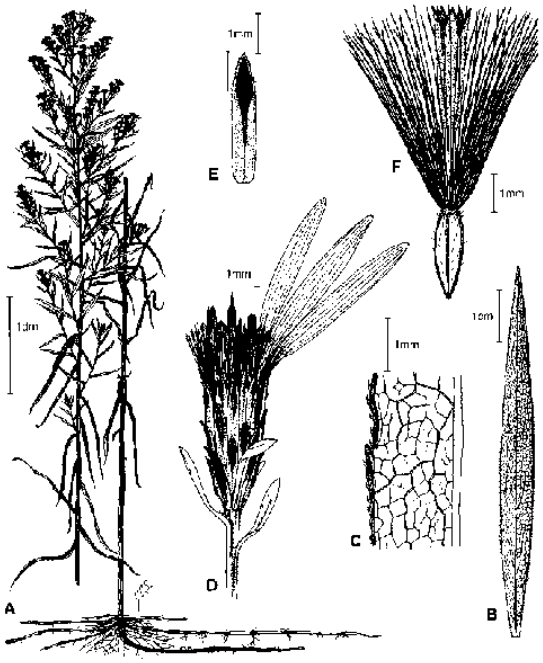
COSEWIC
Assessment and Status Report

on the

Willowleaf Aster
Symphyotrichum praealtum

in Canada



THREATENED
2003

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE IN
CANADA

COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

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Willowleaf aster *Symphyotrichum praealtum* was formerly listed by COSEWIC as willow aster *Symphyotrichum praealtum.*

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Willowleaf Aster — Illustration by Semple et al. (1996).

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COSEWIC
Assessment Summary

Assessment Summary – May 2003

Common name
Willowleaf aster

Scientific name
Symphyotrichum praealtum

Status
Threatened

Reason for designation
This is a geographically highly restricted species that has undergone range contraction and occurs mainly in fragmented remnant prairie habitats. There are few occurrences and ongoing risks from further habitat and population losses due to presence primarily in urbanized centres.

Occurrence
Ontario

Status history
Designated Special Concern in April 1999. Status re-examined and uplisted to Threatened in May 2003. Last assessment based on an existing status report.

COSEWIC
Executive Summary

Willowleaf Aster
Symphyotrichum praealtum

Species Information

Willowleaf aster is an herbaceous, rhizomatous, upright perennial with a relatively smooth and waxy stem growing to 1.5 m tall. The upper stem leaves are generally narrow, linear, with a few small teeth along the margins and lack leaf stalks; the lowermost leaves have usually shriveled and fallen off at the time of flowering. The inflorescence consists of a series of leafy flower clusters with the lowermost branches generally being the longest. The stalks of the flowering heads are moderately to densely hairy. The hairless, leaf-like bracts (phyllaries) surrounding the flower heads are borne in 4-6 strongly graduated series; each has a small, green, diamond-shaped zone towards the tip. The flower heads have 20-35 outer florets with pale blue-violet rays; the central yellow disc florets number 20-30 and become purple with age.

Distribution

Southwestern Ontario is the northeastern range limit of this species. It is found in Lambton, Essex and Middlesex Counties and the Municipality of Chatham-Kent.

Habitat

Over its total range, this aster is found in thickets, meadows and prairies, as well as in oak savannahs as found in the Windsor area and on Walpole Island.

Biology

Throughout its range in North America, the species comprises several varieties with varying numbers of chromosomes. The entity that is present in Ontario (var. *praealtum*) has double the normal set of chromosomes (2*n* = 32). Like other asters, var. *praealtum* is a facultative out-breeder. Self-fertilization is possible but typically occurs only at a low level. Thus, large colonies consisting of a single clone will only set a few seeds even though thousands of heads may have been in bloom during the season. This has a significant consequence for the long-term adaptability of the species in sites consisting of single clone populations.

Population Sizes and Trends

About 12 extant populations are known. The species is clonal and actual numbers of individuals are difficult to determine, but clone sizes range from one shoot to over 100 shoots. Three populations are known only from reports in the 1960s. At least one population has been extirpated. No trend information is available.

Limiting Factors and Threats

Most populations consist of scattered clones at the edge of woods, in woodland openings or along the banks of streams and ditches. Habitat loss due to construction or agriculture is the main threat to this species in Canada.

