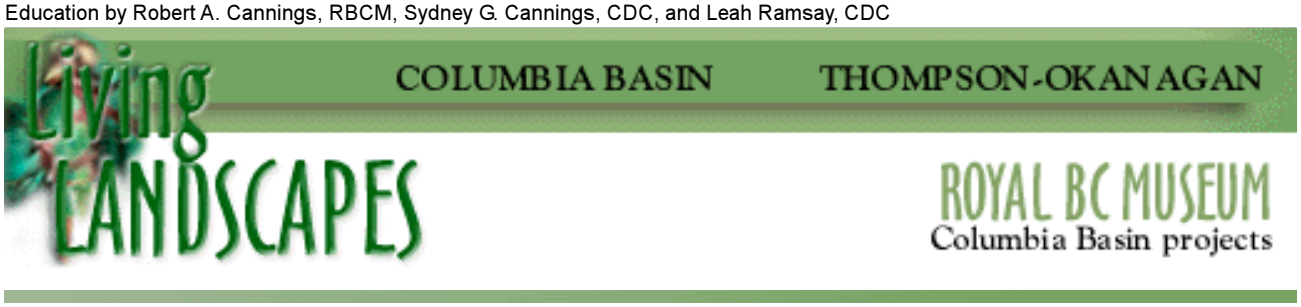

The Dragonflies (Insecta: Odonata) of the Columbia Basin, British Columbia: Field Surveys, Collections Development and Public Education

by:
Robert A. Cannings, Royal BC Museum
Sydney G. Cannings, B.C. Conservation Data Centre
Leah Ramsay, B.C. Conservation Data Centre

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Royal British Columbia Museum
675 Belleville Street
Victoria, British Columbia
CANADA

1-888-447-7977
(250) 356-7226
http://www.royalbcmuseum.bc.ca

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Volunteer field assistants were a critical part of the project. Some residents of the region and other volunteer naturalists helped collect specimens and data. These assistants are mentioned in the list of cooperatives in Appendix 3. Resident naturalists trained in these activities will contribute long-term information on the status of species and wetland habitats, and act as a core of local enthusiasts to encourage and train other interested people. The Habitat Conservation Trust Fund provided a grant for salary and travel expenses (1999).

Blair Nikula (*Lestes forcipatus, Somatochlora cingulata, S. forcipata, S. walshii*) and Dennis Paulson (*Calopteryx aequabilis, Aeshna tuberculifera, Ophiogomphus occidentis, Stylurus olivaceus*) provided photographs not available in the RBCM collections.

Overview of the Project

As part of the *Living Landscapes* Project in the Columbia Basin of southeastern British Columbia, the Royal British Columbia Museum (RBCM) and the Ministry of Environment, Lands and Parks British Columbia Conservation Data Centre (CDC) joined forces to study the dragonflies (Insecta: Odonata) of the region. The area treated is the Columbia River Basin in British Columbia, exclusive of the Okanagan River drainage. In British Columbia this area is commonly called the Kootenay Region or The Kootenays after the Kootenay River the largest of the Canadian tributaries of the Columbia River.

The project was a two-year effort to determine the present status, precise location of occurrences and habitat requirements of the dragonflies of selected areas of the Columbia Basin. Although the RBCM has dragonfly specimens and a species list for the region that represents our knowledge up to 1997, no comprehensive survey for dragonflies had ever been made: some of the recorded populations were known only from collections made in the early 1900s.

Dragonflies are invertebrates that seldom receive the attention they deserve from government biologists and resource managers. But they are of ecological importance for many reasons. They are upper-level predators in aquatic and semi-aquatic habitats, often dominating the large invertebrates, especially in fish-free systems. They inhabit, for the most part, the edges of water bodies, living in the riparian interface between land and water. Many species are habitat-specific and their presence can be used to characterize healthy wetlands of all sorts. Furthermore, unlike most invertebrates dragonflies are identifiable in the field by experts, and surveys can proceed with speed and efficiency. Within the constraints of weather, these surveys are well-suited for long-term monitoring programs. Finally, because they are large, colourful, diurnal creatures with interesting behaviours, dragonflies are excellent subjects for nature interpretation programs and public education about aquatic ecosystems in general.

Recently, similar inventories have been carried out by the CDC and the RBCM in southwestern British Columbia, the Okanagan Valley and the Peace River region, which have resulted in many new discoveries that have greatly increased our knowledge of dragonfly distribution and ecology. This new information improves our ability to produce comprehensive public programs such as Web pages, interpretive programs and publications (such as the planned fieldguide to the dragonflies of Northwestern North America), which will be useful and informative to students, naturalists and professional biologists in the Columbia Basin and further afield. Detailed inventory

information will help local and provincial habitat managers and National Parks staff to make better informed decisions about wetland environments, and to set realistic conservation priorities for wetlands.

The three main objectives of this project were:

- to survey and study the dragonflies of the Columbia Basin to improve scientific knowledge and gather information for use in wetland management and conservation planning;
- to develop simple educational programs to promote understanding of dragonflies and their relationship to diverse and healthy wetland habitats;
- to involve residents of the regional community in the study of dragonflies and the long-term monitoring of selected species and localities.

We surveyed dragonflies in selected areas throughout the Basin over the 1998 and 1999 field seasons. Experienced RBCM and CDC staff were the primary field workers doing collection, identification, data entry and photography. In addition, several Basin residents who expressed interest in the study helped gather specimens and data. (Appendix 3 lists the participants.) Students in the Co-operative Programs of the University of Victoria and Simon Fraser University helped create the initial databases and distribution maps.

In 1998 the survey focused on the mountain ranges and the Rocky Mountain Trench north of Invermere, especially in the four National Parks there (Kootenay, Yoho, Glacier and Mount Revelstoke). Many of the rare species of management concern are found in the northern mountainous areas of the region. The project met the interpretive and management goals of Parks Canada, and it agreed to support the project. In 1999 we concentrated on the southern Trench and in the Creston-Kootenay Lake region and selected areas to the west, especially along the Highway #3 corridor. Due to the size of the study area, and time and financial constraints, we did not cover the whole region.

We visited the widest possible array of habitats to identify and note adult dragonflies. We usually netted specimens for close examination and kept voucher specimens. Larval specimens or the cast skins of larvae (exuviae) can also be used as indicators of a species' use of a particular site. Both adult and larval specimens were prepared, labelled, identified and accessioned into the RBCM collections.

Details of numbers of dragonflies, their behaviour and ecology, as well as precise UTM grid coordinates were recorded and entered into an RBCM database. Distribu

tion maps of each species were produced using ArcView GIS. The distribution of larvae and breeding adults was analysed to determine critical habitats.

Slide shows of two types (slides on videotape with voice-over commentary; shows made up of individual slides and associated hardcopy text) were distributed to parks and naturalist organizations for use in interpretive programs.

The English names of dragonflies used in this report are those adopted by the Dragonfly Society of the Americas (Paulson and Dunkle 1996). Except for the Introduction, these names are not used in the body of the report, but are listed in Appendix 1.

The first dragonfly records from the Kootenays were listed by Currie (1905). Other early major works by Walker (1912, 1925, 1927), Buckell (1938) and Whitehouse (1941) also included references to the Columbia Basin dragonflies. Walker (1953, 1958) and Walker and Corbet (1975), cited some of the earlier works mentioned above while researching the dragonflies of Canada and Alaska. Scudder *et al*. (1976) and Cannings and Stuart (1977) updated and summarized the information known for British Columbia. Since then, general collecting, mostly by RBCM and CDC staff, has improved our understanding of regional species distributions in minor ways (Cannings 1980a, Cannings 1983, Cannings and Cannings 1983, Cannings 1984, Cannings and Cannings 1994). The main sources of distributional information on the species of the region are the databases of the Spencer Entomological Museum, at the University of B.C. in Vancouver, and the Royal B.C. Museum in Victoria.

Part II of the Overview of the Project

By the end of the 1999 season we had visited over 291 sites and had identified 4,466 dragonflies during the two-year project. RBCM collections made before the survey accounted for 75 different sites and 594 specimens; thus, in total there are 366 Columbia Basin sites and 5,060 specimens in the RBCM database. Distribution maps and collection data for all species are found in Appendix 4 and can also be reached through individual species accounts in the Systematic Review section.

Fifty-seven species were known from the Columbia Basin in British Columbia before the start of the project: at the completion, sixty-six species were on the list. The nine additions were: *Calopteryx aequabilis* (River Jewelwing), *Lestes forcipatus* (Sweetflag Spreadwing), *Coenagrion interrogatum* (Subarctic Bluet), *Stylurus olivaceus* (Olive Clubtail), *Somatochlora cingulata* (Lake Emerald), *Somatochlora forcipata* (Forcipate Emerald), *Somatochlora minor* (Ocellated Emerald),

Somatochlora walshii (Brush-tipped Emerald), *Leucorrhinia glacialis* (Crimson-ringed Whiteface).

Calopteryx aequabilis
(River Jewelwing)
Photo: Dennis Paulson.

Lestes forcipatus
(Sweetflag Spreadwing)
Photo: Blair Nikula.

Coenagrion interrogatum
(Subarctic Bluet)
Photo: George Doerksen.

Stylurus olivaceus
(Olive Clubtail)
Photo: Dennis Paulson.

Somatochlora cingulata
(Lake Emerald)
Photo: Blair Nikula.

Somatochlora forcipata
(Forcipate Emerald)
Photo: Blair Nikula.

Somatochlora minor
(Ocellated Emerald)
Photo: George Doerksen.

Somatochlora walshii
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Photo: Blair Nikula.

Leucorrhinia glacialis
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The inventory has also improved our understanding of the status of other species rarely recorded in the Columbia Basin. Thirteen of the inventoried species are considered rare, based on collections in museums. However, with increased study, species such as *Aeshna tuberculifera* (Black-tipped Darner), *Somatochlora cingulata* (Lake Emerald) and *Gomphus graslinellus* (Pronghorn Clubtail) will prove to be more widespread than initial records suggested. Others, such as *Argia vivida* (Vivid Dancer), live in restricted habitats that are threatened by human-caused development, and are more likely to be at risk, even if more populations are discovered.

Several species, including *Enallagma clausum* (Alkali Bluet), *E. hageni* (Hagen's Bluet), *Aeshna septentrionalis* (Azure Darner) and *Somatochlora hudsonica* (Hudsonian Emerald), remain to be found in the region, but probably occur there.

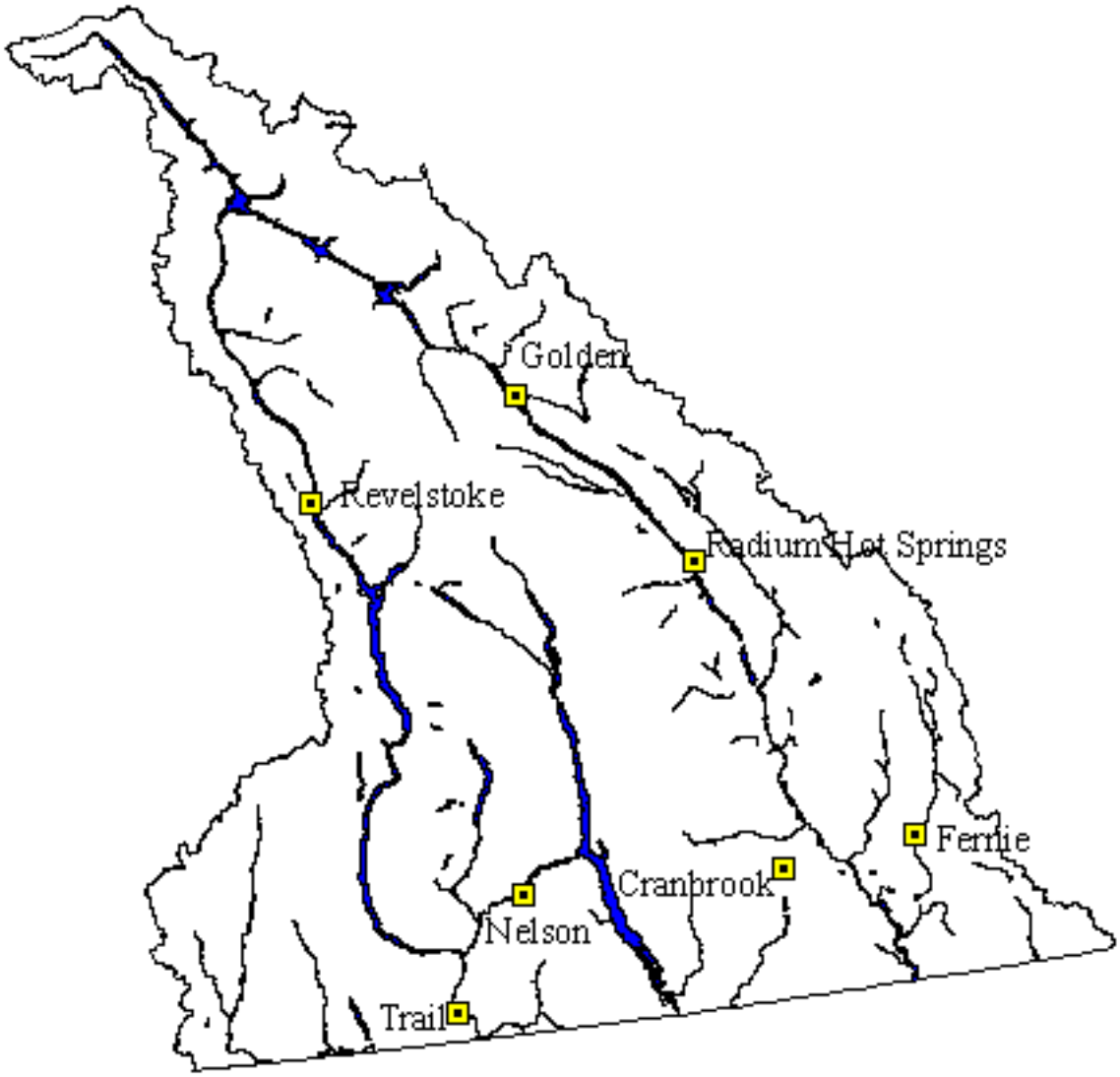
Calopteryx aequabilis (River Jewelwing), *Lestes forcipatus* (Sweetflag Spreadwing) and *Somatochlora forcipata* (Forcipate Emerald) are species new to British Columbia. *C. aequabilis* represents a new family of Odonata for B.C.: the Calopterygidae. This spectacular damselfly is recorded from Stevens County, Washington; and for several decades we had suspected that it lived in the streams of the Boundary district. However, we had not managed to find it there until July 1999, when Leah Ramsay discovered it near Christina Lake.

In 1998, in a wetland near Donald in the Rocky Mountain Trench, Ramsay also found *Lestes forcipatus*, not confirmed elsewhere in Canada west of Saskatchewan. This is a good example of an uncommon species that had been overlooked simply because it was not expected, and because it very closely resembles the widespread *Lestes disjunctus* (Common Spreadwing). The species was subsequently discovered in 15 more sites in the region.

Finding *Somatochlora forcipata* (Forcipate Emerald) was also a goal that had eluded us for years. This species had been collected about 3 kilometres from the British Columbia/Alberta boundary in Banff National Park in the 1920s (Walker and Corbet 1975). This ancient collection had remained the only record west of Manitoba. Surely it also had to live in "small spring runs" following "devious courses" (as described by Edmund Walker, the 1920s collector) west of the Continental Divide. After much searching, *S. forcipata* was located at three peatland sites in Yoho and Kootenay national parks. It is clearly a sparsely distributed member of the Rocky Mountain dragonfly community, and an inhabitant of an apparently rare habitat as well.

The 66 species now known from the Columbia Basin represent 77% of the 86 species

recorded from British Columbia, and 33 % of the 202 recorded in Canada. At least six more species are thought to occur in the region, and several more than that will probably be added to the list. All these species are native to Canada. Thirteen species in the Columbia Basin are considered rare or potentially at risk (Appendix 1).



Introduction to the Dragonflies (Odonata)

Although the insect order Odonata (Greek for toothed jaws) contains both the groups of insects known in English as the dragonflies and damselflies, following common usage we also use the name "dragonflies" to refer to the whole order. The term "odonates" is also sometimes used. The Odonata is a small order of insects of about 5,000 named species and 23 families worldwide. It is predominantly tropical in distribution and is not as diverse at higher latitudes.

Dragonflies are large and abundant insects and, because of this, the order forms one of the predominant groups in standing freshwater communities in the Columbia Basin. In the western mountains, species are less abundant in running water than they are in standing water habitats. Dragonflies live around most types of fresh water. Certain kinds prefer lakeshores, others are found only along streams, or around springs and in peatlands. Ponds and marshes rich in aquatic vegetation support the most species.

The Odonata and their ancestors are some of the most ancient of insects. They have many primitive features, but also possess many specializations that reflect their aerial and predatory lifestyle. The order is divided into three suborders: the Zygoptera (damselflies), the Anisoptera (dragonflies) and the Anisozygoptera, a small group of two species from Asia that is intermediate in appearance between the other two suborders. Damselflies are slimmer, often smaller, and usually fly more slowly than dragonflies. At rest their equal-sized wings are usually held together above the body. Zygoptera means "joined wings". Dragonflies are robust, often fast-flying, with the hindwings broader than the forewings: when perched they hold their wings out away from the body. Anisoptera means "unequal wings".

The aquatic larvae are predacious and are armed with an enormous hinged labium, sort of a lower lip, which is used as an extendible grasping organ for capturing prey. Larvae are voracious, eating small aquatic insects, crustaceans and even fish. Larvae can be placed in three categories according to their feeding behaviour. Climbers (Zygoptera, Aeshnidae) are streamlined stalkers that live in submerged vegetation. Sprawlers (Macromiidae, Corduliidae and Libellulidae) lie in ambush on the bottom mud and detritus. Burrowers (Gomphidae, Cordulegastridae) cover themselves with sand and mud and await their prey. Larvae moult 10 to 15 times as they grow. When fully grown, the larva crawls out of the water up a plant stalk or some other support. The skin on its back splits open and the adult dragonfly squeezes out. The newly emerged dragonfly pumps blood into the wing veins and the wings expand. Gradually the body hardens, and after an hour or so the dragonfly can fly. It leaves the empty larval skin

(exuviae) clinging to the plant.

Adults are aerial, visually oriented predators: they are large, strong-flying insects with large eyes, strong mandibles and spiny legs. Their prey is a wide range of flying insects, which are usually captured in flight. Adults are often colourfully patterned, and exhibit a wide variety of readily observed behaviour. Mature males patrol the breeding habitats, aggressively searching for mates, and may, like birds, defend a territory against other males of the species. These territories limit aggression and prevent undue disturbance of egg-laying females. Sometimes in crowded situations group territories with dominance hierarchies are established.

When he is ready to mate, a male grasps a female by the front of the thorax (damselflies) or by the top of the head (dragonflies) with the appendages at the tip of the abdomen. The female loops the end of her abdomen up to the base of the male's abdomen where the sperm is stored and transferred. The Odonata are the only insects that mate in this wheel position.

The female lays the eggs once they are fertilised. All damselflies and some dragonflies (mainly the Aeshnidae) have a knifelike egg-laying structure called an ovipositor, at the tip of the abdomen. They lay their eggs in plant tissue of various sorts. Competition for mates is usually fierce, and male aggression can prevent females from laying their eggs. Females ovipositing alone are usually secretive. In many species, the male often retains his hold on the female while she lays her eggs, guarding her from other males who may attempt to mate with her. Some damselflies crawl below the water surface to escape the attentions of males, remaining there for over an hour to lay their eggs. They can take a film of air down with them, trapped in the hairs on their body. The large stream-dwelling *Cordulegaster* has a spikelike ovipositor that drives eggs into the mud and sand of the streambed. Other species lacking ovipositors usually just dip the tip of the abdomen into the water and wash the eggs off, and the eggs sink to the bottom.

Damselflies, and many dragonflies, develop rapidly. For many species in the Kootenays the life cycle takes about a year. *Lestes* and some *Sympetrum* species overwinter as eggs, hatch in the spring and emerge as adults in the summer. Others overwinter as larvae and emerge the following spring or summer, although probably in some species under certain conditions, the larvae overwinter two years. However, in the larger dragonflies, such as *Aeshna* or *Somatochlora*, the short summers of high altitudes in the region often mean that four or five years are spent in the larval stage. Adult dragonflies in the Columbia Basin live for about one to two months.

Dragonfly Habitat In the Columbia Basin

1. Large lakes (wave-washed shores with little vegetation)

Some southern lakes, such as Christina, Columbia, Wasa, and the southern parts of Kootenay to name a few, have wave-washed shores with little vegetation. The dragonflies associated with this habitat are: *Argia emma, Enallagma carunculatum* (in *Scirpus* beds), *E. ebrium, Aeshna umbrosa,Gomphus graslinellus, Ophiogomphus severus* and *Macromia magnifica*. In large, deep lakes north of the southern valleys, the waters are colder and less productive, and dragonflies are restricted to shallow waters in sheltered bays, where the fauna resembles that found in small lakes and ponds.

2. Small lakes and ponds (floating, but little emergent vegetation)

A wide variety of small lakes and ponds are present in the Columbia Basin, and an equally diverse array of Odonata: *Enallagma ebrium, Aeshna canadensis,A. eremita, A. multicolor, A. palmata, A. tuberculifera, A. umbrosa, Cordulia shurtleffi, Epitheca spinigera, Somatochlora albicincta, S. cingulata,Leucorrhinia glacialis, L. hudsonica, L. proxima, Libellula julia, L.lydia* and *Sympetrum vicinum.*

3. Alkaline lakes

These salty lakes occur primarily in grasslands and open forests in the dry, warm southern valleys and plateaux. These species are able to live in this unusual habitat despite the often high salinity, and their life histories enable them to take advantage of the ephemeral nature of the shallower lakes and ponds: *E. boreale, Lestes congener, L. unguiculatus,Sympetrum corruptum,* and *S. costiferum.* These species are not restricted to this habitat.

4. Cattail/bulrush marshes (including margins of lakes and ponds)

Marshes dominated by tall stands of cattails *(Typha)* and bulrushes *(Scirpus)* are most common in nutrient-rich, warm waters at low to medium elevations. They are especially common in the Columbia River Valley between Columbia Lake and Golden. Species associated with this habitat are: *Lestes congener, L. disjunctus, L. dryas, L. forcipatus,L. unguiculatus, Enallagma carunculatum,*

E. cyathigerum, Ischnura cervula,I. perparva, Aeshna californica, A. canadensis, A. constricta, A. interrupta, A. multicolor, A. palmata, Anax junius, Leucorrhinia intacta, Libellula forensis, L. lydia, L. pulchella, L. quadrimaculata, Sympetrum costiferum, S. danae, S. internum, S. obtrusum, S. occidentale and *S. pallipes.*

5. Sedge marshes

Sedges *(Carex)* form dense stands around many lakes and ponds, especially at medium and high elevations. Species associated with this habitat are: *Lestes congener, L. disjunctus, L. dryas, L. forcipatus,*

Coenagrion resolutum, Enallagma boreale, E. cyathigerum, Nehalennia irene, Aeshna interrupta, A. juncea, A. palmata, Epitheca spinigera, Somatochlora semicircularis,Libellula quadrimaculata, Leucorrhinia borealis, L. hudsonica, Sympetrum internum and *S. obtrusum.*

6. Ephemeral ponds (temporary ponds)

In addition to some saline ponds that may disappear during hot weather, fresher ephemeral waters support the following species: *Lestes dryas,L. unguiculatus, Sympetrum corruptum, S. madidum* and *S. pallipes.*Some of these species overwinter as eggs in the dry pond basin.

