

COSSARO Candidate Species at Risk Evaluation
for
Northern Bobwhite (*Colinus virginianus*)

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

Assessed by COSSARO as ENDANGERED

June 2013

Final

Colin de Virginie (*Colinus virginianus*)

Le colin de Virginie est une espèce de caille du sud-est de l'Amérique du Sud; on trouve cette espèce du sud de l'Ontario vers le sud jusqu'en Floride et en Amérique du Sud et vers l'ouest jusqu'aux États du Midwest américain. Au Canada, il ne vit qu'en Ontario dans les habitats de prairie de graminées et de hautes graminées et souvent en relation avec un habitat agricole. En Ontario, la situation de la population indigène s'est aggravée depuis le rapport de situation de 2003 sans qu'il n'y ait aucun indice de rétablissement. On croit que l'espèce se trouve maintenant seulement sur l'île Walpole dans l'extrémité sud-ouest de l'Ontario, principalement en raison de la perte et de la fragmentation de l'habitat. Cette population est aussi extrêmement en péril et est menacée de disparition; aucun individu reproducteur n'a été entendu lors d'un relevé de 2013 et aucun oiseau n'a été aperçu lors du Recensement des oiseaux de Noël depuis 2003. Il existe un certain nombre de petits groupes d'oiseaux issus d'introductions dans l'ensemble du sud-ouest de l'Ontario qui compliquent la détermination de la situation de la population. Ces populations ne persistent pas très longtemps et représentent une menace potentielle en raison de dilution génétique du patrimoine génétique indigène. La perte et la fragmentation de l'habitat sont des menaces qui persistent pour cette population. Le colin de Virginie répond à de nombreux critères de la désignation en voie de disparition en Ontario, y compris une population de petite taille et en déclin. Ces facteurs indiquent fortement que le colin de Virginie est **en voie de disparition** en Ontario et qu'il risque d'en disparaître.

Cette publication hautement spécialisée « Ontario Species at Risk evaluation report prepared under the Endangered Species Act, 2007 by the Committee on the Status of Species at Risk in Ontario », n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des Richesses naturelles par courriel à recovery.planning@ontario.ca.

PART 1

CURRENT STATUS AND DISTRIBUTION

Current Designations:

GRANK – G5 (Last reviewed 25/11/1996) (NatureServe 2013)

NRANK Canada – N1 (Assessed 15/11/2011) (NatureServe 2013)

COSEWIC – Endangered (re-examined and confirmed April 2013)(COSEWIC 2013a)

SARA – Endangered (Schedule 1) (Environment Canada 2013)

ESA 2007 – Endangered (OMNR 2013)

SRANK – S1 (NatureServe 2013)

Distribution in Ontario:

Northern Bobwhite distribution in Ontario apparently reached its maximum in the mid- to late-1800s shortly after European settlement, when it was found throughout southern Ontario as far north as southern Muskoka and as far east as Kingston (Risley 2007). Its range has declined since that time, and it is currently is restricted to the extreme southwestern corner of the province in Lambton County (OMNR 2013). Natural populations are limited primarily to Walpole Island and perhaps the adjacent mainland (OMNR 2013, Environment Canada 2013). Most other records scattered across southwestern Ontario are apparently released or escaped captive-reared birds (Risley 2007).

Distribution and Status outside Ontario:

In Canada Northern Bobwhite is found only in southwestern Ontario. Elsewhere it is found throughout the eastern United States and northern Central America from southeastern Wyoming east to Massachusetts and south to Florida and western Guatemala (James and Cannings 2003, NatureServe 2012). Introduced populations are found in several Caribbean islands and parts of the western U.S. (James and Cannings 2003).

PART 2

ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness

Yes. The species is taxonomically distinct. However it appears that a number of the populations across southwestern Ontario are from escaped or released captive-reared birds, with different genetic composition from the native stock. There is a high degree of variation, and there are 22 recognized subspecies of Northern Bobwhite; a long history of introductions has further complicated an understanding of systematics (Brennan 1999). Most introduced birds were introduced from the United States, and were considered of different genetic stock from the native subspecies *C. v. virginianus* (Sandilands 2005). Research from other jurisdictions has shown that introduced birds have often been from a different subspecies, and of different genetic composition, than the native birds (Nebdl *et al.* 1997).

Designatable Units

Northern Bobwhite is restricted in Canada to one small area of southwestern Ontario, and there is only one Designatable Unit.