Special Significance of the Species

The species has no known unique economic or biological significance. In part, perhaps, due to its similarity to another more widespread aster of southern Ontario, no specific Aboriginal use has been found in the literature.

Existing Protection or Other Status Designations

A number of clonal populations occur in Ojibway Nature Center, Ojibway Prairie Provincial Nature Reserves and Tall-grass Heritage Park in the City of Windsor; these are protected. Other populations are on private property with no formal protection at all.

Summary of Status Report

Willowleaf aster is a highly localized species occurring in southwestern Ontario mainly in two areas of concentration around Windsor and Walpole Island. About 13 localities are known for this clonal species with perhaps a total of several thousand flowering stems. Risks to the species are posed by the nearness of some of its clones to roadsides and agricultural areas with potential impact from human activities.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fish, lepidopterans, molluscs, vascular plants, lichens, and mosses.

COSEWIC MEMBERSHIP

COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership), three nonjurisdictional members and the co-chairs of the species specialist groups. The committee meets to consider status reports on candidate species.

DEFINITIONS

Species	Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora.
Extinct (X)	A species that no longer exists.
Extirpated (XT)	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A species facing imminent extirpation or extinction.
Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)**	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)***	A species for which there is insufficient scientific information to support status designation.

* Formerly described as “Vulnerable” from 1990 to 1999, or “Rare” prior to 1990.
** Formerly described as “Not In Any Category”, or “No Designation Required.”
*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list.

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The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

COSEWIC Status Report

on the

Willowleaf Aster

Symphyotrichum praealtum

in Canada

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1999

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SPECIES INFORMATION

Name and Classification

Scientific Name:	*Symphyotrichum praealtum* (Poir.) Nesom
Bibliographic citation:	Phytologia 77: 289. 1994.
Type specimen:	not seen, location uncertain
Synonyms:	*Aster praealtus* Poir. Encyc. Suppl. 1: 493. 1810 *Aster salicifolius* Ait., Hort. Kew. Ed. 1. 3: 203. 1789. non Juss. ex Lam. (1789), non Nees (1818), non Richardson (1823). TYPE: "Nat. North America, cult. Mr. P. Miller " (Holotype: Hort. Kew, not seen). ?*Aster rigidulus* Desf., Cat. 122. 1815. non Nees (1818). TYPE: not seen. ?*Aster obliquus* Nees, Syn. Ast. 27. 1818. TYPE: not seen. *Aster subasper* Lindl. in Hook., Comp. Bot. Mag. 1: 97. 1835. *Aster praealtus* Poir. var. *subasper* (Lindl. in Hook.) Wieg., Rhodora 35: 24. 1933. *Symphyotrichum praealtum* (Poir.) Nesom var. *subasperum* (Lindl. in Hook.) Nesom, Phytologia 77: 290. 1994. TYPE: U.S.A. MISSOURI. St. Louis, 1831, Drummond 185 (Lectotype [Jones 1986]: K ! (Herb. Hook.); Isolectotype: P; possible Isolectotype: CGE !). *Aster coerulescens* DC, Prod. 5: 235. 1836. *Aster salicifolius* Lam. var. *coerulescens* (DC.) A. Gray, Synop. Fl. N. Amer. 1,2: 188. 1884. *Aster praealtus* Poir. var. *coerulescens* (DC.) A.G. Jones, Phytologia 55: 383. 1984. TYPE: U.S.A. TEXAS. Cammancheros Oriental, Dec. 1828, Berlandier 1885 (Holotype: G-DC !; Isotypes: BM !, G,G-DC, GH !, K !, MO, P(2) !). ?*Aster carneus* Nees, Syn. Ast. 26. 1818. TYPE: not seen. ?*Aster carneus* Torr. & Gray, Fl. N. Amer. 2: 133. 1841. in part. [attributed to Nees in protologue].
Common name:	Willowleaf Aster; willow aster
Family name:	Asteraceae, Compositae
Common family name:	Sunflower family, Aster family
Major plant group:	Angiosperm (dicot flowering plant)

Willowleaf aster, prior to acceptance of Nesom's name change, was commonly recognized as *Aster praealtus* Poir. Two varieties of willowleaf aster are recognized by Semple (1996); *S. praealtum* var. *praealtum* occurs widely throughout the central United States and extends into Canada whereas var. *angustior* is an eastern variety restricted mainly to the Appalachians in the USA and does not extend into Canada.

