COSEWIC
Assessment and Update Status Report

on the

Victorin's Gentian
Gentianopsis procera macounii var. *victorinii*

in Canada

THREATENED
2004

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA

COSEPAC
COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

COSEWIC status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows:

COSEWIC 2004. COSEWIC assessment and update status report on the Victorin's gentian *Gentianopsis procera macounii* var. *victorinii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 24 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Previous report:

Legault, A. 1987. COSEWIC status report on the Victorin's gentian *Gentiana victorinii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 22 pp.

Production note: COSEWIC acknowledges Frédéric Coursol for writing the update status report on Victorin's gentian *Gentianopsis procera macounii* var. *victorinii* in Canada. The report was overseen and edited by Erich Haber, COSEWIC Co-chair (Vascular Plants) Plants and Lichens Species Specialist Subcommittee. Formerly listed by COSEWIC as Victorin's gentian *Gentiana victorinii.*

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Également disponible en français sous le titre Évaluation et Rapport de situation du COSEPAC sur la gentiane de Victorin (*Gentianopsis procera macounii* var. *victorinii)* au Canada – Mise à jour.

Cover illustration:
Victorin's gentian — Provided by the author.

Catalogue No. CW69-14/386-2004E-PDF
ISBN 0-662-37329-4
HTML: CW69-14/386-2004E-HTML
0-662-37330-8

COSEWIC
Assessment Summary

Assessment Summary – May 2004

Common name
Victorin's gentian

Scientific name
Gentianopsis procera macounii var. *victorinii*

Status
Threatened

Reason for designation
A geographically highly restricted and short-lived annual or biennial that is endemic to the freshwater or slightly brackish shoreline areas of the St. Lawrence River estuary in Quebec. It is present at 28 extant sites but in very small localized habitats where it is at risk from a wide range of impacts. These include habitat disruption by ATVs, shoreline in-filling, mowing of vegetation, picking of flowers and potentially from oil spills.

Occurrence
Quebec

Status history
Designated Special Concern in April 1987. Assessment status re-examined and designated as Threatened in May 2004. Last assessment based on an update status report.

COSEWIC
Executive Summary

Victorin's Gentian
Gentianopsis procera macounii var. victorinii

Species information

Victorin's gentian (*Gentianopsis procera* ssp. *macounii* var. *victorinii*) is an annual or biennial plant of the family Gentianaceae. It has undergone several taxonomic changes since it was described by Fernald. Gillett placed it in the genus *Gentianella,* whereas it is believed that fringed gentians belonged to the genus *Gentianopsis*. Victorin's gentian is the only gentian that occurs in estuarine environments of the St. Lawrence River.

Distribution

Victorin's gentian is found only in Canada, where it is considered to be endemic to the fluvial section of the St. Lawrence River estuary. It grows only in the freshwater and slightly brackish intertidal zones of the St. Lawrence River. To date, it has been found in 43 localities. The southwestern limit is at Deschambault and Lotbinière, while its northeastern limit is at Saint-Roch-des-Aulnaies and Île aux Oies.

Habitat

Victorin's gentian habitat consists of dense, tall prairie cord grass beds and sometimes sparsely vegetated raised outcrops. It occurs at the interface of the upper and mid-littoral zone or near openings in the vegetation in the upper littoral portion of the freshwater and slightly brackish estuarine intertidal zone. In lower vegetation, it receives more light than in the upper littoral where the herbaceous stratum is higher. Victorin's gentian prefers thick surficial deposits (over 15 cm) of fine or mixed materials (seldom coarse), with no or very little stoniness (rarely very stony). This zone is covered by water for two to three hours a day during equinoctial high tides, but is seldom reached by low high tides.

Biology

Victorin's gentian is an annual or biennial plant that flowers from mid-July to mid-September. The flowers exhibit periodic sleep movements. They remain closed on

dark days and when submerged by tides (Rousseau, 1932). Pollination is by insects. Fruiting begins in August and continues until October. The seeds are dispersed by water.

Population Sizes and Trends

Victorin's gentian is now known from 28 extant localities; 43 sites are known in total, including 8 historic and 7 extirpated. The total number of flowering plants in 2003 is estimated to be between 1700 and 6000.

Limiting Factors and Threats

There are a number of actual or potential threats to Victorin's gentian populations. Its limited habitat prevents it from colonizing other sites outside the freshwater and slightly brackish intertidal zone; fruit predation can adversely affect recruitment; the mowing of grass beds and flower picking prevents reproduction; ice scouring and spring ice breakup are natural events that tear up parts of shoreline containing seed banks but may also have positive effects in opening habitat for seed germination (it is unknown if such impacts have changed since earlier historic times prior to shoreline alteration); plants can become covered with debris due to water quality and level; shoreline filling results in habitat loss; and oil spills could destroy populations. The most serious threats to the species are human trampling and recreational vehicle traffic (ATVs).

Special Significance of the Species

The species is of interest to scientists because of what they can learn from it about the origin of the endemic flora of the estuarine beaches of the St. Lawrence River.

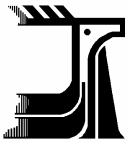
Given the beauty of this plant, it is a symbol of the conservation of estuarine environments and of the protection of threatened or vulnerable species.

Existing Protection or Other Status Designations

In 1987, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated Victorin's gentian as a "species of special concern". The organization *NatureServe* has assigned Victorin's gentian a global rank of G2, a Canadian rank of N2 and a Quebec rank of S2 (NatureServe 2001).

Two localities (Anse Saint-Vallier and Grosse-Île) are located within the boundaries of protected areas, i.e., the Saint-Vallier Migratory Bird Sanctuary and the Grosse-Île and the Irish Memorial National Historic Site. Other ill-defined historic populations may occur within the boundaries of other protected territories: the L'Islet, Cap-Saint-Ignace and Trois-Saumons migratory bird sanctuaries. In addition, the organization *Conservation de la nature Québec* owns part of the site on which the Pointe de Saint-Vallier population at Saint-Vallier occurs.

In Quebec, Victorin's gentian was designated as a "threatened" species in February 2001 and is now protected under the Quebec *Act Respecting Threatened or Vulnerable Species*. Its habitat is also protected against the most serious threat to its survival by the *Regulation Respecting Motor Vehicle Traffic in Certain Fragile Environments* (R.S.Q., c. Q-2, r.2.2). Further, the Quebec policy respecting the protection of lakeshores, riverbanks, littoral zones and floodplains seeks to maintain and improve water quality by ensuring a minimum adequate level of shoreline protection.



COSEWIC HISTORY

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. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species and include the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal organizations (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership, chaired by the Canadian Museum of Nature), three nonjurisdictional members and the co-chairs of the species specialist and the Aboriginal Traditional Knowledge subcommittees. The committee meets to consider status reports on candidate species.

DEFINITIONS (AFTER MAY 2004)

Species	Any indigenous species, subspecies, variety, or geographically or genetically distinct 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 that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
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.