Native Status

Yes. There is some debate over whether the species was present prior to European settlement or not. The earliest report was made by the Commandant of the French settlement at Detroit, M. de Lamothe Cadillac, who mentioned an abundance of game including “quail” in a letter dated 1701 (Lajeunesse 1960). Northern Bobwhite possibly moved into Ontario only following land clearing or at least was very scarce before European settlement (Clarke 1954). Lumsden (1987) reported that the species was probably present in Kent and Essex counties prior to that. However it is clearly a native species to eastern North America that, if not present in Ontario originally, colonized naturally several centuries ago¹.

Presence/Absence

Present. However, native populations may already be extirpated (but not yet meet the formal criteria² for extirpated status).

¹ According to the COSSARO criteria (CATEGORIES AND CRITERIA FOR STATUS ASSESSMENT COMMITTEE ON THE STATUS OF SPECIES AT RISK IN ONTARIO. June 2009), a native species is a 'species that now occurs in Ontario in the wild, and that was present in the geographic area now described as Ontario (or in adjacent geographic areas and has arrived in Ontario without human assistance), prior to colonization by Europeans'.

² According to the COSSARO criteria, a species may be considered extirpated if there have been no confirmed reports or sightings in the past 40 years or three generations, whichever is less, despite repeated searches by knowledgeable observers at historical occurrence sites or at other sites where the species might be expected to occur.

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. G5 (Nature Serve 2013).

2. Global Decline

Endangered. BBS data show a significant long-term decline across all survey areas (Canada and United States) of -4.2% per year (1966-2011) (Sauer et al. 2012), equating to an overall 45-year decline of 85.5%. Between 1966-1998, significant declines occurred in nearly every state within their geographic range, with a significant range-wide decline of -2.7%/year; the rate of decline increased through time (NatureServe 2013). Of 39 jurisdictions for which Breeding Bird Survey (BBS) data are available for the period 1966-2011, 30 showed a significant negative population trend, five showed a nonsignificant negative population trend, and four showed a nonsignificant positive population trend (Sauer et al. 2012).

3. Northeastern North America Ranks

Special Concern. Northern Bobwhite is ranked in 19 of 21 native jurisdictions, and is ranked as extremely rare (S1, S2, SH or SX) in 5 (26% of those jurisdictions). Although Northern Bobwhite have declined drastically in the northeastern U.S. states (Sauer et al. 2013), this fact is not reflected in the corresponding subnational ranks.

4. Northeastern North America Decline

Endangered. There has been a significant 45-year negative decline in 15 of 21 (71.4%) northeastern North America jurisdictions where it occurs (Appendix 1). Meets the criterion for an unquantified but generally recognized drastic population decline or range contraction in Northeastern North America.

5. Ontario Occurrences

Endangered. There is apparently only one population of native birds remaining in Canada, located on Walpole Island, Ontario (Risley 2007, COSEWIC 2013a, COSEWIC 2013b), although this population may now be extirpated (Don Sutherland pers. comm.). The number of Ontario occurrences is confounded by populations apparently derived from released or escaped birds across southwestern Ontario (Risley 2007). As noted by COSWIC (2013b), "Virtually all records of birds that are now detected elsewhere in southern Ontario are believed to be of captive-bred origin. Such birds are raised and released for sport hunting, have poor viability in the wild, and do not maintain self-sustaining populations."

6. Ontario Decline

Endangered. Fewer than 5 extant occurrences (1 or potentially 0) and absent from more than 75% of documented Ontario sites (96.3% of known EOs). There was an estimated 1055 covies in 5 southwestern Ontario counties in 1972-73 (Holdsworth [1973] from Lumsden [1987]). On Walpole Island the population collapse over the past 1.5 decades has been evidenced by a decline from 92 calling males on roadside surveys in 2000 to fewer than 5 coveys found after intensive surveys in suitable habitat in 2006 (Risley 2007) to not a single calling bird being found in the spring of 2013 during a survey by experienced observers (Don Sutherland, pers. comm.). The species has not been recorded on the annual Wallaceburg Christmas Bird Count since 2003 (this CBC area includes most of Walpole Island) (Don Sutherland pers. comm.). Bobwhite are apparently extirpated from the Municipality of Chatham-Kent. During the first Ontario Breeding Bird Atlas in the early 1980s, there were pockets of native birds along the Thames River in Middlesex County and Chatham-Kent; during the second atlas in the early 2000s, there were only sporadic single calling birds at these sites, which was considered more indicative of released birds (Risley 2007). In 2000, native populations of Bobwhite were considered absent from 22 (96%) of the counties and regions in which they formerly occurred (Essex, Elgin, Middlesex, Perth, Huron, Waterloo, Grey, Oxford, Haldimand-Norfolk, Niagara, Hamilton-Wentworth, Halton, Peel, York, Simcoe, Durham, Northumberland, Victoria, Peterborough, Hastings, Lennox & Addington, and Frontenac) (OMNR data). It is apparent that bobwhite has been declining in Ontario for over a century (Clarke 1954).

