



**Garry Oak
Ecosystems
Recovery Team**

**Stewardship Account for
Kellogg's Rush**
Juncus kelloggii Engelm

Prepared for the
Garry Oak Ecosystems Recovery Team

March, 2002

by

Brenda Costanzo,
BC Conservation Data Centre,
PO Box 9344
Station Provincial Government,
Victoria, BC V8W 9M7

Funding provided by the Habitat Stewardship
Program of the Government of Canada and
the Nature Conservancy of Canada

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**NATURE
CONSERVANCY** 
C A N A D A

STEWARDSHIP ACCOUNT

Juncus kelloggii Engelm.

Species information:

Kingdom: Plantae
Subkingdom: Tracheobionta
Superdivision: Spermatophyta
Division: Magnoliophyta
Class: Liliopsida
Subclass: Commelinidae
Order: Juncales
Family: Juncaceae
Genus: *Juncus*
Species: *kelloggii*
Juncus kelloggii Engelm.
Kellogg's rush

Synonyms:

Juncus brachystylus Piper
Juncus triformis var. *brachystylus* Engelm.

(Douglas *et al.* 2001; Hitchcock, 1969; U.S.D.A. Natural Resources Conservation Service Plants Database)

J. kelloggii is potentially confused with toad rush (*Juncus bufonius*), another small annual rush. The latter species has an involucre bract that appears as a continuation of the stem, whereas *J. kelloggii* has only scalelike involucre bracts (A. Ceska, pers. com.).

Description:

Annual herb from a short root. Stems are erect, 0.4-4 cm tall. Leaves basal, bristlelike, nearly circular in cross-section, tapered and lacking cross-walls. Flowers mostly single or in clusters of 2 on the leafless stem, terminal; perianth segments brown reddish-brown, 2.5-3.5 mm long, pointed, and subequal. Stamens 3, anthers 0.4 mm long, shorter than the filaments. Bracts scalelike and inconspicuous. Fruits are capsules, blunt, as long as the perianth segments. Seeds barrel-like, with prominent longitudinal ribs and cross-walls, about 0.4 mm long and lacking tail-like appendages. (Douglas *et al.* 2001).

Range and Known Distribution:

Juncus kelloggii occurs in North America 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; CalFlora Database 2001; Douglas *et al.* 2002). The Flora of North America states that there is one locality in Nevada (Brooks and Clemants 2000), however, Morefield (pers. comm.) stated that *J. kelloggii* is not considered to occur in Nevada, only the segregate *J. tiehmii* as per Ertter (1986).

Kellogg's rush occurs in North America from British Columbia into Washington (Klickitat County) west of the Cascade Mountains, in 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 the species is restricted to southeastern Vancouver Island where it is known from one locality in Victoria.

Habitat Description:

Juncus kelloggii occurs in seasonally wet depressions and vernal pools (Douglas *et al.* 2001). Washington Natural Heritage Program (1999) describes the habitat as sandy to clayey damp soils in vernal pools, seepage sites and low areas in fields and meadows. Elevations range from 0 to 555 m. Swab (1993) states that the species occurs in damp sandy or clay soils, vernal pools, fields and meadows less than 800 m. Hitchcock *et al.* (1969) states that it is found along moist banks, damp areas in open fields, edges of vernal pools and montane meadows.

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. Plants growing with this species in British Columbia include chaffweed (*Anagallis minima*), the red-listed species, Muhlenberg's centaury (*Centaurium muhlenbergii*), heterocodon (*Heterocodon rariflorum*), toad rush (*Juncus bufonius*) and the red-listed species, tall woolly-heads (*Psilocarphus elatior*). Elevations: to 10 m.

Status of Species:

Global rank: G3?

Canada Heritage Rank: N1

British Columbia: S1

California: SR

Oregon: SU

Washington: S1

(from NatureServe web site)

Other related species that are threatened are *Juncus arcticus* ssp. *alaskanus* (Arctic rush), *Juncus confusus* (Colorado rush), *Juncus oxymetris* (pointed rush), *Juncus regelii* (Regel's rush) and *Juncus stygius* (bog rush). All are blue-listed in British Columbia except for the Colorado rush which is a red-listed species (BC SRM red and blue listed species).

