

Ontario Species at Risk Evaluation Report for
Kentucky Coffee-tree
Chicot févier
(*Gymnocladus dioicus*)

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

Assessed by COSSARO as Threatened in Elgin, Essex, Lambton,
Middlesex, Norfolk and Oxford Counties and the Municipality of
Chatham-Kent.

November 2021

Chicot févier (*Gymnocladus dioicus*)

Le chicot févier est classé dans la catégorie des espèces menacées dans son aire de répartition indigène en Ontario qui englobe les comtés d'Elgin, d'Essex, de Lambton, de Middlesex, de Norfolk et d'Oxford et la municipalité de Chatham-Kent.

Le chicot févier (*Gymnocladus dioicus*) est un arbre de taille moyenne, qui peut atteindre 15 à 25 mètres de hauteur. Cette espèce peut vivre plus de 100 ans en atteignant la maturité sexuelle entre l'âge de 25 et 50 ans. Le chicot févier est présent aux États-Unis, en s'étendant, vers l'est, depuis le Minnesota jusqu'à l'État de New York et, vers le sud, jusqu'en Oklahoma, en Arkansas et au Tennessee (COSEPAC, 2021). Les sous-populations indigènes de chicots féviers en Ontario sont principalement confinées aux comtés d'Essex, de Chatham-Kent, de Lambton et de Middlesex. Les sous-populations indigènes en Ontario représentent environ 3 % de son aire de répartition mondiale.

Le chicot févier est le rare composant de peuplements forestiers naturels et il est rarement abondant au sein de son aire de répartition. On estime que le nombre d'individus matures, appartenant aux 34 populations indigènes existantes de cette espèce en Ontario, est compris entre 429 et 527. Le nombre de chicots féviers matures en Ontario est stable et pourrait augmenter quand on tient compte des composants manipulés de sa population. Les menaces principales pour cette espèce en Ontario sont les incendies et la suppression des incendies, les espèces indigènes problématiques, les tempêtes et les inondations et les autres modifications de l'écosystème.

Comme cela est indiqué ci-dessus, le chicot févier est classé dans la catégorie des espèces menacées dans son aire de répartition indigène en Ontario qui englobe les comtés d'Elgin, d'Essex, de Lambton, de Middlesex, de Norfolk et d'Oxford et la municipalité de Chatham-Kent, conformément au critère D1. Aucun facteur de modification de la situation n'a été appliqué. Entre 429 et 527 individus matures connus sont présents dans l'aire de répartition indigène de cette espèce en Ontario.

Le chicot févier est classé dans la catégorie des espèces non en péril dans toutes les autres administrations en Ontario, comme plus de 1 000 individus sont connus en Ontario si on tient compte des spécimens plantés.

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Executive summary

Kentucky Coffee-tree (*Gymnocladus dioicus*) is a moderate-sized tree, which can grow to 15-25 metres in height. This species can live for more than 100 years and reaches sexual maturity at 25-50 years of age. Kentucky Coffee-tree occurs in the United States from Minnesota east to New York and south to Oklahoma, Arkansas, and Tennessee (COSEWIC 2021). Native sub-populations of Kentucky Coffee-tree in Ontario are primarily restricted to Essex, Chatham-Kent, Lambton, and Middlesex counties. The extent of native sub-populations in Ontario represents approximately 3% of the global range of Kentucky Coffee-tree.

Kentucky Coffee-tree is a rare component of naturally occurring forest stands and is seldom abundant throughout its range. It is estimated that 429-527 mature individuals occur within 34 extent native sub-populations of this species in Ontario. The number of mature Kentucky Coffee-tree in Ontario is stable, and may be increasing when manipulated population components are considered. Primary threats to this species in Ontario include fire and fire suppression, problematic native species at diseases, storms and flooding and other ecosystem modifications.