7. Small peatland ponds with aquatic moss

Peatlands are poorly drained wetlands where decaying moss and other vegetation accumulates as peat. Ponds in these sites generally at moderate to high elevations may be bordered with floating moss or firm peat. This habitat supports the following species: *Coenagrion interrogatum* and *A.subarctica,* among others.

8. Shallow sedge/moss fens

Peatlands affected by flowing water, evenly vegetated with sedges and dotted with shallow pools, host a particular assemblage of species: *Enallagma boreale, Coenagrion resolutum, Nehalennia irene, Aeshna sitchensis,Somatochlora franklini, S. semicircularis* and *S. whitehousei.*

9. Streams

Odonata are not normally found in the cold streams of mountainous areas. The following species living in flowing waters are generally restricted to the warmer slow-flowing, southern lowland streams or montane streams that drain lake basins, beaver ponds or peatlands.

Calopteryx aequabilis,Argia emma, Ophiogomphus occidentis, Stylurus olivaceus and *Macromia magnifica* are restricted to the southern valleys. *Aeshna umbrosa* and *Ophiogomphus severus* are more widespread and also live in lakes. *Somatochlora forcipata* is restricted to the Rocky Mountains, *S. minor* and *S. walshii* are more widespread in small montane streams.

10. Springs and shallow seeps

Some of the more uncommon species of Odonata are associated with small springs and shallow seeps.

Amphiagrion abbreviatum is widespread in such habitats. *Argia vivida* is, for the most part, restricted to warm springs in the mountains. *Cordulegaster dorsalis* is found in many warm streams draining lakes on the west side of the Coast Mountains, but in the Columbia Basin has been found only in spring-fed streams.

Biogeography and Faunal Elements

Dragonfly species may be grouped with others that share similar distributions to form what can be termed faunal elements. The majority of the 66 species known from the Columbia Basin are restricted to North America (Nearctic Region), although six are holarctic, and are defined here as species with transcontinental ranges in both North America and Eurasia. Two species (*Anax junius* and *Sympetrum corruptum*) are known from eastern Asia but do not have holarctic distributions. This section describes the Nearctic faunal elements found in the Columbia Basin (species with holarctic distributions are also assigned to a North American faunal element). This discussion is summarized in the list in Appendix 2. The faunal elements are:

1. Boreal (21 species, 32%). Species occurring in the northern spruce (*Picea*) forests, across the boreal zone from treeline to the southern margin. In general, these species range from the Atlantic Provinces across the northern New England states, Quebec, northern Ontario, parts of the northern tier of mid-western states, the Prairie Provinces north of the Great Plains, and northern British Columbia, often ranging considerably southward in the higher mountains and plateaux of the western Cordillera. These species can be further subdivided into:

i. Widespread Boreal (13 species, 20%). With ranges as described above. *Coenagrion resolutum*, *Enallagma boreale*, *E. cyathigerum* (also Holarctic), *Aeshna eremita*, *A. juncea* (also Holarctic), *A. sitchensis*, *A. subarctica* (also Holarctic), *Cordulia shurtleffi*, *Somatochlora albicincta*, *S. franklini*, *S. whitehousei, Leucorrhinia hudsonica, Sympetrum danae* (also Holarctic).

ii. Northern Boreal (1 species, 1.5%). Species that are common near the northern treeline, but that are virtually absent from the northern contiguous United States and from the southeastern Atlantic Provinces, and do not extend far south into the Cordillera. Only one species from this element, *Coenagrion interrogatum*, has been collected.

iii. Southern Boreal (6 species, 9%). Species that are uncommon north of 60º N in the West and absent near the Arctic treeline in the East, but range far down the Cordillera and/or into the southeastern Atlantic Provinces and New England states. Some (e.g. *Aeshna interrupta)* are common on the Great Plains. *Nehalennia irene, Aeshna interrupta,Somatochlora cingulata, S. minor, S. walshii, Leucorrhinia proxima.*

iv. Western Boreal (1 species, 1.5%). Species not found east of Hudson Bay. *Leucorrhinia borealis.*

2. Transition (15 species, 23%). Species generally most common in the southern boreal forests and adjacent montane forests in the West, and mixed and deciduous forests in the East. *Calopteryx aequabilis, Enallagma ebrium, Aeshna canadensis, A. constricta, A. tuberculifera,A. umbrosa, Gomphus graslinellus, Epitheca spinigera,Somatochlora forcipata, Leucorrhinia glacialis, L. intacta,Libellula julia, Sympetrum costiferum, S. internum,S. obtrusum.*

3. Cordilleran (11 species, 17%). Species confined to the western mountains and their intervening valleys and plateaux. *Argia emma, A. vivida, Ischnura cervula, Aeshna californica, A. palmata, Ophiogomphus occidentis, Stylurus olivaceus, Cordulegaster dorsalis, Macromia magnifica, Somatochlora semicircularis, Libellula forensis.*

4. Western (7 species, 10%). Species confined to west of the 100th meridian, but otherwise ranging widely in North America. *Amphiagrion abbreviatum, Ischnura perparva, Ophiogomphus severus, S. madidum, S. occidentale.*

5. Austral (6 species, 9%). Species ranging across the continent south of the boreal forests, often extending into Transition areas, but with most of the range in the United States. *Lestes forcipatus, Enallagma carunculatum, Anax junius, Libellula lydia, L. pulchella, Sympetrum vicinum.*

6. Widespread (6 species, 9%). Species with broad distributions in North America, from north to south and east to west, overlapping several of the other elements listed. These species range into boreal regions to varying degrees. *Lestes congener, L. disjunctus, L. unguiculatus,L. dryas* (also Holarctic), *Libellula quadrimaculata* (also Holarctic), *Sympetrum corruptum.*

The faunal elements are thus represented in the Columbia Basin as follows:
21 species of Boreal origin (32%) are recorded. Of these, 13 (20%) are Widespread Boreal, 6 (9%) are Southern Boreal, 1 (1.5%) is Northern Boreal and 1 (1.5%) is Western Boreal. Transition species total 15 species (23%) and there are 11 (17%) Cordilleran species. Seven species (10%) are Western, 6 (9%) are Austral and 6 (9%) are Widespread according to our definitions.

Six species *Lestes dryas, Enallagma cyathigerum, Aeshna juncea, A. subarctica, Libellula quadrimaculata* and *Sympetrum danae* are holarctic, ranging around the Northern Hemisphere. It is likely that these species have had such wide distributions since before the last glacial age. In contrast to the situation in some other insect

groups, there is no evidence that the Beringian glacial refugium influenced the distribution of British Columbian Odonata. The only odonate with a Beringian distribution, *Somatochlora sahlbergi* Tryböm, does not range south of the central Yukon (Cannings and Cannings 1997). There, however, it hybridizes with two close relatives widespread in the Montane Cordillera: *S. albicincta* and *S. hudsonica* (Cannings and Cannings 1985).

The Columbia Basin is part of the Montane Cordillera Ecozone, which includes all the southern Interior of B.C. north to roughly the northern end of Williston Lake. Farther north in the Cordillera, 70 percent of 33 species in the Yukon are of Boreal origin (Cannings and Cannings 1997); in the Montane Cordillera Ecozone this boreal component is reduced to 34% of 77 species, about the same as in the Columbia Basin (33% of 66 species). This reduction is the result of the strong influence of more southerly faunas, since all but one (*Somatochlora kennedyi* Walker) of the Yukon's boreal species range south into the Montane Cordillera.

Five boreal species: *Aeshna septentrionalis* Burmeister, *Ophiogomphus colubrinus* Selys, *Somatochlora hudsonica* (Selys), *S. septentrionalis* (Hagen) and *Leucorrhinia patricia* Walker, are known from the Montane Cordillera Ecozone, but are yet to be found in the Columbia Basin. Eighteen species in the Boreal element of the Columbia Basin range south of 51ºN along the mountains and plateaux of the Cordillera: *Coenagrion resolutum,Enallagma boreale, E. cyathigerum, Nehalennia irene, Aeshna eremita, A.interrupta, A. juncea, A. sitchensis, A. subarctica, Cordulia shurtleffi, Somatochlora albicincta, S. cingulata, S. minor, S. walshii, Leucorrhinia borealis, L. hudsonica, L. proxima* and *Sympetrum danae*. These also could be termed boreomontane species.

In contrast, two species of the Boreal element are scarce as far south as even the northern parts of the Kootenays: *Coenagrion interrogatum* and *Somatochlora whitehousei*. These species are also sparsely distributed further to the north relative to their numbers east of the Cordillera. Their rarity in the west is probably more related to habitat scarcity rather than to limited post-glacial colonization.

Since the last glacial age, the Columbia Basin has been recolonized by Odonata from at least two southern refugia: one in what is now the southeastern United States and another in the intermontane Cordillera south of Canada. The putative species pairs *Somatochlora albicincta/S. hudsonica* and *Leucorrhinia hudsonica/L. borealis* have distribution patterns that suggest this history. *S. albicincta* and *L. hudsonica* are boreal species with transcontinental ranges. Presumably they inhabited the southeast

ern refugium and recolonized the Columbia Basin from the east and north, following the early retreat of the continental ice sheet east of the Rocky Mountains. *S. hudsonica* and *L. borealis* have similar distributions, but do not range east of Hudson's Bay, indicating that they recolonized the Cordillera from the southwest. *S. hudsonica* has yet to be recorded from the Columbia Basin, but certainly occurs there.

From 10,000 to 8,000 years before present, following the retreat of the Cordilleran glaciers, the climate became warmer in the region than it is today (Hebda 1995). Presumably, although there is no fossil evidence, southern, warm-adapted species ranged more widely to the north than they do at present. Disjunct, present-day populations in isolated, unusually warm habitats offer evidence for these former distributions.

For example, *Ischnura damula* Calvert is apparently now restricted in the Cordillera to the Liard River Hot Springs. *Argia vivida*, in a genus known for its Neotropical origins (Pritchard 1991), is largely associated with geothermally heated streams in the Columbia Basin and elsewhere in British Columbia (Pritchard 1982). It, too, perhaps, was more widespread during the warmer hypsithermal period and has subsequently been restricted to warm sites (Pritchard 1989).

Patterns of distribution between the Pacific Maritime and the Montane Cordillera ecozones require more study. In Washington State, several species considered completely coastal in British Columbia, such as *Ischnura erratica*, *Sympetrum illotum* and *Pachydiplax longipennis*, also occur east of the Cascade Mountains. The Columbia River Valley may have acted as a corridor for these coastal species to range inland. In addition, a number of interior species, such as *Archilestes californica* McLachlan, *Erpetogomphus compositus* Hagen and *Gomphus lynnae* Paulson, do not range north of the Columbia Basin in central Washington (Paulson 1997). This area is the northern limit of distribution of many plants and animals. In contrast, *Argia emma*, which ranges at least as far east in the Interior as Christina Lake, is also locally common in the lower Fraser River Valley of British Columbia on the western side of the Coast Mountains. It has apparently colonized this area by using the Fraser River Valley as a conduit from the Interior valleys of the Thompson and Okanagan drainages. It is not known from coastal habitats in Washington State, although it is common east of the Cascades there.

Systematic Review of the Fauna

This is an overview of the families and genera of dragonflies known in the Columbia Basin. A distribution map for each species is included with each species account. A systematic checklist of the 66 species recorded in the region, including their English names, is listed in Appendix 1. Collection data from Royal BC Museum specimens are listed in Appendix 3. Only data from the RBCM are used in the maps and Columbia Basin flight season ranges.

Order Odonata (Damselfies and Dragonflies)

Suborder Zygoptera (Damselfies)
Family Calopterygidae (Jewelwings)
Family Lestidae (Spreadwings)
Family Coenagrionidae (Pond Damsels)

Suborder Anisoptera (Dragonflies)
Family Aeshnidae (Darners)
Family Gomphidae (Clubtails)
Family Cordulegastridae (Spiketails)
Family Macromiidae (Cruisers)
Family Corduliidae (Emeralds)
Family Libellulidae (Skimmers)

Male Ophiogomphus occidentis.
Photo: Dennis Paulson.

Family Calopterygidae (Jewelwings)

The most spectacular damselflies in Canada are members of the Calopterygidae. These are large species with metallic bodies and broad, often coloured, wings. The wings are densely veined. The larvae develop in streams, where they cling to plant stems and roots. They can be distinguished by their long antennae -- the first segment is longer than all the others combined. One genus, *Calopteryx*, occurs in British Columbia.

Genus:
Calopteryx

Female *Calopteryx aequabilis*.
Photo: Dennis Paulson.

Calopteryx Leach

Calopteryx damselflies are the largest in Canada. Their bodies are metallic green with blue reflections, and the legs are long and black with long, stiff spines. They fly with a dancing, butterflylike flight and perform striking courtship displays. *C. aequabilis* is the only representative in British Columbia.

Calopteryx aequabilis Say*
River Jewelwing

Provincial Status
- CDC rank: S1
- Red List

Known only from one site in the province: Christina Creek at the outlet of Christina Lake.

Columbia-Kootenay Distribution
The only known location of a *C. aequabilis* population in the study area is Christina Creek, approximately 18 km east of Grand Forks. Because this species requires slow-moving warm streams, it probably will not be found in many other localities in the region.

Global Distribution
C. aequabilis is a widely distributed northern species across Canada and the USA. Its range is concentrated in northeastern North America; western populations are disjunct and scattered. In Washington State it is found more commonly in the southeastern portion of the state, primarily in lowlands (Paulson 1999). Faunal element: Transition (see Appendix 2).

Biological Information
Larvae are found in rivers and larger creeks where they cling to aquatic plants, roots and woody debris. They take two or three years to develop, and the females take longer than the males. *Calopteryx* species have elaborate, well-studied courtship behaviour. Females lay eggs in floating mats of vegetation. At the Christina Creek site the females oviposited in *Potamogeton illinoensis,* an aquatic plant uncommon in British Columbia. Oviposition was observed on 17 August. This is probably near the end of the season as only three individuals were seen. The known flight period in British Columbia is from 19 July to 17 August (1999); however, it probably begins earlier and lasts slightly longer. North American dates are 6 May to 2 September (Westfall and

May 1996).

For those naturalists wanting to search for this rare species, the male has dark brown wingtips with the darkened area larger on the hindwings. In the female the bases of the wings are diffuse yellow-brown, the tips are brown and there are white pterostigmata (spots on the front edge of the wing near the tip).

Management and Protection Considerations

The protection of the riparian zone and the maintenance of a relatively undisturbed edge along Christina Creek is critical. Samways and Steytler (1996) provide recommendations for width of the riparian buffer and heterogeneity of the vegetation for species assemblages. These assemblages are of different species; however their life requirements are similar. The River Jewelwing uses the vegetation overhanging the stream for roosting, and floating mats of vegetation for oviposition; this streamside vegetation would be at risk with development.

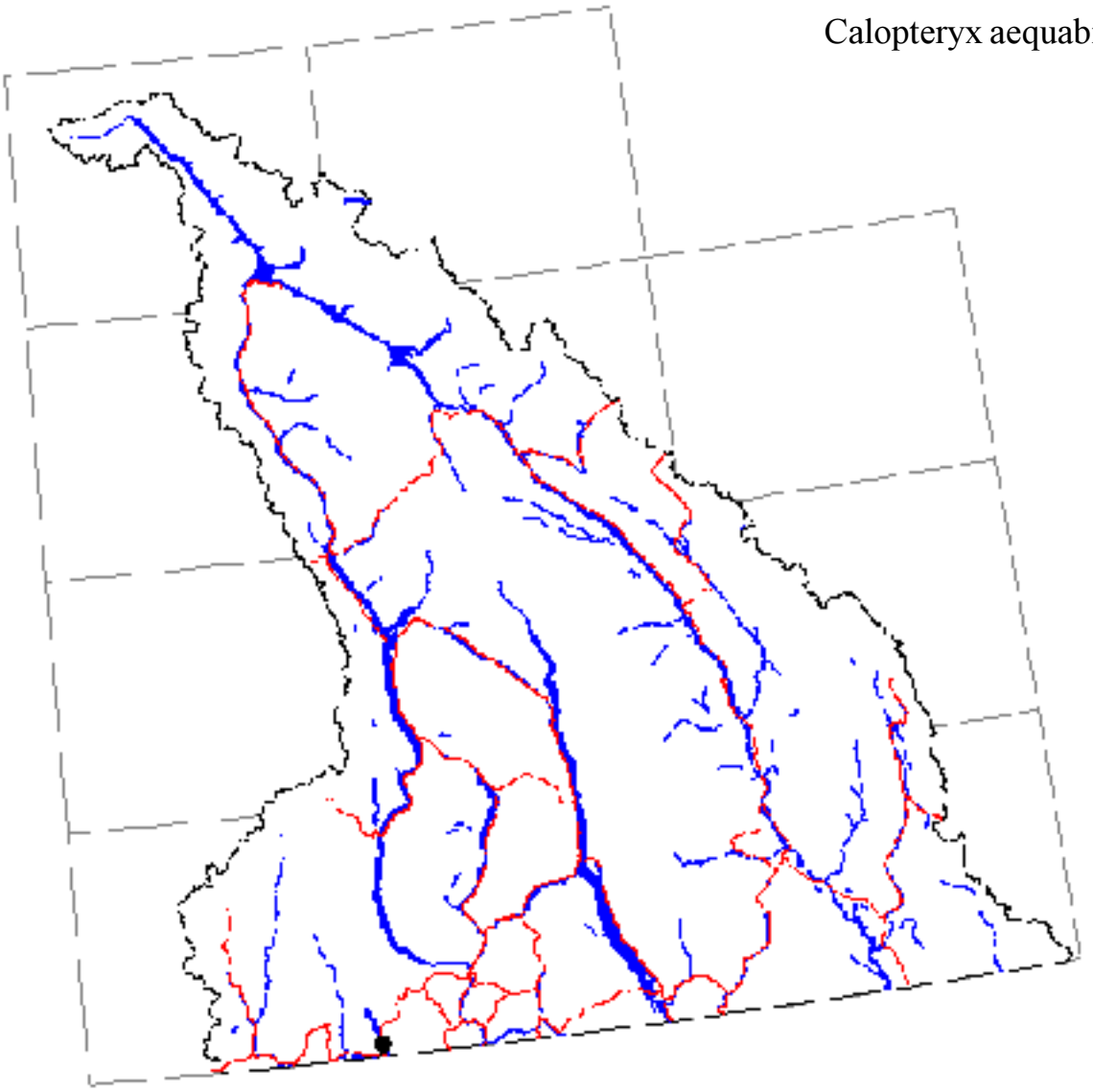
Limiting recreational use and controlling the type of use are also important. Of particular concern is the use of personal watercraft (i.e. Jet Ski) along the shallow creek where this species is found. The wakes from these craft break down the banks (observed directly in this study) and ultimately will collapse the streamside vegetation.

The impact of introduced predatory fish, especially bass, on this rare damselfly is unknown, but is definitely of concern.

Male C. aequabilis.
Photo: Dennis Paulson.

Female C. aequabilis.
Photo: Dennis Paulson.

Calopteryx aequabilis Say



Calopterygidae

Calopteryx aequabilis Say

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990719	Ramsay, Leah	1	3	0	4
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	1	1	0	2
Kootenay Total			2	4	0	6

Family Lestidae (Spreadwings)

The Lestidae, or spreadwing damselflies, is one of two cosmopolitan families of Zygoptera. It is a small but widely distributed family in the Columbia Basin, where it contains only one genus, *Lestes*, with five species.

Lestes Leach

Lestes adults are metallic green or bronze, with parts of the body, including the tip of the abdomen, often becoming pruinose white with age. They characteristically perch with wings half-spread. Females oviposit in tandem with males, and eggs are usually placed in plants above the surface of the water. The larvae are long and slender with banded gills and unusually elongated labia. Some species are adapted to temporary ponds (see Habitat section); in these situations larvae grow rapidly after overwintering as eggs.

Cannings *et al.* (1980, 1987) described the ecology of three of these species that inhabit a series of lakes on the Chilcotin Plateau northwest of the Columbia Basin that range greatly in salinity and alkalinity. *Lestes dryas* colonizes only the freshest ponds, *L. disjunctus* occurs in lakes up to medium salinities and *L. congener* inhabits the complete range of salinities and occurs in very large numbers, even at the highest concentrations (conductivity of 15,524 microSiemens). Emergence and mating of the three species are also temporally separate: *L. dryas* emerged about ten days before *L. disjunctus*, which preceded *L.congener* by nine days. The main emergence of *L. disjunctus* occurred 20 days before the peak of the *L. congener* emergence. This emergence sequence also occurs in the Columbia Basin.

Species:

Lestes congener
Lestes disjunctus
Lestes dryas
Lestes forcipatus
Lestes unguiculatus

Female *Lestes disjuntus* laying her eggs. Male (top) guarding female. Photo: George Doerksen.

