

COSSARO Candidate Species at Risk Evaluation
for
Bluehearts (*Buchnera americana*)

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

Assessed by COSSARO as ENDANGERED

December 2011

Final

La **Buchnéra d'Amérique** (*Buchnera americana*) est une plante herbacée vasculaire attrayante qui est disparue ou menacée dans la plus grande partie du nord-est de son aire de répartition nord-américaine, y compris dans les États immédiatement adjacents à l'Ontario. En Ontario, son habitat est limité à de rares marais côtiers sur des sols humides des forêts ouvertes et des dunes intertidales le long des rives du lac Huron. La Buchnéra d'Amérique est un parasite facultatif qui obtient une partie de ses nutriments des racines des arbres, s'il y en a. Au Canada, elle n'est présente que sur une bande de 10 km des côtes du lac Huron dans le sud-ouest de l'Ontario, sans lien avec le reste de son aire de répartition mondiale dans le sud-est des États-Unis. Il ne subsiste que trois populations en Ontario; quatre autres sont considérées disparues. Les principales menaces humaines sont liées à l'habitat. Une seule population en Ontario est considérée relativement en sécurité; une deuxième pourrait faire face à certaines perturbations de son habitat, tandis que la troisième n'est pas jugée viable à long terme. L'espèce semble toujours en déclin en Ontario en raison des perturbations de l'habitat, bien que le taux de diminution semble en ralentissement. En raison du faible nombre d'observations en Ontario, de sa distribution limitée, de son statut d'espèce menacée dans la plus grande partie du Nord-Est des États-Unis, des menaces d'autres perturbations de l'habitat et de son historique de vie spécialisé, la Buchnéra d'Amérique est classée comme une espèce **en voie de disparition** en Ontario.

Cette publication hautement spécialisée, COSSARO Evaluation for Bluehearts n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez contacter le secrétariat de COSSARO par courrier électronique à l'adresse COSSAROsecretariat@ontario.ca.

PART 1: Current status and distribution

Current designations:

GRANK – G5? (Assessed 14 March 1994) (NatureServe, accessed Dec. 2011)

NRANK Canada – N1 (NatureServe, accessed Dec. 2011)

COSEWIC – Endangered (COSEWIC 2011a)

SARA – Endangered (Schedule 1) (Environment Canada, 2011)

ESA 2007 – Endangered (Ontario Ministry of Natural Resources, 2011).

SRANK – S1 (NatureServe, accessed Dec. 2011)

Distribution in Ontario:

Bluehearts is restricted to a 10-km section of shoreline along Lake Huron in southwestern Ontario (COSEWIC 2011b).

Distribution and status outside Ontario:

Outside Ontario, Bluehearts occurs in 17 southern and eastern American states, from Ohio and Indiana south and southwest to Florida and Texas respectively. The areas of greatest concentration are in Tennessee, Kentucky, western Illinois, Missouri, Kansas and Oklahoma (COSEWIC 2011b). It is extirpated from several northeastern states, including Michigan, New Jersey, Pennsylvania, the District of Columbia and, apparently, New York. In Canada, it occurs only in southwestern Ontario. The species has a broad global distribution with a concentration of extant sites within a much smaller core, implying past population loss.

PART 2: Eligibility for Ontario status assessment

2.1 Application of eligibility criteria

Taxonomic distinctness

Yes. While some authors have considered *B. americana* to be conspecific with *B. floridana*, most experts and recent publications treat these as two distinct species; their ranges overlap in the southeastern U.S.A. (COSEWIC 2011b). There is no dispute that only *B. americana* occurs in Ontario.

Designatable units

One. The Ontario and Canadian population is represented by a single DU along the southeastern shoreline of Lake Huron in the Great Lakes Ecological Area (COSEWIC 2011b).

Native status

Yes. Earliest records of Bluehearts in Ontario date back to the late 1800's in the Port Franks – Ipperwash area (COSEWIC 2011b).

Presence/absence

Present.

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

Insufficient Information. G5? is the rounded global status rank (NatureServe 2011). As noted by NHIC (2011), this global ranking includes both *B. americana* and *B. floridana*, and *B. americana* would be considered a much rarer plant if *B. floridana* were excluded, which better reflects current thinking on the species' taxonomy (COSEWIC 2011).

2. Global Decline

Threatened. Bluehearts undergoes large population fluctuations from year to year, making interpretation of trends difficult. NatureServe (2011) indicates a short-term decline of 10-30%. NatureServe, however, includes *B. floridana* with *B. americana*, further complicating interpretation of trends. Bluehearts has been extirpated from five American jurisdictions, and it has not been seen recently (past 20 years) in Maryland, Delaware and North Carolina (COSEWIC 2011b).

3. Northeastern North America Ranks

Endangered. Bluehearts is ranked as S1, S2, SH or SX in 10 of 12 (83%) northeastern North American jurisdictions, with five of those jurisdictions being SX or SH (NatureServe 2011). It has been extirpated or presumed extirpated in three of the states adjacent to Ontario (New York, Pennsylvania, Michigan), and is ranked S2 (imperiled) in the fourth (Ohio). It is not ranked "secure" (S4 or S5) in any of the jurisdictions in the northeast (NatureServe 2011).