Kentucky Coffee-tree is classified as Threatened in its native Ontario range, which includes Elgin, Essex, Lambton, Middlesex, Norfolk and Oxford Counties and the Municipality of Chatham-Kent, based on meeting criterion D1. No status modifiers have been applied. Between 429 and 527 known mature individuals occur in the native range of this species in Ontario.

Kentucky Coffee-tree is classified as Not at Risk in all other jurisdictions in Ontario, as more than 1000 individuals are known in Ontario when considering planted specimens.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Kentucky Coffee-tree (*Gymnocladus dioicus*) is recognized as a distinct taxon with no known subspecies (COSEWIC 2021). Genetic analysis to date has suggested that Kentucky Coffee-tree has high genetic similarity through much of its North American range (COSEWIC 2021).

1.1.2. Designatable units

Kentucky Coffee-tree populations in Canada are considered to represent a single designatable unit (COSEWIC 2021).

1.1.3. Native status

Kentucky Coffee-tree is native to Ontario, with numerous historic records and observations (COSEWIC 2021). Both native and planted occurrences of this species can be found in Ontario.

1.1.4. Occurrence

Kentucky Coffee-tree occurs in Ontario with many recent observations.

1.2. Eligibility results

Kentucky Coffee-tree (*Gymnocladus dioicus*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 1984)
- IUCN: Vulnerable (2016)
- NRANK Canada: N2
- COSEWIC: Threatened (May 2021)
- SARA: Threatened (Schedule 1)
- ESA 2007: Threatened (2008)
- SRANK: S2 (2021)

2.2. Distribution in Ontario

Native sub-populations of Kentucky Coffee-tree are restricted to southwestern Ontario, particularly Essex, Chatham-Kent, Lambton, and Middlesex counties. The extent of native sub-populations in Ontario represents approximately 3% of the global range of Kentucky Coffee-tree (COSEWIC 2021). Extirpated sub-populations previously occurred in Oxford and Norfolk counties (Environment Canada 2014), as well as Elgin County (MECP 2018).

In addition to the native sub-populations that occur in southwest Ontario, Kentucky Coffee-tree has been introduced throughout southern Ontario. Planted individuals have been reported throughout the Mixedwood Plains Ecozone (Ecoregions 6E and 7E), as far north and east as Ottawa.

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Kentucky Coffee-tree occurs in the United States from Minnesota east to New York and south to Oklahoma, Arkansas, and Tennessee (COSEWIC 2021). The status of this species varies throughout its distribution in the United States, ranging from Endangered in New York to apparently secure in Pennsylvania and through many of the central and southern states. Although no detailed assessments have been completed, Carstens and Schmitz (2017) reports that this species is generally rare throughout its native distribution in the United States and ecological conditions allowing this species to persistence may be declining.

Native sub-populations of Kentucky Coffee-tree in southern Ontario occupy North American Terrestrial Ecoregion 8.1 (Mixed Wood Plains). This Ecoregion generally extend into New York, Pennsylvania, Michigan and Ohio, and extents west into Iowa and Minnesota. The distribution of this this species throughout Ecoregion 8.1 is considered to represent the BBRGR for Kentucky Coffee-tree.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

| Adjacent Jurisdictions | Biologically Relevant to Ontario (n/a, yes, no) | Condition | Notes & Sources |
|-------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------|
| Quebec | N/A | | |
| Manitoba | N/A | | |
| Michigan | Yes | S3S4 | (NatureServe 2021) |
| Minnesota | Yes | S3, listed as special concern in Minnesota. | (Minnesota DNR 2021; NatureServe 2020) |
| Nunavut | N/A | | |
| New York | Yes | S1, listed as Endangered in New York. | (Young 2020) |
| Ohio | Yes | SNR, unknown if populations are currently stable, increasing, or declining | (NatureServe 2021) |
| Pennsylvania | Yes | S4, unknown whether populations are currently stable, increasing, or declining | (NatureServe 2021) |
| Wisconsin | Yes | S2, listed as special concern in Wisconsin. | (NatureServe 2021; Wisconsin DNR 2021) |
| Indiana | Yes | SNR, unknown if populations are currently stable, increasing, or declining | (NatureServe 2021) |
| Illinois | Yes | SNR, unknown if populations are currently stable, increasing, or declining | (NatureServe 2021) |
| Iowa | Yes | S4, unknown whether populations are currently stable, increasing, or declining | (NatureServe 2021) |