There are no other known pharmacological, ethnobotanical or horticultural uses for *Juncus kelloggii* (Bailey and Bailey 1976; N. Turner, pers. comm.).

Life History:

- a) General - *J. kelloggii* is an annual species that requires sites that are moist to wet in the winter and spring, but that dry up 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, 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).
- b) Phenology – Flowers in June and sets seeds in July (A. Ceska, pers. com).
- c) Pollination Biology – Primarily self-pollinated (Ertter 1986; Swab 1993) but also cross-pollinated, however no insects were seen visiting the flowers (Ertter 1986).
- d) Reproductive ecology - This annual species is generally self-pollinating (Swab, 1993). In the *Juncus triformis* complex (of which *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 maybe 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.
- e) 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*, all are factors that could contribute to its survivability in a drought environment (Ertter 1986).
- f) Physiology - The flowers require long daylength to trigger flower production and they open only for a few hours. Seedlings of the *J. triformis* complex developed leaves and culms after a lag period from the production of cotyledons, but this could have been due to the artificial growing conditions (Ertter 1986).
- g) Dispersal - Dispersal is potentially by birds who pick-up the seeds in their feet and feathers after walking through the muddy habitat (Ertter 1986).

- h) Nutrition & 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. *J. kelloggii* can tolerate or perhaps prefers more clayey soils than the other species of this complex (Ertter 1986).
- i) Behaviour/Adaptability - *J. kelloggii* may survive unfavourable seasons as drought tolerant seeds. It is dependent on an annual life cycle that can survive in a habitat that fill in with water, then dries out in the summer. This potentially decreases competition from other species (Ertter 1986).

How the species is at risk:

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.

The British Columbia Conservation Data Centre considers *Juncus kelloggii* a Ministry of Sustainable Resource Management “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).

Currently, there is one occurrence of this species in Canada, in Uplands Park in Victoria, British Columbia. The site is possibly subject to trampling and disturbance by parks maintenance crews. There is nothing known about the susceptibility of *J. kelloggii* to disturbance or limitations on population size. This species has not been monitored for population trends, however, there was a potential decrease in size from several hundred to a few plants between the 1991 and 2001 (observations by A. Ceska and F. W. Lomer from CDC HERB database). Any activity that alters the hydrological regime of the site can be a potential threat to this species (Washington Natural Heritage Program, 1999).

Management Recommendations:

There are no current management policies and actions for the occurrences of *J. kelloggii*. Any changes in the hydrological regime will potentially affect the population (Washington Natural Heritage Program). Currently, there is no management plan for Uplands Park (L. Middleton, pers. com.) Further study is needed on the life history, particularly on population dynamics.

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Authorities Consulted/Personal Communications:

Anne Bradley. Regional Botanist, USDA Forest Service, Pacific Southwest Region, 1323 Club Dr., Vallejo, CA 94592, Phone: 707-562-8938, Fax: 707-562-9050, E-mail: abradley@fs.fed.us.

Florence Caplow. Botanist, Washington Natural Heritage Program. Department of Natural Resources. PO Box 47014. Olympia, Washington. Phone: 360-902-1793. Email: Florence.Caplow@wadnr.gov.

Adolf Ceska. Program Community Ecologist. British Columbia Conservation Data Centre. BC Ministry of Sustainable Resource Management, Terrestrial Information Branch, Victoria, BC. Phone: 250-356-7855. Email: Adolf.Ceska@gems4.gov.bc.ca.

Steven E. Clemants. Herbarium, Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, NY. Phone: 718-623-7309. Email: steveclemants@bbg.org. (no response).

Beth Corbin. Botanist, Bureau of Land Management, Eagle Lake Field Office, 2950 Riverside Dr., Susanville, CA 96130, Phone: 530-252-5305, Fax: 530-257-4831, E-mail: bcorbin@ca.blm.gov.