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

Update
COSEWIC Status Report

on the

Victorin's Gentian

Gentianopsis procera macounii var. *victorinii*

in Canada

2004

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SPECIES INFORMATION

Name and classification

Scientific name: *Gentianopsis procera* (Th. Holm) Ma ssp. *macounii* (Th. Holm) Iltis var. *victorinii* (Fern.) Iltis

Pertinent synonyms: *Gentiana victorinii* Fern; *Gentianella crinita* (Froel.) G. Don ssp. *victorinii* (Fern.) J.M. Gillett; *Gentianopsis victorinii* (Fernald) Iltis

French names: gentiane de Victorin, gentianopsis de Victorin, gentianopsis élancé variété de Victorin

English name: Victorin's fringed gentian, Victorin's gentian

Family name: Gentianaceae

Victorin's gentian has undergone several taxonomic changes since it was described by Fernald (1923). Gillett (1957, 1963) placed it in the genus *Gentianella*, separate from *Gentiana* in the strict sense. He defined all taxa of northeastern North America as subspecies of *Gentianella crinita* and created the subspecies *victorinii* (Fern.) Gillett. He based his taxonomic classification primarily on the species' exceptional habitat, its morphological characters being considered intermediate between the subspecies *procera*, *macounii* and *crinita*. In 1963, Gillet provided a more precise description of the morphological differences between the members of the *Gentianella crinita* complex and, in his key, the subspecies *victorinii* is associated with the subspecies *macounii*. Scoggan (1979) adopts Gillet's taxonomy. Iltis (1965) believed that fringed gentians belong to the genus *Gentianopsis* of Ma (1951), which is corroborated by the molecular phylogenetic studies of Yuan and Kupfer (1995). Because Ma had not carried out all taxonomic transfers, Iltis created the missing combinations in the genus *Gentianopsis*, including *Gentianopsis victorinii* (Fern.) Iltis. Iltis suggested that only two species be retained in the first group: *Gentianopsis crinita* and the highly variable *Gentianopsis procera*. Iltis believed that the differences between the populations of the taxa that he associated with *Gentianopsis procera* were minor compared to the differences with *Gentianopsis crinita*. In his opinion, *Gentianopsis victorinii* does not differ significantly from *Gentianopsis procera*, although it shows greater uniformity for the characters measured and its habit appears to be different. Mason and Iltis (1965) created a combination that better reflects this taxonomic opinion: *Gentianopsis procera* (Th. Holm) Ma ssp. *macounii* (Th. Holm) Iltis var. *victorinii* (Fern.) Iltis. Kartesz (1994) ignores the work of Iltis and recognizes *Gentianopsis victorinii* as a valid taxon. In this report, as in the Province of Quebec, the position is to adopt the classification of Mason and Iltis (1965) until more detailed studies are conducted to clarify the matter.

Typical *Gentianopsis procera* (ssp. *procera*) occurs primarily within the Great Lakes region and mid-western states from, in the USA, New York south to Illinois

and westward to South Dakota and North Dakota, with an outlier in Colorado. Its ranking is under review in 6 states, is critically imperiled in NY, imperiled in SD and vulnerable in Iowa and Wisconsin. In Canada it is found in Ontario and Manitoba where it is apparently secure (NatureServe 2004). The ssp. *macounii* is a widespread taxon occurring in the USA mainly in the midwestern states of Iowa, North Dakota, and South Dakota where its rank is under review; it is unrankable in Minnesota and Nebraska and unrankable in Nevada in the southwestern USA. In Canada, this subspecies ranges from Quebec to British Columbia and possibly the Northwest Territories and the Yukon Territory. It is critically imperiled in Quebec, but apparently secure in Ontario, Manitoba and possibly Saskatchewan, and between vulnerable and critically imperiled in British Columbia with unrankable status in Alberta, Yukon Territory, and the Northwest Territory. Overall in Canada, due to its primary distribution and relatively secure status extending from Ontario to Saskatchewan, the subspecies is likely at limited risk. The variety *victorinii* is a distinctive entity within ssp. *macounii* that is recognized by some authors at the species level and is endemic to the intertidal habitat of the St. Lawrence estuary.

Description

Herbaceous annual or biennial, 10–50 cm high, emerging from a small pivoting root, relatively unbranched (Figure 1). Stem glabrous, cylindrical at the base, becoming hexagonal in the centre, simple or branched 1–2 times. Stem leaves somewhat fleshy, linear-lanceolate, asymmetric, acute summit, sessile, opposite, 1–6 cm long; basal leaves spatulate, in 1–4 pairs in rosette. Flowers 1–30, on a quadrangular, ribbed peduncle; calyx herbaceous, formed of 4 sepals cleft on nearly half their length, 2 lanceolate, the other 2 ovate and shorter; corolla 3.5–4.5 cm long at maturity, formed by 4 purplish petals, cleft on 3/5 their length and terminating in a lobe; lobes rolled, horn-shaped at the preflowering stage, then spreading, finely dentate on summit and very slightly lacerate at the margin. Fruit: a capsule 3–3.8 cm long, opening at maturity. Seeds brown, approximately 400 per fruit (Coursol, 2001).

DISTRIBUTION

Global range

Victorin's gentian is found only in Canada, in the St. Lawrence estuary (Figure 2). Given its limited range, it is considered endemic to the fluvial section of the estuary (Labrecque and Lavoie, 2002).

Figure 1. Photograph of Victorin's gentian in its habitat at Saint-Augustin-de-Desmaures.