2.4. Ontario conservation responsibility

COSEWIC (2021) estimates that approximately 3% of the global range of Kentucky Coffee-tree occurs in Ontario. This estimate is based on the extent of native sub-populations in Ontario. With the inclusion of introduced individuals, the proportion of global range in Ontario will increase slightly. Ontario does not have a significant conservation responsibility for this species.

2.5. Direct threats

Currently, the most significant threats facing Kentucky Coffee-tree sub-populations in Ontario are attributed to fire suppression (High-Medium impact), high densities of cormorant nesting on Lake Erie islands (Medium impact), and the possibility of prolonged flooding in sub-populations on islands or at shorelines of lakes Erie and St. Clair (Medium impact) (COSEWIC 2021).

Alteration of the fire regime, through fire suppression, can contribute to forest succession leading toward closed-canopy conditions not optimal for Kentucky Coffee-tree growth (COSEWIC 2021). Increased canopy closure can prevent seed establishment and impair ramet growth (White and Oldham 2000; Environment Canada 2014).

Hebert et al. (2005) reported that the large population of Double-crested Cormorant in the western basin of Lake Erie threatens some island sub-populations, primarily due to defoliation from nesting and roosting, as well as acidification of soils from ammonium-rich guano.

Kentucky Coffee-trees have been shown to be very susceptible to mortality from heavy and prolonged flooding (COSEWIC 2021), and the species is only capable of withstanding infrequent and short duration flooding (McClain and Jackson 1980). High Lake Erie water levels in recent years may cause further mortality at several locations along shorelines associated with Lake Erie (COSEWIC 2021).

These, along with several lesser threats associated with Other ecosystem modifications (Medium-Low impact), Droughts (Low impact), Utility & service lines (Low impact), Roads & railroads (Low impact) and Logging and wood harvesting (Low impact) resulted in COSEWIC assigning an overall threat impact as High (COSEWIC 2021).

2.6. Specialized life history or habitat use characteristics

Kentucky Coffee-tree is a rare component of naturally-occurring forest stands (USDA 2007) and is seldom abundant throughout its range (COSEWIC 2021). Kentucky Coffee-tree mainly occurs in rich floodplain forests and edges of marshes in Ontario, although it can occur in various types of soil and topography (COSEWIC 2021). Limbird et al. (1980) described this species as inhabiting well-drained sites, which was also reported by Schmitz and Carstens (2018). This species is shade-intolerant and favours habitats that are susceptible to occasional flooding, which limits canopy closure by competing species (COSEWIC 2021).

Kentucky Coffee-tree can live more than 100 years, reaching sexual maturity at 25-50 years of age. The species is usually dioecious, with male and female flowers occurring on separate trees (Environment Canada 2014). Often male and female trees are not near enough to cross-pollinate, and therefore reproduction occurs only rarely by seed (COSEWIC 2021). This species has been documented to spread mainly by root suckers (COSEWIC 2021).

As of 2020, only seven sub-populations are known or suspected to have sexual reproduction (COSEWIC 2021). Kentucky Coffee-tree seeds can remain in pods for several years, until being released after decay. Natural seed germination rates were reported to be <5%, occurring only after the hard seed coat is broken. Since the Kentucky Coffee-tree seeds are toxic to wildlife, natural long-distance dispersal of Kentucky Coffee-tree relies primarily on the flow of water in watercourses or ditches to translocate seeds downstream (COSEWIC 2021). Although seed dispersal is thought to be the primary method of dispersal, the low buoyancy of seeds and pods limits the success of this dispersal method (Environmental Canada 2014).