Lestes congener Hagen
Spotted Spreadwing

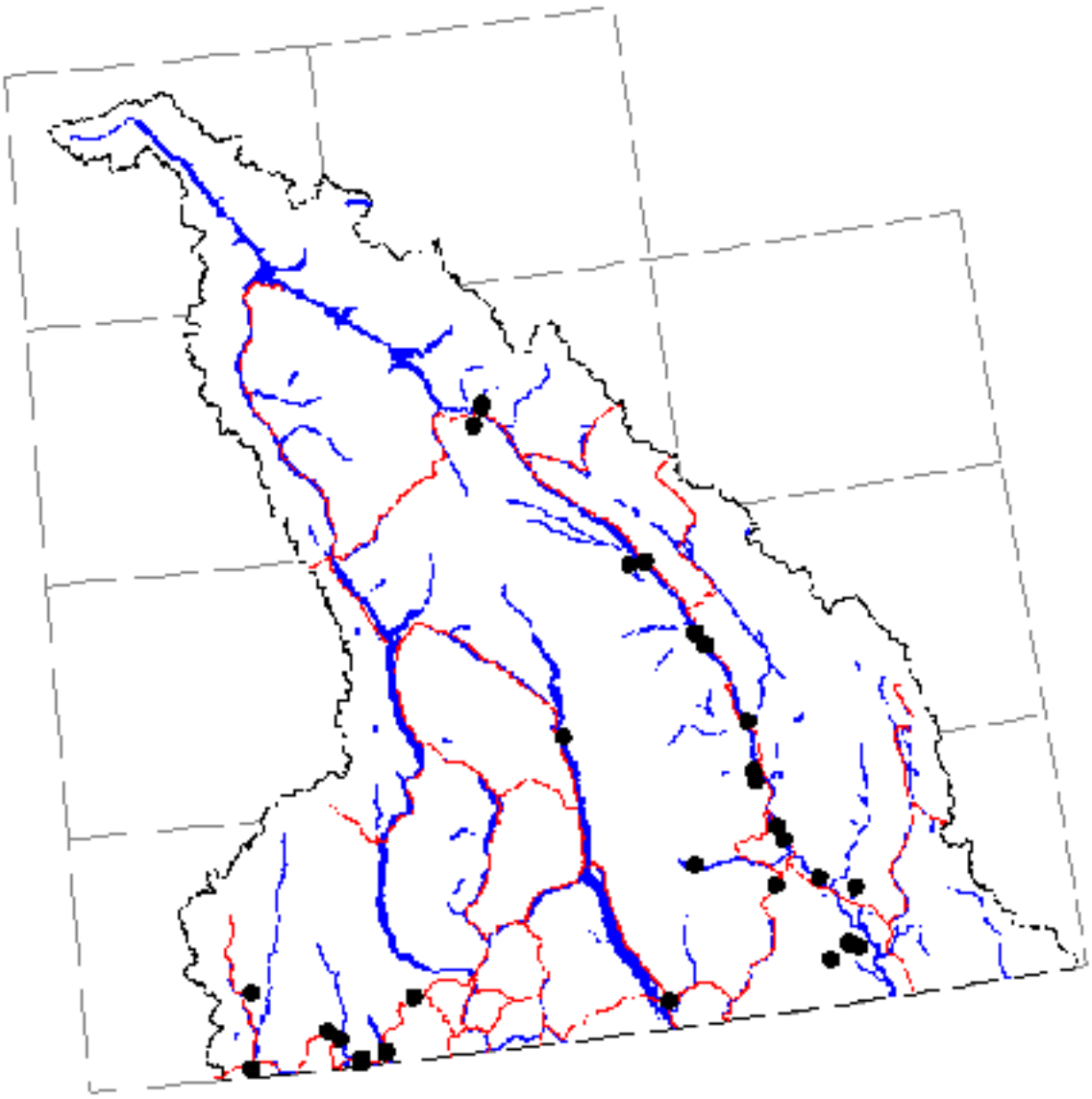
Provincial Status
CDC rank: S5
Widespread and common, especially in the south.

Columbia-Kootenay Distribution
Found in all parts of the region.

Global Distribution
British Columbia east through the Northwest Territories to Labrador and Newfoundland; south to Alabama, Missouri, New Mexico and California (Westfall and May 1996). Faunal element: Widespread (see Appendix 2).

Biological Information
Common in wetlands of many types, from alkaline ponds to cattail marshes and peatlands. In British Columbia *L. congener* emerges later than the other species in the genus (see *Lestes* introduction). In the Kootenays, adults have been recorded from 5 July to 19 October.

Lestes congener Hagen



Lestidae

Lestes congener Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	1	0	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	0	0	1
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	1	0	1
Columbia River	19871019	Guppy, Crispin S.	0	4	0	4
Cranbrook	19800711	Cannings, Robert A.	0	0	4	4
Cranbrook; Alkaline Lake	19800711	Cannings, Robert A.	0	1	0	1
Creston	19790708	Askevold, I.	0	0	2	2
Creston	19810705	Askevold, I.	0	0	2	2
East Kootenay Valley, Waldo	19970930	Cannings, Sidney G.	0	1	0	1
East Kootenay Valley, Waldo	19970930	Cannings, Sydney G.	1	1	0	2
Fernie; Jaffray; Caven Creek	19990823	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	1	2	0	3
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	2	3	0	5
Golden; Donald	19830822	Cannings, Robert A	1	0	0	1
Golden; Donald	19970902	Cannings, Sydney G.	1	2	0	3
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	1	1	0	2
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	1	2	0	3
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	3	10	13
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	0	0	7	7
Grand Forks; Niagara	19990725	Blades, David C.A.; Sendall, Kelly A.	0	0	9	0
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	2	2
Invermere; Athalmer	19820821	Cannings, Robert A.	0	2	0	2
Invermere; Athalmer	19980808	Cannings, Robert A.	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	1	2	0	3
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	1	0	1
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	1	0	1
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	1	18	20
Rock Creek; Taurus Lake	19990829	Hatter, Ian	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	2	0	3
Tamarack Lake	19880929	Taylor, M. Elizabeth	0	2	0	2
Torrent; Larchwood Lake	19881004	Taylor, M. Elizabeth	2	0	0	2
Torrent; Larchwood Lake	19890718	Guppy, Crispin S.	0	0	8	8
Windermere	19760803	Ricker, Nancy; Ricker, W. E.	0	1	0	1
Kootenay Total			**17**	**37**	**63**	**117**

Lestes disjunctus
Common Spreadwing

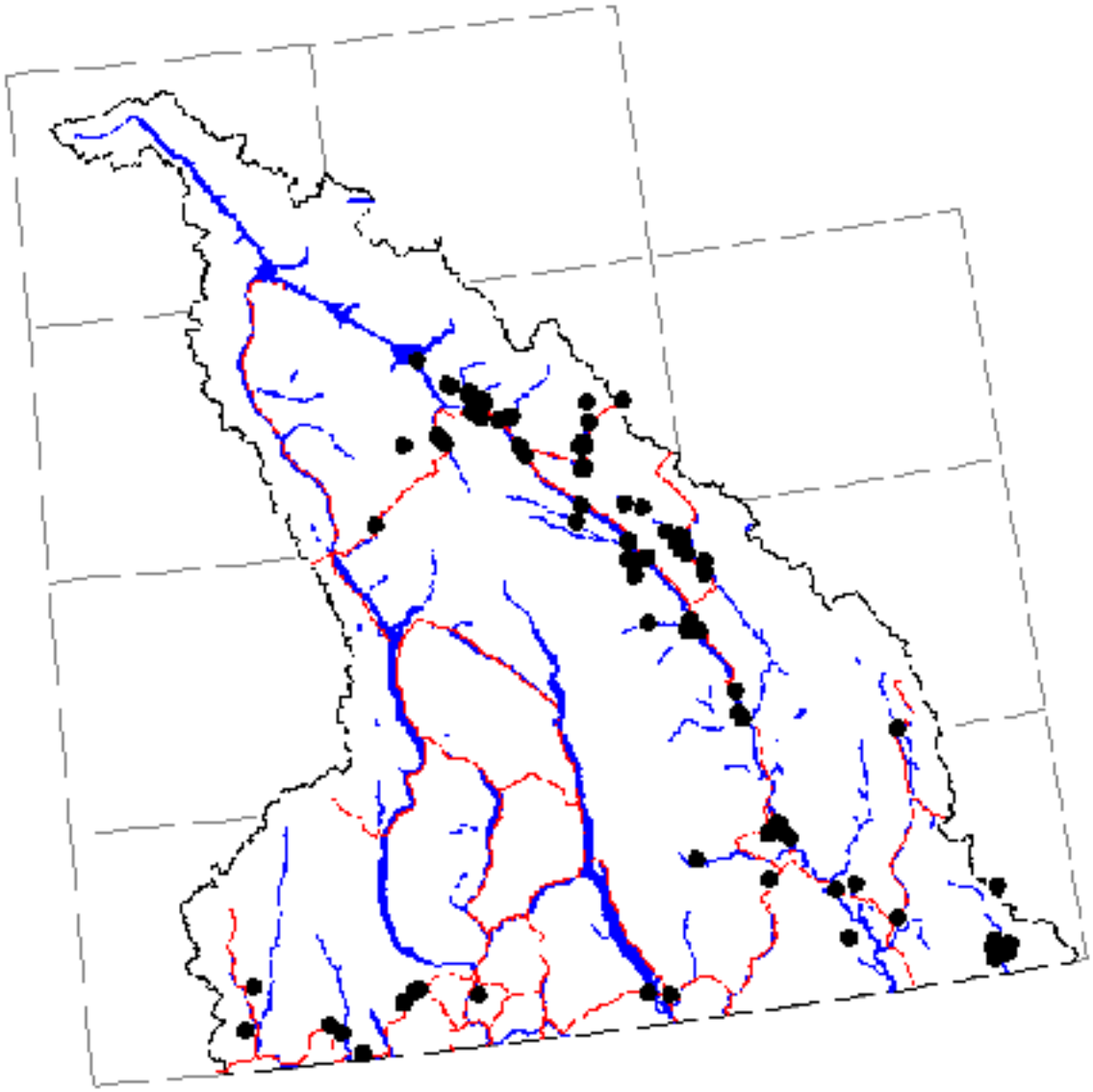
Provincial Status
CDC rank: S5
Widespread and common.

Columbia-Kootenay Distribution
Found in all parts of the region.

Global Distribution
Alaska east to the Northwest Territories, Labrador and Newfoundland; south to Florida, Texas and California (Westfall and May 1996). Faunal element: Widespread (see Appendix 2).

Biological Information
Found in all types of dragonfly habitat; probably the most common *Lestes* species in the Kootenays. There are more records of *L. disjunctus* from the region than records of the other four species combined. The bulk of the adult population emerges after the first *L. dryas* and before most *L. congener* individuals. In the Kootenays, adults have been recorded from 25 June to 2 September.

Lestes disjunctus Selys



Lestidae
Lestes disjunctus Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Cleland Lake	19980806	Cannings, Robert A.	0	1	0	1
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	3	0	3
Canal Flats	19760806	Ricker, William E.; Ricker, N.	0	4	0	4
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	2	2	0	4
Castlegar; Mud Lake	19990818	Hatter, Ian	3	7	0	10
Castlegar; Mud Lake	19990818	Ramsay, Leah	4	5	0	9
Castlegar; Mud Lake	19990826	Ramsay, Leah	4	3	0	7
Christina Lake; Bonanza Pass	19990818	Hatter, Ian	1	2	0	3
Christina Lake; Bonanza Pass	19990818	Ramsay, Leah	1	4	0	5
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	2	2	0	4
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Ramsay, Leah	0	1	0	1
Conkle Lake Park; Osoyoos; Conkle Lake	19990728	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	1	1	0	2
Cranbrook; Campbell Lake	19990729	Ramsay, Leah	0	2	0	2
Cranbrook; Elizabeth Lake	19800706	Cannings, Robert A.	1	1	0	2
Creston	19800712	Cannings, Robert A.	0	2	0	2
Creston	19810705	Askevold, I.	0	0	2	2
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Elkford	19990822	Ramsay, Leah	1	2	0	3
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	3	4	0	7
Flathead	19990802	Cannings, Sydney G.	1	2	0	3
Flathead	19990802	Ramsay, Leah	1	4	0	5
Flathead; Cabin Creek	19990801	Ramsay, Leah	1	0	0	1
Flathead; Marl Lake	19990801	Cannings, Sydney G.	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	3	0	4
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	3	0	3
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Fort Steele	19990724	Ramsay, Leah	3	4	0	7
Glacier National Park; Rogers Pass; Beaver River	19980723	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	4	2	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Archard, Gabrielle A.	0	1	0	1

Lestidae
Lestes disjunctus Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Coates, Sally E.	0	2	0	2
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	0	1	0	1
Golden	19980806	Cannings, Robert A.	0	2	0	2
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	1	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	0	3	0	3
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	3	0	3
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ferguson, Bob	0	1	0	1
Golden; Donald	19970902	Cannings, Sydney G.	1	2	0	3
Golden; Donald	19980802	Cannings, Robert A.	0	4	0	4
Golden; Donald	19980802	Hutchings, Gordon E.	2	5	0	7
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ferguson, Bob	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	2	0	2
Golden; Donald; Blackwater Creek	19980805	Archard, Gabrielle A.	0	1	0	1
Golden; Donald; Blackwater Creek	19980805	Ramsay, Leah	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	1	3	0	4
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	1	0	1
Golden; Kicking Horse River	19980804	Archard, Gabrielle A.	0	2	0	2
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Golden; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	2	0	2
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	1	2
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	1	0	1
Grand Forks; Niagara	19990725	Blades, David C.A.; Sendall, Kelly A.	0	0	6	6
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	1	2
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	1	5	0	6
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1
Harrogate; Kootenay River	19980804	Archard, Gabrielle A.	2	6	0	8
Invermere; Athalmer	19820821	Cannings, Robert A.	0	2	0	2
Invermere; Athalmer	19820821	Cannings, Sydney G.	1	1	0	2
Invermere; Athalmer	19830820	Cannings, Robert A.	1	1	0	2
Invermere; Athalmer	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	0	1	0	1

Lestidae

Lestes disjunctus Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kimberley	19990723	Ohanjanian, Penny	0	2	0	2
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	0	2	0	2
Kimberley; Bummers Flats	19990729	Ramsay, Leah	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	1	1	0	2
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	1	0	1
Koocanusa Lake	19760806	Ricker, William E.; Ricker, Nancy	1	9	0	10
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	1	1	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	3	6	0	9
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	4	0	4
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Coates, Sally E.	0	2	0	2
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Ramsay, Leah	1	2	0	3
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980723	Ramsay, Leah	0	6	0	6
Parson	19980806	Cannings, Robert A.	0	2	0	2
Parson	19980806	Hutchings, Gordon E.	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	1	0	2
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	2	0	2
Trail; Champion Lakes	19990806	Ramsay, Leah	0	1	0	1
Wilmer	19820821	Cannings, Robert A.	0	2	0	2
Wilmer	19980719	Cannings, Robert A.	0	2	0	2
Yoho National Park; Field; Emerald Lake	19980726	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980726	Ramsay, Leah	0	1	0	1

Lestidae

Lestes disjunctus Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	2	3	0	5
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	2	0	2
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	1	3	0	4
Yoho National Park; Field; Kicking Horse River	19980802	Coates, Sally E.	1	3	0	4
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Ramsay, Leah	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Archard, Gabrielle A.	2	5	0	7
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	0	5	0	5
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	1	5	0	6
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Coates, Sally E.	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980627	Cannings, Sydney G.	0	0	1	1
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	0	4	0	4
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	1	3	0	4
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	3	0	3
Yoho National Park; Golden; Leanchoil	19980731	Ramsay, Leah	1	3	0	4
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	3	0	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	2	2	0	4
Yoho National Park; Stephen; Ross Lake	19980801	Coates, Sally E.	0	1	0	1
Kootenay Total			**59**	**268**	**12**	**339**

Lestes dryas Kirby
Emerald Spreadwing

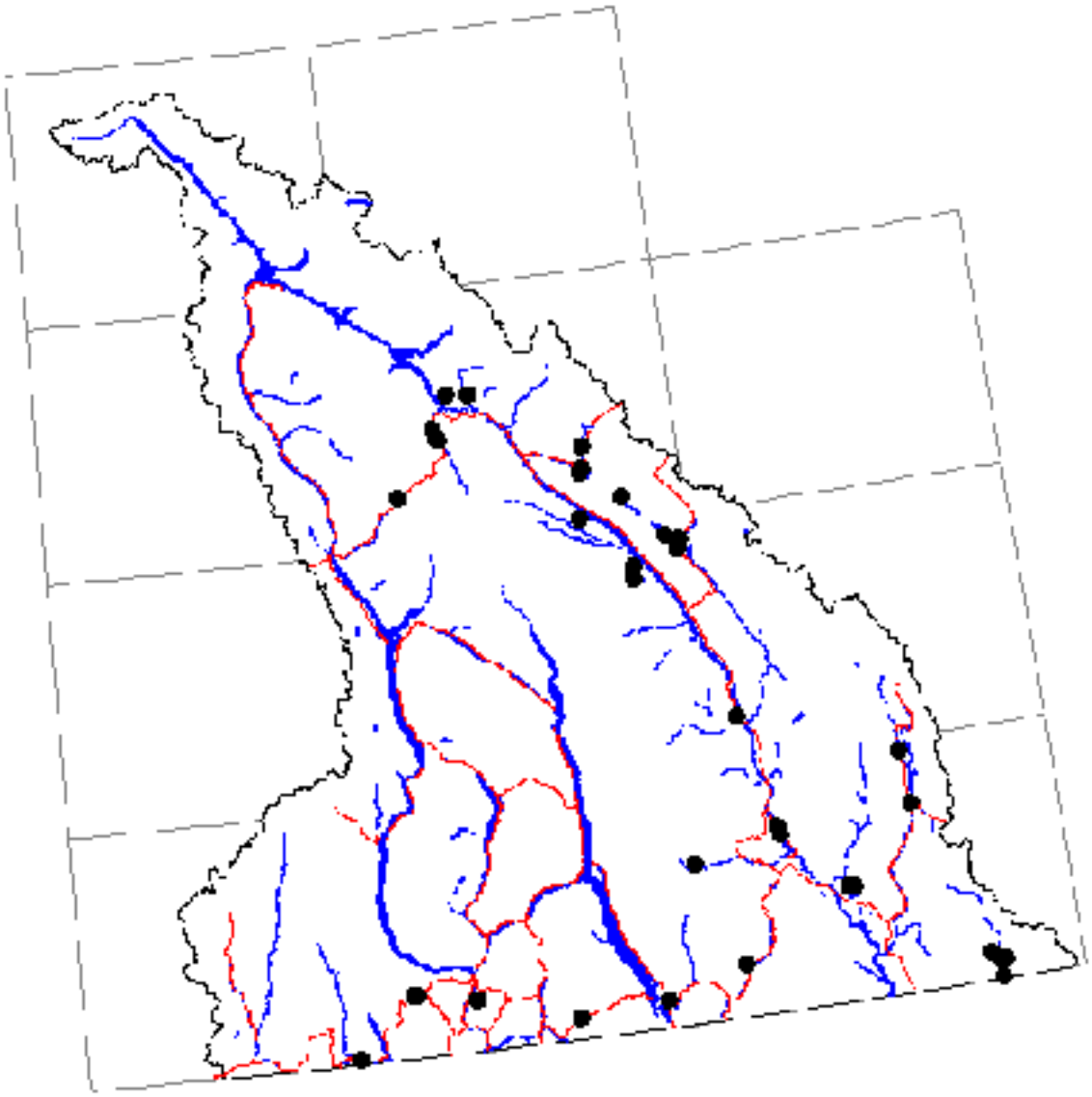
Provincial Status
CDC rank: S5
Widespread throughout most of British Columbia, but not recorded from the north coast.

Columbia-Kootenay Distribution
Found in all parts of the region.

Global Distribution
Alaska east to the Northwest Territories, James Bay and the north shore of the St Lawrence River and Nova Scotia; south to Virginia, Nebraska and California (Westfall and May 1996). Faunal element: Widespread, Holarctic (see Appendix 2).

Biological Information
Lestes dryas is the only holarctic (occurring in both Eurasia and North America) member of the family. In British Columbia, *L. dryas* is usually the first *Lestes* to emerge in the year. It is common in early summer, especially around small ponds and places that may dry up in summer. Flight records in the Columbia Basin range from 24 June to 24 August.

Lestes dryas Kirby



Lestidae

Lestes dryas Kirby

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Halfway Lake	19980807	Cannings, Robert A.	1	0	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	1	0	2
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	0	1	0	1
Cranbrook; Moyie Lake; Moyie River	19990813	Nicholson, Dean	0	2	0	2
Creston	19800712	Cannings, Robert A.	0	2	0	2
Elkford	19990731	Cannings, Sydney G.	0	1	0	1
Elkford	19990822	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	1	3	0	4
Flathead	19890726	Guppy, Crispin S.	2	4	0	6
Flathead	19990802	Cannings, Sydney G.	2	3	0	5
Flathead	19990802	Ramsay, Leah	4	3	0	7
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	2	2	0	4
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Archard, Gabrielle A.	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Cannings, Sydney G.	1	3	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Coates, Sally E.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Woods, John	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724		0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Archard, Gabrielle A.	2	1	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	1	1	0	2
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	0	1	0	1
Golden; Donald; Susan Lake	19980805	Hutchings, Gordon E.	0	1	0	1
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	2	2	0	4
Harrogate; Beaverfoot River; Dainard Creek	19980727	Archard, Gabrielle A.	1	1	0	2
Harrogate; Beaverfoot River; Dainard Creek	19980727	Coates, Sally E.	2	1	0	3
Harrogate; Beaverfoot River; Dainard Creek	19980727	Ramsay, Leah	1	1	0	2
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Coates, Sally E.	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	3	3	0	6

Lestidae

Lestes dryas Kirby

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	2	3	0	5
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Coates, Sally E.	0	3	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	2	6	0	8
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	4	4	0	8
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	3	3	0	6
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	1	4	0	5
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	2	0	2
Parson	19980806	Cannings, Robert A.	0	1	0	1
Rossland; Nancy Greene Lakes	19990726	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Sparwood	19800711	Cannings, Robert A.	0	1	0	1
Stagleap; Bridal Lake	19800712	Cannings, Robert A.	1	0	0	1
Trail; Champion Lakes	19990806	Cannings, Sydney G.	0	1	0	1
Trail; Champion Lakes	19990806	Ramsay, Leah	1	1	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	1	0	0	1
Yoho National Park; Golden; Leanchoil	19980627	Ramsay, Leah	0	0	1	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	0	1	0	1
Kootenay Total			**46**	**84**	**2**	**132**

Lestes forcipatus Rambur*
Sweetflag Spreadwing

Provincial Status
CDC rank: S1S3
Red List
Although only discovered in the province during this project in 1998, *Lestes forcipatus* has since been found in many areas in southeastern British Columbia.

Columbia-Kootenay Distribution
L. forcipatus is known from 16 localities in the Columbia Basin, from the Bluewater Creek area north of Donald, to Bonanza Pass west of Castlegar. When found, it was always the least dominant *Lestes* species at the locality. *L. forcipatus* is certainly more widespread than records suggest, as it has apparently been confused with the much more common and abundant *L. disjunctus*, which it closely resembles. *L. forcipatus* is unusual in odonates in that the female is more easily identified than the male. Males are so similar to those of *L. disjunctus* that unless a female is collected, the species may be overlooked.