Description

The following comprehensive technical description is taken from Semple et al. (1996):

> Herbaceous perennials from herbaceous rhizomatous rootstocks. Stems erect, 1-15 dm tall, glabrate, somewhat glaucous, sparsely to moderately pubescent in lines in capitulescence. Lower stem leaves oblanceolate, sessile, serrate, deciduous by flowering. Upper stem leaves linear to elliptic-lanceolate, sessile, margins entire to sparsely serrate-ciliate, upper surface glabrate to sparsely short-scabrous, cuticle thick, undersurface glabrate, veins pronounced, most alveolae isodiametric; branch leaves similar, reduced. Capitulescence paniculiform, leafy, few to many heads. Peduncles moderately to densely pubescent; bracts many, foliaceous, narrowly elliptic to lanceolate. Involucres campanulate-turbinate, 4.0–6.0 mm high. Phyllaries in 4-6 strongly graduated series, glab rate, inner surface sparsely pubescent, diamond-shaped chlorophyllous zone small. Rays 20-35, 5-9 mm long, 1-1.7 mm wide, pale blue-violet. Disc corollas 20-30, 4-6 mm long, yellow becoming purple, somewhat ampliate, lobes 0.5-1.0 mm long. Achenes compressed obconic, 1(-2) ribs per side, sparsely strigose; single pappus whorl about equal to disc corolla. Chromosome numbers: 2*n*=32, [64]; several populations sampled in Ontario.

Willowleaf aster is distinguished by its smooth and somewhat waxy stems, its pale violet rays, and its leaves with pronounced veins on the lower surface which enclose isodiametric alveolae (Figure 1).

DISTRIBUTION

Global Range

The variety *praealtum,* which occurs in Canada, is common in the midwestern United States and extends northward to southwestern Ontario where it reaches its northeastern range limits. The eastern variety (var. *angustior*) is geographically separate from var. *praealtum* occurring only in the eastern United States (Figure 2).

Canadian Range

Within Canada, the species is found only in the Ontario counties of Lambton, Essex, Middlesex and the Municipality of Chatham-Kent with most of the localities concentrated in the Windsor area and on Walpole Island (Figure 3).