Kentucky Coffee-tree is a hardy tree that is not generally vulnerable to serious disease or insect pests (Waldron 2003). This species is also frequently planted as an ornamental tree. While it is believed that local seed sources/stock have been used for some plantings in Canada, the genetic sources of these are often unknown and it is likely that material from outside of the species' Canadian range has been used (COSEWIC 2021). Despite apparently low genetic diversity across the North American range (COSEWIC 2021), the possibility remains that native Canadian genotypes can be altered via introductions, potentially resulting in phenotypic changes (e.g., cold tolerance) (COSEWIC 2021).

2.7. Existing Conservation and Recovery Actions

A Recovery Strategy for Kentucky Coffee-tree has been adopted for Ontario (OMNR 2017) and a Government Response Statement produced (MECP 2018). The focus of recovery efforts in Ontario are targeted to native, extant populations of Kentucky Coffee-tree, and primarily those in natural settings. Subsequently, the Recovery Strategy for Kentucky Coffee-tree (OMNR 2017) indicates that the population and distribution objectives for the Kentucky Coffee-tree in Ontario are to:

- maintain extant native populations within natural settings at their current abundance and distribution;
- augment extant single-sex native populations (i.e., populations that are not sexually-reproducing) occurring within natural settings to attempt to establish sexually-reproducing populations, if biologically and technically feasible, and;
- maintain the remaining extant native populations that occur in landscaped or agricultural settings either *in situ* or through their incorporation into, or use in the establishment of, populations in natural settings.

To assist with implementing the objectives of the Recovery Strategy, a Government Response Statement has been prepared (MECP 2018). This response statement indicates that recovery efforts will be focused on naturally occurring populations or

those populations previously established for restoration or recovery purposes within the species' natural range (MECP 2018). MECP (2018) indicates that actions to be implemented by the government of Ontario include:

- Continue to monitor and manage East Sister Island Provincial Park in a manner consistent with the park management plan; including monitoring of Kentucky Coffee-tree populations and potential threats (e.g., impact of Double-crested Cormorants) and determining whether specific management actions are necessary.
- Explore taking appropriate management actions in accordance with provincial policy direction on cormorants to support protection and recovery for Kentucky Coffee-tree.
- Collaborate with federal partners, such as Parks Canada, Environment and Climate Change Canada and Canadian Wildlife Service to implement protection and recovery actions for Kentucky Coffee-tree on federal lands, including Middle Island.
- For populations that occur on Pelee Island, explore opportunities to work collaboratively with the Township of Pelee, including the Pelee Island Environmental Advisory Committee, the federal government and local partners to integrate approaches to stewardship, implement recovery actions and explore integrated approaches to managing species at risk.
- Continue to implement the Ontario Invasive Species Strategic Plan (2012) to address the invasive species (e.g., Dog Strangling Vine, Garlic Mustard) that threaten Kentucky Coffee-tree.
- Continue to implement Ontario's Invasive Species Act to control the spread of invasive species (i.e., Dog Strangling Vine) that threaten Kentucky Coffee-tree by restricting the importation, deposition, release, breeding/growing, buying, selling, leasing or trading of Dog Strangling Vine.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Kentucky Coffee-tree data to Ontario's central repository through the citizen science projects that they receive data from (i.e., iNaturalist) and directly through the Natural Heritage Information Centre.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario.
- Continue to protect Kentucky Coffee-tree and its habitat through the ESA.
- Support conservation, agency, municipal and industry partners, and Indigenous communities and organizations to undertake activities to protect and recover Kentucky Coffee-tree. Support will be provided where appropriate through funding, agreements, permits (including conditions) and/or advisory services.
- Encourage collaboration, and establish and communicate annual priority actions for government support in order to reduce duplication of efforts.