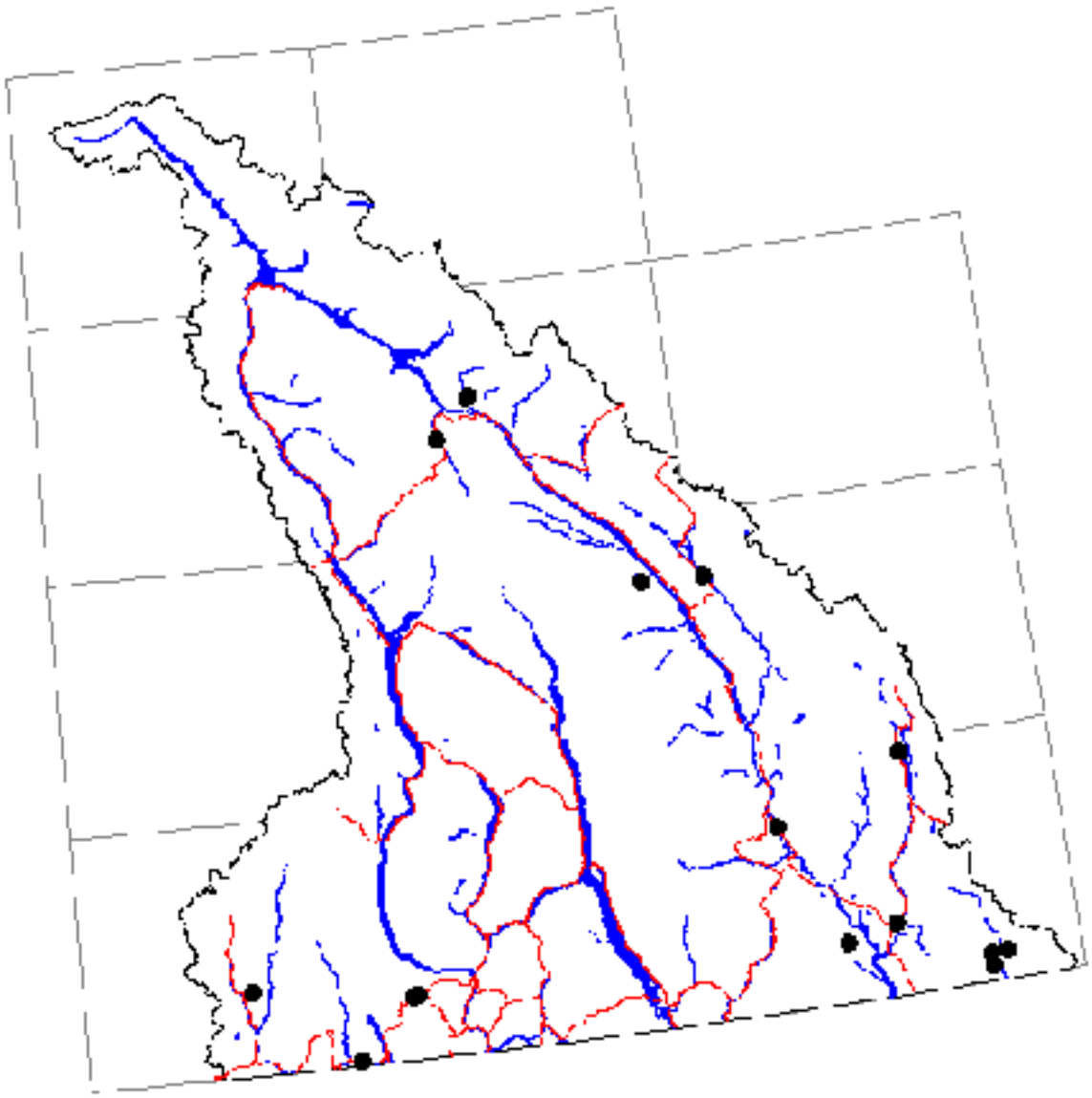
Global Distribution
Lestes forcipatus is a widespread eastern North American species that was recently collected in Washington, this for the first time west of Montana (Paulson 1997). In Canada it had not been confirmed west of Saskatchewan (Westfall and May 1996) until it was recognized in 1998, when during these surveys it was discovered north of Golden. In 1999 we discovered several more locations farther south and west. In 2000, an unidentified specimen that had been collected in Wells Gray Provincial Park in the mid-1980s was identified as *L. forcipatus*. In Washington it has been collected in Okanogan, Kitsap and Clark counties. Faunal element: Austral (see Appendix 2).

Biological Information
Walker (1953) described *L. forcipatus* habitat as "ponds, both temporary and permanent, marshy lakes, and slow, weedy streams". In the Kootenay region we found this species in marshes and *Carex* fens. Specific information on its biology, range and flight dates has been confounded by misidentification, as noted above. In British Columbia (and Columbia Basin) adult records have been confirmed from 24 June to 29 August (present study). The North American dates are 4 April to 21 October (Mauffray and Beckenbach 2000).

Management and Protection Considerations

The habitats that *L. forcipatus* was found in were not particularly specialized or threatened. They are in lower-lying wetlands where there is always the risk of draining, development or pollution. The habitat descriptions from other areas include temporary as well as permanent ponds, which makes one think that this species may be relatively tolerant of some disturbance. Management practices that ensure the continued viability of wetlands should be followed.

Lestes forcipatus Rambur



Lestidae

Lestes forcipatus Rambur

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Hall Lakes	19990726	Ramsay, Leah	1	2	0	3
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	1	1	0	2
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	0	0	1
Elkford	19990731	Cannings, Sydney G.	2	0	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	1	0	0	1
Flathead	19990802	Ramsay, Leah	1	2	0	3
Flathead; Sage Creek	19990803	Cannings, Sydney G.	4	4	0	8
Flathead; Sage Creek	19990803	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	1	0	0	1
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	2	2	0	4
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	2	2	0	4
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Kimberley; Bummers Flats	19990729	Ramsay, Leah	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	1	1	0	2
Rock Creek; Taurus Lake	19990829	Hatter, Ian	1	0	0	1
Kootenay Total			**19**	**18**	**0**	**37**

Lestes unguiculatus Hagen
Lyre-tipped Spreadwing

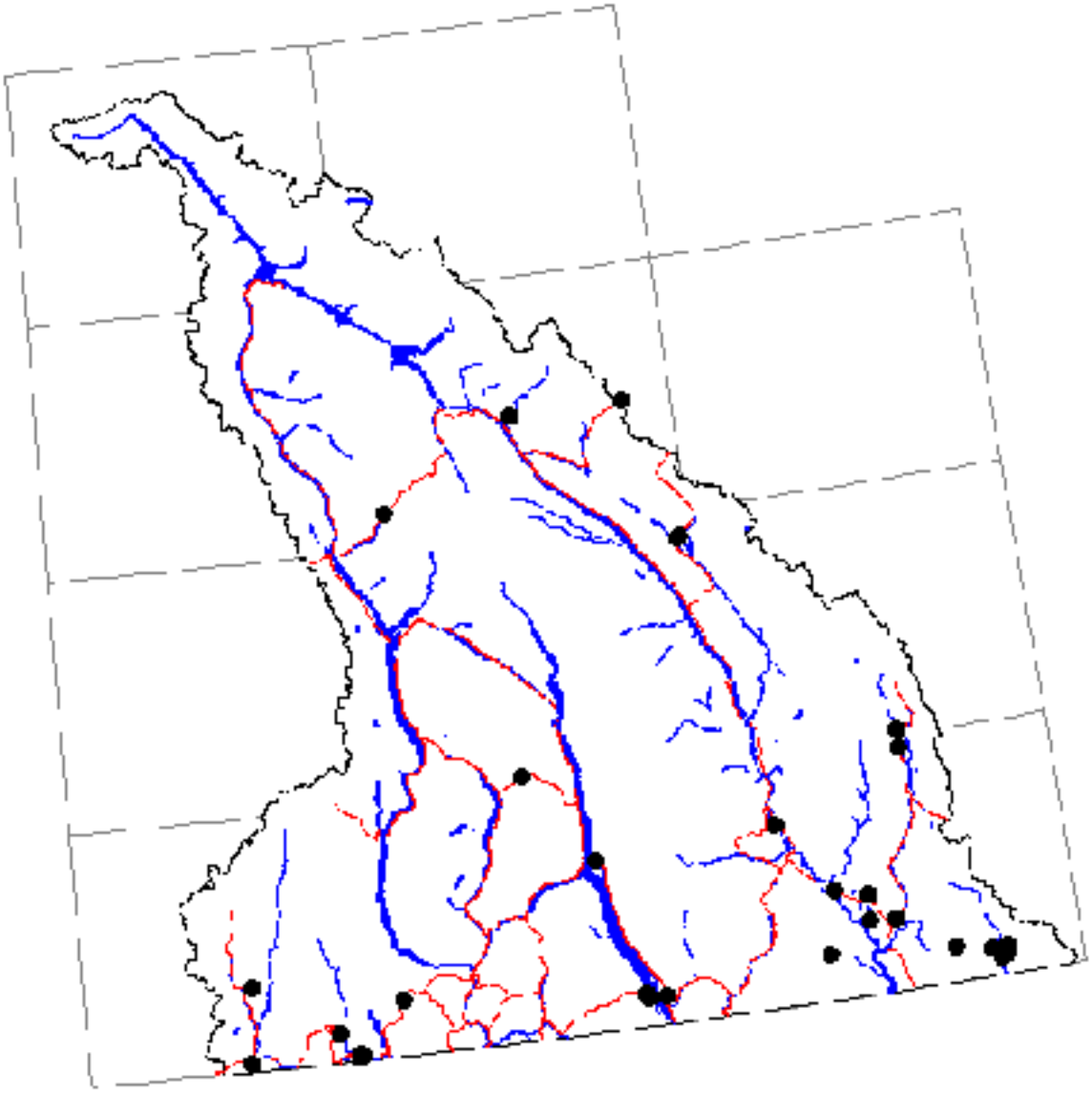
Provincial Status
CDC rank: S5
A distinctly southern species, *L. unguiculatus* is apparently restricted in the province to low or mid elevations south of about 55ºN.

Columbia-Kootenay Distribution
Found in all parts of the region.

Global Distribution
British Columbia east to Nova Scotia; south to District of Columbia, Tennessee, Texas and California (Mauffray and Beckenbach 2000).
Faunal element: Widespread (see Appendix 2).

Biological Information
Typical of warm ponds at low elevations; tolerates alkaline conditions (Cannings and Stuart 1977). However, also inhabits peatland pools or sedge fens in subalpine regions -- obviously this is a species that deserves more ecological study. Adults are recorded in British Columbia from 6 June to September 7 (Cannings and Stuart 1977).

Lestes unguiculatus Hagen



Lestidae

Lestes unguiculatus Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Albert Canyon	19980730	Archard, Gabrielle A.	0	1	0	1
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	1	5	0	6
Creston	19800712	Cannings, Robert A.	1	0	0	1
Creston	19800713	Cannings, Robert A.	1	0	0	1
Creston; Creston Marsh	19990720	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Elkford	19990822	Ramsay, Leah	6	5	0	11
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	1	0	0	1
Fernie; Jaffray; Caven Creek	19990823	Ramsay, Leah	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	1	5	0	6
Flathead	19990802	Ramsay, Leah	0	3	0	3
Flathead; Cabin Pass; Cabin Creek	19990804	Cannings, Sydney G.	1	2	0	3
Flathead; Cabin Pass; Cabin Creek	19990804	Ramsay, Leah	2	1	0	3
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	2	0	3
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Galloway	19990810	Nicholson, Dean	1	0	0	1
Golden; Blaeberry	19980804	Hutchings, Gordon E.	1	2	0	3
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	6	5	0	11
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Grand Forks; Niagara	19990725	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Kaslo	19980809	Hutchings, Gordon E.	0	1	0	1
Kikomun Creek Park; Jaffray; Kikomun Park	19990828	Nicholson, Dean	1	1	0	2
Koocanusa Lake	19760806	Ricker, William E.; Ricker, Nancy	1	5	0	6
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	1	1	0	2
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	1	0	0	1
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	1	3	0	4
Kootenay Total			**34**	**51**	**1**	**86**

Family Coenagrionidae (Pond Damsels)

In the Columbia Basin the family Coenagrionidae consists of 6 genera and 12 species. The adults are frequently blue, marked with black -- but the ground colour may be green, yellow, orange, red or purple. There are often two female colour forms, one of which is similar to the male (usually blue). Eggs are laid in the tissues of water plants and females may completely submerge for considerable periods during oviposition. The larvae are less elongate than those of the Lestidae, and have short labia, unstalked at the base. The genera most often encountered are *Enallagma* and *Ischnura*.

Genus:
Amphiagrion (Selys)
Argia Rambur
Coenagrion Kirby
Enallagma Selys
Ischnura Charpentier
Nehalennia Selys

Mating *Argia emma*: male, top; female, bottom. Photo: George Doerksen.

Amphiagrion (Selys)

Amphiagrion is restricted to North America and is the only genus in North America that has red and black colouring in both sexes. The adults are thick-set with stubby abdomens and short legs. The head of the larva has the hind corners acute and out-turned. There are only two species, one eastern and one western.

Amphiagrion abbreviatum (Selys)
Western Red Damsel

Provincial Status

CDC rank: S5
Locally common at low and mid elevations south of about 52°N in British Columbia.

Columbia-Kootenay Distribution

Found in all parts of the region.

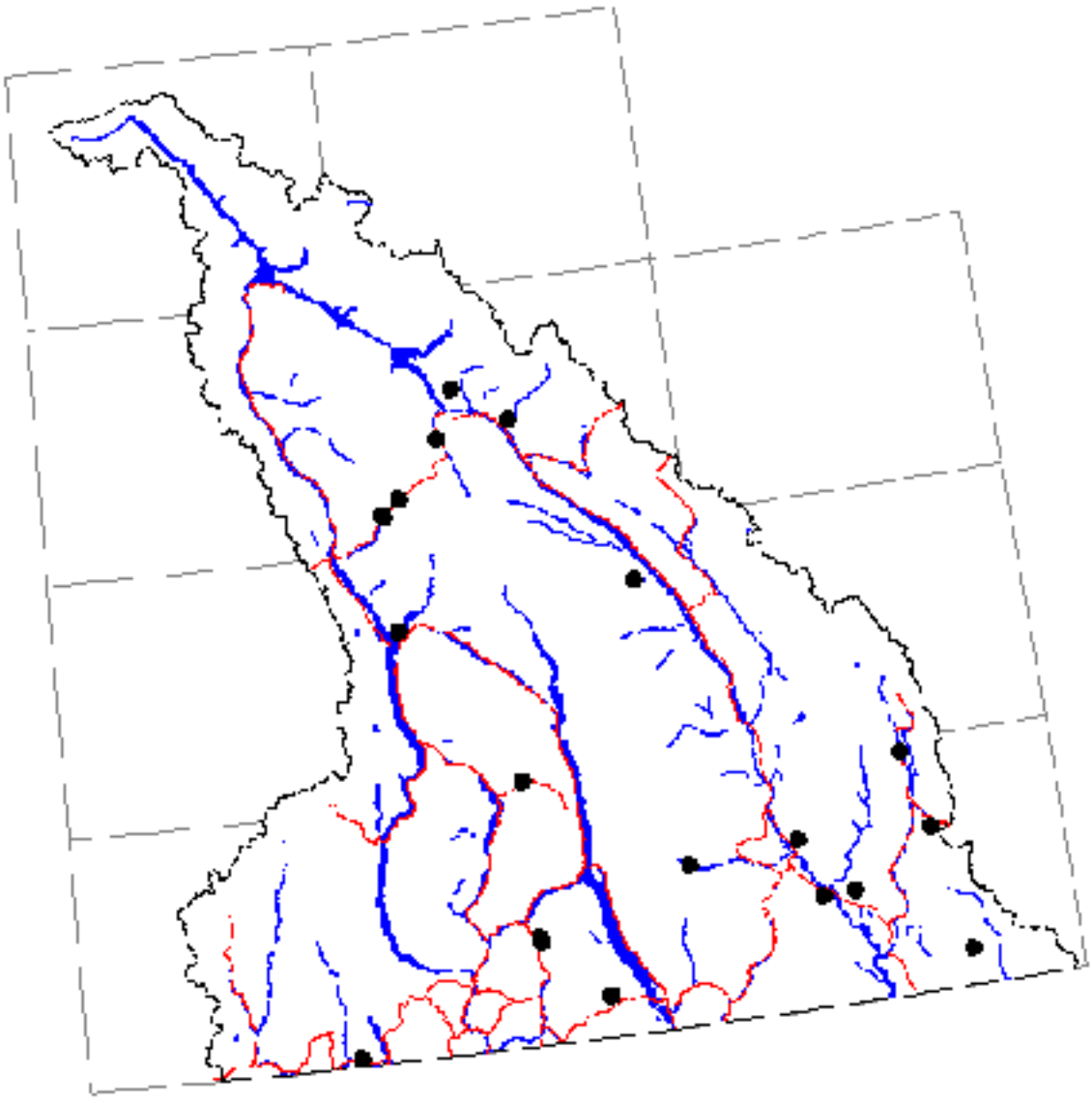
Global Distribution

Southern British Columbia east to Saskatchewan, south to New Mexico and Baja California (Westfall and May 1996). Faunal element: Western (see Appendix 2).

Biological Information

A. abbreviatum typically occurs at spring-fed seeps and shallow ponds. It is not normally associated with peatlands, but can occur in fens. Adults stay close to the ground and perch frequently in low vegetation. Flight records in the Columbia Basin range from 13 June to 9 August.

Amphiagrion abbreviatum (Selys)



Coenagrionidae

Amphiagrion abbreviatum (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Albert Canyon	19980730	Archard, Gabrielle A.	0	2	0	2
Albert Canyon	19980730	Cannings, Sydney G.	0	1	0	1
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	1	0	1
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	1	0	1
Creston; John Bull Mountain; Blazed Creek	19990721	Sendall, Kelly	0	1	0	1
Elkford	19990731	Cannings, Sydney G.	2	0	0	2
Elkford	19990731	Ramsay, Leah	0	1	0	1
Elkford; Line Creek	19990614	Ramsay, Leah	1	0	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Flathead; Storm Creek	19890727	Guppy, Crispin S.	1	3	0	4
Fort Steele; Brewery Creek	19990627	Nicholson, Dean	0	1	0	1
Galena Bay	19810701	Cannings, Robert A.	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	0	4	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	2	1	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	2	0	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1
Golden; Blaeberry; Goat Mountain Creek	19950723	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	1	0	1
Grand Forks	19990615	Cannings, Sydney G.	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Coates, Sally E.	1	2	0	3
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Ramsay, Leah	0	2	0	2
Kaslo	19980809	Hutchings, Gordon E.	0	2	0	2
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	2	2	0	4
Nelson	19990722	Sendall, K and Blades, D.	1	0	0	1
Nelson	19990722	Sendall, K. and Blades, D.	0	2	0	2
Nelson; Hall	19990722	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Sparwood; Michel Creek	19990613	Ramsay, Leah	1	3	0	4
Kootenay Total			**15**	**39**	**0**	**54**

Argia Rambur

Argia emma

Argia species are large coenagrionid damselflies in our fauna. The males are blue or purple, and the females are usually olive or brown. Our two species develop in streams or in seeps associated with springs. *A.emma* apparently also emerges along some lakeshores. Adults prefer to rest on bare sunny spots adjacent to the streams or springs that they frequent. The larvae are stocky and flattened; the gills are unusually broad and pigmented.

Species:

Argia emma
Argia vivida

Argia emma

Argia emma Kennedy*
Emma's Dancer

Provincial Status
CDC rank: S3S4 Blue List

Columbia-Kootenay Distribution
A. emma was recorded commonly at Christina Creek during this study, and by Whitehouse (1941).

Global Distribution
Western North America from southern British Columbia to California and the Great Basin; east to Nebraska (Westfall and May 1996). Faunal element: Cordilleran (see Appendix 2).

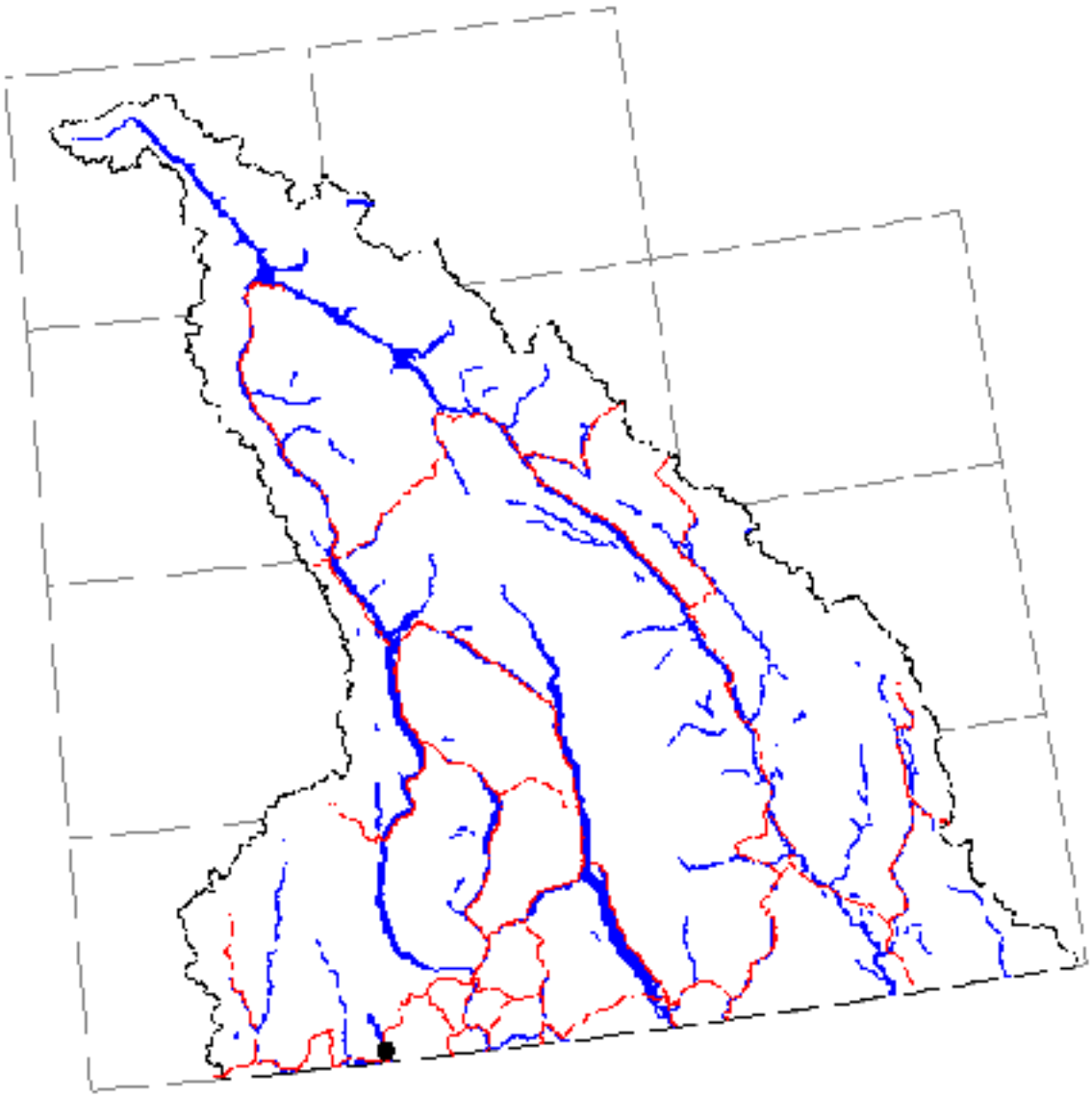
Biological Information
Argia emma occurs in flowing streams and creeks as well as along the shores of some lakes in southwestern British Columbia. It is locally common where found. The larvae are found throughout the creek bed, in the bottoms of creek pools and under rocks in the riffles (Kennedy 1915). They also live on the roots and in the detritus of larger pools among riffles (Cannings and Stuart 1977, Westfall and May 1996). Adults rest along the shoreline of creeks and lakes, especially on the ground or on debris floating in the water. They generally live at lower elevations (to 670 m in Washington State). The recorded flight period in British Columbia is 5 June to 5 September (Cannings and Stuart 1977, Cannings 1998). They likely fly later than this date as they were still common and ovipositing at Christina Creek on 28 August 1999 (present study).