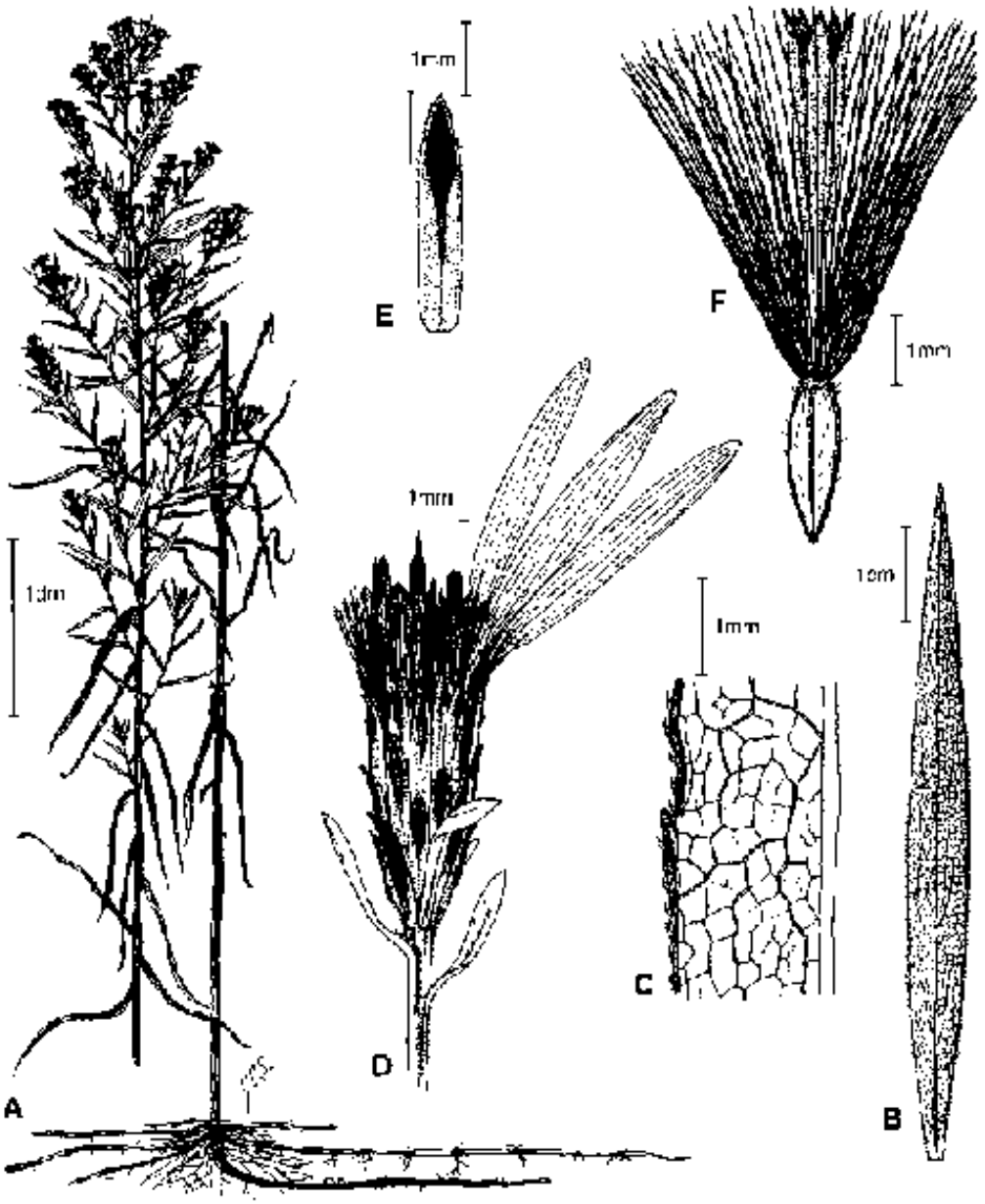

Figure 1. Morphology of willowleaf aster (*Symphyotrichum praealtum* var. *praealtum*) from Semple et al. (1996). A. Habit. B. Upper stem leaf with upper surface on left and lower surface on right. C. Branch leaf detail of mid portion enlarged to show alveolae on the underside. D. Head with only some florets drawn. E. Mid series phyllary with chlorophyllous zone dark. F. Mature disc floret achene with corolla attached.

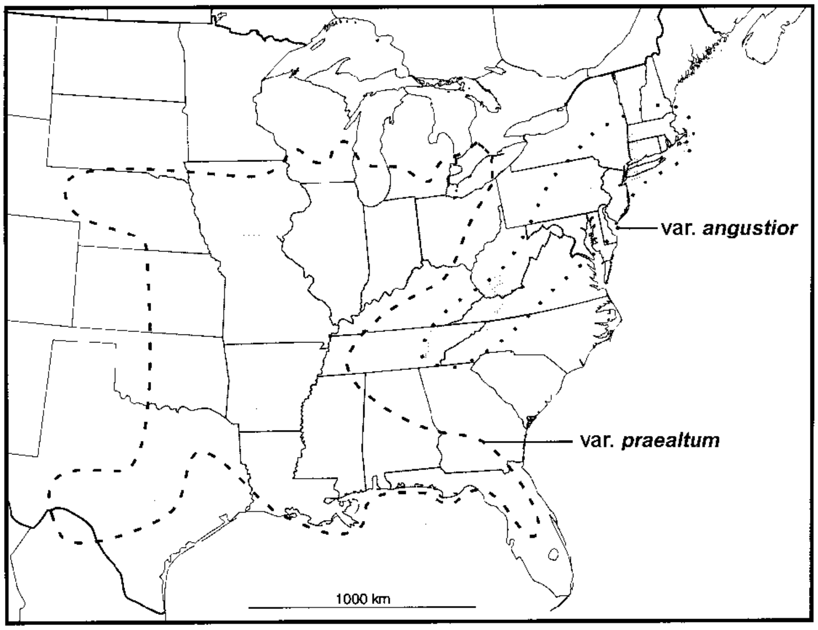

Figure 2. Range map of willowleaf aster in North America based on fieldwork, collections and the literature.