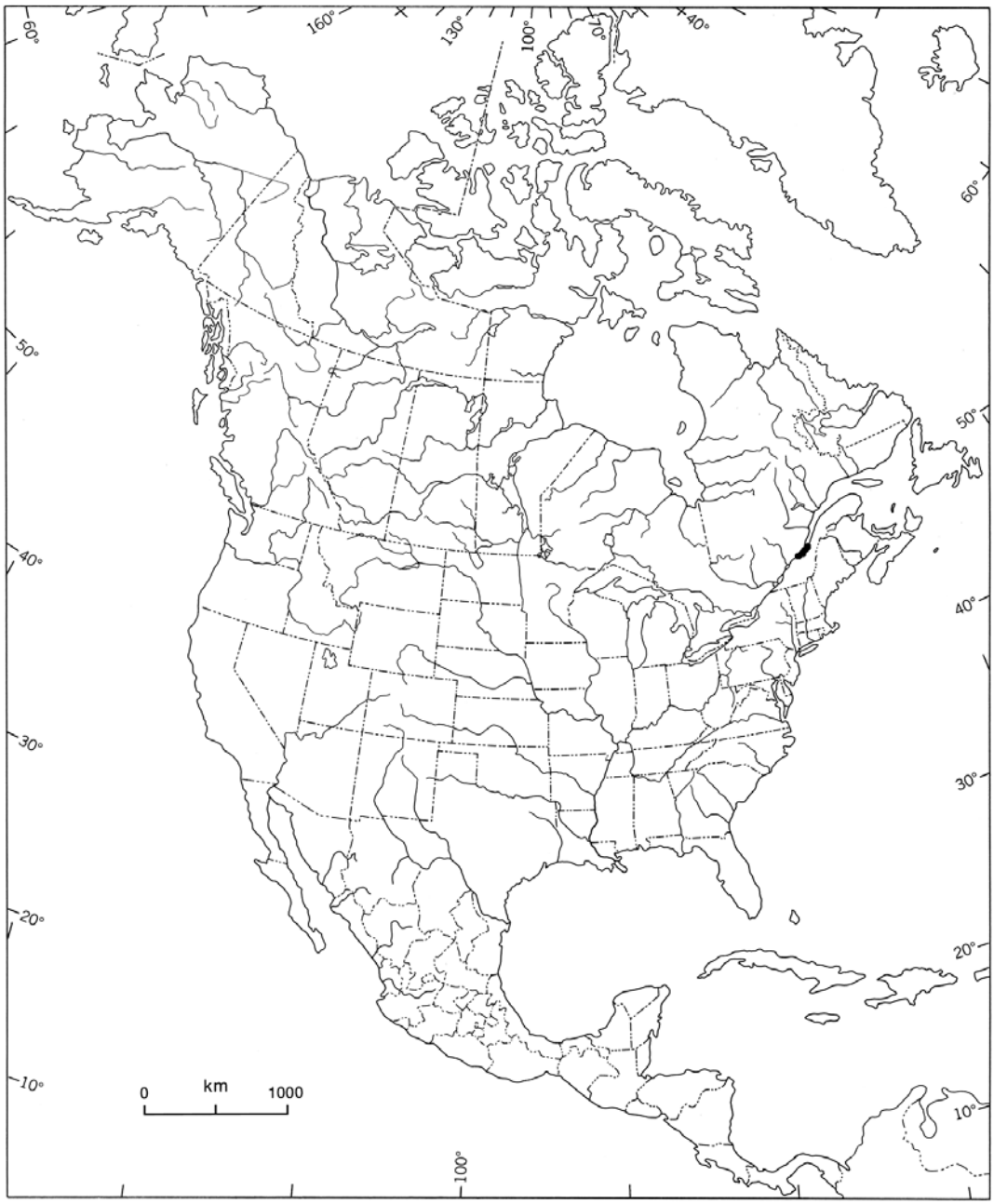

Figure 2. Global range of Victorin's gentian.

Canadian range

Victorin's gentian grows only in the freshwater and slightly brackish intertidal zones of the St. Lawrence River (Figure 3). To date, the plant has been inventoried in 43 localities (Table 1). The southwestern limit is at Deschambault and Lotbinière, and the northeastern limit is at Saint-Roch-des-Aulnaies and Île aux Oies (Brouillet et al., 1996).

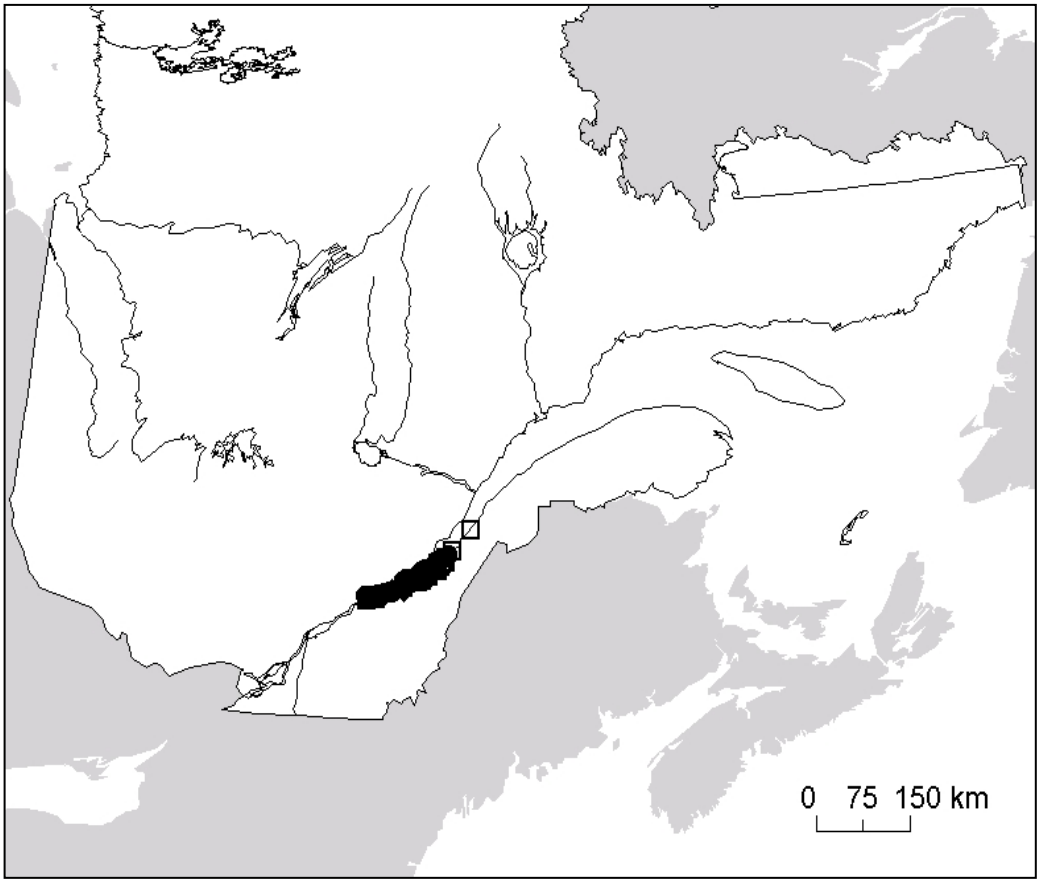

Figure 3. Canadian range of Victorin's gentian (taken from Labrecque and Lavoie, 2002).

Four localities mentioned in the report provided by the *Centre de données sur le patrimoine naturel du Québec* (CDPNQ) seem unlikely, questionable or ephemeral. One herbarium specimen from Pont-Rouge, collected by Father Louis-Marie, Brothers Fabius and Adonis, Marcel Raymond and J. Paquin on August 12, 1934 (No. 34605 at Laval University's Louis-Marie herbarium) is an unlikely locality, because the site is not subject to tidal cycles and has since been extensively botanized by various botanists, including the author in preparing the update status report on Provancher's fleabane (*Erigeron philadephicus var. provancheri*). In this specific case, the inaccuracy must be due to a label error. The locality of Sainte-Anne (no collection date) is more plausible because the label reads "freshwater beaches". In this specific case, it could be Sainte-Anne-de-Beaupré, but no Victorin's gentian plants were observed in several inventories conducted in this sector, despite the existence of adjacent localities. The localities of Saint-Germain (July 30, 1952) and "North Shore" (1932) are likely ephemeral and are specimens that were uprooted by the ice along the shorelines in upstream localities and redeposited further downstream. The water salinity at Saint-Germain-de-Kamouraska and on the North Shore is too high for the long-term survival of Victorin's gentian.