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

3.1.1. Criterion A – Decline in total number of mature individuals

Not applicable. No declines are known among native sub-populations.

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Not applicable. EOO (7,205 km²) and IAO (384 km²) in native range meets threshold criteria for Endangered and Threatened, respectively, and there has been a decline in EOO and quality of habitat in native range. However, there are more than 10 sub-populations of this species in Ontario and no extreme fluctuations have occurred.

3.1.3. Criterion C – Small and declining number of mature individuals

Not applicable. Although there are fewer than 2500 mature individuals within the native range and there are no sub-populations with more than 250 mature individuals (both satisfying the criteria for Endangered), there has been no decline in mature individuals.

3.1.4. Criterion D – Very small or restricted total population

Threatened in native range. Meets Criteria D1. 429-527 known mature individuals in native range.

Not applicable outside of native range. More than 1000 individuals known in Ontario when considering planted specimens.

3.1.5. Criterion E – Quantitative analysis

Not applicable. No quantitative analysis has been completed.

3.2. Application of Special Concern in Ontario

Not applicable.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply. The species is designated G5 and ranked as Vulnerable by IUCN, however Ontario contains only 3% of the global range.

3.3.2. Status modification based on level of risk in broader biologically relevant geographic range

Populations in adjacent jurisdictions of the BBGRR have status listings of S1-S4, with populations in Ohio, Indiana and Illinois listed as SNR (NatureServe 2021). Individuals in south and mid-west United States are genetically similar, however may not have the same cold weather adaptations as individuals in Ontario and are therefore not considered part of the BBRGR. Because this species is generally considered to be rare in adjacent jurisdictions considered part of the BBRGR, may be experiencing a reduction in suitable ecological conditions in the United States and is designated as Endangered in New York and Special Concern in Minnesota, no status modifiers based on BBRGR are recommended.

3.3.3. Rescue Effect

Natural migration of seed or root fragments from adjacent states is unlikely. The only known mode of contemporary natural dispersal is flowing water (Zaya and Howe 2009). While sufficient suitable habitat exists in Canada, it is improbable that seed or root fragments from the United States population could reach these habitats. No modifiers based on rescue effect are recommended.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Applicable to individuals outside of native Ontario range.

4. Summary of Ontario status

Kentucky Coffee-tree (*Gymnocladus dioica*) is classified as Threatened in Elgin, Essex, Lambton, Middlesex, Norfolk and Oxford Counties and the Municipality of Chatham-Kent based on meeting criterion D1. Kentucky Coffee-tree is classified as Not at Risk in all other jurisdictions in Ontario.

The status of this species in Elgin, Essex, Lambton, Middlesex, Norfolk and Oxford Counties and the Municipality of Chatham-Kent is consistent with the definition of Threatened under the Endangered Species Act, 2007.

5. Information sources

Carstens, J.D. and A.P. Schmitz. 2017. Kentucky coffeetree, *Gymnocladus dioicus* (L.) K. Koch: Current abundance in nature and prospective persistence. In: Snieszko, Richard A.; Man, Gary; Hipkins, Valerie; Woeste, Keith; Gwaze, David; Kliejunas, John T.; McTeague, Brianna A., tech. cords. 2017. Gene conservation of tree species—banking on the future. Proceedings of a workshop. Gen. Tech. Rep. PNW-GTR-963. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. p. 92.

COSEWIC. 2021. IN PRESS. COSEWIC assessment and status report on the Kentucky Coffee-tree *Gymnocladus dioicus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 43 pp.

Environment Canada. 2014. Recovery Strategy for the Kentucky Coffee-tree (*Gymnocladus dioicus*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vi + 36 pp.

Hebert, C. E., J. Duffe, D.V.C. Weseloh, E.M.T. Senese, and G.D. Haffner. 2005. Unique island habitat may be threatened by Double-crested Cormorants. *Journal of Wildlife Management* 69(1):68-76.