7. Ontario's Conservation Responsibility

Not in any category. Current and historical ranges in Ontario represent a very small proportion of the species' global range.

3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)

8. Population Sustainability

Insufficient information. No quantitative analysis or PVA have been conducted.

9. Lack of Regulatory Protection for Exploited Wild Populations

Not in any category. Protected as an endangered species both federally (SARA Schedule 1) and provincially (ESA 2007). The Walpole Island population of Northern Bobwhite is on a federal Indian Reserve.

10. Direct Threats

Endangered. Northern Bobwhite populations are threatened by continued habitat loss of native prairie and old meadow habitats and shrinking habitat block size, leading to fragmented and isolated small populations prone to local extinctions (James and Cannings 2003, COSEWIC 2013b). Genetic dilution of native gene pools by released birds of unknown origin and genetic lineage may also be a problem, although this is not well understood. Wild Northern Bobwhite populations are more genetically diverse than

game-farmed bobwhite, with greater polymorphism and slightly higher observed heterozygosity (Ellsworth *et al.* 1988). Introduced populations generally do not persist (Brennan 1999, James and Cannings 2003, COSEWIC 2013b). Feral house cats are also considered a probable but unquantified threat to remaining populations (James and Cannings 2003). A draft Walpole Island Ecosystem Recovery Strategy is under development, but is not yet completed or available.

11. Specialized Life History or Habitat-use Characteristics

Not in any category. Although the Northern Bobwhite utilizes provincially rare vegetation communities in Ontario (e.g., Tallgrass Prairie communities on Walpole Island), it is not dependent on them. The Northern Bobwhite had adapted to agricultural landscapes of southern Ontario, typically occupying areas with grassland, crops, and brushy cover in close proximity to one another. Although not considered rare habitats, pastureland and summer fallow fields are potential habitats for the Northern Bobwhite and have declined in extent in Ontario by 65% and 85%, respectively, since 1976 (Statistics Canada 2013). Winter weather is a critical limiting factor; severe winter weather conditions such as prolonged severe temperatures and/or heavy snow cover, particularly where adequate suitable habitat is lacking, has led to further decline of residual bobwhite populations (James and Cannings 2003, Sandilands 2005, NatureServe 2013). Snow cover >10 cm can limit access to food and winter mortality can average 80% with 100 days of snow cover (Sandilands 2005).

3.3 COSSARO EVALUATION RESULTS

1. Criteria satisfied in each status category

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

ENDANGERED – [4/1]
THREATENED – [0/0]
SPECIAL CONCERN – [1/0]

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

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

2. Data Deficiency

No. The number of criteria assessed as “insufficient information” is 1. This relates to the lack of a PVA and is not a significant factor in the assessment outcome.

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that **Northern Bobwhite 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

Endangered. Meets criterion A2b – greater than 50% decline, using an index of population appropriate to the species (i.e. BBS, CBC). COSEWIC (2003) considered this criterion to be met, whereas COSEWIC (2013b) did not; it is unclear how the latter determination was made.

Criterion B – Small Distribution Range and Decline or Fluctuation

Endangered. Meets B1 and B2ab(iii) for Endangered because the extent of occurrence is less than 5000 km², the area of occupancy is less than 500 km², there are fewer than 5 occurrences, and there is a continuing decline in the area, extent and quality of habitat (COSEWIC 2013b).

Criterion C – Small and Declining Number of Mature Individuals

Endangered. Meets criterion for Endangered because there are fewer than 2500 individuals, and meets C2a(i, ii) because there is a continuing observed decline in the number of mature individuals and no population is estimated to contain more than 250 mature individuals. COSEWIC (2013b) did not consider this criterion to be met because of insufficient information to estimate current population trends; however the trend and relative population size are both clear.