Table 1. List of Victorin's gentian populations in 2002 with quality indices.				
Location	**Population**	**Disturbance**	**Quality index[1]**	**Latest observation**
Deschambault	100-1000	low	A	1996-09-01
Grosse-Île	200-400	none	A	2000-08-10
Sainte-Croix, Pointe Platon	111-1050	moderate	A	1995-09-05
Saint-François, Pointe d'Argentenay	100-1000	none	A	1995-09-14
Saint-Augustin-de-Desmaures	300-500	low	A	2002-08-29
Sainte-Pétronille, Anse chez Porteous	200-500	none	A	2002-08-10
Saint-Vallier, Pointe à Labrecque	200-400	none	A	2002-08-10
Berthier-sur-Mer, Anse de Berthier	55-110	none	B	1995-09-13
Ile aux Grues, Rivière à Anguilles	13-60	none	B	1996-09-04
L'Ange-Gardien, Casgrain Street	51-100	low	C	1996-09-03
L'Ange-Gardien, du Fleuve Street	51-100	low	C	1996-09-03
Saint-Jean-Port-Joli, two sides of wharf	30-120	high and none	C	1997-09-01
Saint-Jean-de-Boischatel	11-59	low	C	1995-08-24
Saint-Antoine-de-Tilly, Les Fonds	11-50	low	D	1995-09-07
Saint-Nicolas, Anse Ross	2-10	low	D	1996-09-03
Sainte-Pétronille	32	high	D	1997-09-02
Beaumont, Anse de Vincennes	11-50	none	D	1995-08-24
Saint-Laurent-d'Orléans	32	low	D	1997-09-02
Pointe-aux-Trembles-Ouest	3-11	low	D	1995-09-19
Lévis, Pointe Martinière	15	low	D	1996-09-04
Saint-Laurent-d'Orléans, Village-des-Anglais	25-100	moderate	D	1995-09-20
Ile aux Grues, wharf	11-50	low	D	1996-09-04
Neuville, Provancher marsh	10-30	low	D	1999-08-04
Berthier-sur-Mer, Road 561	1	none	D	2000-08-11
Montmagny	1	low	D	1977
Saint-Vallier, Anse de Saint-Vallier	-	none	E	1985
Saint-Jean-Port-Joli, Pointe à Menin	-	-	H	1975-07-17
Lotbinière	-	high	H	1986
Île de Bellechasse	-	-	H	1925-08-28
Île aux Deux-Têtes	-	-	H	1925
Île aux Oies, Anse à la Beguine	-	-	H	1970-08-05
Sainte-Croix	-	low	H	1943
Saint-Michel-de-Bellechasse	-	high	H	1961-09-03
Cap Saint-Ignace	-	none	H	1959
Saint-Jean-Port-Joli, Anse de Trois-Saumons	-	none	H	1954
Saint-Roch-des-Aulnaies	-	none	H	1939
Beauport	-	high	X	1943
Cap Rouge	-	high	X	1942
Lévis	-	high	X	1935
L'Islet-sur-Mer, Rocher Panet	-	high	X	1947
Saint-Romuald, Garneau Bridge	-	high	X	1954
Saint-Romuald	-	high	X	1936
Sillery	-	high	X	1971
Total	1,576-5,781	**Average**	3,679	

1 – See Table 2 for the meaning of classes A-D. The quality index X (extirpated) indicates that the habitat and/or Victorin's gentian are extirpated from this location, despite sampling efforts in recent years. The quality index E (recent) indicates that the observation of the population dates back at least 25 years, but that we do not have information on its demography. The quality index H (historic) indicates that the observation of the population dates back more than 25 years.

Table 2. Definition of quality indices of Victorin's gentian populations.	
Quality index	**Meaning of index**
A	Population of over 200 individuals in a habitat that is only slightly or not disturbed by human activity.
B	Population of 101-200 individuals in a habitat that is only slightly or not disturbed by human activity or population of 200 individuals disturbed by filling or pedestrian or vehicle traffic.
C	Population of 50-100 individuals in a habitat that is only slightly or not disturbed by human activity or population of 101-200 individuals disturbed by filling or pedestrian or vehicle traffic.
D	Population of less than 50 individuals in a habitat that is only slightly or not disturbed by human activity or population of 50-100 individuals disturbed by filling operations, human trampling or vehicle traffic.

HABITAT

Habitat requirements

The habitat of Victorin's gentian is the portion of the littoral located in the transition zone between the mid-and upper littoral portions of the freshwater and slightly brackish estuarine intertidal zone. This zone is covered by water for two to three hours per day during equinoctial high tides (Figure 4), but is seldom reached by low high tides. Brouillet et al. (1996) observed Victorin's gentian in seven segments (1.45% of the segments sampled) of the 34 sampling sites and all of these segments (100%) were located in the upper littoral zone. The species grows in dense, high prairie cord-grass beds (Figure 5) and sometimes on sparsely vegetated raised outcrops. It occurs at the interface of the upper and mid-littoral or near openings in the vegetation of the upper littoral; with lower vegetation, it receives more light than in the upper littoral, where the herbaceous stratum is higher. It prefers thick surficial deposits (over 15 cm) of fine or mixed materials (seldom coarse), with no or very little stoniness (rarely very stony).

Figure 4. Victorin's gentian habitat at Saint-Vallier.

Two other species designated by COSEWIC as species of special concern often occur in the same habitat with Victorin's gentian: one population of Provancher's fleabane and several populations of Victorin's water-hemlock.

Trends

In his report, Legault (1986) mentions 20 populations of Victorin's gentian, two of which were considered extirpated. Since then, several of the populations have been threatened or destroyed by shoreline filling. Thus, five of the known populations at that time are now extirpated and three are now historic, despite efforts by the author in recent years to locate them (Table 1). As a result, only 10 of the 20 known populations mentioned in Legault's report (1986) are still extant.

Figure 5. Disturbances of Victorin's gentian habitat at Saint-Jean-Port-Joli.

Potentially suitable habitat for Victorin's gentian has declined dramatically in the Quebec City metropolitan region. Virtually all of the upper and middle littoral zones between Boischâtel and Cap-Rouge have been destroyed by highway and railway construction on the flats of the St. Lawrence River. Habitat quality has been seriously affected by filling operations in the upper littoral zone and the construction of a retaining wall for homes in the sectors of Lévis and Saint-Romuald and in several other residential sectors along the St. Lawrence River (Figure 5).

The introduction of tighter environmental legislation seems to have slowed or halted this trend. The major sampling effort by Brouillet *et al*. (1996) has advanced the state of knowledge of estuarine taxa and their ranges. Since the publication of the status report by Legault (1986), 32 new populations have been discovered, while others, such as those of Deschambault, Pointe Saint-Vallier at Saint-Vallier, Pointe Platon at Sainte-Croix, Pointe d'Argentenay at Saint-François, Grosse-Île and Saint-Augustin-de-Desmaures are large, accounting for over three quarters of all Victorin's gentian plants.