4. Northeastern North America Decline

Endangered. There is no quantitative information on the extent of population decline other than at the scale of jurisdictions. There has been a short-term trend of 10-30% across its global range, but there is no information specific to northeastern North America (NatureServe 2011). Five of 12 (42%) jurisdictions in northeastern North America are currently classed as SX or SH, indicating significant range loss "due to loss of habitat by physical destruction and succession" (NatureServe 2011). This equates to at least a 42% non-cyclical population decline within the original northeastern range. When coupled with known declines in other jurisdictions, it suggests that there has been a non-

cyclical decline of >50% accompanied by a generally recognized but unquantified drastic population decline and range contraction.

5. Ontario Occurrences

Endangered. This species has a restricted Ontario and Canadian distribution. COSEWIC (2011b) identifies three populations in Ontario, at former Camp Ipperwash, Pinery Provincial Park and Ipperwash Beach.

6. Ontario Decline

Threatened. Population size and trends are difficult to determine due to the lack of consistent survey effort and wide fluctuations of numbers between years (COSEWIC 2011b). COSEWIC (2011b) recognizes three extant and four extirpated populations, representing a 63% loss. Three of these extirpations occurred since 1984. NHIC (2011) records indicate four extant and four extirpated populations, a loss of 50%. Although range loss is difficult to determine because the species can remain dormant in the seed bank in some years, it appears that four populations were lost since the previous status report was prepared in 2000 (COSEWIC 2011b), therefore qualifying this species as Threatened under this criterion.

7. Ontario's Conservation Responsibility

Not in any category. Ontario represents approximately 1% of the global range (COSEWIC 2011b).

3.2 Application of secondary criteria (threats and vulnerability)

8. Population Sustainability

Insufficient Information. It is difficult to infer population trends because populations can fluctuate over an order of magnitude from year to year, and the species can remain in the seedbank for some time. No population viability analyses have been conducted.

9. Lack of Regulatory Protection for Exploited Wild Populations

Not in any category. Individuals are protected under the *Endangered Species Act, 2007* and the federal *Species at Risk Act*.

10. Direct Threats

Threatened. Habitat loss and degradation appear to serve as the most significant threats to this species. Although there may have been some declines in the past decade, most losses appeared to have occurred prior to this period (COSEWIC 2011b). Of the 3 Ontario populations, only the population within Pinery Provincial Park occurs in a formally protected area. However, it is still vulnerable to vegetation succession, trampling by pedestrians and vehicles, illegal plant picking, and invasive species. A second population at former Camp Ipperwash is on federal land (Dept. of National Defense) although land tenure may change. Accordingly, this plant faces potential habitat disruption due to site decommissioning prior to the transfer of ownership, although this threat appears to be diminishing. The third population is located on undeveloped private land and adjacent Crown land, and is threatened by human use and vegetation succession; it is not considered viable in the long-term (COSEWIC 2011b). At least 2 of these populations are at risk of disappearance or serious decline as a consequence of identified threats, and the third site at Pinery also faces continued threats, thereby qualifying this species as at least Threatened under this criterion.

Periods of low water levels of Lake Huron may contribute to reduced habitat quality (COSEWIC 2011b).

11. Specialized Life History or Habitat-use Characteristics

Threatened. Very specific habitat requirements include "moist sandy or gravelly soil in open woods, prairies, and intertidal dunes" (COSEWIC 2011b). This species is restricted to rare Graminoid Coastal Meadow Marsh (S2, Bakowsky 1996) and Shrubby Cinquefoil Coastal Meadow Marsh (S1, Bakowsky 1996) habitat types. Some form of habitat disturbance such as fire is required to suppress woody vegetation and retain open habitat. In Ontario, it is found mainly "on the edges of wet intertidal depressions in fine sand, between 200 m and 50 m from the Lake Huron shoreline" (COSEWIC 2011b).

3.3 COSSARO evaluation results

1. Criteria satisfied in each status category

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

Endangered – [3/0]

Threatened – [2/2]

Special concern – [0/0]

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

Endangered – [1]

Threatened – [1]

Special concern – [0]

2. Data Deficiency

No.

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that Bluehearts 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. While there has clearly been a global and provincial decline in Bluehearts, the degree of the decline over the past decade is unknown and unquantified. Although still occurring, the decline appears to be slower in recent years.

Criterion B – Small distribution range and decline or fluctuation

Endangered. Meets criteria B1ab (ii, iii, iv) and B2ab (ii, iii, iv) - the Extent of Occurrence is much less than 5000 km² (28 km²), the Area of Occupancy is much less than 500 km² (1.22 km²), known to exist at fewer than 5 locations (3), with a continuing decline projected in the area of occupancy, area, extent and quality of habitat, and number of locations or populations.

Criterion C – Small and declining number of mature individuals

Threatened. Meets criterion C2a(i) – total population less than 10,000, a continuing (albeit unquantified) decline in the number of mature individuals, and no population estimated to contain more than 1000 mature individuals.

Criterion D – Very small or restricted total population

Threatened. Meets criterion D1 and D2:

D1 – Ontario population estimated to contain fewer than 1000 mature individuals;

D2 – fewer than 6 locations (3), its specialized habitat requirements and multiple threats and limiting factors make it prone to the effects of human activities or stochastic events (e.g. habitat disruption, water level changes).

Criterion E – Quantitative analysis

Insufficient information. No quantitative analysis conducted.

Rescue effect

No. The disjunct Ontario population is separated from other populations by several hundred kilometres. All adjacent U.S.A. jurisdictions are ranked as SX or SH except for Ohio, which is ranked as S2 (NatureServe 2011)

Special concern status

No.

4.2 COSEWIC evaluation results

1. Criteria satisfied in each status category

Endangered – Yes (1)

Threatened – Yes (2)

Special concern – No

2. Data Deficiency

No. There are unknowns regarding the recent degree of decline of the population, but the population trend, number of populations, and threats are well known and substantiated.

3. Status Based on COSEWIC Evaluation Criteria

The application of COSEWIC evaluation criteria suggests that Blueheart 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

Bluehearts is classified as Endangered in Ontario.

Bluehearts (*Buchnera americana*) is an attractive, herbaceous vascular plant that is extirpated or at risk throughout much of its eastern North American range, including the states immediately adjacent to Ontario. In Ontario its habitat is restricted to rare coastal marshes on moist soils in open woods and intertidal dunes along the Lake Huron shoreline. Bluehearts is a facultative parasite obtaining some nutrients from roots of trees, where trees are present. In Canada, it occurs only within a 10 km stretch of the Lake Huron shoreline in southwestern Ontario, disjunct from the rest of the global range in the southeastern United States. There are only three extant populations in Ontario; four others are considered extirpated. Primary human threats are habitat-related. Only one Ontario population is considered relatively secure; a second may be facing habitat disruption and a third is not considered viable in the long-term. The species still appears to be declining in Ontario due to habitat disruption, although the rate of decline may be decreasing. Due to the small number of Ontario occurrences, limited distribution, its imperiled status throughout much of the northeastern United States, threats of further habitat disruption, and its specialized life history, Bluehearts is considered Endangered in Ontario.

Information sources

1. Literature cited

Bakowsky, W.D. 1996. Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough. 21 pp.

COSEWIC. 2011a. [Wildlife species search](#). Bluehearts, *Buchnera americana*. Last updated April 2009. Accessed Nov. 21 2011.

COSEWIC. 2011b. COSEWIC status report on Bluehearts *Buchnera americana* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa. ix + 35 pp.

Environment Canada. 2011. Environment Canada 2011. [Species at Risk Public Registry](#). Last updated July 2011. Accessed November 21 2011.

NatureServe. 2011. [NatureServe Explorer](#): An online encyclopedia of life [web application]. Version 4.3. NatureServe, Arlington, Virginia. Last updated July 2011. Accessed: November 21 2011.

Natural Heritage Information Centre. 2011. [Biodiversity Explorer](#). Species report for *Buchnera americana* Bluehearts. Last updated July 2010. Accessed November 21 2011.

Ontario Ministry of Natural Resources. 2011. [Species at Risk in Ontario \(SARO\) List](#). Last updated October 2011. Accessed November 21 2011.

2. Community and Aboriginal traditional knowledge sources

No community or Aboriginal traditional knowledge received through submissions to COSSARO.

3. Acknowledgements

No information obtained through personal communications or review of the evaluation.

Appendix 1: Northeastern North America status rank and decline

State/Province	Subnational Rank	Sources	Decline	Sources
CT	Not present	NatureServe 2011		
DE	SH	NatureServe 2011		
IL	S3	NatureServe 2011		
IN	S1	NatureServe 2011		
IA	Not present	NatureServe 2011		
LB	Not present	NatureServe 2011		
KY	S3S4	NatureServe 2011		
MA	Not present	NatureServe 2011		
MB	Not present	NatureServe 2011		
MD	SH	NatureServe 2011		
ME	Not present	NatureServe 2011		
MI	SX	NatureServe 2011		
MN	Not present	NatureServe 2011		
NB	Not present	NatureServe 2011		
NF	Not present	NatureServe 2011		
NH	Not present	NatureServe 2011		
NJ	SX	NatureServe 2011		
NS	Not present	NatureServe 2011		
NY	SH	NatureServe 2011		
OH	S2	NatureServe 2011		
ON	S1	NatureServe 2011		
PA	SX	NatureServe 2011		
PE	Not present	NatureServe 2011		
QC	Not present	NatureServe 2011		
RI	Not present	NatureServe 2011		
VA	S1S2	NatureServe 2011		
VT	Not present	NatureServe 2011		
WI	Not present	NatureServe 2011		
WV	Not present	NatureServe 2011		

Occurs as a native species in 12 of 29 northeastern jurisdictions

Strank or equivalent information available for 12 of 12 jurisdictions = (100%)

S1, S2, SH, or SX in 10 of 12 = (83%)