Management and Protection Considerations
The protection of the riparian zone and the maintenance of a relatively undisturbed edge along Christina Creek is important. Samways and Steytler (1996) provide recommendations for width of the riparian buffer and heterogeneity of the vegetation for species assemblages, these assemblages are of different species; however, the life requirements are similar. The stream-side vegetation would be at risk with development.

Limiting recreational use and the type of recreational use is also important. Particularly, the use of personal watercraft (i.e. Jet Ski) along the shallow creek where this species is found. The wake from these craft cause the breakdown of the banks and causes the collapse of the vegetation on these banks.

The impact of introduced predatory fish (especially bass) on this scarce dragonfly is also of concern, but no data is available at this time.

Argia emma Kennedy



Coenagrionidae
Argia emma Kennedy

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990719	Ramsay, Leah	1	4	0	5
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	1	3	0	4
Christina Lake; Christina Creek	19990807	Ramsay, Leah	2	2	0	4
Christina Lake; Christina Creek	19990817	Hatter, Ian	1	2	0	3
Christina Lake; Christina Creek	19990828	Hatter, Ian	0	2	0	2
Christina Lake; Christina Creek	19990828	Ramsay, Leah	1	1	0	2
Kootenay Total			**7**	**14**	**0**	**21**

Argia vivida Hagen*
Vivid Dancer

Provincial Status
CDC rank: S2
Red List
Associated with warm or hot springs in southern British Columbia from Meager Creek in the Coast Range east to the Rocky Mountains.

Columbia-Kootenay Distribution
In British Columbia, before 1980, *A. vivida* was believed to occur only in the Kootenays; but further surveys have found it at other sites in the Okanagan and Pemberton valleys. Nevertheless, the bulk of the province's population lives in the Kootenays because of the large number of hot springs there. In the Kootenays, the species is known from nine localities, including Fairmont Hot Springs, Little Sand Creek (north of Galloway) and Albert Canyon (east of Revelstoke).

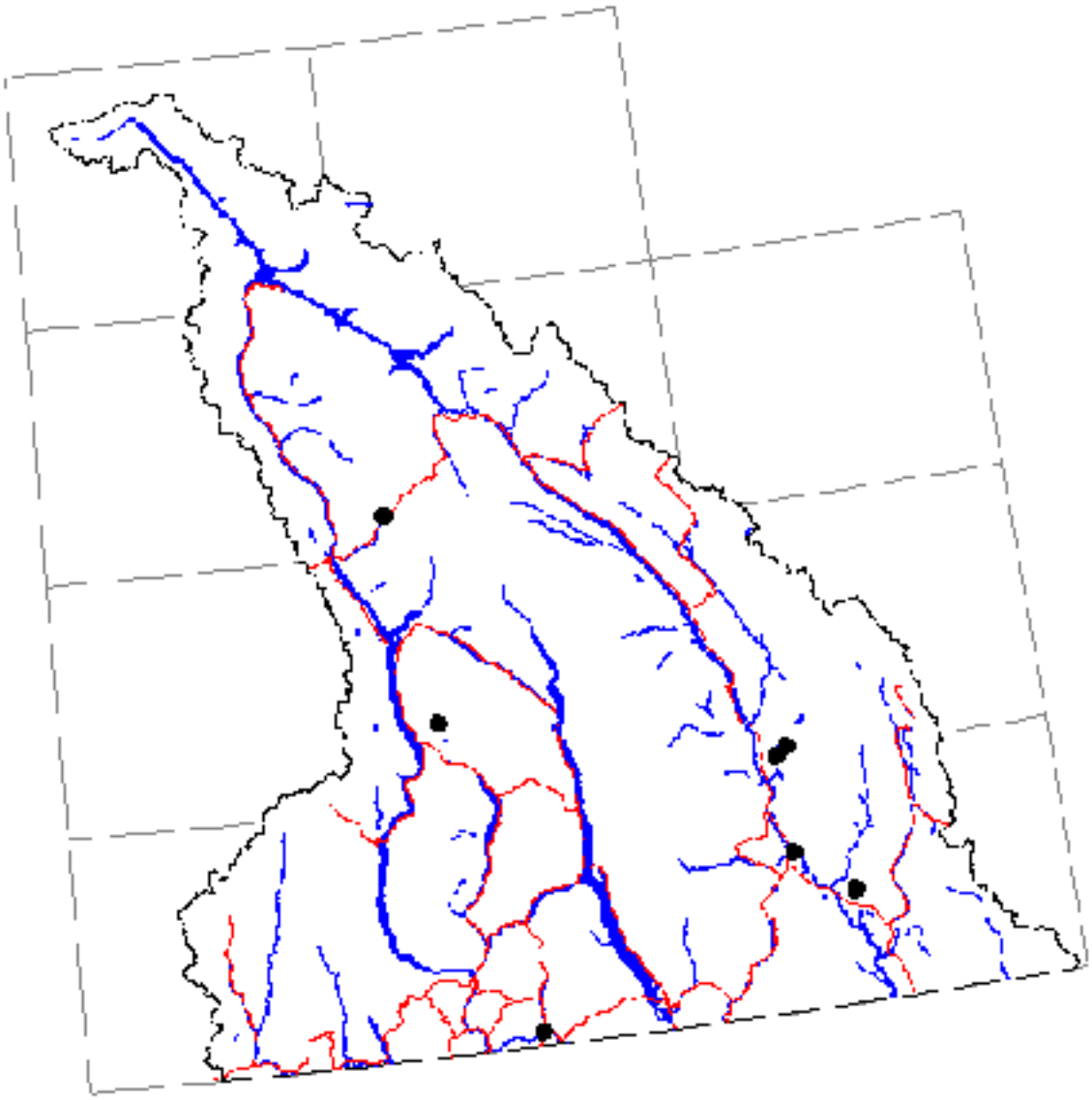
Global Distribution
British Columbia and the Rocky Mountains of Alberta, south through the western United States and Baja California. Also recorded from South Dakota and Iowa. (Westfall and May 1996). Faunal element: Cordilleran (see Appendix 2).

Biological Information
A. vivida lives in warm or hot springs and spring-fed pools. This association is so strong that Williamson (1932, *in* Walker 1953) stated "So dependent is it on springs that its presence anywhere can be taken as positive proof of adjacent spring water". The larvae live in these spring-fed pools and streams. The adults fly low, not far from the water and perch frequently on the ground. Pritchard (1982, 1989), Conrad and Pritchard (1988, 1990) and Conrad (1992) documented the development and behaviour of *A. vivida* in hotsprings at Banff, Alberta and at Albert Canyon and Halcyon Hot Springs, British Columbia. The recorded flight period in B.C. is 14 May to 27 August (Cannings and Stuart 1977, Guppy pers. comm.). The North American dates are 23 February to 24 October (Westfall and May 1996).

Management and Protection Considerations
Hot springs are vulnerable to development for recreational activity, either directly at the site or indirectly when the outflow is diverted. Springs are often used for watering livestock, an activity that can cause breakdown of the banks, trampling of vegetation and deterioration of water quality. Direct protection of springs is one way of mitigating these impacts. There appears to be some room for development if it is done conserva

tively. For example, at Fairmont Hot Springs there is a recreational development, but at the source of the springs, mossy pools and free-running streams have been retained and *A. vivida* still breeds there in numbers. The outflow at Albert Canyon has also been diverted, but where the stream is still flowing in mossy areas, damselflies are present. At any spring where *Argia* occurs it is essential that the vegetation, and especially the flow of water, are not significantly disturbed.

Argia vivida Hagen



Coenagrionidae
Argia vivida Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Albert Canyon	19830822	Cannings, Robert A.	1	1	0	2
Albert Canyon	19980730	Cannings, Sydney G.	2	0	0	2
Canal Flats; Ram Creek Hot Springs	19990101	Salter, Sue	0	0	1	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Ramsay, Leah	0	1	0	1
Fort Steele	19810705	Cannings, Robert A.	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	1	1	0	2
Nakusp; Nakusp Hot Springs	19800630	Cannings, Robert A.	0	0	16	16
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Skookumchuck; Ram Creek Hot Springs	19990619	Nicholson, Dean	1	3	0	4
Kootenay Total			**6**	**8**	**17**	**31**

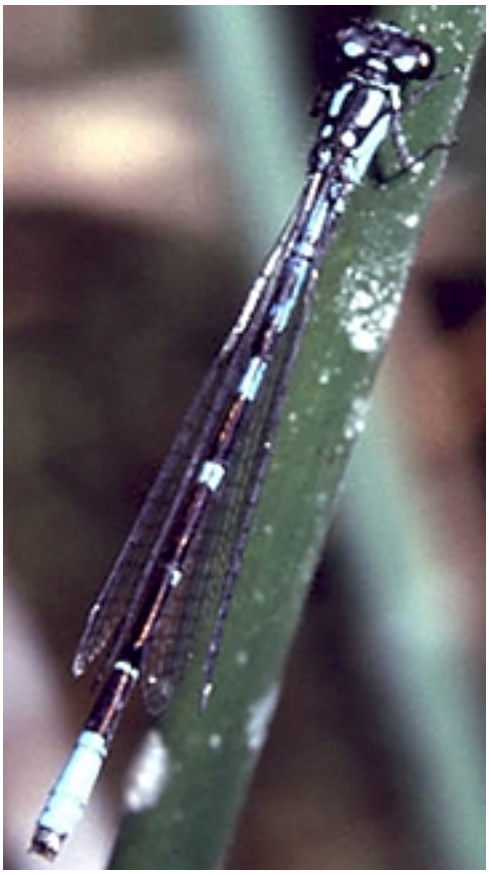
Coenagrion Kirby

Coenagrion is a predominantly Eurasian genus with two species ranging across most of boreal North America -- *C. interrogatum* and *C. resolutum* -- both of which also occur in the Columbia Basin. The third species, *C. angulatum*, is a species of the Great Plains. The adults and larvae are similar to those of *Enallagma*.

Species:
Coenagrion interrogatum
Coenagrion resolutum

Coenagrion interrogatum (Hagen)
Subarctic Bluet

Provincial Status
CDC rank: S4
In British Columbia this is primarily a northern species known only from the Interior. It ranges into the extreme southern parts of the province along mountain ranges and high plateaus.

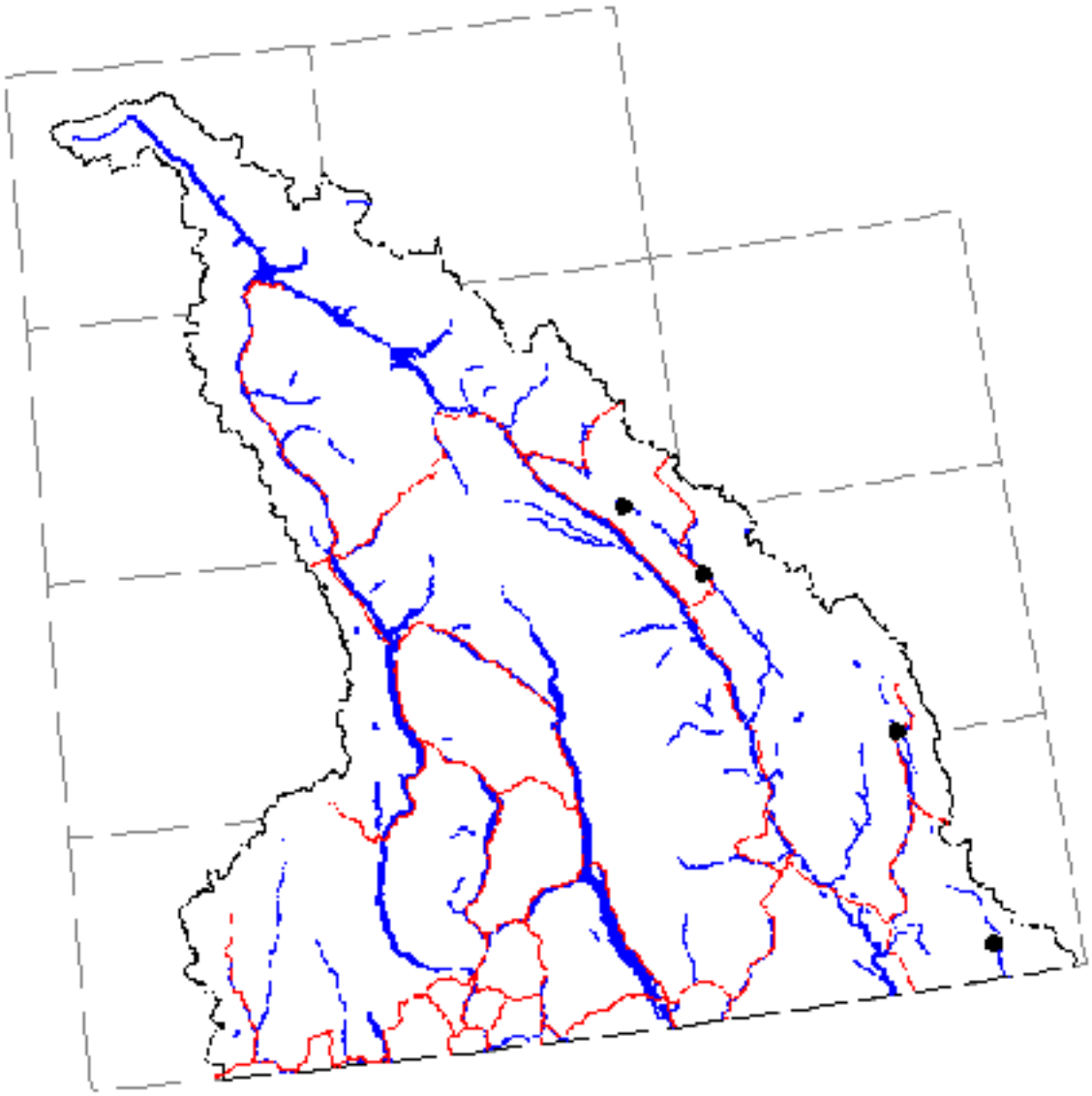


Columbia-Kootenay Distribution
Known only from five localities, which show as four dots on the distribution map. All are east of the Rocky Mountain Trench.

Global Distribution
Yukon and British Columbia east to Labrador and Newfoundland; south to Maine, Wisconsin and Montana; absent from the Great Plains (Westfall and May 1996). Faunal element: Northern Boreal (see Appendix 2).

Biological Information
C. interrogatum, the most boreal of North American damselflies, is apparently restricted to peatland water bodies with aquatic moss (Cannings and Cannings 1994). Flight records in the Columbia Basin range from 17 June to 2 August.

Coenagrion interrogatum (Hagen)



Coenagrionidae
Coenagrion interrogatum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Elkford	19990731	Ramsay, Leah	1	0	0	1
Flathead; Marl Lake	19990801	Ramsay, Leah	1	1	0	2
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	0	1	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	4	0	4
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Halverson, Larry	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Ramsay, Leah	0	8	0	8
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	2	2	0	4
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	0	1	0	1
Kootenay Total			**4**	**18**	**1**	**23**

Coenagrion resolutum (Hagen)
Taiga Bluet

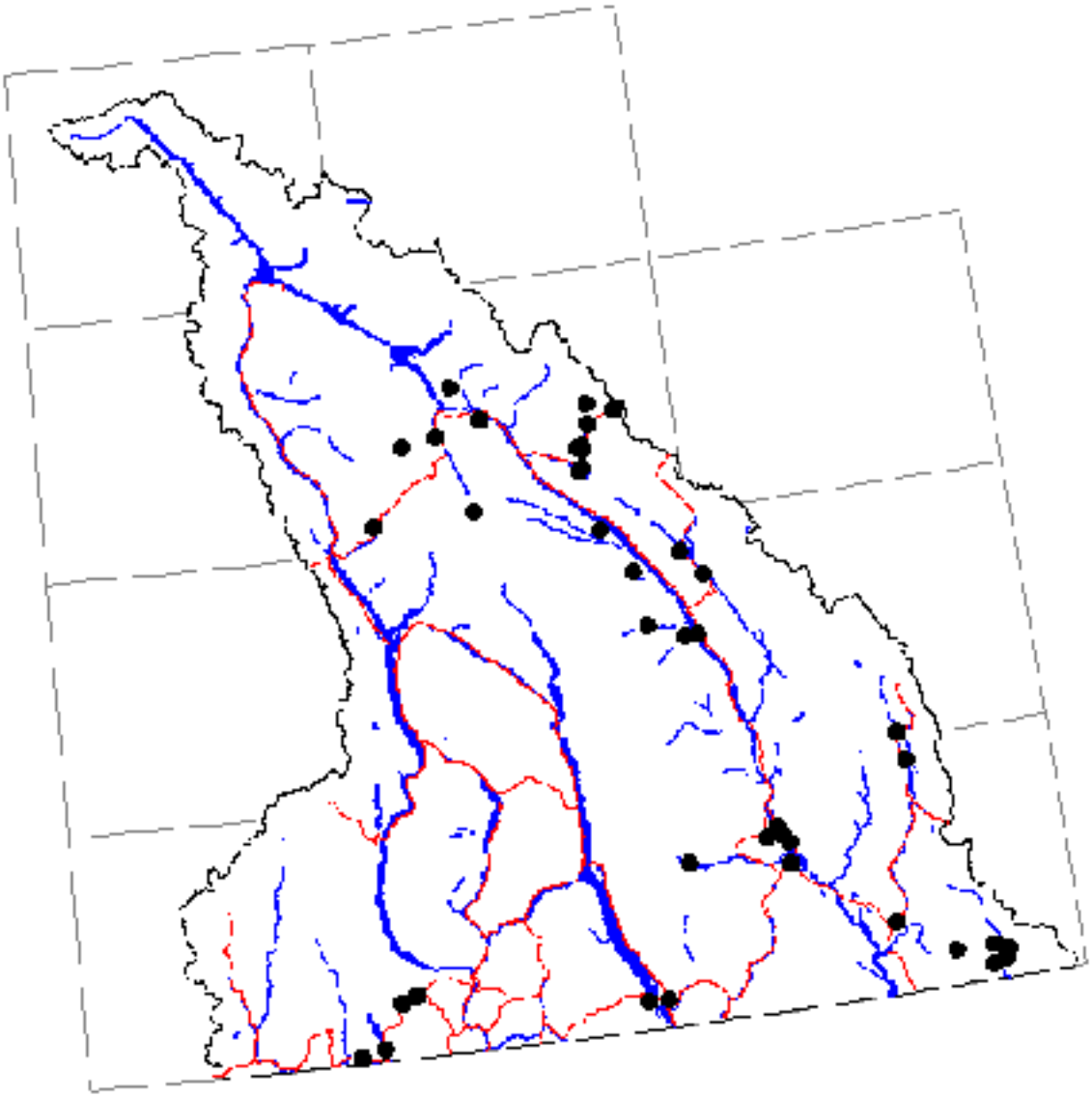
Provincial Status
CDC rank: S5
In British Columbia *C. resolutum* is a common and widespread species in the Interior, but is rare on the coast. Most common in the north and at higher elevations in the south.

Columbia-Kootenay Distribution
Widespread.

Global Distribution
Alaska east to Labrador and Newfoundland; south to New York, Ohio, Nebraska, Colorado, Arizona and California (Westfall and May 1996). Faunal element: Widespread Boreal (see Appendix 2).

Biological Information
Found in many types of habitat, but most common in sedge marshes and peatlands. An early species, *C. resolutum* flight records in the Columbia Basin range from 3 May to 11 August.

Coenagrion resolutum (Selys)



Coenagrionidae
Coenagrion resolutum (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Twin Lakes	19980630	Cannings, Sydney G.	1	1	0	2
Christina Lake; Bonanza Pass	19990615	Cannings, Sydney G.	0	3	0	3
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	1	4	0	5
Christina Lake; Christina Creek	19990719	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	2	0	2
Cranbrook	19990704	Nicholson, Dean	1	1	0	2
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	2	0	2
Creston	19800503	Askevold, Ingolf	0	2	0	2
Elkford	19990614	Ramsay, Leah	0	1	0	1
Elkford	19990731	Cannings, Sydney G.	0	1	0	1
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Flathead	19990801	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	1	2	0	3
Flathead	19990802	Ramsay, Leah	2	3	0	5
Flathead; Cabin Pass; Cabin Creek	19990804	Cannings, Sydney G.	0	1	0	1
Flathead; Marl Lake	19990801	Cannings, Sydney G.	0	1	0	1
Flathead; Marl Lake	19990801	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	1	4	0	5
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Woods, John	0	1	0	1
Golden; Donald	19980802	Cannings, Robert A.	0	1	0	1
Golden; Donald; Blackwater Creek	19980626	Cannings, Sydney G.	0	2	0	2
Grand Forks	19990615	Cannings, Sydney G.	1	4	0	5
Invermere; Horsethief Creek	19980629	Cannings, Sydney G.	1	0	0	1
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	0	2	0	2
Kimberley; Bummers Flats	19990616	Ramsay, Leah	4	3	0	7
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	0	1	0	1
Kimberley; Mather Creek	19990721	Ohanjanian, Penny	1	2	0	3
Kimberley; Mather Creek	19990721	Ramsay, Leah	0	3	0	3
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	0	2	0	2

Coenagrionidae
Coenagrion resolutum (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Cannings, Sydney G.	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Ramsay, Leah	0	1	0	1
Parson; Bittern Lake	19990620	Nicholson, Dean	1	0	0	1
Rossland; Nancy Greene Lakes	19990726	Blades, David C.A.; Sendall, Kelly A.	3	7	0	10
Yoho National Park; Field; Emerald Lake	19980627	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	3	0	3
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Ramsay, Leah	1	1	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Archard, Gabrielle A.	0	3	0	3
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	0	3	0	3
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	2	0	0	2
Yoho National Park; Golden; Leanchoil	19980627	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	0	4	0	4
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	2	0	2
Kootenay Total			**23**	**99**	**0**	**122**

Enallagma Selys

Enallagma is a large, predominantly North American genus containing some of our most abundant damselflies. Most of the common blue and black damselflies of the Columbia Basin are *Enallagma.* Four of the seven British Columbia species are known in the Basin. The larvae are patterned in brown or green, and usually climb in aquatic vegetation.

