria

The application of COSEWIC evaluation criteria suggests that **Bank Swallow** is **Threatened** in Ontario.

PART 5

ONTARIO STATUS DETERMINATION

5.1 APPLICATION OF COSSARO AND COSEWIC CRITERIA

COSSARO and COSEWIC criteria give the same result. **No**

The COSSARO criteria suggest a status of endangered, based upon declines both provincially and across northeastern North America, both primary criteria. The Bank Swallow is still relatively common and widespread, and there is some potential, albeit limited, for rescue effect. This suggests that the determination of Threatened by application of the COSEWIC criteria may be more appropriate.

5.2 SUMMARY OF STATUS EVALUATION

Bank Swallow is classified as **Threatened** in Ontario.

The **Bank Swallow** is a small, globally distributed avian insectivore. It nests colonially in nesting burrows excavated in vertical silt and sand banks. There is one Designatable Unit in Ontario. It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time; many nests are in active or former aggregate pits. Bank Swallow is well distributed across southern Ontario, and has a broad but scattered distribution across northern Ontario. The largest, natural Ontario colonies are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen and Albany rivers (the latter in far northwestern Ontario near Hudson Bay). Although still widespread in Ontario, the species has declined in both abundance and distribution. Atlas data indicate a 45% decline in the probability of observation province-wide, and the centre of Bank Swallow distribution in Ontario has shifted southward in the past 2 decades. Provincial BBS data indicate that the species has declined by 40% over the past decade and 96% over a 45-year period. Threats are believed to be cumulative, including loss of breeding and foraging habitat, destruction during aggregate excavation, collision with vehicles, widespread pesticide use affecting prey abundance, and impacts of climate change. Aggregate and other human activity have created many nesting habitats over time, and also have the potential to destroy many nests and breeding sites. The significant population and distribution decline, coupled with ongoing, poorly understood threats, support a designation of **Threatened** for this species.

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List of selected aggregate pits and quarries with Bank Swallow presence in Hearst and Cochrane districts, provided by Derek Seim and John Sadowsky, Ontario Ministry of Natural Resources.

3. Acknowledgements

Cadman, Mike, Songbird Biologist, Canadian Wildlife Service, Environment 1212 Canada, Burlington, ON. Email correspondence to C. Risley (OMNR) June 2013.

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APPENDIX 1

NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE

	Subnational Rank	Sources	Annual change (1966-2011) (bolded numbers indicate a significant population trend); overall population change in brackets	Sources
CT	S5B	NatureServe 2013	-0.4 (-16.5)	Sauer et al. 2013
DE	S2B	"	0.5 (25.2)	"
IL	S5	"	-1.0 (-36.8)	"
IN	S4B	"	1.2 (71.1)	"
IA	S4B	"	-1.8 (55.8)	"
LB	S3B	"		"
KY	S3B	"	-2.3 (64.9)	"
MA	S5B	"	**-5.7 (92.9)**	"
MB	S4B	"	-3.6 (80.8)	"
MD	S3S3B	"	**-8.8 (98.4)**	"
ME	S5B	"	**-10.6 (99.4)**	"
MI	S5	"	-0.1 (4.4)	"
MN	SNRB	"	**-5.1 (90.5)**	"
NB	S3B	"	**-9.4 (98.8)**	"
NF	S3B	"		"
NH	S3B	"	**-8.6 (98.3)**	"
NJ	S4B	"	-10.9 (99.5)	"
NS	S3B	"	**-8.4 (98.1)**	"
NY	S5B	"	-6.5 (95.1)	"
OH	S4	"	**-3.5 (79.9)**	"
ON	S4B	"	**-6.9 (96.0)**	"
PA	S4B	"	-0.8 (30.3)	"
PE	S4B	"	-9.2 (98.7)	"
QC	S4	"	**-10.3 (99.2)**	"
RI	S3B	"		"
VA	S3B	"	-4.0 (84.1)	"
VT	S5B	"	**-5.2 (91.0)**	"
WI	S4B	"	**-3.5 (79.9)**	"
WV	S2B	"	-4.7 (88.5)	"

Occurs as a native species in 29 of 29 northeastern jurisdictions
Srank or equivalent information available for 28 of 29 jurisdictions = (96.6%)
S1, S2, SH, or SX in 1 of 28 = (3.6%)