Since the report by Brouillet et al. (1996), the general status of populations appears to be stable, but there are a number of threats that could impact populations.

Protection/ownership

Two localities (Anse Saint-Vallier and Grosse-Île) are within the boundaries of protected areas: the Saint-Vallier Migratory Bird Sanctuary and the Grosse-Île and the Irish Memorial National Historic Site. Other ill-defined historic populations may occur within the boundaries of other protected territories: the L'Islet, Cap-Saint-Ignace and Trois-Saumons migratory bird sanctuaries. Most Quebec localities of Victorin's gentian are on lands that do not have conservation status and the ownership of which is unclear. Victorin's gentian habitat is located on public lands under the jurisdiction of the Quebec government. However, the localities in the R.C.M. of Cote-de-Beaupré (Boischâtel and Ange-Gardien) may be on private land and could be claimed down to the low tide water line. Cadastral surveys (legal boundary surveys) are required in order to identify these sites.

The Quebec *Regulation Respecting Motor Vehicle Traffic in Certain Fragile Environments* (R.S.Q., c. Q-2, r.2.2) protects Victorin's gentian habitat by prohibiting access by motor vehicles to the tidal flats of the St. Lawrence River. The application and enforcement of this regulation could put an end to the problem of ATV traffic at Saint-Augustin-de-Desmaures.

BIOLOGY

General

Victorin's gentian is an annual or biennial that flowers from mid-July to mid-September. The flowers exhibit periodic "sleep movements" in which they remain closed on dark days and when submerged by tides (Rousseau, 1932) and open when conditions are more favourable, such as bright sunny days. Pollination is by various insects. Fruiting begins in August and continues until October, and the seeds are dispersed by water.

Reproduction

No signs of clonal reproduction have been observed. Reproduction thus appears to be by seed production. The observation of various insects on the flowers (Figure 6) suggests that they are pollinators. Because the anthers are no more than two-thirds the length of the pistil and because the flower is always erect, insects are needed to pollinate the plants. The nectar secreted at the base of the stamens attracts primarily bumble bees (*Bremus terricola*, etc.), which sometimes become trapped for the night (Rousseau, 1932; Marie-Victorin, 1995). Bouillé (1996) reported that the periodic sleep movements resulting in flower closure could hinder pollination by insects because they limited their access to the flowers.

Figure 6. Pollinators in a Victorin's gentian flower.

Survival

Victorin's gentian appears to be intolerant of competition and is unable to survive in areas of dense herbaceous cover. Thus, part of the Saint-Augustin-de-Desmaures population can vary considerably because it occurs in denuded areas in the upper littoral zone or surrounding area. These areas may, over several years, become relatively densely vegetated, thereby becoming unfavourable to Victorin's gentian.

No predators have been observed, but Bouillé (1996) reported a lepidopteran larva inside an ovary of a specimen from Beaumont. She indicated that the seeds of the flower were very small and dark compared to other seeds from the same individual, suggesting the possible impact of predation by insects on reproduction. She also reported that the periodic closure of the flowers could hinder pollination by insects because it limits their access to the floral parts.

ATV traffic in the littoral zone is the primary cause of plant mortality.

Physiology

Victorin's gentian populations downstream from Quebec City flower and fruit earlier than populations upstream. This phenomenon is strange, because the climate is generally harsher and colder downstream from Quebec City. No other information is available on the physiology of this species.

Movements/dispersal

Caldwell and Crow (1992) studied the dynamics of estuarine environments and found three factors that contribute significantly to plant community structure. The duration of flooding by tides is the most important factor, followed by the presence of life forms and physical disturbances caused by ice boulders. Plants having the most success in such fluctuating environments are annuals, such as Victorin's gentian, and highly rhizomatous perennials. Rhizome proliferation allows these plants to maintain an equilibrium between sedimentation and constant erosion and to store nutrient reserves in order to emerge and grow quickly. The seeds of annuals, such as Victorin's gentian, are produced in large quantities and find protection in marsh surface microrelief. In addition, ice boulders stir up sediments and even vegetation cover, which can be carried over large distances and redeposited along the stream, thereby contributing to the dispersal of these species.

Victorin's gentian seeds are heavier than water, but can float due to the papillae covering them, which act as floats. They are carried offshore by tidal and wave action. When the papillae are imbibed, the seeds sink with the slightest movement of the water (Rousseau, 1932; Marie Victorin, 1995). According to Rousseau (1932), this property contributes little to the spread of the species. Locally, hydrochory (water dispersal) is most likely, but it is plausible that the seeds are dispersed over large distances by "epiornithochory"(Brouillet *et al.*, 1996), whereby seeds are transported in mud stuck to birds' feet.

Behaviour/adaptability

According to the data from the Montreal Botanical Garden, Victorin's gentian was cultivated for at least two years. There have been at least eight attempts to germinate seeds, but despite the various cultural methods used, virtually all of the attempts failed.

Teusher (1941) reported that the following treatment was successfully applied to Victorin's gentian. Seeds that were to be sown in the spring were first placed in the refrigerator at 35°F for approximately three months (seeds can also be sown in the fall and overwintered in a cold frame). The plantings were relatively dense in a 5-inch clay pot, and when the first 2 or 3 leaves appeared, they were thinned, keeping only 10 plants, which is much better than transplanting seedlings. The pots were kept moist by placing them in a saucer of water throughout the entire growing season. Vigorous rosettes formed the first year. After overwintering in a cold frame, they flowered abundantly the following summer.

In 1996, seeds were sent to the environmental cytology and phytogenetic resources laboratory (Laval University – Quebec Department of Environment and Wildlife) for a chromosome count. Gervais and Trahan (1996) succeeded in germinating only the seeds from Pointe Platon. The protocol used is as follows: the seeds are rinsed with 70% ethyl alcohol for three minutes, then rinsed with distilled water and placed on a piece of moist filter paper in a petri dish. They are left for two

weeks at ambient temperature and then placed in the refrigerator for one month (Coursol, 1998).

POPULATION SIZES AND TRENDS

Legault (1986) reported that Victorin's gentian was known in 20 localities in 1985, including two destroyed localities. The Lotbinière population totaled 15 individuals, the Berthier-sur-Mer population had 10 individuals and the Saint-Vallier population had 300 individuals. The inventory by Brouillet *et al*. (1996) resulted in the discovery of several new localities, and the inventory of 2002 confirmed the disappearance of several localities and resulted in the discovery of one new population. In 2002, the *Centre de données sur le patrimoine naturel du Québec* (CDPNQ) had information on 49 populations of Victorin's gentian, but after verification, it was found that a number of populations appeared twice, with slightly different names (e.g., Pointe à Belleau and Pointe à Alain, which designate the same location). A different problem occurred in Saint-Jean-Port-Joli, where CDPNQ created two occurrences for a single locality, whereas the two sub-populations are within 100 metres of each other. The opposite occurred at Saint-Vallier, where Anse de Saint-Vallier and Pointe de Saint-Vallier were combined, despite the fact that the two sub-populations were 5 km apart. The situation was reported to CDPNQ and will soon be corrected. The four questionable localities will not be included in this report.

Victorin's gentian is now known in 43 localities and we have demographic data for 32 of the 43 localities. The populations are classified as follows: 7 populations have a quality index A, 2 populations have a quality index B, 4 populations have a quality index C, 12 populations have a quality index D, 7 populations have a quality index X (eradicated population), and 1 population has a quality index E (see Tables 1 and 2 for explanation of index ratings). There are also 10 historic populations.

The discovery of many new populations has resulted in a significant increase in the number of known individuals of Victorin's gentian since 1986. Seven of these populations alone (Deschambault, Pointe Platon at Sainte-Croix, Pointe d'Argentenay at Saint-François, Grosse-Île, Pointe de Saint-Vallier at Saint-Vallier, Sainte-Augustine-de-Desmaures and Anse chez Porteous à Sainte-Pétronille) account for over three-quarters of the Victorin's gentian plants in Canada (between 90% if we use the lower limit and 75% if we use the upper limit). New populations may still be discovered along the St. Lawrence River. The inventories of the summer of 2002 on several localities resulted in the discovery of a new population (Sainte-Pétronille, Anse chez Porteous) and made it possible to update the demographic data for certain populations (Saint-Vallier, Pointe à Labrecque and Saint-Augustin-de-Desmaures). Five of the remaining 10 historic localities, should not be considered eradicated because the habitat is favourable to the growth of Victorin's gentian.

[Subsequent to the completion of this report, two populations were re-discovered. Despite many previous efforts to locate it, Victorin's gentian was finally found in July 2003

by André Sabourin at the Saint-Jean-Port-Joli, Pointe à Menin, site. It consisted of 50 -100 flowering plants. Victorin's gentian was also re-located at a historic site at Saint-Roch-des Aulnaies, Pointe à Chouinard where Sabourin found 70-100 flowering plants in August 2003. These new data have been included in the technical summary.]

LIMITING FACTORS AND THREATS

Predation

Bouillé (1996) observed a lepidopteran larva inside an ovary on a specimen from Beaumont. She reported that the seeds of the flower were very small and very dark compared to the others of the same individual, suggesting the possible impact of predation by insects on reproduction.

Mowing and flower picking

Mowing of the littoral zone by property owners along the St. Lawrence River has been observed at some localities and prevents the formation of flower stalks. Part of the habitat at Montmagny is mowed and is possibly the reason for the plant's extirpation from the site. The same is true with respect to the picking of flowers to make bouquets, which was observed in the locality of Deschambault. Mowing and flower picking deprive gentian of its only means of reproduction and could result in its extirpation from certain localities. Such activity may be more common in areas frequented by numerous people walking along the shore as at Saint-Augustin-de-Desmaures and possibly at sites at Beaumont, anse de Vincennes, Sainte-Pétronille, and Saint-Nicolas, anse Ross.

Limited habitat

Victorin's gentian is restricted to the freshwater and slightly brackish intertidal zone. Its habitat is limited in Quebec by the low tidal range upstream from Deschambault and the high water salinity in the region of Saint-Roch-des-Aulnaies downstream.

Ice scouring

Ice scouring of the rocks and shoreline during the daily tides and ice break-up in the spring could tear up some individuals. Such actions, also, may be beneficial in providing areas for seed establishment. It is uncertain, however, if such natural events have become more extensive than in earlier historic times prior to shoreline developments along the St. Lawrence R.

Water quality and level

Although the water quality of the St. Lawrence River is improving, it is still polluted. Several populations were observed covered with large clumps of algae and other

aquatic vegetation. These had to be removed by the author before the plants, which were literally buried beneath the plant debris (*Vallesneria americana*, *Potamogeton* sp., etc.), could be counted. The subsequent tide should stir up the water and uncover the plants, but the range of the tides is variable. If the plants remain covered for too long, the flowering and survival of part of the populations could be compromised at these localities (Figure 4). No doubt, however, such impacts likely are also of natural occurrence and not primarily related to pollution.

Filling operations

Shoreline filling for the construction of homes, roads, railway lines or marinas has resulted in habitat loss for several species along the river. For example, railway construction at Cap-Rouge has destroyed virtually the entire natural shoreline between Saint-Augustin-de-Desmaures and Cap-Rouge, thereby preventing recolonization by Victorin's gentian. The same is true for the municipalities forming the amalgamated cities of Quebec City (Sainte-Foy, Sillery, Beauport) and Lévis (Saint-Romuald, New-Liverpool, Lauzon). In 1996, the construction of a marina at Saint-Jean-Port-Joli destroyed a large part of the upper littoral zone. Miraculously, the Victorin's gentian population was missed by just a few metres. In the 2002 inventory of this population, no plants were observed, despite the fact that the habitat is still present.

Oil spills

As in the case of Provancher's fleabane (Sabourin et Paquette, 1991; Coursol, 1998), riparian colonies of Victorin's gentian along the St. Lawrence River could be adversely affected by an oil spill.

Human trampling

Victorin's gentian populations are highly exposed to human trampling and/or ATV traffic. ATV traffic in the intertidal zone poses a significant threat. ATVs not only cause plant mortality, but also profoundly alter the fragile balance of its habitat. Thus, the Victorin's gentian population at Lotbinière is probably extirpated due to the repeated passage of ATVs in the upper littoral zone, where they disturb a swath ranging from two to sometimes ten metres wide. The report by Legault (1986) reported this problem for this locality and for the locality of Berthier-sur-Mer.

SPECIAL SIGNIFICANCE OF THE SPECIES

The species is of interest to scientists because it draws attention to the issue of the origin and diversification of the endemic flora of the estuarine shores of the St. Lawrence River (Marie Victorin, 1995). Along with Victorin's gentian, Bouchard et al. (1983) list the following 12 taxa as St. Lawrence estuarine endemics: *Bidens eatonii*, *Cicuta maculata* var. *victorinii*, *Epilobium cliliatum* var. *ecomosum*, *Erigeron philadelphicus* var. *provancheri*, *Eriocaulon parkeri*, *Gratiola neglecta* var. *glaberrima*,

Lycopus americanus var. *laurentianus*, *Physostegia virginiana* var. *granulosa*, *Polygonum punctatum* var. *parvum* and *Zizania aquatica* var. *brevis*.

Given the beauty of this plant, it is a symbol of the conservation of estuarine environments and of the protection of threatened or vulnerable species.

EXISTING PROTECTION OR OTHER STATUS DESIGNATIONS

In 1987, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated Victorin's gentian as a "species of special concern". The organization *NatureServe* has assigned Victorin's gentian a global rank of G2, a Canadian rank of N2 and a Quebec rank of S2 (NatureServe 2001). Argus and Pryer (1990) consider it to be rare in Canada and assign it a Canadian priority of 1.