Species:
Enallagma boreale
Enallagma carunculatum
Enallagma cyathigerum
Enallagma ebrium

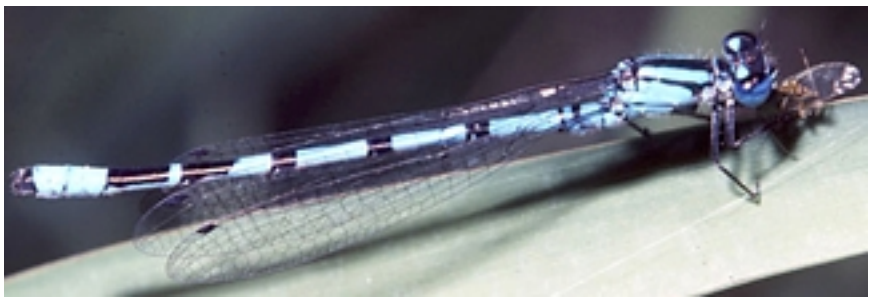
Enallagma boreale Selys
Boreal Bluet

Provincial Status
CDC rank: S5
Common over the whole province.

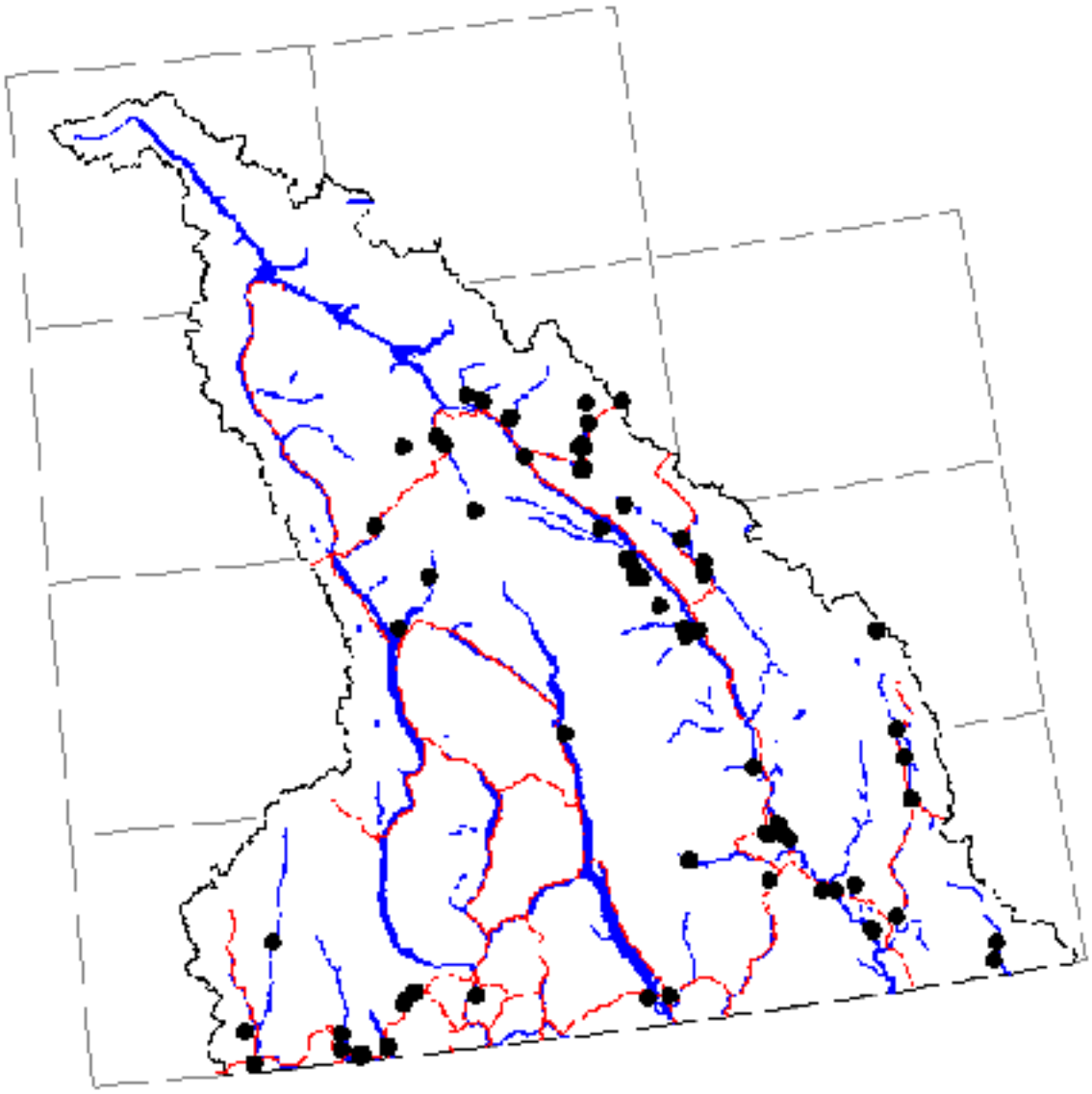
Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to West Virginia, Nebraska, and along the mountains to New Mexico and California (Westfall and May 1996).
Faunal element: Widespread Boreal (see Appendix 2).

Biological Information
The wide distribution of *E. boreale* is partly the result of its tolerance of a wide variety of habitats. It swarms around warm saline ponds in dry grasslands, it can be common along the marshy shores of lakes and ponds, and is a typical species of cold peatland waters. As a species it has a long flight season in the province, often emerging in April and flying well into October. In the Columbia Basin records are from 13 June to 26 August.



Enallagma boreale Selys



Coenagrionidae
Enallagma boreale Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Cleland Lake	19980806	Cannings, Robert A.	0	1	0	1
Brisco; Hall Lakes	19990726	Ramsay, Leah	1	2	0	3
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	0	1	0	1
Brisco; Twin Lakes	19980630	Ramsay, Leah	1	0	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	1	0	2
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	1	0	0	1
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	2	8	0	10
Christina Lake; Bonanza Pass	19990818	Hatter, Ian	0	2	0	2
Christina Lake; Bonanza Pass	19990818	Ramsay, Leah	0	4	0	4
Christina Lake; Christina Creek	19990719	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	1	4	0	5
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	2	0	2
Conkle Lake Park; Osoyoos; Conkle Lake	19990728	Blades, David C.A.; Sendall, Kelly A.	1	3	0	4
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	1	1	0	2
Cranbrook; Elizabeth Lake	19800706	Cannings, Robert A.	2	4	0	6
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	1	0	1
Cranbrook; Wardner; Haha Lake	19990730	Ramsay, Leah	0	1	0	1
Creston	19800712	Cannings, Robert A.	0	1	0	1
Creston	19810705	Askevold, I.	0	0	3	3
Creston	19990623	Nicholson, Dean	1	0	0	1
Edgewater; Cleland Lake	19990726	Ramsay, Leah	0	1	0	1
Elkford	19880613	Guppy, Crispin S.	1	0	0	1
Elkford	19990614	Ramsay, Leah	0	3	0	3
Elkford	19990731	Cannings, Sydney G.	1	1	0	2
Elkford	19990731	Ramsay, Leah	1	3	0	4
Elkford	19990822	Ramsay, Leah	2	5	0	7
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	1	1	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	1	0	0	1
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Beryl Creek	19990801	Cannings, Sydney G.	0	1	0	1
Fort Steele	19990724	Ramsay, Leah	2	6	0	8
Galena Bay	19810701	Cannings, Robert A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980723	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	0	2	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	1	2	0	3
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	2	8	0	10

Coenagrionidae
Enallagma boreale Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	2	8	0	10
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724		0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	3	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	1	2	0	3
Golden	19980806	Cannings, Robert A.	1	0	0	1
Golden; Blaeberry	19980625	Cannings, Sydney G.	0	1	0	1
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	1	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	2	5	0	7
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	2	0	2
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Bluewater Creek	19980626	Ramsay, Leah	0	2	0	2
Golden; Kicking Horse River	19980804	Archard, Gabrielle A.	0	1	0	1
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Grand Forks	19990615	Cannings, Sydney G.	1	3	0	4
Grand Forks	19990616	Cannings, Sydney G.	3	3	0	6
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Grand Forks; Gilpin	19990616	Cannings, Sydney G.	3	3	0	6
Grand Forks; Gilpin	19990817	Hatter, Ian	0	1	0	1
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	0	3	0	3
Grand Forks; Niagara	19990616	Cannings, Sydney G.	0	1	0	1
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	0	2	0	2
Incomappleux River	19990805	P.M. Troffe and J. Ladell	0	2	0	2
Invermere; Athalmer	19980629	Cannings, Sydney G.	1	0	0	1
Invermere; Lake Eileen	19980630	Cannings, Sydney G.	0	1	0	1
Invermere; Lake Eileen	19980630	Ramsay, Leah	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	2	0	2
Invermere; Lake Eileen	19980808	Hutchings, Gordon E.	1	1	0	2
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	1	1	0	2
Invermere; Lillian Lake	19980630	Ramsay, Leah	1	3	0	4
Invermere; Lillian Lake	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
Kelowna; Christian Valley	19990728	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	3	4	0	7
Kikomun Creek Park; Elko; Surveyors Lake	19990615	Ramsay, Leah	1	2	0	3
Kimberley; Bartholomew Lake	19990615	Ramsay, Leah	0	1	0	1
Kimberley; Bummers Flats	19990616	Ramsay, Leah	0	3	0	3
Kimberley; Bummers Flats	19990727	Cannings, Sydney G.	0	1	0	1
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	1	1	0	2
Kimberley; Bummers Flats	19990729	Ramsay, Leah	1	1	0	2

Coenagrionidae
Enallagma boreale Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kimberley; Mather Creek	19990721	Ramsay, Leah	0	2	0	2
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	0	1	0	1
Koocanusa Lake	19760806	Ricker, William E.; Ricker, Nancy	0	3	0	3
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	1	1	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	2	2	0	4
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Ramsay, Leah	2	1	0	3
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	0	3	0	3
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Ramsay, Leah	6	6	0	12
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	1	3	0	4
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	0	3	0	3
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Archard, Gabrielle A.	1	1	0	2
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Cannings, Sydney G.	0	2	0	2
Parson; Bittern Lake	19990620	Nicholson, Dean	1	1	0	2
Radium Hot Springs; Dogsleg Lake	19980629	Cannings, Sydney G.	0	3	0	3
Radium Hot Springs; Dogsleg Lake	19980629	Ramsay, Leah	0	4	0	4
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	6	0	7
Sparwood	19800711	Cannings, Robert A.	0	1	0	1
Torrent; Larchwood Lake	19890718	Guppy, Crispin S.	5	9	0	14
Yoho National Park; Field; Emerald Lake	19980627	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	2	2	0	4
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	3	3	0	6
Yoho National Park; Field; Kicking Horse River	19980802	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	3	0	3
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	1	0	1

Coenagrionidae
Enallagma boreale Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980627	Ramsay, Leah	1	1	0	2
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	1	0	0	1
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	1	1	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	1	1	0	2
Kootenay Total			**79**	**232**	**3**	**314**

Enallagma carunculatum Morse
Tule Bluet

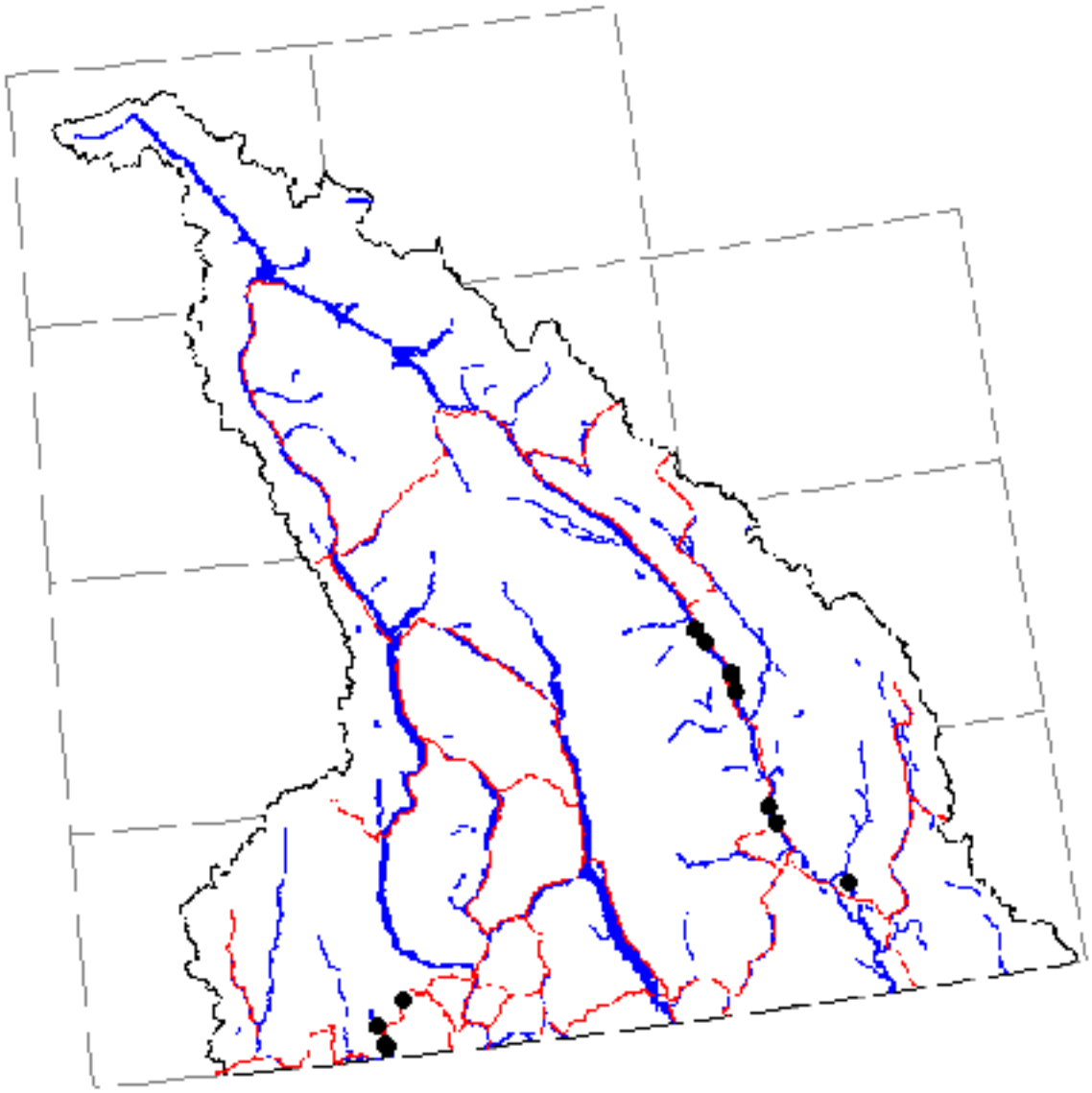
Provincial Status
CDC rank: S5
Widespread over at least the southern part of the province at low and moderate elevations.

Columbia-Kootenay Distribution
Known from the Rocky Mountain Trench from Invermere south, and from the Christina Lake area; probably more widespread than records indicate.

Global Distribution
British Columbia east to Nova Scotia; south to Maryland, Kentucky, Oklahoma, New Mexico and Baja California (Westfall and May 1996). Faunal element: Austral (see Appendix 2).

Biological Information
In British Columbia *E. carunculatum* is typical of lakes and large marshes rather than small ponds. It tolerates alkaline conditions and is often common along the exposed shorelines of large lakes, especially where there are stands of bulrush *(Scirpus)* (Cannings and Stuart 1977). Flight records in British Columbia range from 4 June to 16 October.

Enallagma carunculatum Morse



Coenagrionidae
Enallagma carunculatum Morse

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	1	12	0	13
Christina Lake	19990807	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990817	Ramsay, Leah	2	2	0	4
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	3	3	0	6
Christina Lake; Christina Creek	19990807	Ramsay, Leah	2	4	0	6
Christina Lake; Christina Creek	19990817	Ramsay, Leah	1	0	0	1
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	2	0	2
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Cannings, Sydney G.	0	2	0	2
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Ramsay, Leah	1	1	0	2
Cranbrook; Wasa Lake	19990614	Nicholson, Dean	1	2	0	3
Fairmont Hot Springs	19800705	Cannings, Robert A.	1	2	0	3
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	0	2	0	2
Invermere; Athalmer	19980630	Cannings, Sydney G.	1	0	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	0	1	0	1
Windermere	19760805	Ricker, William E.; Ricker, N.	0	8	0	8
Windermere	19800705	Cannings, Robert A.	1	1	0	2
Kootenay Total			**14**	**44**	**0**	**58**

Enallagma cyathigerum (Charpentier)
Northern Bluet

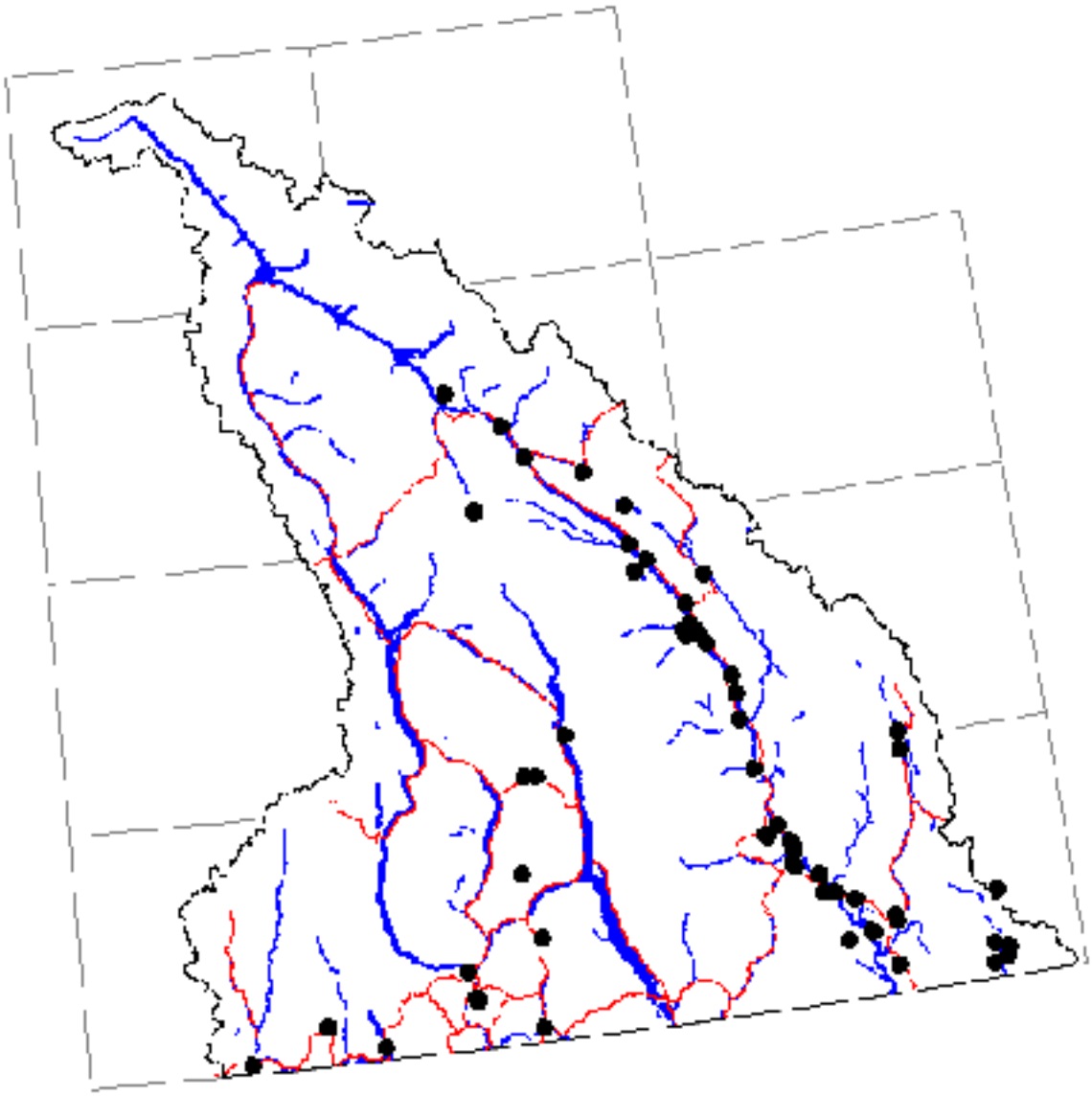
Provincial Status
CDC rank: S5
Common over the entire province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Eurasia; Alaska east to Newfoundland; south to Virginia, Iowa, Nebraska, New Mexico and Baja California (Westfall and May 1996). Faunal element: Widespread Boreal; Holarctic (see Appendix 2).

Biological Information
E. cyathigerum is the most common damselfly in British Columbia. It lives in a wide variety of aquatic habitats, mostly the marshy shores of ponds and lakes. It usually avoids significantly acid or saline waters. *E. cyathigerum* usually emerges about two weeks after its close relative *E. boreale.* Records of adults in British Columbia range from 13 May to 20 October (Cannings and Stuart 1977).

Enallagma cyathigerum (Charpentier)



Coenagrionidae
Enallagma cyathigerum (Charpentier)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Twin Lakes	19980630	Cannings, Sydney G.	0	1	0	1
Brisco; Twin Lakes	19980630	Ramsay, Leah	0	1	0	1
Canal Flats; Columbia Lake	19760806	Ricker, William E.; Ricker, N.	0	3	0	3
Castlegar	19740727	Merilees, William J.	0	1	0	1
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	2	8	0	10
Champion Lakes Park; Trail; Champion Lakes	19990724	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Christina Lake; Christina Creek	19990719	Ramsay, Leah	1	1	0	2
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	2	0	2
Christina Lake; Christina Creek	19990828	Hatter, Ian	0	1	0	1
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Cannings, Sydney G.	0	4	0	4
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Ramsay, Leah	0	3	0	3
Cranbrook	19880603	Cannings, Robert A.	4	6	0	10
Cranbrook	19990704	Nicholson, Dean	0	1	0	1
Cranbrook; Alkaline Lake	19800711	Cannings, Robert A.	0	6	0	6
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	1	4	0	5
Cranbrook; Campbell Lake	19990729	Ramsay, Leah	2	4	0	6
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	1	4	0	5
Cranbrook; Wardner; Haha Lake	19990730	Ramsay, Leah	0	1	0	1
Elkford	19990731	Ramsay, Leah	0	1	0	1
Elkford	19990822	Ramsay, Leah	0	2	0	2
Fairmont Hot Springs	19800705	Cannings, Robert A.	1	0	0	1
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	1	2	0	3
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Edwards Lakes	19990823	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	1	2	0	3
Flathead	19990802	Cannings, Sydney G.	1	2	0	3
Flathead	19990802	Ramsay, Leah	1	2	0	3
Flathead; Marl Lake	19990801	Cannings, Sydney G.	0	5	0	5
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	3	0	4
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	2	0	2
Flathead; Sage Creek	19990803	Cannings, Sydney G.	3	3	0	6
Flathead; Sage Creek	19990803	Ramsay, Leah	1	3	0	4
Fort Steele	19800705	Cannings, Robert A.	2	2	0	4
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	0	1	0	1
Golden	19980806	Cannings, Robert A.	0	2	0	2
Golden; Donald; Susan Lake	19980805	Cannings, Robert A.	0	1	0	1
Golden; Moberly	19950724	Cannings, Sydney G.	0	1	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	2	6	9
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	1	2	0	3
Invermere; Lake Eileen	19880710	Halverson, Larry	1	1	0	2
Invermere; Lake Eileen	19980630	Cannings, Sydney G.	2	4	0	6
Invermere; Lake Eileen	19980630	Ramsay, Leah	2	2	0	4
Invermere; Lillian Lake	19980630	Ramsay, Leah	0	1	0	1

Coenagrionidae
Enallagma cyathigerum (Charpentier)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Jaffray	19800706	Cannings, Robert A.	2	1	0	3
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	3	0	3
Kaslo	19980809	Hutchings, Gordon E.	0	1	0	1
Kaslo; Rettalack; Bear Lake	19990723	Blades, David C.A.; Sendall, Kelly A.	2	8	0	10
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	3	4	0	7
Kikomun Creek Park; Elko; Surveyors Lake	19990615	Ramsay, Leah	0	1	0	1
Kimberley	19990723	Ohanjanian, Penny	0	1	0	1
Kimberley; Bartholomew Lake	19990615	Ramsay, Leah	0	2	0	2
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	0	1	0	1
Koocanusa Lake	19760806	Ricker, William E.; Ricker, Nancy	1	9	0	10
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	2	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	1	0	0	1
Nelson; Hall	19990722	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Nelson; Willow Point; Six Mile Lakes	19990722	Blades, David C.A.; Sendall, Kelly A.	1	5	0	6
Nelway; Rosebud Lake	19990721	Ramsay, Leah	2	4	0	6
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	1	3	0	4
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	2	4	0	6
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	4	4	9	17
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	1	0	1
Torrent; Larchwood Lake	19890718	Guppy, Crispin S.	1	2	0	3
Trail; Champion Lakes	19990806	Cannings, Sydney G.	1	4	0	5
Trail; Champion Lakes	19990806	Ramsay, Leah	0	1	0	1
Wilmer	19820821	Cannings, Robert A.	1	3	0	4
Wilmer	19980719	Cannings, Robert A.	0	2	0	2
Wilmer; Columbia River	19820615	Sargent, Randy	0	1	0	1
Wilmer; Columbia River	19880602	Cannings, Robert A.	5	8	0	13
Windermere	19760805	Ricker, William E.; Ricker, N.	0	8	0	8
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	0	1	0	1
Kootenay Total			**57**	**196**	**15**	**268**

Enallagma ebrium (Hagen)
Marsh Bluet

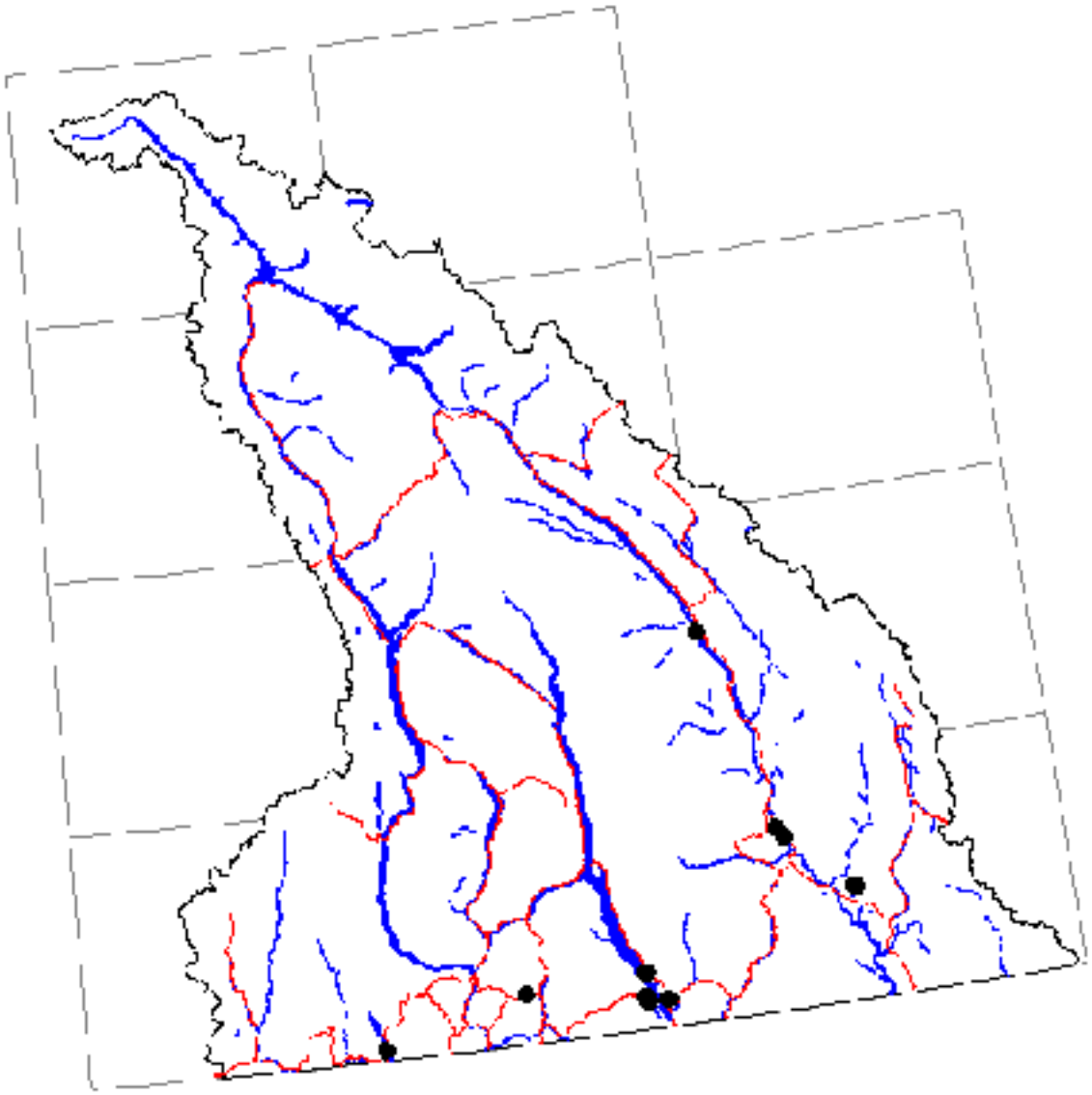
Provincial Status
CDC rank: S5
Widespread east of the Coast Mountains. Ranges north into the Peace and Liard regions, but is more common in the southern half of the province.

Columbia-Kootenay Distribution
Frequently found in the valleys of the southern Kootenays.

Global Distribution
British Columbia east to Newfoundland; south to Virginia, Tennessee, Nebraska, Colorado and Washington (Westfall and May 1996). Faunal element: Transition (see Appendix 2).

Biological Information
E. ebrium is locally common, especially in marshes or open lakeshores. It is one of the most common damselflies of the extensive Kootenay River marshes at Creston. Normally the species avoids peatlands and acidic habitats. British Columbia records range from 6 June to 3 September (Cannings and Stuart 1977).

Enallagma ebrium (Hagen)



Coenagrionidae
Enallagma ebrium (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	16	16
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	1	1	0	2
Creston	19790606	Askevold, I.	0	0	4	4
Creston	19790705	Askevold, Ingolf	0	0	2	2
Creston	19800712	Cannings, Robert A.	0	1	0	1
Creston	19800713	Cannings, Robert A.	0	1	0	1
Creston	19810705	Askevold, I.	1	0	0	1
Creston	19980620	Cannings, Richard J.	0	2	0	2
Creston	19990623	Nicholson, Dean	1	1	0	2
Creston; Creston Marsh	19990720	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	2	5	0	7
Creston; Duck Lake	19980621	Cannings, Richard J.	0	1	0	1
Creston; Duck Lake	19990722	Lupichuk, Jennifer	0	1	0	1
Creston; Duck Lake	19990722	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	1	3	0	4
Fernie; Jaffray; Little Sand Creek	19990730	Ramsay, Leah	1	3	0	4
Fernie; Jaffray; Little Sand Creek	19990821	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	0	2	0	2
Fort Steele	19990724	Ramsay, Leah	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	1	1	0	2
Invermere; Athalmer	19980630	Cannings, Sydney G.	1	0	0	1
Invermere; Athalmer	19980630	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	1	4	0	5
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Salmo; Erie Lake	19990806	Cannings, Sydney G.	0	1	0	1
Salmo; Erie Lake	19990806	Ramsay, Leah	0	4	0	4
Salmo; Erie Lake	19990828	Ramsay, Leah	0	2	0	2
Kootenay Total			**10**	**42**	**22**	**74**

Ischnura Charpentier

Ischnura is a cosmopolitan genus, occurring almost everywhere Odonata live, although it is mostly absent from boreal habitats. Its distribution in North America is decidedly southern. British Columbia has four species, but only the two most widespread, *I. cervula* and *I. perparva,* occur in the Columbia Basin. B.C.'s male species are mostly blue and green; females may be similarly coloured or be tan or orange. The abdomen is usually black above with a blue tip. Males have a distinct projection on top of the last abdominal segment. Females may develop extensive pruinosity as they age.

Species:
Ischnura cervula
Ischnura perparva

Ischnura cervula with prey

Ischnura cervula Selys
Pacific Forktail

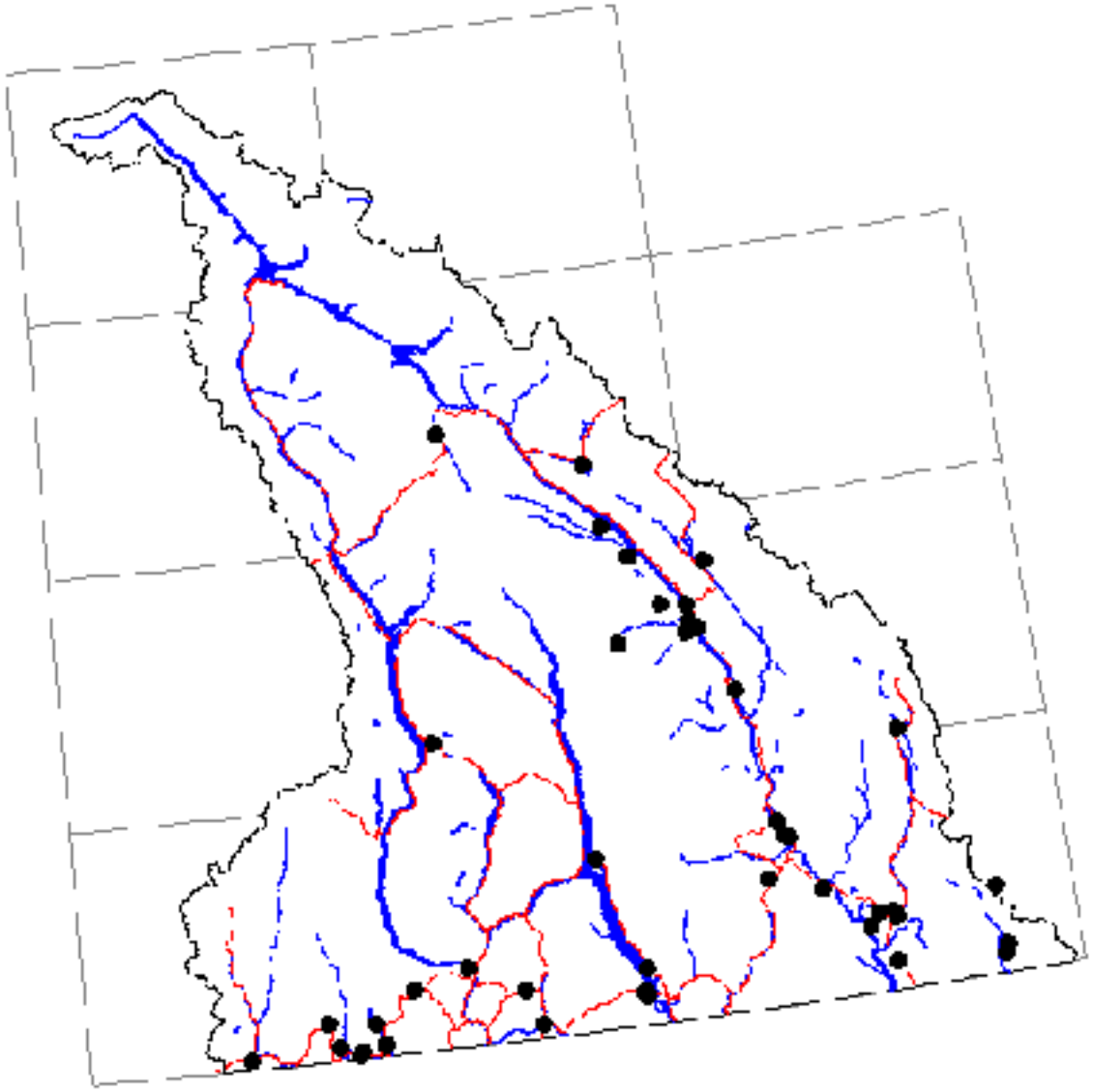
Provincial Status
CDC rank: S5
I. cervula is one of the most common and widespread damselflies of low and moderate elevations across southern British Columbia. There are a few records as far north as 55ºN.

Columbia-Kootenay Distribution
Widespread in the region, especially in valleys.

Global Distribution
British Columbia and Alberta south to New Mexico and Baja California (Westfall and May 1996). Faunal element: Cordilleran (see Appendix 2).

Biological Information
I. cervula lives in many different habitats, but it is most common around marshes and the marshy edges of small lakes and ponds. It prefers neutral and alkaline waters. Adults seldom fly far from the vegetation at the water's edge. When perching they commonly hold their wings half-spread, resembling a miniature *Lestes*. In British Columbia, the species flies from April to the end of October, and thus has one of the longest flight periods of any odonate in the province. Flight records in British Columbia are from 7 May to 25 October.

Ischnura cervula Selys



Coenagrionidae
Ischnura cervula Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar	19740727	Merilees, William J.	1	1	0	2
Castlegar; Mud Lake	19990818	Hatter, Ian	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	0	0	1
Christina Lake	19990807	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990719	Ramsay, Leah	1	1	0	2
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	7	6	0	13
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	1	0	1	2
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	1	1	0	2
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990828	Hatter, Ian	0	1	0	1
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	1	0	1
Christina Lake; Texas Creek	19990817	Ramsay, Leah	0	1	0	1
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Cannings, Sydney G.	1	1	0	2
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Ramsay, Leah	1	1	0	2
Cranbrook: Elizabeth Lake	19980715	Nicholson, Dean	1	0	0	1
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	5	2	0	7
Cranbrook; Campbell Lake	19990729	Ramsay, Leah	1	2	0	3
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	1	0	1
Cranbrook; Wardner; Haha Lake	19990730	Ramsay, Leah	1	2	0	3
Creston	19980620	Cannings, Richard J.	1	1	0	2
Creston	19990623	Nicholson, Dean	1	0	0	1
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	3	1	0	4
Creston; Duck Lake	19990722	Lupichuk, Jennifer	1	0	0	1
Creston; Duck Lake	19990722	Ramsay, Leah	0	1	0	1
Edgewater; Cleland Lake	19990726	Ramsay, Leah	4	3	0	7
Elkford	19990731	Ramsay, Leah	0	2	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	2	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	1	0	0	1
Fernie; Jaffray; Edwards Lakes	19990823	Ramsay, Leah	3	1	0	4
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	1	0	2
Flathead; Proctor Lake	19990803	Ramsay, Leah	1	0	0	1
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	1	0	1
Fort Steele	19990724	Ramsay, Leah	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	2	2	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1

Coenagrionidae
Ischnura cervula Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Grand Forks	19990615	Cannings, Sydney G.	0	3	0	3
Grand Forks	19990616	Cannings, Sydney G.	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	1	0	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Invermere: Dorothy Lake	19980726	Nicholson, Dean	1	1	0	2
Invermere; Athalmer	19980629	Cannings, Sydney G.	0	1	0	1
Invermere; Athalmer	19980630	Cannings, Sydney G.	0	1	0	1
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	1	1	0	2
Invermere; Lillian Lake	19980630	Ramsay, Leah	1	0	0	1
Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
Jaffray	19990619	Nicholson, Danielle; Harris, Valerie	0	1	0	1
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	0	2	0	2
Kimberley; Bummers Flats	19990616	Ramsay, Leah	0	1	0	1
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	1	0	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Archard, Gabrielle A.	1	4	0	5
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Ramsay, Leah	1	2	0	3
Nakusp; Box Lake	19320814	Buckell, E. Ronald	3	1	0	4
Parson; Bittern Lake	19990620	Nicholson, Dean	1	0	0	1
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	1	0	0	1
Radium Hot Springs; Dogsleg Lake	19980629	Cannings, Sydney G.	2	1	0	3
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	3	0	4
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	1	1	0	2
Salmo; Erie Lake	19990806	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990828	Ramsay, Leah	2	2	0	4
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Wilmer; Columbia River	19880602	Cannings, Robert A.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	1	2	0	3
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	1	2	0	3
Kootenay Total			**64**	**78**	**2**	**144**

Ischnura perparva Selys
Western Forktail

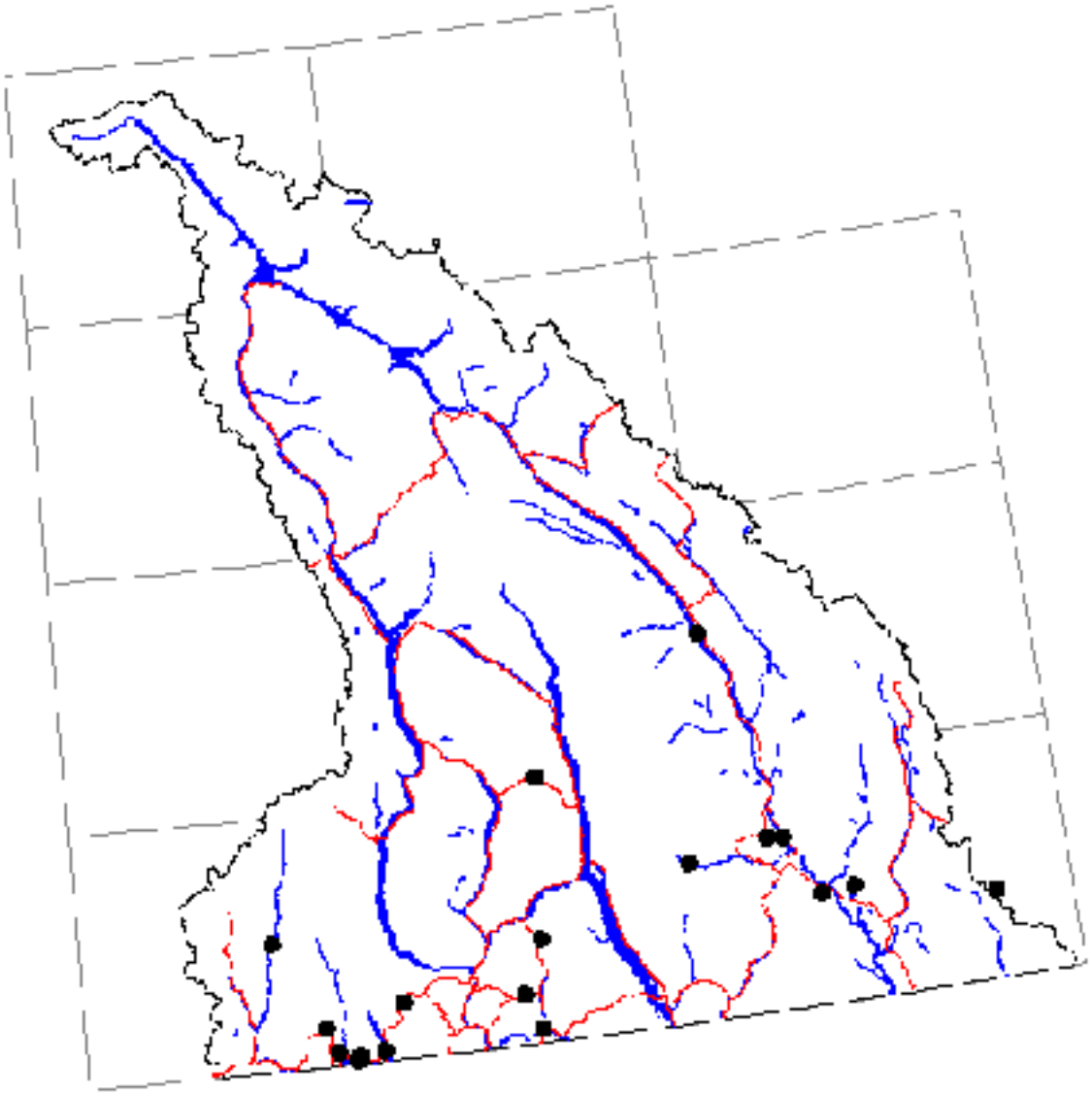
Provincial Status
CDC rank: S5
Common across southern British Columbia, mainly at low and moderate elevations.

Columbia-Kootenay Distribution
Widespread in the region, especially in valleys.

Global Distribution
British Columbia east to Manitoba, south to Oklahoma, New Mexico and California (Westfall and May 1996). Faunal element: Western (see Appendix 2).

Biological Information
I. perparva lives in similar habitats as those of *I. cervula*. The stocky little females oviposit alone. Their pruinose, grey bodies and green eyes make them easy to identify. British Columbia flight records range from 13 May to 9 September (Cannings and Stuart 1977).