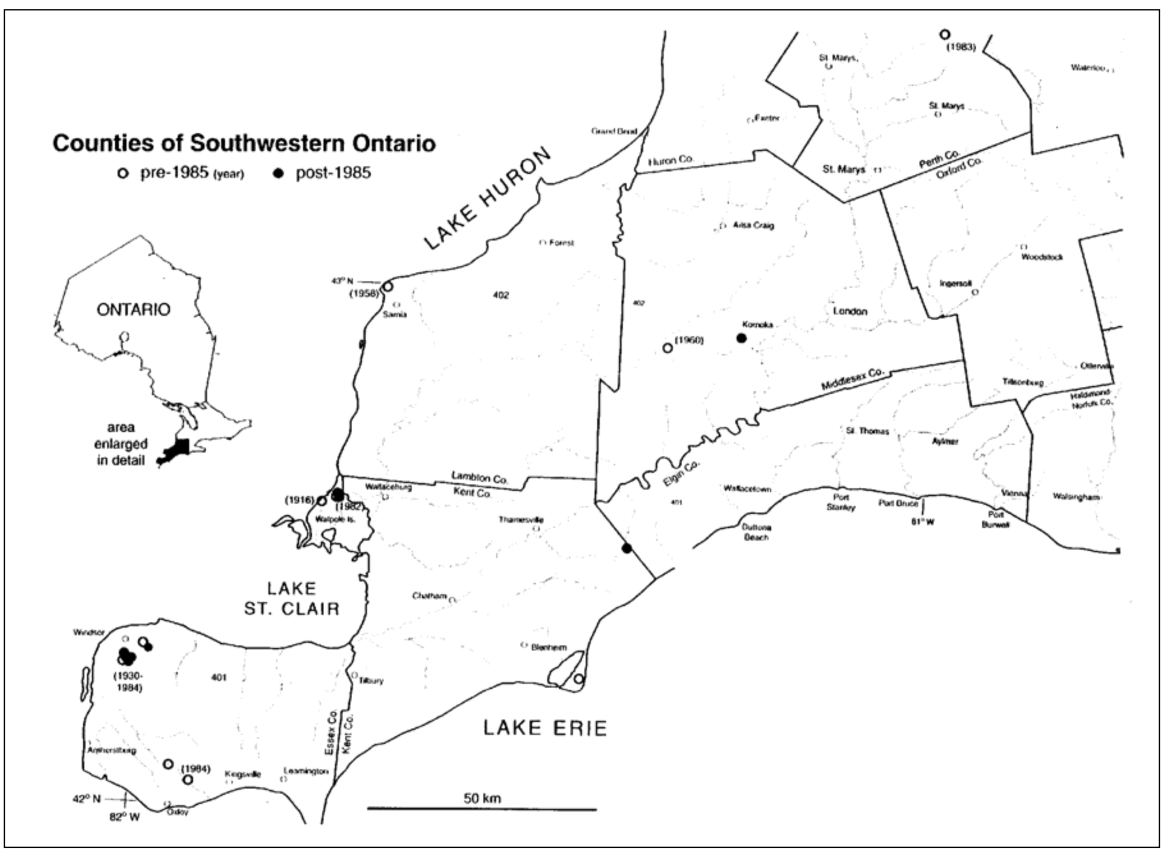

Figure 3. Distribution of willowleaf aster in Ontario based on fieldwork and collections.

HABITAT

Over its North American range this aster is found in thickets, meadows and prairies, as well as in oak savannahs as found in the Windsor area and on Walpole Island (see habitat photos, Figures 4 and 5). In Ontario it is also reported as found along railways, roadsides and old abandoned fields (pers. comm. Mike Oldham, Ontario NHIC, Peterborough, and Paul Pratt, Naturalist, Windsor Department of Parks and Recreation; July 2002). Although now found in a variety of open disturbed sites, its typical prairie habitats have been historically reduced and impacted through human disturbance.

Figure 4. Habitat of willowleaf aster population at City of Windsor - site 3.

Figure 5. Habitat of population willowleaf aster at City of Windsor – site 8.

Protection/Ownership

Some populations, such as those in the prairie complexes within Windsor are on land owned by the Ontario Ministry of Natural Resources or the City of Windsor. Four sites are considered as Environmentally Significant areas within the province: Ojibway Prairie Complex; Locality 1, Table 1; Windsor – sites 7 & 8; Locality 8 (Table 1) (pers. comm. from Dan Lebedyk, Conservation Biologist, Essex Region Conservation Authority; Aug. 2002). Most populations are on private property.

Table 1. Extant Sites of Willowleaf Aster

Compiled from information tabulated by the authors and the Ontario Conservation Data Centre.

