

COSSARO Candidate Species at Risk Evaluation
for
Peregrine Falcon (*Falco peregrinus*)

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

Assessed by COSSARO as SPECIAL CONCERN

December 2011

Final

Le **Faucon pèlerin** (*Falco peregrinus*) est un faucon cosmopolite de taille moyenne dont la population a connu une baisse importante tant en distribution qu'en abondance sur l'ensemble de son aire de répartition en Amérique du Nord, au Canada et en Ontario au milieu du 20^e siècle. Le Faucon pèlerin n'existait plus en Ontario comme espèce nicheuse du milieu des années 1960 jusqu'au milieu des années 1980. L'interdiction de l'utilisation du DDT en Amérique du Nord ainsi que les efforts de réintroduction comme la libération en Ontario et ailleurs de jeunes oiseaux élevés en captivité a permis une hausse de la population partout en Amérique du Nord. La population de l'Ontario est passée de 0 en 1985 à un minimum de 119 territoires en 2010, 50 de ces territoires produisant des oisillons. Au moins 140 oisillons ont pris leur premier envol en 2010, le niveau de productivité le plus élevé jamais recensé. Un nombre considérable de sites de nidification le long des falaises ont été réoccupés dans le Nord de l'Ontario et de nouveaux habitats ont été colonisés dans les régions urbaines du sud de la province. La très grande majorité (94 p. 100) des sites de nidifications le long des falaises historiquement documentées en Ontario restent inoccupés, la plupart dans le centre et le sud-est de la province. Il subsiste des préoccupations à propos de menaces, notamment l'effet des produits chimiques sur l'environnement et les effets potentiels de la récolte à des fins de fauconnerie aux États-Unis. Le statut de l'espèce en Ontario a été ramené d'espèce en voie de disparition à menacer en 2006. Compte tenu des menaces persistantes, de la population relativement faible en Ontario et de la forte proportion de son aire de répartition historique restant inutilisée, le statut d'**espèce préoccupante** est approprié.

Cette publication hautement spécialisée, COSSARO Evaluation for Peregrine Falcon 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 – *Falco peregrinus* G4; (last reviewed November 2000; NatureServe 2011)

NRANK (Canada) – N3N N4B; *F.p. anatum* N3B; *F.p. tundrius* N3B (NatureServe 2011)

COSEWIC – *F.p. anatum/ tundrius* – Special Concern (reassigned April 2007)
(COSEWIC 2011)

SARA – *F.p. anatum* Threatened; *F.p. tundrius* Special Concern (Environment Canada 2011)

ESA 2007 – Threatened (Downlisted from Endangered July 1 2006)

SRANK (Ontario) – S3 (Don Sutherland, pers. comm., Nov. 1 2011)

Distribution in Ontario

The Peregrine Falcon was originally sparsely distributed throughout the Great Lakes watershed from northwestern Ontario south to the Bruce Peninsula and Niagara Escarpment, and east of Georgian Bay through southcentral and eastern Ontario. The population is currently distributed from western Lake Superior and Lake Nipigon, eastward along the north shore of lakes Superior and Huron to the Ottawa River valley, and south to southwestern Ontario, the north shore of Lake Ontario, and eastern Ontario. The area of southcentral Ontario east of Georgian Bay where many of the previously documented historical nesting sites were located has not yet been recolonized (Armstrong and Ratcliff 2010).

Distribution and status outside Ontario

A cosmopolitan species, the Peregrine Falcon (*Falco peregrinus*) breeds on every continent except Antarctica. In North America, it historically bred in every Canadian jurisdiction except Nunavut, insular Newfoundland and Prince Edward Island (COSEWIC 2007). It breeds from Alaska, across northern Canada, and in many lower 48 states south to northern Mexico. A long-distance migrant, the Peregrine Falcon mainly winters from the Caribbean and Central America to northern South America, although records as far south as Chile and Argentina are known. In recent decades, it has begun to overwinter and often establishes year-round territories in urban centres.

PART 2: Eligibility for Ontario status assessment

2.1 Application of eligibility criteria

Taxonomic Distinctness

Yes. Peregrine Falcon is recognized as a distinct species.