George W. Douglas. Program Botanist. British Columbia Conservation Data Centre. BC Ministry of Sustainable Resource Management, Terrestrial Information Branch, Victoria, BC. Phone: 250-356-5019. Email: George.Douglas@gems7.gov.bc.ca.

Barbara Ertter. University and Jepson Herbaria, University of California, 1001 Valley Life Science Building 2465, Berkeley, CA. Phone: 510-642-2465. Email: ertter@uclink4.berkeley.edu.

Mike Foster. Forest Botanist, Mount Pinos Ranger District, Los Padres National Forest. Phone: 661-245-3731. Email: mfooster01@fs.fed.us.

David F. Fraser. Species Specialist. BC Ministry of Water, Air and Land Protection, Environmental and Stewardship Division, Biodiversity Branch. 2975 Jutland Road, Victoria, BC. Phone: 250-387-9756, Fax: 250-356-9145, Email: Dave.Fraser@gems8.gov.bc.ca.

Steve Gisler. Oregon Department of Agriculture-Natural Resources Division, Botanist, Plant Conservation Biology Program. Oregon Dept. of Agriculture-Natural Resources Division 635 Capitol St. NE, Salem, OR 97301-2532 Phone: (503) 986-4717. Email: sgisler@oda.state.or.us.

Claire Hibler, Botanist and IWM Coordinator, Salem District Office, Bureau of Land Management, 1717 Fabry Road SE, Salem, OR 97306. Phone: 503-375-5677, Fax: 503-315-5970, Email: chibler@or.blm.gov.

Lawrence Janeway. Curator, Biological Sciences Herbarium (CHSC), California State University, Chico, Chico CA 95929-0515. Phone: 520-898-5381. Email: Ljaneway@csuchico.edu.

Edward Lorentzen. California State Office, Bureau of Land Management, 2800 Cottage Way, Room W-1834, Sacramento, California, 95825-1886, Phone: (916) 978-4646, Fax: (916) 978-4657, E-mail: Edward.Lorentzen@ca.blm.gov.

Lorne Middleton. Oak Bay Municipality. Parks Department. 1771 Elgin Street, Victoria, BC. Phone: 350-370-7147.

James D. Morefield. Botanist, Nevada Natural Heritage Program. Department of Conservation and Natural Resources. 1550 East College Parkway, Suite 145. Carson City, Nevada 89706-7921. Phone: 775-687-4245, Fax: 775-687-1288, Email: jdmore@govmail.state.nv.us.

Kristina A. Schierenbeck. Associate Professor, Herbarium Director, Editor, *Madroño*, Dept. of Biological Sciences, California State University, Chico, Chico, CA 95929-0515, Phone: 530-898-6410, Fax: 530-898-4363, kschierenbeck@csuchico.edu. (no response).

Scott Sundberg. Coordinator Oregon Flora Project., Dept. of Botany and Plant Pathology, Oregon State University, Cordley Hall 2082, Corvallis, OR 97331-2903. Phone: 541-737-4338, Fax: 541-737-3573, Email: sunbers@bcc.orst.edu. (no response).

Nancy J. Turner. Professor, School of Environmental Studies, University of Victoria. Phone: 250-721-6142, Fax: 250-721-8985, Email: nturner@uvic.ca.

Susan Vrilakas. Botanist/Data Manger, Oregon Natural Heritage Program/The Nature Conservancy. 1322 SE Morrison Street, Portland, OR 97214. Phone: 503-731-3070, Fax: 503-731-3070, Email: svrilakas@tnc.org.

John Willoughby. State Botanist, Bureau of Land Management, 2800 Cottage Way, Sacramento, CA 95825, Phone: 916.978.4638, Fax: 916.978.4657, Email: john_willoughby@ca.blm.gov.

James C. Zech. Dept. of Biology C-57, Sul Ross State University, Alpine, TX. Phone: 915-837-8114. Email: jzech@sulross.edu.