	Collection Site	Date	Collector or observer	Notes
1)	Essex Co.: Colchester South Twp.	18 Sep. 1976	*W. Botham 1930* (CAN 499313)	
	Near Arner	27 Sep. 1984	*G.M. Allen 1460* (TRTE)	Open field in association with *Solidago canadensis* and *Aster ericoides*
2)	Essex Co.: Windsor – Site 1	5 Oct. 1979	*Wilfred Botham 2237* (DAO 269314)	
3)	Essex Co.: City of Windsor – Site 2	1 Oct. 1997	*J.C. Semple and J. Zhang v.v.*	Many clones in bloom along roadside, on the bank of drainage ditch
	Essex Co.: City of Windsor – Site 3 [likely a sub-population of the above]	14 Sep. and 1 Oct. 1997	*J.C. Semple & J. Zhang v.v.*, picture taken	Along trail, 4 clones found, at the early stage of blooming
4)	Essex Co.: City of Windsor – Site 4	21 Sep. 1994	*M.J. Oldham 16851* (WAT, NHIC)	Uncommon; flowering.
5)	Essex Co.: City of Windsor – Site 5	27 Oct. 1993	*M.J. Oldham 15954* (DAO)	ca. 50 plants in shrubby area near railway; flowering.
	Essex Co.: City of Windsor – Site 6	27 Oct. 1993	*M.J. Oldham 15957* (WAT, NHIC)	Single low bushy plant in disturbed ground near railway; flowering.
6)	Essex Co.: City of Windsor – Site 7	22 Sep. 1992	*M.J. Oldham & A.A. Reznicek 14426* (WAT, NHIC)	Sandy prairie, locally common; flowering
	Essex Co.: City of Windsor – Site 8	21 Sep. 1994	*M.J. Oldham 16824* (DAO 687565)	Prairie; open areas beneath hydro corridor; flowering, locally common
7)	Essex Co.: City of Windsor – Site 9	24 Sep. 1982	*J.C. Semple et al. 6792* (DAO 486683, WAT)	
	Essex Co.: City of Windsor – Site 10	1 Oct. 1997	*J.C. Semple & J. Zhang v.v.*	Many clones scattered within the open woods, or along the edge of woods, roadside, in bloom (picture taken).
8)	Essex Co.: Windsor area, Sandwich West Township	28 Oct. 1991	[SOURCE?]	Woodlot, no collector and collection information.
9)	Municipality of Chatham-Kent: Orford Township	26 Sep. 1991	*M.J. Oldham & G. Payton 13498* (WAT, NHIC)	Open meadow between railway tracks; common, flowering.
10)	Lambton Co.: Walpole Island	24 Sep. 1982	*J.C. Semple et al. 6795* (DAO 486688, WAT)	Oak savannah
	Indian Reserve	22 Oct. 1986	*G.M. Allen et al. 2823* (TRTE)	Edge of mesic prairie
11)	Middlesex Co.: Caradoc Township	2 Sep. 1992	*M.J. Oldham 14320* (WAT, NHIC)	Roadside, rare; flowering
12)	Perth Co.: Ellice Township	2 Oct. 1983	*J. Chmielewski 1861* (WAT)	

In addition to information provided in Table 1, the following new population was also located: Lambton Co.: Walpole Island, one population found, in bloom, near a residential house.

BIOLOGY

Population size varies from one to many individuals. It is difficult to determine the actual number of genetic individuals at a site because the species is rhizomatous and potentially forms large, overlapping, clones. This is a late fall flowering herbaceous perennial species.

Reproduction is by asexual propagation (fragmentation of rhizomes) as well as by sexually produced seeds. The species is easily transplanted using only small portions of the rhizome (10 cm long) with a short length of aerial shoot attached.

The species is a semi-obligate out-breeding species, as are nearly all asters (Jones 1978). This means that populations usually must consist of several genetically different individuals in order for there to be significant fruit and seed set. Asters can self-pollinate, when stimulated by the presence of pollen from other species or by chance. Normal pollen transfer between individuals is accomplished by insects, primarily bees, flies and Lepidoptera. Other insects may also serve as occasional pollen vectors.

Achene (single seeded indehiscent fruit) dispersal is presumed to be by wind.

