WILDLIFE IN BRITISH COLUMBIA AT RISK

Rare Grassland Plants

Restricted to a few sites in highly developed areas, these grassland species are all at risk in British Columbia.

BRITISH COLUMBIA
Ministry of Environment, Lands and Parks

What are they?

Most of British Columbia's grasslands are found in the rainshadow of the Coast and Cascade mountains, in areas where low rainfall and seasonal drought limit tree growth and allow grasses to dominate. Covering about 1.8 percent of British Columbia, grasslands are unique ecosystems that provide habitat for a variety of vertebrates and invertebrates, as well as common and rare plants. Grasslands are highly varied in B.C. due to the province's diverse geology, topography and climate. The bunchgrass community is the most extensive grassland type, dominated by bluebunch wheatgrass (*Elymus spicatus*) and Idaho fescue (*Festuca idahoensis*), and found in hot valley bottoms in the Okanagan basin, in the Thompson basin, and in the middle Fraser River and lower Chilcotin River valleys. A few patches of mountain grasslands grow at low elevations in the southern Rocky Mountain trench, while vast grassy parklands spread across the Peace River region. On southern Vancouver island, a scattering of Garry oak (*Quercus garryana*) meadows persist.

Limited suitable habitat along with the continuing loss of our grasslands puts these species at risk.

Among the many rare grassland species in British Columbia, **scarlet gaura**, **flat-topped broomrape** and **blue grama** clearly illustrate the status of the province's grasslands and their inhabitants. Although common in other provinces and in the United States, these species are extremely rare in British Columbia, and are at risk due to ecological changes occurring in their habitats.

Scarlet gaura (*Gaura coccinea*) is an eye-catching member of the fireweed family (*Onagraceae*), best viewed just before evening when the flowers open for pollination by night-flying insects. Its botanical name comes from the Greek – *gauros* meaning "superb," and *cocinnea* meaning "scarlet." This perennial grows east of the Rocky Mountains in dry, open grasslands. It is common in prairie habitats from Alberta to Manitoba and south to Mexico and Texas. In British Columbia, scarlet gaura is found in the Okanagan basin and within grassland patches in the southern part of the Rocky Mountain trench.

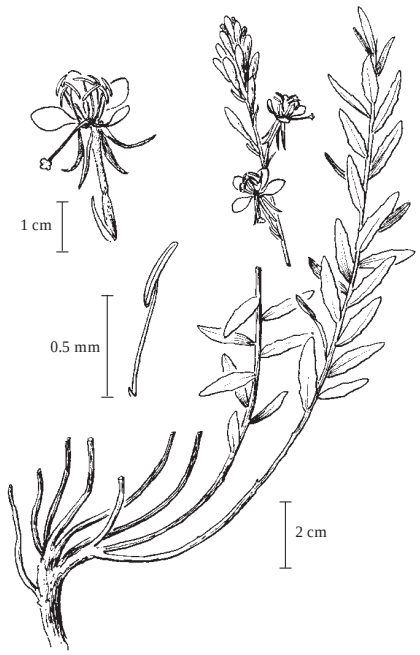
Flat-topped broomrape (*Orobanche corymbosa* spp. *mutabilis*) is a member of the broomrape family (*Orobanchaceae*), which is well known for its parasitism. The plants of this genus gained their common name from a British species that is parasitic on Scotch broom (*Cystisus scoparius*). The botanical name orobanche also describes its parasitic nature – in Greek, *orobos* means "vetch" and *anchien* means "to choke." The species name *corymbosa* describes the shape of its flat-topped inflorescence. Flat-topped broomrape is an austere, elegant, purple-tinted perennial, often found in association with big sagebrush (*Artemisia tridentata*) on dry grassy slopes. It is parasitic on the roots of this and other plants and gets its nutrients and water through specialized root organs called *haustoria*. Flat-topped broomrape is found east of the Cascade Mountains in Washington, south to California and east to Montana and Utah. In Canada it is restricted to British Columbia, growing in a few sites in the Okanagan Valley, southeastern Vancouver Island and the southern part of the Rocky Mountain trench.

With its lovely, feather-like spikelets, **blue grama** (*Bouteloua gracilis*) is a very attractive member of the grass family (Poaceae). Unlike other grasses, blue grama is not easily overlooked. Its aesthetic qualities are alluded to by the species name *gracilis*. The genus name comes from the Spanish explorers Claudio and Esteban Boutelou. This perennial likes dry, grassy hills where it forms thick mats, growing from short *rhizomes* (underground stems). Blue grama is a common dominant species of the North American short grass prairie, which extends east to Manitoba and the eastern United States, and south to Mexico. In British Columbia it is known only from a few sites in the Cariboo-Chilcotin region of the Fraser River basin and in the southern part of the Rocky Mountain trench.

These species depend on habitat protection and stewardship for survival.

What do they look like?

Scarlet gaura is a lovely 20- to 60-centimetre tall plant that bears many flowers crowded on a long terminal spike. Each flower is made up of four petals, ranging in colour from white to red, and of four sharply bent back sepals (modified leaves next to the petals), which move in a remarkably butterfly-like manner with the slightest breeze. The long stamens and styles (the male and female sexual organs of the plant) enhance the insect-like appearance of the scarlet gaura, also called



SCARLET GAURA – *GAURA COCCINEA*

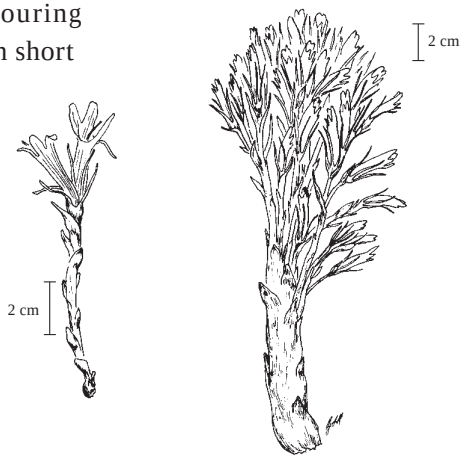
"waving butterfly." Short, lance-shaped leaves are crowded below the inflorescence; the fruit is a diamond-shaped nut. No other species of the genus *Gaura* is found in British Columbia. Scarlet gaura can easily be distinguished from other grassland flora by its terminal spikes of colourful, fluttering flowers.

As a true parasitic plant, flat-topped broomrape lacks chlorophyll and is white to purplish in colour. Deprived of their photosynthetic role, the leaves are reduced to simple, alternate, brownish scales. This relatively small plant (5 to 12 cm tall) has deep, fleshy roots that obtain water and nutrients from neighbouring plants. The flowers are borne on short stalks in a compact inflorescence. The petals are fused in a two-lipped corolla lined with purple strips; the five sepals are inconspicuous. The fruit is a many-seeded capsule that splits in two to release small, dark seeds. There are five other species of broomrape in British Columbia, all restricted to the southern part of the province. Flat-topped broomrape however, is easily identified by its compact, many-flowered inflorescence. It can be distinguished from the more common California broomrape (*Orobanche californica* ssp. *californica*), by the shorter lips of its corolla.

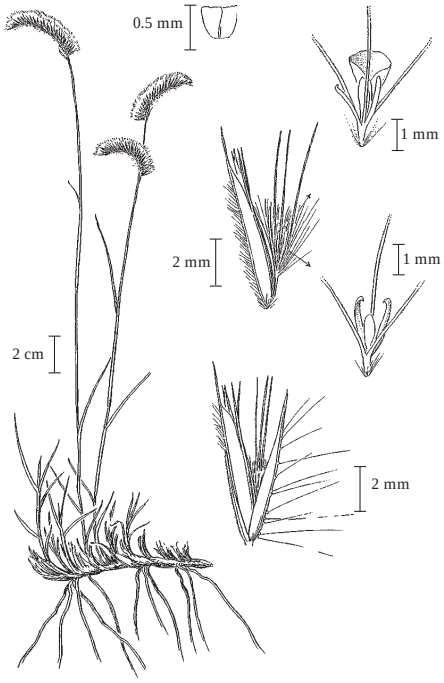
Blue grama is a 10- to 50-centimetre tall, densely tufted grass. Its leaves are up to 15 cm long, often crisp and curly with flat blades. It usually bears two showy, purplish blue spikes made up of 20 to 80 spikelets arranged in two rows. When ready to release seeds, the comb-like spikes roll into a distinctive and graceful spiral. It is the only species of its genus in B.C.

What is their status?

Rare and restricted to a few sites located in highly developed areas, flat-topped broomrape, blue grama and scarlet gaura are on the provincial Red List (species being considered for legal designation as Endangered or Threatened). Flat-topped broomrape is known from 13 sites in Canada, all restricted to southern B.C. Blue grama has been found in only seven locations in this province. Scarlet gaura is known from only eight sites in B.C., four of which are historical records dating from before 1950. Considering the transformation the grasslands have undergone during the last 50 years, can we reasonably assume that these historic populations still exist? If they have survived, how much longer are they likely to last under current conditions?



FLAT-TOPPED BROOMRAPE – *OROBANCHE CORYMBOSA*



BLUE GRAMA – *BOUTELOUA GRACILIS*

Population trends are not known for any of these three species. All that can currently be assessed is their presence or absence in grassland habitats. Field work is needed to gather more information about them. Most of the known sites should be revisited, and further surveys should be undertaken to assess their status and provide guidelines for conservation actions. Except for one flat-topped broomrape population that occurs in a protected area – Cathedral Lakes Provincial Park – these plants are not protected in British Columbia. Only a fraction of the province's remaining native grassland is protected. Churn Creek Protected Area, established in 1994, has been set up to conserve some of the austere beauty of the Cariboo grasslands.

Through the Forest Practices Code, the Province of British Columbia has issued guidelines to preserve biodiversity on a provincial scale.

The Range Management Guidebook, which is part of that Code, provides recommendations on how to manage grassland habitats. Rare grassland plants are also candidates for protection under the Managing Identified Wildlife Strategy under the Forest Practices Code.

A few regulations found in the *Range Act*, such as protection of watersheds, and seeding of exposed soil, provide some legislative protection for grasslands in the province. The BC Ministry of Forests regulates grazing rotation and duration on Crown lands, which could help limit long-term impacts on ranges. These regulations do not apply, however, to the large part of our grasslands that is found on private property and on Indian Reserve lands.

One-quarter of British Columbia's plants are considered rare.

Why are they at risk?

Flat-topped broomrape, scarlet gaura and blue grama are at risk in British Columbia because their habitat is disappearing. Although grasslands are more endangered than any other ecosystems in B.C., they do not get the public concern and attention they deserve and, therefore, they receive very little protection.

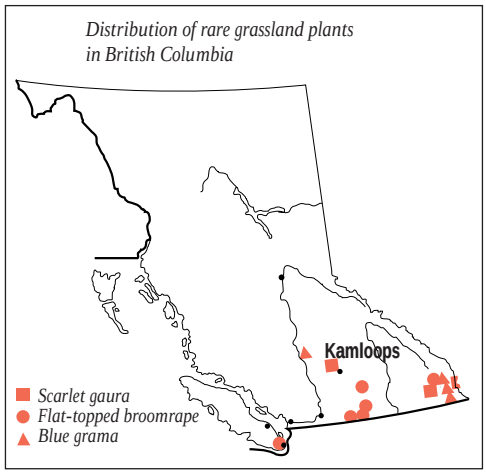
A long history of land use (and abuse) has converted the native grasslands of southern British Columbia to a mosaic of over-grazed rangelands, ever-expanding cities, immaculate fields of alfalfa and ginseng, and productive orchards and vineyards. In the Okanagan region, less than 10 percent of the historical grassland remains in a relatively natural state. Continued overgrazing, fire suppression and expansion of non-native plants are all changing the ecological niche needed by rare grassland species.

Fire is a natural disturbance that plants have adapted to and upon which some plant communities depend. Seasonal fires maintain grassy meadows, keep forest understoreys open and promote biodiversity. For the past 50 years, the control of seasonal fires that once naturally maintained grassland habitats has transformed the original ecology of these areas. Forest encroachment is another major cause of grassland degradation. Non-native species such as knapweed (*Centaurea* species), cheatgrass (*Bromus tectorum*) and orchard grass (*Dactylis glomerata*) have now become established in many places, replacing native grassland species.

Because flat-topped broomrape, scarlet gaura and blue grama are restricted to pockets of dry lands bounded by forested ridges, there is only a limited amount of suitable habitat into which they can expand. In addition, the low genetic diversity of these small, isolated populations limits their ability to disperse and establish themselves in new sites. With their very specific ecological needs and the fierce competition in the warm grasslands, these species depend on habitat protection and stewardship for survival.

Why are they important?

All living organisms have intrinsic value by virtue of their existence and because of their contributions to the ecosystems they inhabit. One quarter of British Columbia's plants are considered rare, and each plays complex ecological roles, which we do not yet fully understand. If we fail to take care of these rare organisms, our ecosystems may become impoverished, and therefore less able to adapt to environmental stress and change.



Rare species can be prove to be valuable indicators of environmental changes, and give us helpful insights into the health of ecosystems. For example, the total number of rare grassland species is a reflection of the history and health of grassland habitats.

In the Okanagan, less than 10 percent of the historical grasslands remain in a relatively natural state.

Scarlet gaura, flat-topped broomrape and blue grama all reach the northwestern limit of their range in B.C. These peripheral populations may be genetically different from core populations, and thereby could add to the genetic adaptability of the species as a whole. Northern populations are particularly important for dealing with global warming because they will be the source for northerly expansion and migration of plant species should the climate become too warm for southern populations.

Another strong argument for

preserving overall biodiversity is the potential medicinal properties of plants. Worldwide, studies in *ethnobotany* (study of the traditional use of medicinal plants by people) show how extremely valuable plants can be. Rare plants are also important for scientific research and can help us understand some of the causes of rarity, allowing us to better manage biological diversity. But most of all, these plants add to the beauty of our grasslands and to the biological richness of the land.

What can we do?

It is not too late to protect the unique diversity of grasslands in British Columbia, but the constant threats to these ecosystems mean that any delay in conservation efforts could bring irreversible and disastrous results.

Detailed field inventories in targeted areas are needed to locate new populations of these species and to provide crucial information on population trends. Thorough field inventory may reveal that some species are naturally rare, whereas others are endangered because of human activities. Further research would help us better understand the complex relationships between the multiple components of grasslands, providing us with tools for conservation.

Habitat restoration, appropriate management strategies and protection of sensitive and species-rich areas are ways we can improve, or at least maintain, the diversity of life around us. One option for keeping grasslands healthy is to limit the extent and intensity of grazing. Another is the re-introduction of fire through prescribed burning, which would help control extensive forest encroachment. BC Parks already uses prescribed fire as a tool to preserve grasslands and biodiversity.

The provincial *Weed Control Act*

THE LOVELY BLUE GRAMA, COMMON IN THE NORTH AMERICAN PRAIRIE REGION, IS ONLY KNOWN FROM SEVEN SITES IN BRITISH COLUMBIA.
Derek Johnson photo

THE BUTTERFLY-LIKE FLOWERS OF SCARLET GAURA CAN ONLY BE ADMIRED AT EIGHT LOCATIONS IN BRITISH COLUMBIA.
Joyce Gould photo

THE PARASITIC FLAT-TOPPED BROOMRAPE DEPENDS ON PROTECTION OF ITS HABITAT FOR SURVIVAL IN BRITISH COLUMBIA.
William Van Dieren photo

IN HOT VALLEY BOTTOMS AND ON DRY SLOPES, GRASSES DOMINATE WHERE TREES CANNOT GROW.
Syd Cannings photo

HUMAN ENCROACHMENT IS THE GREATEST THREAT TO GRASSLANDS IN THE OKANAGAN VALLEY.
Syd Cannings photo

GRASSLAND AND ASSOCIATED WETLANDS ARE CRUCIAL HABITATS FOR PLANTS AND WILDLIFE.
Syd Cannings photo

defines and lists all exotic species considered noxious, and requires all occupants of land in B.C. to control those weeds. Each forest district has a noxious weed plan, which can be consulted for guidance on the species of concern.

What can we do as individuals? Go out and look around for natural grasslands patches in your neighbourhood. Enjoy the great diversity of life they harbour and share your experience with others by joining a local naturalist group or by participating in nature surveys. Learn how to use field guides to identify grassland plants and animals. Garden with native plants, maintain wildlife trees in your backyard. Sponsor and support education and conservation programs, such as the British Columbia Grasslands Conservation Council, the South Okanagan Conservation Strategy or the Okanagan-Similkameen Parks Society. Support land acquisition by private and government agencies, such as The Nature Trust of B.C. or the Land Conservancy of B.C. All these actions can help stop the shrinking of the grasslands. Spread the word! Another piece of the world's biodiversity is disappearing, right here, in our province.

FOR MORE INFORMATION ON RARE SPECIES AND ECOSYSTEMS, CONTACT:

BC Conservation Data Centre
Ministry of Environment, Lands and Parks
PO Box 9344 Stn. Prov. Govt.
Victoria, BC V8W 9M1
www.elp.gov.bc.ca/wld/cdc

FOR MORE INFORMATION ON HABITAT ACQUISITION PROGRAMS CONTACT:

Habitat Conservation Trust Fund
PO Box 9354 Stn Prov Govt
Victoria, BC V8W 9M1
www.elp.gov.bc.ca/hctf

BROCHURE FUNDING PROVIDED BY
Forest Renewal British Columbia

ISBN 0-7726-7661-5
MELP 241537.0399
MARCH 1999

TEXT BY **MARIE FONTAINE** AND **GEORGE DOUGLAS**
COVER ARTWORK COPYRIGHT **MICHAEL HAMES**
LINE DRAWINGS FROM "VASCULAR PLANTS OF THE PACIFIC NORTHWEST", C.L. HITCHCOCK ET AL, COURTESY UNIVERSITY OF WASHINGTON PRESS
DESIGN BY **ARIFIN GRAHAM, ALARIS DESIGN**
DISTRIBUTION MAP BY **RICK PAWLAS**
PROJECT COORDINATION BY **SYD CANNINGS** AND **LAURA FRIIS**

Printed in British Columbia on recycled paper with vegetable inks