Limbird, A., E. Hamilton and D. Preston. 1980. Soil-site characteristics of Kentucky coffeetree (*Gymnocladus dioica*) communities near Lake Erie. *Canadian Field-Naturalist* 94(2):139-147

Michigan Natural Features Inventory. Undated.
<https://mnfi.anr.msu.edu/species/plants>. Accessed September 21, 2021

Ministry of the Environment, Conservation and Parks. 2018. Kentucky Coffee-tree Government Response Statement. 10pp.

Minnesota DNR. 2021. Minnesota Rare Species Guide.
<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDFAB1X010>. Accessed September 20, 2021.

Ontario Ministry of Natural Resources and Forestry. 2017. Recovery Strategy for the Kentucky Coffee-tree (*Gymnocladus dioicus*) in Ontario. Ontario Recovery Strategy Series. Prepared by the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. v + 6 pp. + Appendix

Schmitz, A. and J. Carstens. 2018. Exploring the Native Range of Kentucky Coffee-tree. *Arnoldia* 76(1):2-16.

Waldron, G. 2003. *Trees of the Carolinian Forest*. Boston Mills Press, Erin, Ontario. 275 pp.

Wisconsin DNR. 2021. Wisconsin's rare plants.
<https://dnr.wi.gov/topic/EndangeredResources/Plants.asp?mode=detail&SpecCode=PDFAB1X010>. Accessed September 20, 2021.

White, D.J. and M.J. Oldham. 2000. Update COSEWIC status report on the Kentucky coffee-tree, *Gymnocladus dioicus* in Canada, in COSEWIC assessment and update status report on the Kentucky Coffee-tree *Gymnocladus dioica*. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-11 pp.

Young, S.J. 2020. New York Rare Plant Status Lists November 2020. Albany, NY.

Appendix 1: Technical summary for Ontario

Species: Kentucky Coffee-tree (*Gymnocladus dioicus*)

Demographic information

| Demographic attribute | Value |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years. | 40 years |
| Is there an observed, inferred, or projected continuing decline in number of mature individuals? | No |
| Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations. | Unknown |
| Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations. | Unknown |
| Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations. | Unknown |
| Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future. | Unknown |
| Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased? | a. Unknown, but possible b. Yes c. No. In native range |
| Are there extreme fluctuations in number of mature individuals? | No |

Extent and occupancy information in Ontario

| Extent and occupancy attributes | Value |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i> | 7,205 km ² in native Ontario range |
| Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i> | 384 km ² in native Ontario range |
| Is the total population severely fragmented? i.e., is >50% of its total area of occupancy in habitat patches that are: (a) smaller than would be required to support a viable population, and | a. No b. Yes |

| Extent and occupancy attributes | Value |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| (b) separated from other habitat patches by a distance larger than the species can be expected to disperse? | |
| Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i> | 28-35 in native range. |
| Number of NHIC Element Occurrences <i>Request data from MNRF.</i> | 2717 (linked to EO) 3136 total records |
| Is there an observed, inferred, or projected continuing decline in extent of occurrence? | Yes - in native range No - when considering all records |
| Is there an observed, inferred, or projected continuing decline in index of area of occupancy? | No |
| Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs? | No |
| Is there an observed, inferred, or projected continuing decline in number of locations? | No |
| Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat? | No |
| Are there extreme fluctuations in number of populations? | Yes. In native range |
| Are there extreme fluctuations in number of locations? | No |
| Are there extreme fluctuations in extent of occurrence? | No |
| Are there extreme fluctuations in index of area of occupancy? | No |