POPULATION SIZES AND TRENDS

About 12 extant populations are known. The species is clonal and actual numbers of individuals are difficult to determine, but clone sizes range from one shoot to over 100 shoots. Three populations are known only from reports in the 1960s. At least one population has definitely been extirpated but possibly as many as five in total. With the likely loss of the Pt. Edward locality at Sarnia (site 3 below), the extent of occurrence has declined. No population trend information is available. Indications from local biologists is that the species is locally common within the remnant prairies in Windsor as well as being found in disturbed habitats such as abandoned fields (pers. comm. Paul Pratt, Naturalist, Windsor Department of Parks and Recreation, July 2002). The species is also similar to white panicle aster (*S. lanceolatum*) and might be confused with that species (pers. comm. Mike Oldham, Ontario NHIC, Peterborough, July 2002).

Plants have been collected or observed at the locations documented in Table 1 based on herbarium records. [In some instances it is difficult to definitively correlate localities indicated on specimen labels with those documented by the authors during their fieldwork surveys.

Extirpated populations or of unknown status:

1. Essex Co.: Windsor, Titcombe field; lat/long: 42°18'N / 83°01'W; 11 Oct. 1971, *W. Botham 1372A* (CAN 498454) - extirpated

2. Municipality of Chatham-Kent: Harwich Twp., Rondeau Provincial Park. 1956, *W.J. Cody s.n.* (DAO).

3. Lambton Co.: Pt. Edward (Sarnia). 24 Sep. 1958, *L.O. Gaiser 1848PE* (OAC).

4. Lambton Co.: Squirrel Island. 10 Sep. 1916, *N. Tripp s.n.* (OAC).

5. Middlesex Co.: Cairngorm. 8 Oct. 1960, *Y.S. Shaw s.n.* (UWO 23765).

Potential Sites for Investigation:

Tall-grass prairies in Windsor and Sarnia areas and Walpole Island First Nation.

LIMITING FACTORS AND THREATS

Many of the known populations occur in southwestern Ontario in or near Windsor, or on Walpole Is. These areas have been heavily disturbed by industrial uses, house construction, and agriculture practices. Locality 8 (Table 1) is under Secondary Plan review for development purposes with an Environmental Impact Assessment study under way as of August 2002 (pers. comm. from Dan Lebedyk, Conservation Biologist, Essex Region Conservation Authority; Aug. 2002). The potential for loss of more populations due to human activities is real.

No specific data is available on consequences of modification of specific habitats. It is likely that changing drainage patterns has a critical impact. On Walpole Is., house construction in the last 15 years has eliminated several sites observed by J. Semple in 1982. Most populations are on private property, e.g., Walpole Is. sites.

SPECIAL SIGNIFICANCE OF THE SPECIES

The species has no known economic or biological significance that is unique to this aster. No Aboriginal uses have been recorded in the literature for this species, perhaps, in part, due to its similarity to a widespread southern Ontario aster.

EXISTING PROTECTION OR OTHER STATUS

Willowleaf aster presently has no legal status or formal protection in Canada. It was tentatively considered as a threatened species in Ontario by Semple et al. (1996).

International status

This species has a global ranking of G5 (NatureServe 2002).

National status

Rare in Canada with a National Rank of N2 (NatureServe 2002).

Provincial or state status

Ranked as S2 (very rare in Ontario; usually between 6 to 20 occurrences in the province) by Oldham (1994, 1996 and NatureServe 2002). The NatureServe web site provides the following listing of status for the USA and Canada.

U.S. & Canada State/Province Heritage Status Ranks	
United States	Alabama (SR), Arkansas (SR), Connecticut (SR), District of Columbia (SX), Florida (SR), Georgia (S1?), Illinois (S?), Indiana (SR), Iowa (S4), Kansas (SR), Kentucky (S2), Louisiana (SR), Maine (SR), Maryland (S1), Massachusetts (SX), Michigan (S3), Minnesota (S?), Mississippi (SR), Missouri (SR), Nebraska (SR), New Hampshire (SR), New Jersey (S1), New York (SR), Ohio (SR), Oklahoma (SR), Pennsylvania (S3), Rhode Island (SR), South Dakota (SR), Tennessee (S1), Texas (SR), Vermont (SR), West Virginia (S?), Wisconsin (SR)
Canada	New Brunswick (SE), Ontario (S2)

SUMMARY OF STATUS REPORT

About 12 extant populations exist in Canada; these are restricted to southwestern Ontario, primarily within Windsor and on Walpole Island, where they are at risk from further development and other forms of human activity. As many as 5 historic sites may be extirpated. Habitat destruction is the biggest threat to the populations.