Designatable units

One Designatable Unit. Three North American subspecies have traditionally been recognized: the Eastern or American Peregrine Falcon (*F.p. anatum*), the Arctic-nesting Tundra Peregrine Falcon (*F.p. tundrius*) and Peale's Peregrine Falcon (*F.p. pealei*) nesting on the islands and along the shorelines off the west coast of B.C.

Analysis of historical (pre-population collapse) and current genetics of Peregrine Falcons in Canada indicate that there are only 2 identifiable genetic groups among historical peregrines: *pealei* and other peregrines. *Anatum* and *tundrius* subspecies were not distinguishable genetically (Brown et al. 2007), and are considered by COSEWIC (2007) as a single Designatable Unit. In Ontario, therefore, there is only one recognizable DU.

Only *anatum*-origin stock was released as part of the Canadian recovery program; however, 7 subspecies were released during the Midwest USA recovery program (COSEWIC 2007). The proportion of banded birds in Ontario originating from the USA has ranged from 35% (n= 23) in 2000 to 46% (n= 26) in 2005 to 21% (n= 14) in 2010 (Chikoski and Nyman 2011).

Native status in Ontario

Yes. *Falco peregrinus* is considered native to Ontario, and was first documented by Louis Agassiz in 1848. Historical breeding records are rare and no doubt incomplete; a total of 48 historical (suspected + confirmed pre-population collapse) cliff aeries have been documented (Ratcliff and Armstrong 2002).

Presence/absence

Present. As a result of the population collapse in the mid-20th century, the Peregrine Falcon was extirpated from the province in the early-1960's. As a result of a number of recovery efforts, the species first re-established as a breeding species in 1986 and has been both present annually and steadily increasing in numbers since that time.

2.2 Eligibility results

1. The putative taxon or DU is valid. Yes
2. The taxon or DU is native to Ontario. Yes. *Falco peregrinus* is native to Ontario. Only presumed *F.p. anatum* were re-introduced in Canada (Erickson et al. 1988), although a variety of subspecies were released as part of the USA recovery

program. Although *F.p. anatum* was originally recognized as the subspecies in Ontario, *F.p. anatum* and *F.p. tundrius* cannot be distinguished genetically (Brown et al. 2007).

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

The global rank of the Peregrine Falcon is G4. It has been found breeding on all continents except Antarctica. Populations have been recovering and increasing or stable over much of North America where declines previously occurred.

2. Global decline

Not in any category

Populations are stable or increasing globally. Populations increasing in northern Eurasia (NatureServe 2011). Both the *tundrius* and *anatum* subspecies have been delisted by the U.S. Fish & Wildlife Service (NatureServe 2011). The Canadian population has increased in most areas with good survey coverage, with a "tremendous increase between 2000 and 2005 in some areas" (COSEWIC 2007). There are lower densities in North America compared to Europe (White et al. 2002). There has been a short-term (since the 1980s) increasing global population trend of 10-25% (NatureServe 2011).

3. Northeastern North America Ranks

Endangered

Ranked as S1, S2 or SX in 21 of 23 (91%) northeastern North American jurisdictions where S-ranked (Appendix 1). It is ranked S3 in Ontario and Quebec.

4. Northeastern North America Decline

Not in any category

Population is recovering and increasing in most jurisdictions, and is no longer in decline. The American (*anatum*) Peregrine Falcon was removed from the USA list of threatened and endangered wildlife in 1999. Populations in eastern North America have recovered substantially from essentially being extirpated east of the Mississippi River by the 1960's; populations were reduced but not extirpated in western and northern North America. Population recovery has been widespread since DDT-prohibition in the 1970's and subsequent recovery programs such as captive rearing and releases. There has been a short-term (since the 1980s) increasing population trend globally of 10-25%

(NatureServe 2011), and populations appear to be stable or increasing in all northeastern North American jurisdictions.

5. Ontario occurrences

Special Concern

There are 49 extant EOs in the NHIC database, which has recently been updated (Don Sutherland, pers. comm.). The second Ontario Breeding Bird Atlas shows breeding evidence for Peregrine Falcon in 96 100-km² squares (Armstrong 2007). Breeding was confirmed in 68 (71%) of 96 squares. The 2010 province-wide Peregrine Falcon survey yielded 119 confirmed nesting territories, the highest ever recorded, including 71 confirmed nesting attempts (Chikoski and Nyman 2011). While this survey may have missed a small number of nests, there was considerable public profile to the survey, and the survey was designed to include all historical and current nesting sites, and high potential cliff habitat. It is thus unlikely that a significant number of nests were missed. Because these 3 measures are all developed by different criteria, they cannot be directly compared.

6. Ontario Decline

Not in any category

The number of Peregrine Falcon territories in Ontario has increased steadily and rapidly from 0 in 1985 to 3 in 1990, 15 in 1995, 53 in 2000, 78 in 2005 and 119 in 2010 (Fig. 1); 88% of the 2010 territories were associated with cliffs (Chikoski and Nyman 2011). The initiation of recovery in Ontario was considerably delayed in comparison with other eastern Canadian jurisdictions, but was also more dramatic. Ontario Breeding Bird Atlas data show a similarly dramatic increase from 3 squares with breeding evidence in the early 1980's to 96 squares with breeding evidence in the early 2000's (Armstrong 2007). The species was downlisted from Endangered to Threatened in Ontario in 2006. Although the 2010 Peregrine Survey indicated that the Ontario population consists of 119 territories (Chikoski and Nyman 2011), this is probably significantly fewer than the historical population. There are 48 confirmed or suspected historical breeding sites (Ratcliff and Armstrong 2002), most of them in southern and eastern Ontario. These historical sites are broadly recognized to be a significant underestimate of the original nesting population, as they are spatially biased towards southcentral and eastern Ontario where most of the early collectors, banders and falconers were based but not where the majority of high-quality habitat occurs. Of these 48 known historical sites, only 3 (Chikoski and Nyman 2011) or possibly 4 have been reoccupied, and 2 of those only recently. The vast majority of documented historical nesting sites (94%) are still unoccupied. Ontario's recovery has been more rapid and has occurred over a shorter timeframe than most other jurisdictions, having been underway for just 2½ decades. It's clear that the PEFA population is recovering, but it is also clear that the recovery is far from complete.

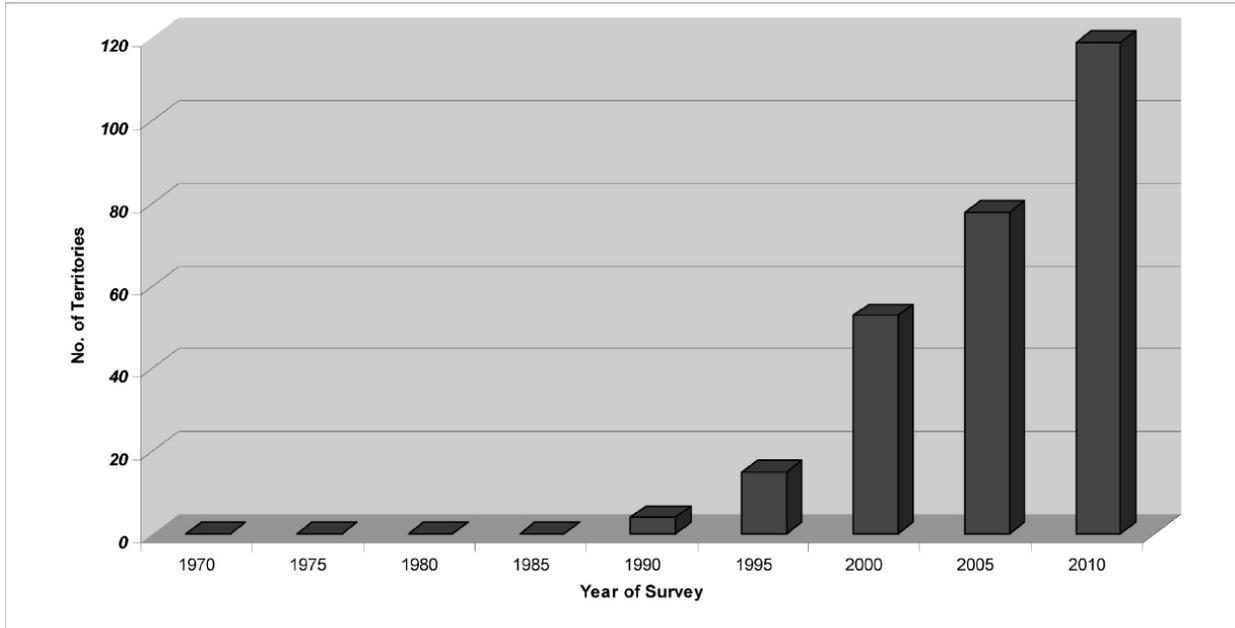


Figure 1. Trends in the number of confirmed Peregrine Falcon territories in Ontario based on 5-year surveys conducted from 1970 to 2010 (from Chikoski and Nyman 2011).

7. Ontario's Conservation Responsibility

Not in any category

The Ontario range represents much less than 10% of the global and North American range of this global species (NatureServe map 2011).

3.2 Application of secondary criteria (threats and vulnerability)

8. Population Sustainability

Not in any category

No evidence of reproductive or recruitment failure in Ontario. Annual natural recruitment in Ontario (140 in 2010 – Chikoski and Nyman 2011) now far exceeds the number of young released in the province during the peak of the release program (52). In 2011, 50 of 71 observed nests successfully fledged young, and productivity averaged 2.0 fledglings/nesting attempt and 2.8 fledglings/successful nest (Chikoski and Nyman 2011). Population modelling of Peregrine Falcons in the USA suggested that populations are robust enough to be self-sustaining with low levels of harvest for falconry purposes (Millsap and Allen 2006).

9. Lack of Regulatory Protection for Exploited Wild Populations

Not in any category

Protective legislation in Ontario includes the *Endangered Species Act, 2007* (ESA) (Peregrine Falcon is designated as Threatened under this act), and the Fish and Wildlife Conservation Act (designated as a specially protected bird [raptor]).

There is currently no known human exploitation of this species in Ontario, although there are ongoing but unsubstantiated concerns about the potential for illegal removal (poaching) of eggs from nests. No harvest of wild Peregrine Falcons is allowed in Ontario; however, the USA has endorsed a small sustainable harvest of free-flying migrant peregrines that could include Canadian and possibly Ontario migrants (Millsap and Allen 2006). Several other Canadian jurisdictions currently allow a small harvest from the wild for falconry. Ontario has proposed to allow capture and use of a small number of common wild raptors for use in falconry to hunt small game (Environmental Registry 2011); however, the proposed list of species does not include Peregrine Falcon.

10. Direct Threats

Special Concern

The provincial Recovery Strategy identified the following threats to the Peregrine Falcon in Ontario: environmental contamination, human disturbance, collisions with inanimate objects including urban buildings and wind energy facilities, human persecution, capture for falconry in other jurisdictions, habitat change or loss, and erratic weather effects (Ontario Peregrine Falcon Recovery Team 2010).

Despite the population recovery following the prohibition on DDT use in the USA and Canada, concerns remain about the effects of chemicals on the Peregrine Falcon. "Pesticide-caused reproductive failure now apparently is rare or absent in northern populations, though organochlorine levels in the environment are still high in some areas" (NatureServe 2011). Some "hot" eggs with high DDE residues have been documented in Alberta and there were still some concerns about eggshell thickness, although subsequently laid eggs appeared to have more normal levels (Court 1993). Concerns remain about ongoing DDT usage in Central and South America.

There is growing concern about the potential effects of polybrominated diphenyl ethers (PBDEs), a cosmopolitan and long-lasting chemical used as a fire retardant, on Peregrine Falcons and other birds of prey (Chen et al. 2007; Fernie and Letcher 2010). PBDEs are not expected to bioaccumulate readily because of their large molecular size, although they have been found in higher concentrations in wildlife associated with terrestrial ecosystems (Kim. Fernie pers. comm., 2011).

Avitrol (4-amino-pyridine) is a commercially available product used for chemical bird control, primarily to control Rock Pigeons (*Columba livia*). The OMNR and the Ministry of the Environment annually issue a voluntary "Pesticide Memorandum" requesting licensed pesticide applicators not to use this chemical in identified urban centres where Peregrine Falcons are known to nesting. Compliance is generally felt to be good. However, a small number of Peregrine Falcons that died as a result of building collisions showed trace levels of Avitrol in their carcass. It is speculated but not confirmed that even small amounts of this chemical may impair flying ability sufficiently to increase the probability of flight errors that result in building collisions.

Urban nesting pairs are generally more productive than cliff-nesting birds. However, bridge-nesting pairs are almost universally unsuccessful, due to the eyasses falling into the water and drowning upon fledging. Mortalities from building collisions also occur. The success of some birds in urban settings and its extensive use of Rock Pigeon as prey, suggest at least some members of the species are not overly sensitive to human activity.

The USA has allowed a small regulated harvest of free-flying Peregrines Falcons annually for falconry purposes (Millsap and Allen 2006). These could potentially include migrant birds from Ontario or elsewhere in Canada, based upon fall North American banding returns.

11. Specialized Life History or Habitat-use Characteristics

Special Concern

Although elsewhere in its range, the species is known to nest on the tundra or sloping river banks (White et al. 2002), all of the traditional nesting sites in Ontario are on cliffs, and the species is thus naturally restricted to and limited by the amount and suitability of cliff habitat. Most cliff habitat is ranked S3, provincially rare, in Ontario. In the past several decades the Peregrine Falcon has colonized rapidly into urban environments in Ontario and elsewhere, where it nests on tall buildings, smokestacks and bridges, and more recently into open pit mines. While urban birds appear to be acclimated to human activity and have chosen to nest in highly disturbed habitats, cliff-nesting birds have typically selected more remote nesting sites and are considered to be more sensitive to human disturbance. Two different populations with distinct distributions appear to nest in these two distinct habitats, based primarily on the habitat in which the birds were raised, with little movement between the two geographic/habitat areas.

3.3 COSSARO evaluation results

1. Criteria satisfied in each status category

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

Endangered 1/0
Threatened 0/0
Special concern 1/2

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

Endangered – 0
Threatened – 0
Special concern – 1

2. Data deficiency

No

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that Peregrine Falcon is Special Concern 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

Not in any category. Population has experienced a continual population increase over past 10 years and 3 generations (generation time of 4-6 years [COSEWIC 2007]. Population recovery has been underway for 25 years, and it has been more than 45 years since the historical collapse of the population).

Criterion B – small distribution range and decline or fluctuation

Not in any category. With broad extent of occurrence and even small home ranges exceeding 100 km² (White et al. 2002) and COSEWIC's use of an average of 500 km² (COSEWIC 2007), the area of occurrence in Ontario for 119 territories far exceeds the threshold for this criterion.

Criterion C – small and declining number of mature individuals

Not in any category. Meets criterion of <250 mature individuals, but does not meet either of the subsequent steps related to continuing decline.

Criterion D – Very Small or Restricted Total Population

Endangered. Meets Criterion D1 (Very small population or restricted distribution). Number of mature individuals in 2010 estimated to be < 250, i.e. 71 confirmed nesting attempts, 29 territorial pairs and 19 single territories (Chikoski and Nyman 2011, Ratcliff and Armstrong 2008) equates to a minimum of 219 mature individuals, with the additional possibility of missed sites and a surplus floating breeding population.

Criterion E – quantitative analysis

Not in any category. No published, peer-reviewed PVA available. Population surveys indicate a continuing population trend on a consistent positive trajectory (Chikoski and Nyman 2011).

Rescue effect

Yes. Rescue effect from adjacent USA and Canadian (particularly Quebec) jurisdictions possible and likely. The species is known to readily move several 100 km from natal sites, the population is well established and increasing in the Midwest USA to the south (Redig et al. 2010) and Quebec to the east (COSEWIC 2007), and there are a number of birds breeding in Ontario currently that were raised in other jurisdictions.

Special Concern Status

N/A.

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

Threatened – no

Special concern – no

2. Data deficiency

No. No indication that data are insufficient to arrive at a status determination.

3. Status Based on COSEWIC Evaluation Criteria

Although the COSEWIC criteria suggest a designation of Endangered, the high potential for rescue effect warrants a downgrading to Threatened. The application of COSEWIC evaluation criteria suggests that Peregrine Falcon 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 support a designation of Special Concern for Peregrine Falcon in Ontario, based upon northeastern North American ranks, number of Ontario populations, direct threats, and specialized habitat characteristics, while the COSEWIC criteria support a designation of Threatened, based upon a very small population (<250 mature individuals) and the potential for rescue effect. Since Ontario Peregrine Falcons are part of a considerably larger recovering eastern North American population, the weight the COSEWIC status assessment placed on the small population size within Ontario is unwarranted. Ontario's Peregrine Falcon population is still relatively small, historical range has not been fully recolonized and the provincial population can still be considered vulnerable. However, the Peregrine Falcon is definitely recovering, and its population is increasing and expanding its distribution. Given this, a status of Special Concern appears appropriate.

5.2 Summary of status evaluation

Peregrine Falcon is designated as Special Concern in Ontario.

Summary

The Peregrine Falcon (*Falco peregrinus*) is a cosmopolitan mid-sized falcon that underwent a dramatic decrease in distribution and abundance across its North American, Canadian and Ontario ranges in the mid-20th century. It was lost as a breeding species in Ontario from the mid-1960s until the mid-1980s. Prohibition on DDT use in North America, and sustained recovery efforts such as the release of captive-reared young in Ontario and elsewhere have resulted in increasing populations across North America. The Ontario population has expanded from 0 in 1985 to a minimum of 119 territories in 2010, with 50 territories producing young. At least 140 young were fledged in 2010, the highest productivity ever recorded. Considerable historical cliff-nesting habitat in northern Ontario has been reoccupied, and new habitat has been colonized in urban southern Ontario. The vast majority (94%) of the historically documented cliff-nesting sites in Ontario remain unoccupied, most of which are in central and southeastern Ontario. There are ongoing concerns about threats including the effects of chemicals in the environment and potential effects of USA harvest for falconry. The species' status in Ontario was downlisted from Endangered to Threatened in 2006. Given persistent threats, the relatively small Ontario population, and the large proportion of its historical range that remains uncolonized, a status of Special Concern is appropriate.

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2. Community and aboriginal traditional knowledge sources

3. Acknowledgements:

Appendix 1: Northeastern North America status rank and decline

Jurisdiction	Subnational Rank	Sources	Decline	Sources
CT	S1B	NatureServe 2011		
DE	S1N	NatureServe 2011		
IA	S1B	NatureServe 2011		
IL	S1	NatureServe 2011		
IN	S2B	NatureServe 2011		
KY	S1B , S3N	NatureServe 2011		
LB	SNR – Not ranked	NatureServe 2011		
MA	S2B S3N	NatureServe 2011		
MB	S1B	NatureServe 2011		
MD	S2B S3N	NatureServe 2011		
ME	S1S2N, S2B	NatureServe 2011		
MI	S1	NatureServe 2011		
MN	S2B	NatureServe 2011		
NB	SNRB - Not ranked	NatureServe 2011		
NF	Not present	NatureServe 2011		
NH	SNR	NatureServe 2011		
NJ	S1B , S1N	NatureServe 2011		
NS	SNRN – Not ranked	NatureServe 2011		
NY	S3B	NatureServe 2011		
OH	S1	NatureServe 2011		
ON	S3	NatureServe 2011		
PA	S1B S1N	NatureServe 2011		
PE	Not present	NatureServe 2011		
QC	S3/S4	NatureServe 2011		
RI	S1B	NatureServe 2011		
VA	S1B S2N	NatureServe 2011		
VT	S2B S2N	NatureServe 2011		
WV	S1B S2N	NatureServe 2011		
WI	S1S2B	NatureServe 2011		

Present and native in 27 of 29 northeastern North American jurisdictions

SRANK (B) or equivalent information available for 23 of 27 jurisdictions = 79%

S1, S2, SH, or SX in 21 of 23 = 91.3%