Criterion D – Very Small or Restricted Total Population

Endangered. Meets D1 for Endangered because the population is estimated to be fewer than 250 adults (COSEWIC 2013b).

Criterion E – Quantitative Analysis

Insufficient information. No Population Viability Analyses conducted.

Rescue Effect

No. Rescue effect is unlikely because populations in adjacent jurisdictions are similarly declining and facing similar threats. Individuals are very sedentary, often spending an entire lifespan within an area of 0.5 km² (Sandilands 2005), and is not known for over-water dispersals. Captive stock may be available for reintroduction, but the genetic purity is questionable and populations based upon captive-released birds appear to die out over time. The Michigan population of Northern Bobwhite has also undergone significant population declines in recent decades (James and Canning 2003)

Special Concern Status

No.

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 – [yes] – 4 Endangered criteria met

THREATENED – [no]

SPECIAL CONCERN – [no]

2. Data Deficiency

No. Although there is not sufficient information for specific population trend evaluation, there is clearly sufficient information to demonstrate the severity and outcome of the trend.

3. Status Based on COSEWIC Evaluation Criteria

The application of COSEWIC evaluation criteria suggests that **Northern Bobwhite** 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

Northern Bobwhite is classified as **Endangered in Ontario**.

The Northern Bobwhite (*Colinus virginianus*) is a quail species of southeastern North America, occurring from southern Ontario south to Florida and Central America, and west to the Midwest U.S.A. In Canada, it occurs only in Ontario. It is found in grassland and tallgrass prairie habitat, and often in association with agricultural habitat. In Ontario, the status of the native population has worsened since the 2003 status report, and shows no sign of recovery. It is now believed to be restricted to Walpole Island in extreme southwestern Ontario, largely as a result of habitat loss and fragmentation. This population is also extremely imperiled and in danger of extirpation, with no breeding birds heard during a 2013 survey, and no winter birds seen on Christmas Bird Counts since 2003. There are a number of small groups of birds originating from introductions across southwestern Ontario that confound determination of population status. These populations do not persist very long and pose a potential threat through genetic dilution of native gene pools. Habitat loss and fragmentation are continuing threats to this population. Northern Bobwhite meets many criteria for endangered status in Ontario, including a small and declining population. These factors all indicate strongly that Northern Bobwhite is Endangered in Ontario, and is at risk of extirpation.

Information Sources

1. Literature Cited

Brennan, L.A. 1999. Northern Bobwhite (*Colinus virginianus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:
<http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/397doi:10.2173/bna.397>

Cadman, M.D., P.F.J. Eagles, and F.M. Helleiner (eds.) 1987. Atlas of the breeding birds of Ontario. Federation of Ontario Naturalists, Don Mills, and Long Point Bird Observatory. University of Waterloo Press, Waterloo, Ontario. 617 pp.

Clarke, C.H.D. 1954. The Bob-white Quail in Ontario. Ontario Department of Lands and Forests, Technical Bulletin Fish and Wildlife Series No. 2. 10 pp.

COSEWIC. 2003. COSEWIC assessment and update status report on the Northern Bobwhite *Colinus virginianus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 20 pp.

COSEWIC. 2013a. Wildlife species search. Bobwhite, Northern / *Colinus virginianus*. COSEWIC Secretariat, Canadian Wildlife Service, Environment Canada, Gatineau QC. Available at:
http://www.cosepac.gc.ca/eng/sct1/searchdetail_e.cfm?id=28&StartRow=1&boxStatus=All&boxTaxonomic=All&location=All&change=All&board=All&commonName=northern%20bobwhite&scienceName=&returnFlag=0&Page=1. Accessed May 21 2013.

COSEWIC. 2013b. COSEWIC status appraisal summary on Northern Bobwhite *Colinus virginianus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 11 pp.

Ellsworth, D.L., J.L. Roseberry and W.D. Klimstra. 1988. Biochemical genetics of wild, semi-wild and game-farm Northern Bobwhites. *Journal of Wildlife Management* 52(1): 138-144.

Environment Canada. 2013. Species profile (Northern Bobwhite). Species at Risk Public Registry. Environment Canada, Gatineau QC. Available at:
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=28. Last updated Aug. 29 2013. Accessed May 21 2013.

Holdsworth, C. 1973. Winter study of Bobwhite Quail in southwestern Ontario, 1972-1973. Manuscript report, Ontario Ministry of Natural Resources.

James, R.D. and R. Cannings. 2003. COSEWIC update status report on the Northern Bobwhite *Colinus virginianus* in Canada in COSEWIC assessment and update status report on the Northern Bobwhite *Colinus virginianus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa ON. 1-20 pp.

Lumsden, H. 1987. Northern Bobwhite (pp. 144-145). Species accounts in *Atlas of the Breeding Birds of Ontario*. M.D. Cadman, P.F.J. Eagles, F.M. Helleiner (eds.). University of Waterloo Press, Waterloo. 617 pp.

Lajeunesse, E.J. 1960. The Windsor border region Canada's southernmost frontier. A collection of documents. University of Toronto Press, Toronto. 374 pp. Available at: <http://ia700806.us.archive.org/1/items/windsorborderreg00laje/windsorborderreg00laje.pdf>. Accessed May 21 2013.

NatureServe. 2013. NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.3. NatureServe, Arlington, Virginia. Available at NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.3. NatureServe, Arlington, Virginia. Available at: http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=106280&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=106280&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=106280. Accessed: May 21 2013.

Nebdal, M.A, R.I. Honeycut, S.G. Evans, R.M. Whiting and D.R. Dietz. 1997. Northern Bobwhite restocking in east Texas – a genetic assessment. *Journal of Wildlife Management*. 61(3): 854-863.

OMNR. 2013. Species at Risk in Ontario list. Available at: <http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html>. Last updated April 22 2013. Accessed on May 21 2013.

Risley, C., 2007. Northern Bobwhite. Pages 134-135 in *Atlas of the Breeding Birds of Ontario, 2001-2005*. Edited by M.D. Cadman, D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier. Published by Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature. 706 pp.

Sandilands, A. 2005. The birds of Ontario: habitat requirements, limiting factors and status. UBC Press, Vancouver. 365 pp.

Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2013. The North American Breeding Bird Survey, Results and Analysis 1966 - 2011. Version 12.13.201. Most recent update February 22 2013. USGS Patuxent Wildlife Research Center, Laurel, MD. Available at <http://www.mbr-pwrc.usgs.gov/cgi->

[bin/atlas11.pl?02890&1&11](#). Accessed May 23 2013.

Statistics Canada. 2013. Census of Agriculture, total area of farms and use of farm land, Canada and provinces, every 5 years. CANSIM (database).

2. Community and Aboriginal Traditional Knowledge Sources

No community or aboriginal traditional knowledge was received.

3. Acknowledgements

Don Sutherland (OMNR) and Mike Oldham (OMNR) are acknowledged for their contribution of data and recent survey information. This evaluation benefitted from a previous COSSARO assessment conducted by Anthony Zammit, Don Sutherland and Colin Jones in 2000.

APPENDIX 1

NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE

	Subnational Rank	Sources	Decline (1966-2011) (bolded numbers indicate a significant population trend)	Sources
CT	S4	NatureServe 2013	-11.1	Sauer et al. 2013
DE	S4	"	-10.1	"
IL	S5	"	-3.9	"
IN	S4	"	-4.5	"
IA	S5B	"		
S5	Not present	"		
KY	S5	"	-2.9	"
MA	S2	"	-10.5	"
MB	Not present	"		
MD	S5	"	-9.4	"
ME	Not present	"		
MI	S4	"	-12.3	"
MN	SU	"	+0.9	"
NB	Not present	"		
NF	Not present	"		
NH	SX	"	+4.0	"
NJ	S5B/S5N	"	-10.6	"
NS	Not present	"		
NY	S4	"	-7.2	"
OH	S5	"	-7.1	"
ON	S1	"	-19.7	"
PA	S1	"	-8.9	"
PE	Not present	"		
QC	Not present	"		
RI	S4B/S4N	"	-5.1	"
VA	S5	"		
VT	SNA	"	-5.4	"
WI	S2/S3B	"	-5.3	"
WV	S3B/S3N	"	-10.0	"

Occurs as a native species in 21 of 29 northeastern jurisdictions
 Srank or equivalent information available for 19 of 21 jurisdictions = (90.5%)
 S1, S2, SH, or SX in 5 of 19 = (26.3%)