TECHNICAL SUMMARY

Symphyotrichum praealtum
Willowleaf Aster — Aster très élevé
Occurrence in Canada: Ontario

Extent and Area information	
• *extent of occurrence (EO)(km²)*	<1000
• *specify trend (decline, stable, increasing, unknown)*	decline
• *are there extreme fluctuations in EO (> 1 order of magnitude)?*	no
• *area of occupancy (AO) (km²)*	perhaps only about 20
• *specify trend (decline, stable, increasing, unknown)*	decline in typical habitat
• *are there extreme fluctuations in AO (> 1 order magnitude)?*	no
• *number of extant locations*	about 12 primarily within 2 areas (Windsor and Walpole Is.)
• *specify trend in # locations (decline, stable, increasing, unknown)*	decline
• *are there extreme fluctuations in # locations (>1 order of magnitude)?*	no
• *habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat*	decline
Population information	
• *generation time (average age of parents in the population) (indicate years, months, days, etc.)*	perhaps 2-3 years
• *number of mature individuals (capable of reproduction) in the Canadian population (or, specify a range of plausible values)*	perhaps several thousand stems in total estimated based on inferences from 7 sites with clones of various sizes seen in 1997)
• *total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals*	unknown
• *if decline, % decline over the last/next 10 years or 3 generations, whichever is greater (or specify if for shorter time period)*	
• *are there extreme fluctuations in number of mature individuals (> 1 order of magnitude)?*	no
• *is the total population severely fragmented (most individuals found within small and relatively isolated (geographically or otherwise) populations between which there is little exchange, i.e., ≤ 1 successful migrant / year)?*	likely fragmented due to presence in remnant prairie sites and meadows in a region with little of the original habitats remaining
• *list each population and the number of mature individuals in each*	no precise data are available but locally common in the Windsor area
• *specify trend in number of populations (decline, stable, increasing, unknown)*	at least 1 and possibly 5 historic sites lost and likely many local populations/sub-populations lost within the Windsor and Walpole Is. areas.
• *are there extreme fluctuations in number of populations (>1 order of magnitude)?*	no

Threats (actual or imminent threats to populations or habitats)	
some plants found as roadside clones subject to human activities; reduced seed production in some clones due to the need for out-crossing; potential development of some sites planned	
Rescue Effect (immigration from an outside source)	Low
• *does species exist elsewhere (in Canada or outside)?*	USA
• *status of the outside population(s)?*	adjoining states: MI S3; PA S3; OH SR; NY SR
• *is immigration known or possible?*	unlikely due to fragmented habitat
• *would immigrants be adapted to survive here?*	probably
• *is there sufficient habitat for immigrants here?*	not much prairie but various types of open habitat are present
Quantitative Analysis	

ACKNOWLEDGEMENTS

Mike Oldham and Jennifer Line, Natural Heritage Information Centre, assisted with location data entry and checking. Mike Oldham, Paul Pratt and Al Woodliffe provided updated information for the revised report.

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Dr. Semple is an expert on evolution and classification of members of the Tribe Astereae of Asteraceae particularly asters, goldenasters, and goldenrods.

Stephenson, David E.

Field biologist; knowledgeable about Ontario flora.

COLLECTIONS EXAMINED

Herbaria at the following institutions were consulted for possible collections of *Aster prenanthoides* from Canada.

CAN	Canadian Museum of Nature
DAO	Vascular Plant Herbarium, Agriculture Canada
HAM	Royal Botanical Garden, Hamilton, Ontario
NHIC	Natural Heritage Information Centre, Peterborough, Ontario
OAC	Botany Department, University of Guelph
TRT	Vascular Plant Herbarium, Botany Department, Royal Ontario Museum
TRTE	Botany Department, University of Toronto – Erindale
UWO	Plant Science Department, University of Western Ontario
WAT	Department of Biology, University of Waterloo
WLU	Biology Department, Wilfrid Laurier University

* Abbreviations as listed in P.K. Holmgren, N.H. Holmgren, and L.C. Barnett, 1990. *Index Herbarium. Part I. The Herbaria of the World*. Eighth Edition. New York Botanical Garden, New York, USA.

FIELDWORK

Field surveys were conducted on 13 to 15 Sep. 1997 and 1 Oct. 1997 by Drs. John C. Semple and Jay J. Zhang.

[Note: Although this report is based on fieldwork conducted in 1997, recent reports from local naturalists indicate that the species is still widely present within the Windsor area.— E. Haber, Feb. 2003.]