Number of mature individuals in each sub-population or total population (if known)

| Sub-population | Number of mature individuals |
|--------------------------------------------|-----------------------------------------|
| A.W. Campbell CA | 1-4 |
| Bear Creek, Avonry, Sombra Township | 2 |
| Bear Creek, Mitchell's Bay, Dover Township | 2 |
| Cairngorm, Middlesex | (not included in quantitative criteria) |
| Canard River Floodplain, Anderdon Township | 25 |
| Canard River, LaSalle | 1 |
| Comber, Tilbury West Township | 0 (none mature) |
| Crawford's Woods, Dover Township | 13-15 |
| East Sister Island, Lake Erie | 45-65 |
| Essex, Maidstone Township | 0 (none mature) |
| Florence, Zone / Dawn Township | 2 |

| | |
|-------------------------------------------------------|-----------------------------------------|
| Grey Tract, Brooke / Mosa Township | 16 |
| Harrow, Colchester Township | 42 |
| Highway 40, Dover Township | 1 |
| Middle Island, Lake Erie | 20-25 |
| Middle Sister Island, Lake Erie | 0-1 |
| North Harbour Island, Lake Erie | 3 |
| Paquette and Lukerville, Anderdon / Sandwich Township | 0 (none mature) |
| Pelee Island, Lake Erie | 7 |
| Pelton, Sandwich Township | 7 |
| Petrolia, Enniskillen Township | 42 |
| Point Pelee National Park | 8-10 |
| Puce River, Maidstone Township | 0-6 |
| Saint Joachim, Lakeshore | 30-50 |
| Shetland Kentucky Coffee-tree Woods, Zone Township | 43 |
| Strathroy CA | (not included in quantitative criteria) |
| Sydenham River, Alvinston, Brooke Township | 20 |
| Sydenham River, Dresden, Camden Township | 20-28 |
| Sydenham River, Florence, Euphemia Township | 6 |
| Sydenham River, Wallaceburg, Sombra Township | 2 |
| Texas Road, Anderdon Township | 0 (none mature) |
| Walpole Island First Nation, Population #1 | 25-30 |
| Walpole Island First Nation, Population #2 | 20 |
| Wilkesport, Sombra Township | 26-52 |
| Total | 429-527 |

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculator was prepared for Kentucky Coffee-tree by COSEWIC (2021):

- i. Fire & fire suppression (IUCN 7.1) (High-Medium impact)
- ii. Problematic native species/diseases (IUCN 8.2) (Medium impact)
- iii. Storms and flooding (IUCN 11.4) (Medium impact)

- iv. Other ecosystem modifications (IUCN 7.3) (Medium-Low impact)
- v. Droughts (IUCN 11.2) (Low impact)
- vi. Utility & service lines (IUCN 4.2) (Low impact)
- vii. Roads & railroads (IUCN 4.1) (Low impact)
- viii. Logging and wood harvesting (IUCN 5.3) (Low impact)

Rescue effect

| Rescue effect attribute | Value |
|------------------------------------------------------------------------------------------------------------|------------------------------|
| Does the broader biologically relevant geographic range for this species extend beyond Ontario? | Yes |
| Status of outside population(s) most likely to provide immigrants to Ontario | Michigan (S3S4), Ohio (SNR) |
| Is immigration of individuals and/or propagules between Ontario and outside populations known or possible? | Possible |
| Would immigrants be adapted to survive in Ontario? | Yes |
| Is there sufficient suitable habitat for immigrants in Ontario? | Yes |
| Are conditions deteriorating in Ontario? | Yes – in native range |
| Is the species of conservation concern in bordering jurisdictions? | Yes – Endangered in New York |
| Is the Ontario population considered to be a sink? | No |
| Is rescue from outside populations likely? | Not naturally |

Sensitive species

This species is not data sensitive.

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada
COSSARO: Committee on the Status of Species at Risk in Ontario
ESA: Endangered Species Act
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
MNRF: Ministry of Natural Resources and Forestry
NHIC: Natural Heritage Information Centre
NNR: Unranked
NRANK: National conservation status assessment
SARA: Species at Risk Act
SNR: unranked
SRANK: subnational conservation status assessment
S1: Critically Imperiled
S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario