COSEWIC
Assessment and Status Report

on the

Kellogg's Rush
Juncus kelloggii

in Canada

ENDANGERED
2003

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA

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ESPÈCES EN PÉRIL
AU CANADA

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COSEWIC
Assessment Summary

Assessment summary — May 2003

Common name
Kellogg's rush

Scientific name
Juncus kelloggii

Status
Endangered

Reason for designation
This is a tiny, inconspicuous, annual species that likely numbers fewer than 600 plants. It occurs in a single, seasonally wet microhabitat that is subject to impacts from human recreational and developmental activities within an urban park located in a nationally rare Garry oak habitat.

Occurrence
British Columbia

Status history
Designated Endangered in May 2003. Assessment based on a new status report.

COSEWIC
Executive Summary

Kellogg's Rush
Juncus kelloggii

Species Information

Juncus kelloggii Engelm. is a small annual herb of the rush family (Juncaceae) that grows 0.40-4 cm tall from a short fibrous root.

Distribution

Juncus kelloggii occurs in North America from British Columbia and Washington along the Columbia River in Klickitat County, into Oregon from Columbia and Hood River counties through to the Willamette Valley and southwest Oregon. It also occurs throughout most of California west of the Sierra Nevada and as far south as San Diego County.

In British Columbia *J. kelloggii* is restricted to southeastern Vancouver Island where it is known from only one locality in Victoria in Uplands Park. The nearest population is in Washington State, 330 km from the Vancouver Island population.

Habitat

Generally, *Juncus kelloggii* is found in seasonally wet depressions and vernal pools throughout the range. It is often found in low spots in fields and meadows.

Biology

Juncus kelloggii is an annual species that requires sites that are moist to wet in the winter and spring and dry during summer. In other parts of the range, this species occurs on sandy to clayey soils. The wet period is necessary for germination and growth, possibly as annual flooding followed by desiccation reduces competition by other plants.

Population Sizes and Trends

There is one extant population of *J. kelloggii* in Canada in the Victoria area. This species has not been monitored for population trends; however, the population has apparently remained stable at several hundred plants between the 1985 and 2001.

Limiting Factors and Threats

Any activity that alters the hydrological regime of the site can be a potential threat to this species. Since this population is in a municipal park that is heavily used by walkers and bicycle enthusiasts, trampling may be a problem.

Special Significance of the Species

The British Columbia population of *Juncus kelloggii* is a disjunct population. The nearest population was in southern Washington, but the species is also reported in southwest Oregon and California. Therefore, it is potentially a genetically significant population since it is the northernmost location of this species.

There is no special interest in this particular species, although it is a component of vernal pool communities that are fragile and subject to alteration. There are no known uses for this species by Aboriginal peoples, in part, perhaps due to its small size and rarity.

Existing Protection or Other Status Designations

Global Rank: G3. Canada Heritage Rank: N1. British Columbia rank: S1. California: SR. Oregon: SU. Washington: S1. There is no existing legislative protection for this species in Canada.

Summary of Status Report

Juncus kelloggii is restricted to southeastern Vancouver Island and is known from only one locality in a municipal park, Uplands Park, in Victoria, British Columbia. Kellogg's rush is uncommon in southwest Oregon and California. The population at Uplands Park contains up to several hundred individuals, and has remained stable for the past ten years. The species is found in seasonally wet depressions and vernal pools through its range. It is an annual species that requires sites that are moist to wet in the winter and spring, but that dry up during the summer. These vernal pool communities are fragile and subject to alteration. This is a small, often overlooked species that may be confused with a similar annual rush (*J. bufonius*).

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

Kellogg's Rush
Juncus kelloggii

in Canada

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2003

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SPECIES INFORMATION

Name and classification

Scientific name: *Juncus kelloggii* Engelm. [see Douglas et al. 2001]
Common name: Kellogg's Rush
Family: Juncaceae Rush Family
Major plant group: monocot flowering plant

Description

Juncus kelloggii is an annual herb that grows from a short, fibrous root. It has erect stems, 0.4-4 cm tall (Fig. 1; Hitchcock et al. 1969). Leaves basal, bristle-like, nearly circular in cross-section, tapered and lacking cross-walls. Flowers are mostly single or in clusters (of 2) on a leafless stem and terminal. The perianth segments are brown to reddish-brown, 2.5-3.5 mm long, pointed, and subequal. There are three stamens. The anthers are 0.4 mm long and are shorter than the filaments. Bracts are scale-like and inconspicuous. Fruits are capsules, blunt and as long as the perianth segments. Seeds are barrel-shaped, with prominent longitudinal ribs and cross-walls, about 0.4 mm long and lacking tail-like appendages (Douglas et al. 2001).

Juncus kelloggii may be confused with (*Juncus bufonius*), another small annual rush. The latter species has an involucral bract that appears as a continuation of the stem, whereas *J. kelloggii* has only scale-like involucral bracts. In Oregon and California, *J. kelloggii* may also be confused with the similar species *J. tiehmii*.

DISTRIBUTION

Global range

Juncus kelloggii occurs in North America (Fig. 2) from British Columbia and in Washington along the Columbia River in Klickitat County (Washington Natural Heritage Program web site, 2001), into Oregon from Columbia and Hood River counties through to the Willamette Valley (Marion and Linn Counties) and southwest Oregon (Josephine County) (Ertter 1986; Oregon Natural Heritage Program web site, 2001). It also occurs throughout most of California west of the Sierra Nevada and as far south as San Diego County (Cronquist et al. 1977; Swab 1993; Brooks and Clemants 2000[1]; CalFlora Database 2001; Douglas et al. 2002).

[1]Brooks and Clemants (2000) note that this species occurs at a single locality in Nevada, but this is probably in error and most likely represents *Juncus tiehmii* as separated by Ertter (1986).

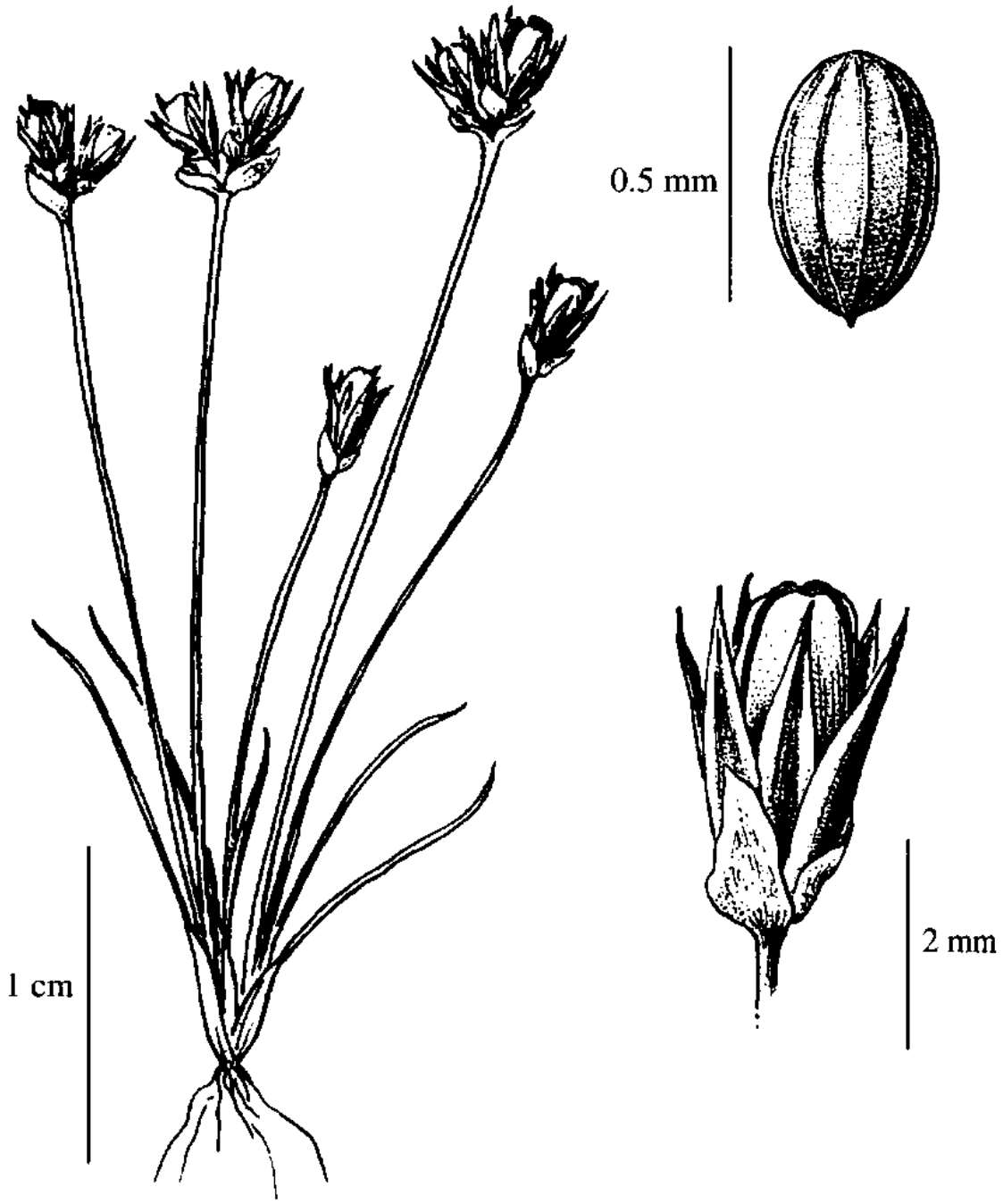

Figure 1. Illustration of *Juncus kelloggii* by Jeanne R. Janish. Reprinted with permission from George W. Douglas et al. 2001.

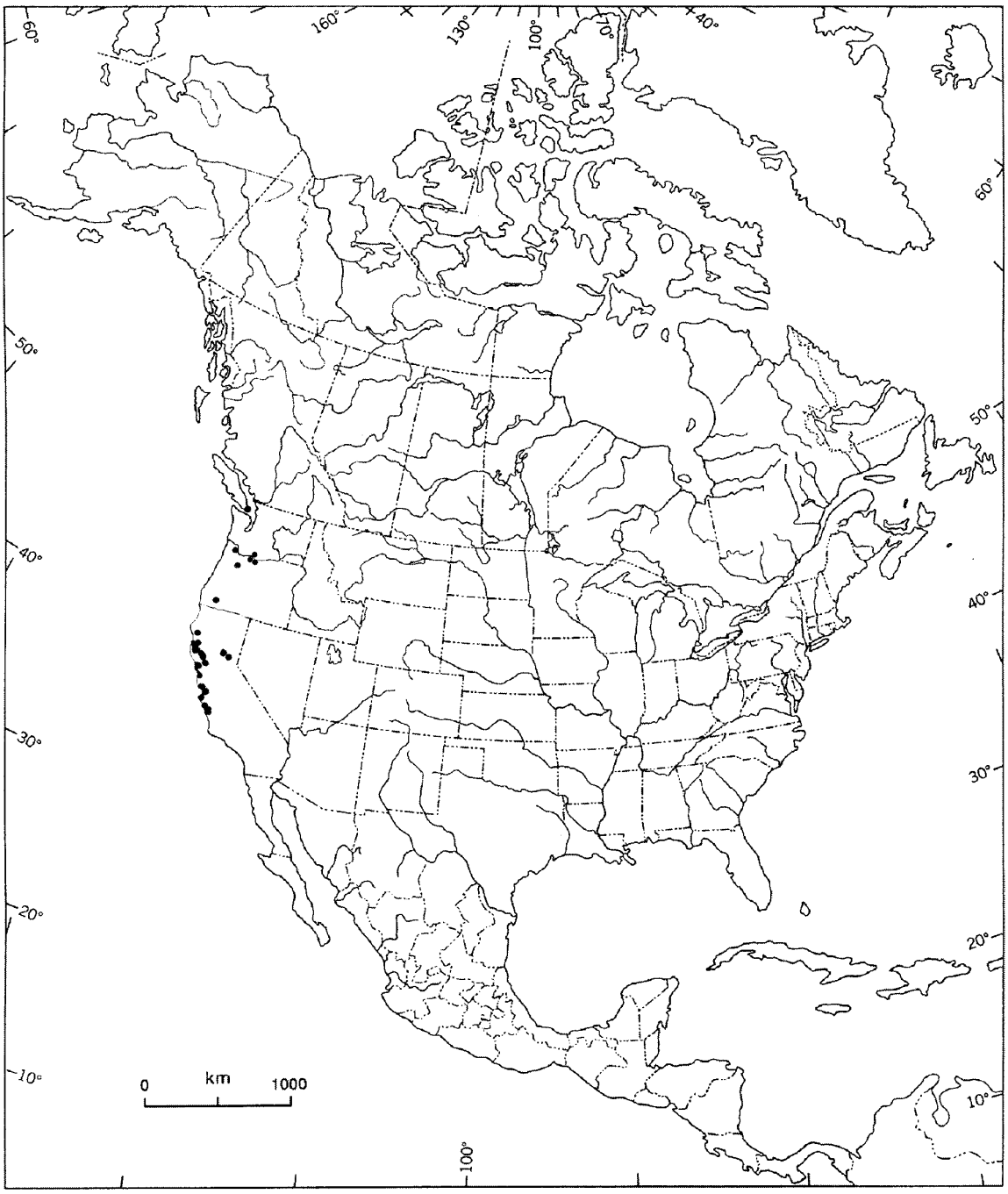

Figure 2. Distribution of *Juncus kelloggii* in North America.

Canadian range

In British Columbia *J. kelloggii* is restricted to southeastern Vancouver Island where it is known from only one locality in Uplands Park, Victoria. This locality is 330 km from the nearest population in Washington State.

HABITAT

Habitat requirements

Generally, *Juncus kelloggii* is found in seasonally wet depressions and vernal pools throughout its range. It is often found in low spots in fields and meadows. Plants growing with this species in British Columbia include chaffweed (*Anagallis minima*), the red-listed species *Centaurium muehlenbergii*, *Heterocodon rariflorum*, *Juncus bufonius* and the red-listed species *Psilocarphus elatior* (BC CDC HERB database 2002; Douglas et al. 2002). Elevations: to 10 m.

Trends

There is one extant population of *J. kelloggii* in Canada in the Victoria area. This population contains up to several hundred plants (RBCM Herbarium records; Table 1). There are no historic records for this species; the first record is from June 1985 (CDC HERB database 2002; Douglas et al. 2002). Considering its tiny size, highly restricted occurrence and presence in a habitat with numerous other rare species it has likely been present for a long period of time.

Table 1. Localities and Population Data for *Juncus kelloggii* in Victoria, British Columbia.

Location	Year	Collector	Number of Plants/area
1. Uplands Park	1991	A. Ceska	100-200 plants
	1993	A. Ceska	Unknown
	1999	F.W. Lomer	200-600
	2001	A. Ceska	3 plants

Protection/ownership

The single *Juncus kelloggii* population is found within a regional park in the Municipality of Oak Bay within Victoria. Currently, there is no management plan for the park (L. Middleton, pers. comm.).

BIOLOGY

General

Juncus kelloggii is an annual species that requires sites that are moist to wet in the winter and spring and dry during the summer. In other parts of the range, this species occurs on sandy to clayey soils. The wet period is necessary for germination and growth, possibly as annual flooding followed by desiccation reduces competition by other plants. Other annual *Juncus* species do not handle competition well and are therefore usually found growing on bare ground (Ertter 1986).

Reproduction

This annual species is generally self-pollinating (Swab, 1993). In the *Juncus triformis* complex (*J. kelloggii* is part of the "*kelloggii* group" within this complex), higher altitude species were found by Ertter (1986) to require cold treatment for germination. Germination began as early as two days after cold treatment and continued up to two weeks afterward. Ertter (1986) stated that since only a certain percentage of the seeds germinated, there may be seeds in the soil that potentially could germinate at a later time. Each *J. kelloggii* capsule contains approximately 50 seeds (Ertter 1986). No seed germination experiments were conducted for this report.

Survival

During germination experiments conducted by Ertter (1986) on the *Juncus triformis* complex, not all seeds germinated in the same year. Therefore, seeds may only germinate in favourable years. The annual life cycle, diminutive size and reduction of flowers in *Juncus kelloggii* are all factors that could contribute to its survivability in a drought environment (Ertter 1986).

Physiology

The flowers require long daylength to trigger flower production and open in the morning. Seedlings of the *J. triformis* complex develop leaves and culms after a lag period from the production of cotyledons. The latter could have been due to the artificial growing conditions (Ertter 1986).

Movements/dispersal

Dispersal may be by birds transporting the seeds in their feet and feathers after walking through the muddy habitat (Ertter 1986).

Nutrition and interspecific interactions

Some members of the *J. triformis* complex require acidic soils such as found in vernal pools. The "*kelloggii*" group, however, prefers sandy or silty soils (Ertter 1986).

Behaviour/adaptability

Juncus kelloggii may survive unfavourable seasons as drought tolerant seeds (Ertter 1986). It is dependent on an annual cycle that can survive in a habitat that fills in with water, then dries out in the summer. This potentially decreases competition from other species (Ertter 1986).

POPULATION SIZES AND TRENDS

This species has not been monitored for population trends at the British Columbia site; however, this population has remained stable at several hundred plants between the 1985 and 2001 (A. Ceska, pers. com. 2002). It undergoes considerable fluctuations in numbers from year to year depending on seasonal precipitation.

LIMITING FACTORS AND THREATS

Any activity that alters the hydrological regime of the site can be a potential threat to this species (Washington Natural Heritage Program 1999). Since this population is in a public park that is heavily used by walkers and bicycle enthusiasts, trampling may be a problem. There has been habitat alteration due to fire hydrant maintenance; gravel was brought into part of the vernal pool area to fill in the tracks created by a fire truck (A. Ceska, pers. comm). The site is in an open area of a Garry oak meadow and where there is encroachment of the outer edges of the park by *Symphoricarpus albus*, *Cytisus scoparius* and non-native grasses. The ephemeral moisture in this site may prevent these species from overtaking these low lying areas. The Municipality of Oak Bay does not have a management plan for the park (L. Middleton, pers. comm.).

SPECIAL SIGNIFICANCE OF THE SPECIES

Other related forms that are threatened in British Columbia include *Juncus arcticus* ssp. *alaskanus*, *J. confusus*, *J. oxymeris*, *J. regelii* and *J. stygius*. All are blue-listed in British Columbia except for *J. confuses,* which is a red-listed species. These species do not occur in the same habitat as *J. kelloggii* (BC CDC Tracking List web site 2002; Douglas et al. 2002*).* The British Columbia population of *Juncus kelloggi* is a disjunct population from the nearest population (330 km away) in southern Washington, but the species is reported in southwest Oregon and California. Therefore, it is potentially a genetically significant population.

There is no special interest in this particular species, although it is a component of vernal pool communities that are fragile and subject to alteration.

There is no known use of this species by Aboriginal peoples (N. Turner, pers. comm.).

EXISTING PROTECTION OR OTHER STATUS

Juncus kelloggii has been globally ranked by The Nature Conservancy of the U.S. as “G3?,” or vulnerable either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction (NatureServe web site 2001).

The British Columbia Conservation Data Centre considers *Juncus kelloggii* "red-listed," or a threatened/endangered taxon (Douglas et al. 2002). This taxon is ranked as an "S1," in British Columbia, or critically imperilled because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (<1,000) (BC CDC Tracking list web site 2002; Douglas et al. 2002). Douglas et al. (2002) lists the global ranking as "G3".

SUMMARY OF STATUS REPORT

Juncus kelloggii is restricted to southeastern Vancouver Island and is known from only one locality in a municipal park, Uplands Park, in Victoria, British Columbia. Kellogg's rush is uncommon in southwest Oregon and California. The population at Uplands Park contains up to several hundred individuals, and has remained stable for the past fifteen years. It undergoes considerable population fluctuation with larger numbers of plants present when adequate moisture is available. The species is found in seasonally wet depressions and vernal pools through its range. It is an annual species that requires sites that are moist to wet in the winter and spring and dry during the summer. These vernal pool communities are fragile and subject to alteration. *Juncus kelloggii* is potentially overlooked due to its diminutive size and similarity to another annual species *Juncus bufonius*.

TECHNICAL SUMMARY

Juncus kelloggii
Kellogg's rush jonc de Kellogg

British Columbia

Extent and Area information	
• *Extent of occurrence (EO)(km²)*	25m^2
• *specify trend (decline, stable, increasing, unknown)*	Stable
• *are there extreme fluctuations in EO (> 1 order of magnitude)?*	Not known
• *area of occupancy (AO) (km²)*	25m^2
• *specify trend (decline, stable, increasing, unknown)*	decline based on gravel dumping on part of the single site
• *are there extreme fluctuations in AO (> 1 order magnitude)?*	Not known
• *number of extant locations*	One
• *specify trend in # locations (decline, stable, increasing, unknown)*	Stable
• *are there extreme fluctuations in # locations (>1 order of magnitude)?*	Not applicable
• *habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat*	Some reduction in size has occurred
Population information	
• *generation time (average age of parents in the population) (indicate years, months, days, etc.)*	one year
• *number of mature individuals (capable of reproduction) in the Canadian population (or, specify a range of plausible values)*	3-600
• *total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals*	Stable
• *if decline, % decline over the last/next 10 years or 3 generations, whichever is greater (or specify if for shorter time period)*	Not applicable
• *are there extreme fluctuations in number of mature individuals (> 1 order of magnitude)?*	Yes
• *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)?*	single tiny site
• *List each population and the number of mature individuals in each*	fluctuation of 3-600 at a single site
• *Specify trend in number of populations (decline, stable, increasing, unknown)*	Stable
• *Are there extreme fluctuations in number of populations (>1 order of magnitude)?*	No
Threats (actual or imminent threats to populations or habitats)	
- Hydrological changes - Trampling of habitat by hikers and bicycle riders - Park maintenance activities	
Rescue Effect (immigration from an outside source)	Low
• *Does species exist elsewhere (in Canada or outside)?*	Not in Canada; Washington, Oregon and California
• *status of the outside population(s)?*	WA: S1; OR: SU; CA: SR
• *is immigration known or possible?*	Unlikely
• *Would immigrants be adapted to survive here?*	Not known
• *is there sufficient habitat for immigrants here?*	Not known
Quantitative Analysis	

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I thank the British Columbia Conservation Data Centre of the Ministry of Sustainable Resource Management, Terrestrial Information Branch, for providing information on this species from their database files. Also, thanks to Adolf Ceska and George W. Douglas for comments and contributions to this report.

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LITERATURE CITED

British Columbia Conservation Data Centre, HERB database. 2002. British Columbia Ministry of Sustainable Resource Management, Terrestrial Information Branch.

British Columbia Conservation Data Centre, Tracking Lists. 2002. British Columbia Ministry of Sustainable Resource Management, Terrestrial Information Branch. Web site: http://srmwww.gov.bc.ca/cdc/trackinglists/red_blue.htm.

Brooks, Ralph E., and Steven E. Clemants. 2000. Juncaceae *In* Flora of North America, North of Mexico. Vol. 22. Magnoliophyta: Alismatidae, Arecidae, Commelinidae (in part), and Zingiberidae. New York.

CalFlora Database, 2002. Information on California plants for education, research and conservation. Web site: http://www.calflora.org/.

Cronquist, Arthur, Arthur H. Holmgren, Noel H. Holmgren, James L. Reveal and Patricia K. Holmgren. 1977. Intermountain Flora. Vascular Plants of the Intermountain West, U.S.A. Volume 6. The Monocotyledons. The New York Botanical Garden, Columbia University Press. New York. 584 pp.

Douglas, George W., Del Meidinger and Jenifer Penny. 2002. Rare Vascular Plants of British Columbia. BC Ministry of Sustainable Resource Management and Parks and BC Ministry of Forests (in press).

Douglas, George W., Del Meidinger and Jim Pojar. 2001. Illustrated Flora of British Columbia. Volume 6. Acoraceae through Najadaceae. BC Ministry of Environment, Lands and Parks and BC Ministry of Forests. 361 pp.

Ertter, Barbara. 1986. The *Juncus triformis* Complex. Memoirs of the New York Botanical Garden 39:1-90.

Hitchcock, C.L., A. Cronquist, M. Ownbey and J.W. Thompson. 1969. Vascular Plants of the Pacific Northwest, Part 1: Vascular Cryptogams, Gymnosperms, and Monocotyledons. University of Washington Press, Seattle, WA. 914 pp.

NatureServe. 2001. An online encyclopedia of life. Version 1.5. Arlington, Virginia, USA: Association for Biodiversity Information. Web site: http://www.natureserve.org/.

Oregon Natural Heritage Program. 2001. Rare, threatened and endangered plants and animals of Oregon. p. 59. Web site: http://www.natureserve.org/nhp/us/or/index.htm.

Swab, Janice Coffey. 1993. Juncaceae *In* Hickman, J.C. 1993. The Jepson manual: higher plants of California. University of California Press, Los Angeles, CA. 1400 pp.

United States Department of Agriculture, Plants Database. 2001. Natural Resources Conservation Service. Web site: http://plants.usda.gov/.

Washington Natural Heritage Program. 2001. Web site: http://www.wa.gov/dnr/htdocs/fr/nhp/index.html.
Washington Natural Heritage Program and the U.S.D.I. Bureau of Land Management. 1999. Field Guide to Selected Rare Vascular Plants of Washington.

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COLLECTIONS EXAMINED

Royal British Columbia Museum (V#177119 and V183745). Uplands Park collected by Adolf and Oluna Ceska, June 17, 1985, and Adolf Ceska, July 8, 2001.

University of British Columbia, Herbarium: http://www.botany.ubc.ca/herbarium/. No records from Canada.

University of Victoria (UVIC), Dept. of Biology, Victoria, BC. No records from Canada.