Two localities (Anse Saint-Vallier and Grosse-Île) are within the boundaries of protected areas: the Saint-Vallier Migratory Bird Sanctuary and the Grosse-Île and the Irish Memorial National Historic Site. Other ill-defined historic populations may also occur within the boundaries of protected territories: the L'Islet, Cap-Saint-Ignace and Trois-Saumons migratory bird sanctuaries. In addition, the organization *Conservation de la nature Québec* owns part of the site on which the Pointe de Saint-Vallier population at Saint-Vallier occurs.

In Quebec, Victorin's gentian was designated as a "threatened" species in February 2001 and is now protected under the Quebec *Act Respecting Threatened or Vulnerable Species*.

Its habitat is protected from the impacts of the most serious threat to its survival under the *Regulation Respecting Motor Vehicle Traffic in Certain Fragile Environments* (R.S.Q., c. Q-2, r.2.2). The Quebec policy respecting the protection of lakeshores, riverbanks, littoral zones and floodplains seeks to maintain and improve the stream water quality by ensuring a minimum adequate level of shoreline protection.

TECHNICAL SUMMARY

Gentianopsis procera ssp. *macounii* var. *victorinii*
Victorin's gentian Gentiane de Victorin
Range of Occurrence in Canada: Quebec

Extent and Area Information	
• *Extent of occurrence (EO)(km²)* (Based on GIS calculation of a polygon in which all points at outer limits of range are included)	171 km²
• *Specify trend in EO*	Stable
• *Are there extreme fluctuations in EO?*	No
• *Area of occupancy (AO) (km²)* (approximate total areas of shoreline habitat)	1 km²
• *Specify trend in AO*	Unknown
• *Are there extreme fluctuations in AO?*	No
• *Number of known or inferred current locations*	28 extant
• *Specify trend in #*	Unknown, but increased numbers of populations reflect greater search effort
• *Are there extreme fluctuations in number of locations?*	No
• *Specify trend in area, extent or quality of habitat*	Decline in quality of habitat
Population Information	
• *Generation time (average age of parents in the population)*	annual or biennial plant
• *Number of mature individuals*	1700-6000 flowering plants
• *Total population trend:*	Unknown, but increased numbers of plants reflect greater search effort
• *% decline over the last/next 10 years or 3 generations.*	Not Applicable
• *Are there extreme fluctuations in number of mature individuals?*	Likely not
• *Is the total population severely fragmented?*	No
• *Specify trend in number of populations*	Increasing due to greater search effort
• *Are there extreme fluctuations in number of populations?*	No

- list populations with number of mature individuals in each:
  Beaumont, Vincennes cove: 11-50
  Berthier-sur-Mer, Anse de Berthier: 55-110
  Berthier-sur-Mer, Road 561: 1
  Deschambault: 100-1000
  Grosse-Île: 200-400
  Ile aux Grues, wharf: 11-50
  Ile aux Grues, Rivière à Anguilles: 13-60
  L'Ange-Gardien, Casgrain Street: 51-100
  L'Ange-Gardien, du Fleuve Street: 51-100
  Lévis, Pointe Martinière: 15
  Montmagny: 1
  Neuville, Provancher marsh: 10-30
  Pointe-aux-Trembles-Ouest: 3-11
  Saint-Antoine-de-Tilly, Les Fonds: 11-50
  Saint-Augustin-de-Desmaures: 300-500
  Sainte-Croix, Pointe Platon: 111-1050
  Sainte-Pétronille: 32
  Sainte-Pétronille, Anse chez Porteous: 200-500
  Saint-François, pointe d'Argentenay: 100-1000
  Saint-Jean-de-Boischatel: 11-59
  Saint-Jean-Port-Joli, the two sides of the wharf: 30-120
  Saint-Jean-Port-Joli, Pointe à Menin: 50-100
  Saint-Roch-des Aulnaies, Pointe à Chouinard:70-100
  Saint-Laurent-d'Orléans : 32
  Saint-Laurent-d'Orléans, Village-des-Anglais: 25-100
  Saint-Nicolas, Anse Ross: 2-10
  Saint-Vallier, Pointe de Saint-Vallier: 200-400

Threats (actual or imminent threats to populations or habitats)

Actual threats:
- human trampling: high risk
- mowing of grass beds: moderate
- shoreline filling: moderate
- flower picking: low
- insect predation of fruit: low
- ? ice scouring: low
- water quality and level: low

Potential threats:
- limited habitat: low level of risk
- oil spills: moderate

Rescue Effect (immigration from an outside source)

- *Status of outside population(s)?*
  USA: None; this is a Canadian endemic

• *Is immigration known or possible?*	Not Applicable
• *Would immigrants be adapted to survive in Canada?*	Not Applicable
• *Is there sufficient habitat for immigrants in Canada?*	Not Applicable
• *Is rescue from outside populations likely?*	Not Applicable
Quantitative Analysis	**Not Applicable**

Other Status

COSEWIC: Special Concern (1987)
Quebec: Menacée

Status and Reasons for Designation

Status:	**Alpha-numeric code:**
Threatened	**D2**

Reasons for Designation:
A geographically highly restricted and short-lived annual or biennial that is endemic to the freshwater or slightly brackish shoreline areas of the St. Lawrence River estuary in Quebec. It is present at 28 extant sites but in very small localized habitats where it is at risk from a wide range of impacts. These include habitat disruption by ATVs, shoreline in-filling, mowing of vegetation, picking of flowers and potentially from oil spills.

Applicability of Criteria

Criterion A (Declining Total Population): N/A**.** No overall declines documented but a significant increase in number of localities due to increased search effort.

Criterion B (Small Distribution, and Decline or Fluctuation): N/A. Extent of occurrence and area of occupancy are small but the taxon is not fragmented, population sizes do not fluctuate and the taxon occurs at 28 sites; habitat quality, however, has decreased and potential habitat for colonization has been greatly reduced.

Criterion C (Small Total Population Size and Decline): N/A. Total population estimate <10,000 but future decline of population size cannot reasonably be inferred in spite of some existing threats; some populations may contain >1000 plants and no extreme fluctuations are known.

Criterion D (Very Small Population or Restricted Distribution): Threatened under D2 with an area of occupancy <<20 km^2.

Criterion E (Quantitative Analysis): N/A

ACKNOWLEDGEMENTS

The author thanks Jacques Labrecque and Line Couillard of the Quebec Environment Department (*Centre de données sur le patrimoine naturel du Québec*) for their field assistance in locating and counting new populations of Victorin's gentian. He also thanks Geneviève Croisetière for her patience during the long counts, particularly when we were trapped by the tide in the cove at Saint-Nicolas.

Funding for the preparation of this status report was provided by the Canadian Wildlife Service, Environment Canada.

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LITERATURE CITED

Argus, G.W. and K.M. Pryer. 1990. Rare Vascular Plants in Canada. Our Natural Heritage. Canadian Museum of Nature, Ottawa. 148 p. + appendices.

Bouchard, A., D. Barabé, M. Dumais and S. Hay. 1983. Les plantes vasculaires rares du Québec. Syllogeus 48. National Museum of Natural Sciences, Ottawa. 79 p.

Bouillé, M. 1996. La taxinomie des gentianes : le cas des espèces rares au Québec. Cours BIO 1001, Université du Québec à Trois-Rivières. 47 p. + annexe.

Brouillet, L., D. Bouchard and F. Coursol. 1996. Les plantes susceptibles d'être désignées menacées ou vulnérables et autres plantes rares de l'estuaire fluvial du Saint-Laurent entre Grondines et Saint-Jean-Port-Joli. Rapport préliminaire préparé pour le ministère de l'Environnement et de la Faune du Québec, Direction de la conservation et du patrimone écologique. 67 p. + annexes.

Caldwell, F.A. and G.E. Crow. 1992. A floristic and vegetation analysis of a freshwater tidal marsh on the Merrimack River, West Newbury, Massachusetts. Rhodora 94: 63-97.

Coursol, F. 1998. La situation du gentianopsis de Victorin (Gentianopsis victorinii) au Québec. Gouvernement du Québec, ministère de l'Environnement et de la Faune, Direction de la conservation et du patrimoine écologique, Québec. 33 p.

Coursol, F. 2001. Fiche sur la gentianopsis élancé variété de Victorin. Site Web : http://www.menv.gouv.qc.ca/biodiversite/especes/gentianopsis-victorin/genti-victorin.htm

Fernald, M.L. 1923. The Gentian of the tidal shores of the St. Lawrence. Rhodora 25: 85-89.

Gervais, C. and R. Trahan. 1996. Personal communication. Laboratoire de cytologie environnementales et des ressources phytogénétiques, Université Laval, Sainte-Foy, Québec.

Gillet, J.M. 1957. A revision of the North American species of Gentianella Moench. Annals of the Missouri Botanical Garden 44 : 195-269.

Gillet, J.M. 1963. The gentians of Canada, Alaska and Greenland. Publication 1180, Research Branch, Canada Department of Agriculture, Ottawa. 99 p.

Government of Quebec. Environment Quality Act, R.S.Q., c. Q-2, s. 31, par. e.

Government of Quebec. Regulation Respecting Motor Vehicle Traffic in Certain Fragile Environments, (1997) 129 G.O. II, 955, s. 1.

Iltis, H.H. 1965. The genus Gentianopsis : Transfers and Phytogeographical Comments. Sida 2 : 129-154.

Kartesz, J.T. 1994. A synonymized checklist of the vascular flora of the United States, Canada and Greenland. Second Edition. Biota of North America Program of the North Carolina Botanical Garden. Timber Press, Portland, Oregon. 2 vols. 622 p. + 816 p.

Labrecque, J. and G. Lavoie. Les plantes vasculaires menacées ou vulnérables du Québec. Québec, Gouvernement du Québec, Ministère de l'Environnement, Direction du patrimoine écologique et du développement durable, 2002, 200 pp.

Legault, A. 1986. Status of Victorin's Gentian, *Gentiana victorinii*. Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Ottawa. 20 p.

Ma, Y.C. 1951. Gentianopsis: a new genus of Chinese Gentianaceae. Acta phytotaxonomica Sinica 1:5-19.

Mason, C.T. and H.H. Iltis. 1965. Preliminary reports on the flora of Wisconsin No. 53. Gentianaceæ and Menyanthaceæ - Gentian and Buckbean Families. Transactions of the Wisconsin Academy of Sciences, Arts and Letters 54: 295-329.

Marie-Victorin, Fr. 1995. Flore laurentienne. 3e édition mise à jour par L. Brouillet, S.G. Hay and I. Goulet en collaboration avec M. Blondeau, J. Cayouette et J. Labrecque. Les Presses de l'Université de Montréal, Montréal. 1093 p.

NatureServe. 2001. An online encyclopedia of life [web application]. 2001. Version 1.6 . Arlington, Virginia, USA: NatureServe. Site Web: http://www.natureserve.org/explorer. (Accessed: September 2002).

NatureServe. 2004. NatureServe Explorer: An online encyclopedia of life [web application]. Version 3.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: May 2004).

Rousseau, J. 1932. Contribution à l'étude du Gentiana victorinii. Contributions du laboratoire de botanique de l'Université de Montréal 23. 7 p.

Sabourin, A. and D. Paquette. February 1991. Status report on Provancher's Fleabane *Erigeron philadephicus* L. subsp. *provancheri* (Victorin & Rousseau) Morton, a vulnerable species in Canada. Committee on the Status of Endangered Wildlife in Canada, COSEWIC. 42 pp.

Scoggan, H.J. 1979. The Flora of Canada, Part 4, Dicotyledoneae (Loasaceae to Compositae). National Museum of Natural Sciences, Publications in Botany 7:1117-1711.

Teuscher, Henry. 1941. La culture des gentianes bisannuelles. Annales de l'ACFAS 7 :108-109.

Yuan, Y.M. et Kupfer, P. 1995. Molecular phylogenetics of the subtribe Gentianinae (Gentianaceae) inferred from the sequences of internal transcribed spacers (ITS) of nuclear ribosomal DNA. Plant Systematics and Evolution 196 : 207-226.

BIOGRAPHICAL SUMMARY OF THE REPORT WRITER

Frédéric Coursol graduated in biological sciences from the University of Montreal in 1992. He is the author of several reports, the two most recent being "*Inventaire des plantes menacées ou vulnérables ou susceptibles d'être ainsi sur les lots intramunicipaux de la MRC de la Vallée-de-la-Gatineau*" and "*Inventaire des plantes susceptibles d'être désignées menacées ou vulnérables dans les îles des rapides de Lachine.*" He has also written five status reports on threatened or vulnerable species in Quebec (*Saururus cernuus*, *Onosmodium molle* var. *hispidissimum*, *Cicuta maculata* var. *victorinii*, *Gentianopsis victorinii* and *Eriocaulon parkeri*) and collaborated with Jacques Labrecque and Luc Brouillet on the update COSEWIC status report on Anticosti aster (*Symphyotrichum anticostense*). Mr. Coursol has familiarized himself with estuarine taxa through field work carried out in 1995 for the 2001 report by L. Brouillet, D. Bouchard and F. Coursol on threatened or vulnerable plants and other rare plants of the fluvial section of the St. Lawrence River estuary between Grondines and Saint-Jean-Port-Joli.

COLLECTIONS EXAMINED

The only herbarium collection consulted to compare specimens of Victorin's gentian was that of the Marie-Victorin Herbarium, located at the University of Montreal's plant biology research institute [*Institut de recherche en biologie végétale*] in Montreal.

The fieldwork was carried out in the summer of 2002, on August 10 at the Pointe Saint-Vallier population at Saint-Vallier and the Anse chez Porteous population at Sainte-Pétronille, on August 29 at the Saint-Augustin-de-Desmaures population, on June 15 and August 30 and 31 at the Saint-Nicolas population, and on September 7 at the Montmagny and Saint-Jean-Port-Joli populations. Efforts to locate the historic populations of Neuville and Cap-Rouge were made on September 8, 2002, those of Pont-Rouge on June 15 and August 29, and those of Beauport and Sillery on August 30.