Ischnura perparva Selys



Coenagrionidae
Ischnura perparva Selys

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	2	1	0	3
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	2	0	1	3
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	1	0	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	2	0	2
Fort Steele	19990724	Ramsay, Leah	1	0	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	1	0	0	1
Grand Forks	19990615	Cannings, Sydney G.	1	1	0	2
Grand Forks	19990616	Cannings, Sydney G.	1	2	0	3
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	1	1	0	2
Grand Forks; Gilpin	19990616	Cannings, Sydney G.	1	0	0	1
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	1	0	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	1	2
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	1	0	0	1
Kaslo	19980809	Cannings, Robert A.	2	0	0	2
Kelowna; Christian Valley	19990728	Blades, David C.A.; Sendall, Kelly A.	3	4	0	7
Kimberley; Mather Creek	19990721	Ramsay, Leah	0	1	0	1
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	0	1	0	1
Nelson; Hall	19990722	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Salmo; Erie Lake	19990806	Ramsay, Leah	1	0	0	1
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Kootenay Total			**21**	**17**	**2**	**40**

Nehalennia Selys

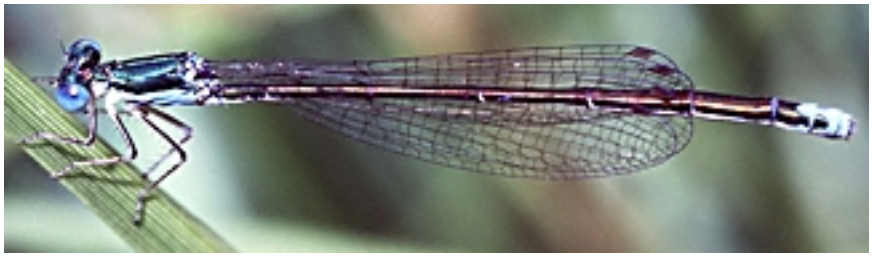
Nehalennia is a genus of five American and one Eurasian species. These damselflies are small and delicate. The two Canadian species, unlike any others in the Pond Damsel family, are completely metallic green on the top of the thorax. They also lack pale spots behind the eyes, so common in many other members of the family. The only species in the West, *Nehalennia irene*, has a boreal range.

Provincial Status
CDC rank: S4
Restricted to the Interior where it is widespread in the southern, central and northeastern areas.

Columbia-Kootenay Distribution
Widespread in the region (see Appendix 3).

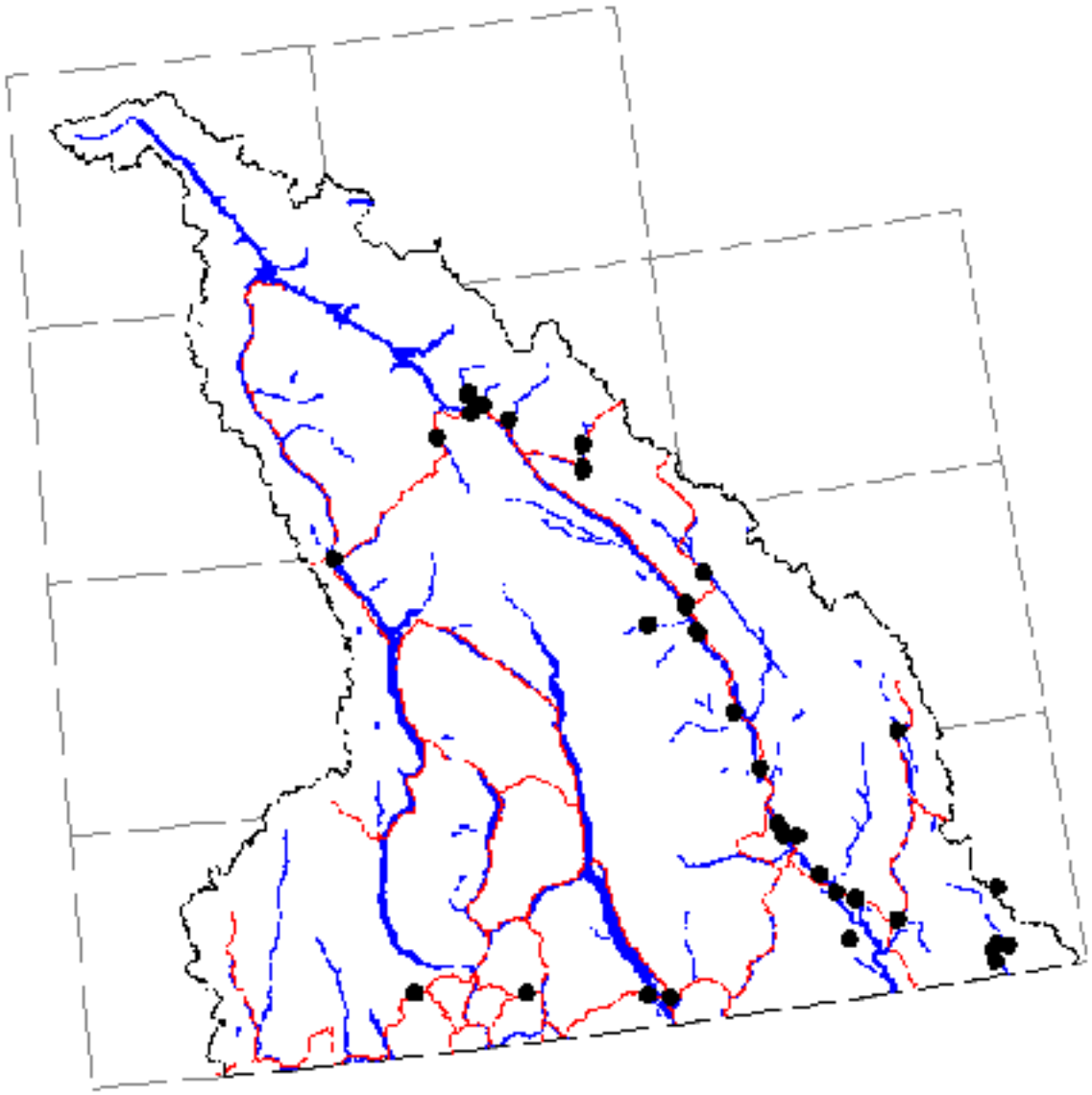
Global Distribution
British Columbia east to Newfoundland; south to South Carolina, Iowa, Wyoming and California (Westfall and May 1996). Faunal element: Southern Boreal (see Appendix 2).

Biological Information
The Sedge Sprite, the smallest damselfly in British Columbia, is inconspicuous because it usually flies weakly in the dense grasses and sedges near the larval habitat. The species is most common in sedge meadows or in lakes bordered by sedges. While ovipositing in floating plants, the female perches horizontally and the male, clasping her thorax with the tip of his abdomen, stiffly holds himself at a 45° angle. Flight dates recorded in British Columbia range from 10 May to 2 September (Cannings and Stuart 1977; S.G. Cannings, unpubl. data).



***Nehalennia irene* (Hagen) Sedge Sprite**

Nehalennia irene (Hagen)



Coenagrionidae
Nehalennia irene (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	2	0	2
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	2	0	3
Columbia Lake; Sun Lake	19860713	Cannings, Sydney G.	0	2	0	2
Cranbrook; Alkaline Lake	19800711	Cannings, Robert A.	1	0	0	1
Creston	19790710	Askevold, Ingolf	2	0	0	2
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	1	2	0	3
Elkford	19990731	Cannings, Sydney G.	1	0	0	1
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	0	1	0	1
Flathead	19990801	Cannings, Sydney G.	1	1	0	2
Flathead	19990802	Cannings, Sydney G.	1	1	0	2
Flathead	19990802	Ramsay, Leah	3	2	0	5
Flathead; Beryl Creek	19990801	Ramsay, Leah	0	1	0	1
Flathead; Cabin Creek	19990801	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	1	3	0	4
Flathead; Sage Creek	19990803	Cannings, Sydney G.	1	1	0	2
Fort Steele	19990724	Ramsay, Leah	1	1	0	2
Fort Steele; Brewery Creek	19990627	Nicholson, Dean	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	4	6	0	10
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	1	2	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	0	2	0	2
Golden; Donald	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald	19980625	Cannings, Sydney G.	2	2	0	4
Golden; Donald	19980802	Hutchings, Gordon E.	1	1	0	2
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	4	2	0	6
Golden; Donald; Bluewater Creek	19980626	Ramsay, Leah	1	1	0	2
Golden; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	0	1	0	1
Invermere	19820821	Cannings, Robert A.	0	2	0	2
Invermere; Athalmer	19980630	Cannings, Sydney G.	1	0	0	1
Invermere; Horsethief Creek	19980629	Cannings, Sydney G.	2	1	0	3
Invermere; Horsethief Creek	19980629	Ramsay, Leah	1	1	0	2
Jaffray	19800706	Cannings, Robert A.	1	3	0	4
Jaffray	19810706	Cannings, Robert A.	1	1	0	2
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	1	2	0	3
Kimberley; Bummers Flats	19990616	Ramsay, Leah	2	2	0	4
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	1	0	0	1

Coenagrionidae
Nehalennia irene (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kimberley; Bummers Flats	19990729	Ramsay, Leah	1	2	0	3
Koocanusa Lake	19760806	Ricker, William E.; Ricker, Nancy	1	1	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	1	2	0	3
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	1	0	1
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	1	1	0	2
Revelstoke	19380802	Whitehouse, Frank C.	0	5	0	5
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Salmo; Erie Lake	19990806	Cannings, Sydney G.	0	1	0	1
Skookumchuck; Johnson Lake	19980712	Nicholson, Dean	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980627	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980627	Ramsay, Leah	1	0	0	1
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	1	2	0	3
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	2	3	0	5
Yoho National Park; Golden; Leanchoil	19980731	Ramsay, Leah	1	1	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	0	1	0	1
Kootenay Total			**51**	**81**	**0**	**132**

Family Aeshnidae (Darners)

Members of the Aeshnidae, the darners, are large, swiftly flying dragonflies usually marked with blue, green or yellow. They are represented in the Columbia Basin by the generas *Aeshna* and *Anax* -- *Aeshna* has twelve species and *Anax* has one. British Columbia supports all species known in western Canada, but *Aeshna septentrionalis* has yet to be recorded in the Columbia Basin, even though it undoubtedly lives in the Rocky Mountains of the province. Adults tirelessly hunt for insects over ponds, lakes and streams, and will wander widely in search of prey. When they land, most species rest in a vertical position. Females oviposit in water plants or floating wood above or below the water line. The larvae are slender and sleek, with flattened labia lacking setae. They are rapacious hunters among water plants.

Genus:
Aeshna
Anax

Aeshna Fabricius

Aeshna is a dominant genus of dragonflies in the Columbia Basin; representatives of the group fly everywhere dragonflies are found. The species are rather uniform in size and colour pattern. The body is brown; the thorax on each side has a pair of blue, green or yellow stripes. The abdominal spots are usually blue on the male and green or yellow on the female.

Cannings (1996) keys the species in British Columbia and outlines the biology and distribution of the species. Peters (1998) discusses the ecology of some *Aeshna* species of British Columbia and presents a key to adults based on wings only. This allows the identification of specimens that have been eaten by birds, a situation often encountered in the field. Five of the twelve *Aeshna* species in the Kootenays are boreal *(A. juncea* and *A. subarctica* are also Holarctic); four others are transcontinental in the Transition forests and three are strictly western in range.

Species:
Aeshna californica
Aeshna canadensis
Aeshna constricta
Aeshna eremita
Aeshna interrupta
Aeshna juncea
Aeshna multicolor
Aeshna palmata
Aeshna sitchensis
Aeshna subarctica
Aeshna tuberculifera
Aeshna umbrosa

Aeshna californica Calvert
California Darner

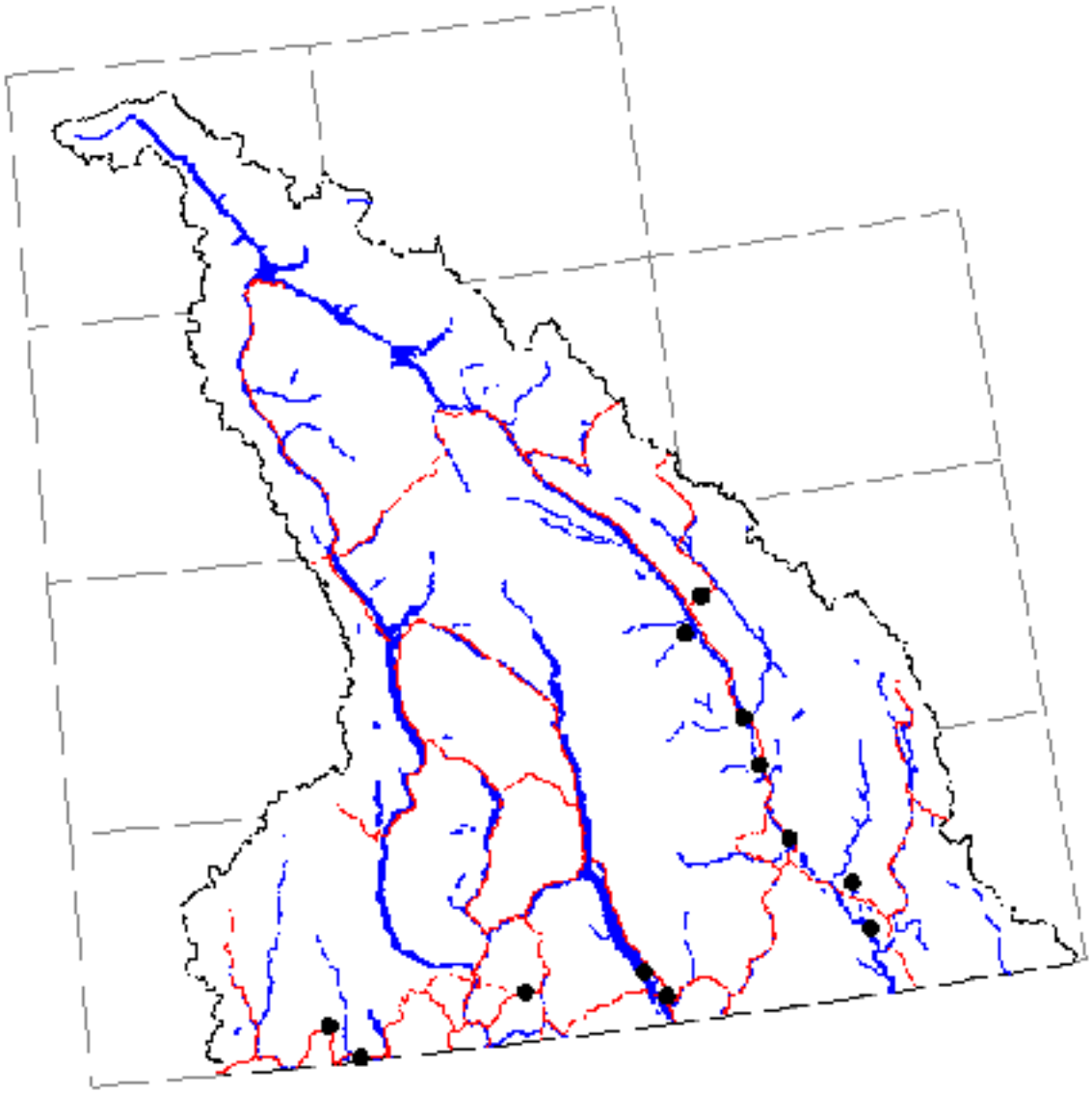
Provincial Status
CDC rank: S5
Common in southern British Columbia at low elevations.

Columbia-Kootenay Distribution
Recorded in the Rocky Mountain Trench south of Radium and from localities along Highway 3. Probably widespread at low elevations in the southern part of the region.

Global Distribution
British Columbia south in the mountains to Mexico; also recorded in South Dakota (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological Information
A. californica is remarkable for its springtime flight season. In the south, it may emerge as early as the last half of April. A species that inhabits lowland ponds and marshes, it normally disappears by early August, just when many darner species are reaching their peak abundance. Columbia Basin records range from 4 May to 6 August (Cannings and Stuart 1977; R.A. Cannings, pers. comm.).

Aeshna californica (Calvert)



Aeshnidae
Aeshna californica (Calvert)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Canal Flats	19760806	Ricker, William E.	0	1	0	1
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	2	0	2
Creston	19800712	Cannings, Robert A.	0	1	0	1
Creston; Duck Lake	19980621	Cannings, Richard J.	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	0	1	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Invermere; Lillian Lake	19980630	Ramsay, Leah	0	1	0	1
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	0	1	0	1
Kootenay National Park; Radium Hot Springs; Kimpton Creek	19760704	Merilees, William J.	1	0	0	1
Kootenay National Park; Radium Hot Springs; Kimpton Creek	19760714	Merilees, William J.	1	0	0	1
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Skookumchuck; Johnson Lake	19980710	Nicholson, Dean	0	1	0	1
Kootenay Total			**2**	**14**	**0**	**16**

Aeshna canadensis Walker
Canada Darner

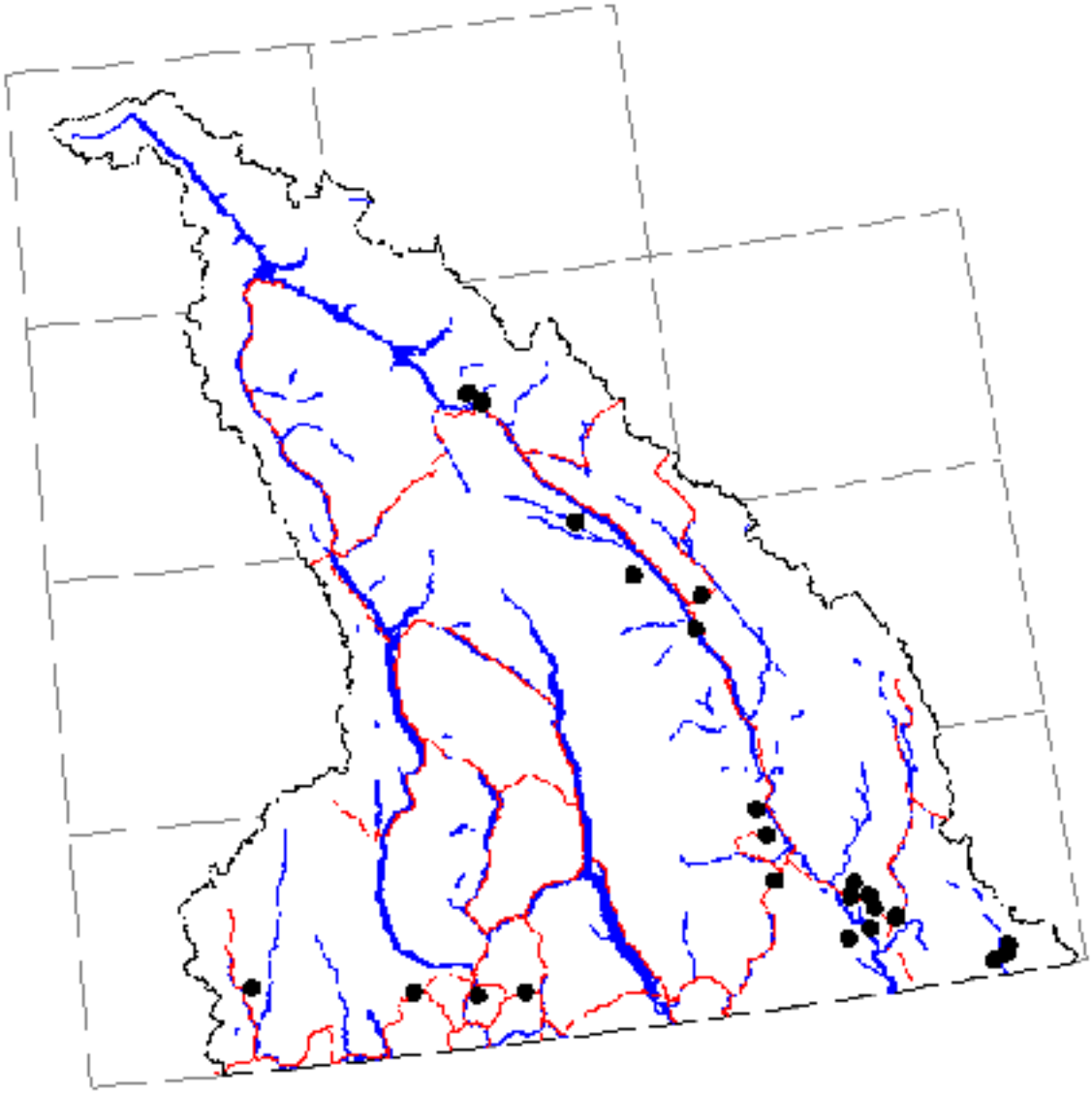
Provincial Status
CDC rank: S5
Widespread in the southern half of British Columbia. Not yet recorded north of 55ºN, but known from the Yukon. Not usually the most dominant species at a locality, except on the south coast, where it can be locally abundant.

Columbia-Kootenay Distribution
Widespread in the region, but not yet recorded from the Kootenay, Slocan and Upper Arrow lakes areas, where it undoubtedly occurs.

Global Distribution
Yukon and British Columbia east to Newfoundland (not recorded from Northwest Territories); south to Virginia, Arkansas, Nebraska, Montana and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological Information
The Canada Darner inhabits a variety of marsh and peatland habitats at low and medium elevations -- forest lakes, flooded beaver ponds and cattail marshes. British Columbia flight records are from 15 June to 9 October (Cannings and Stuart 1977; L.R. Ramsay, unpubl. data).

Aeshna canadensis Walker



Aeshnidae

Aeshna canadensis Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	4	0	4
Brisco; Halfway Lake	19980807	Hutchings, Gordon E.	1	2	0	3
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	1	0	1
Cranbrook	19910815	Cannings, Robert A.; Nadel, Hannah	0	2	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	3	0	3
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	1	4	0	5
Flathead	19990802	Cannings, Sydney G.	0	2	0	2
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	0	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	2	0	2
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	2	0	2
Galloway	19980709	Nicholson, Dean	0	1	0	1
Galloway	19990828	Nicholson, Dean	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	0	1	0	1
Golden; Donald	19970902	Cannings, Sydney G.	1	2	0	3
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	1	1	0	2
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	1	1	0	2
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	3	0	3
Invermere; Athalmer	19820821	Cannings, Sydney G.; Cannings, Robert A.	0	2	0	2
Jaffray	19980810	Nicholson, Dean	0	1	0	1
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	0	2	0	2
Kimberley	19990723	Ramsay, Leah	0	1	0	1
Kootenay National Park; Radium Hot Springs; Kimpton Creek	19760702	Merilees, William J.	0	1	0	1
Parson	19980806	Cannings, Robert A.	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990806	Cannings, Sydney G.	0	1	0	1
Salmo; Erie Lake	19990828	Hatter, Ian	0	4	0	4
Salmo; Erie Lake	19990828	Ramsay, Leah	1	2	0	3
Ta Ta Lake	19880930	Taylor, M. Elizabeth	1	0	0	1
Trail; Champion Lakes	19990806	Ramsay, Leah	0	1	0	1
Kootenay Total			**8**	**54**	**0**	**62**

Aeshna constricta Say*
Lance-tipped Darner

Provincial Status:
CDC rank: S2S3
Blue List
Local and uncommon in the valleys of the southern Interior, north to about 51ºN.

Columbia-Kootenay Distribution
Known only from four records in the Creston area, from the Kootenay River marshes and the Goat River near Kitchener.

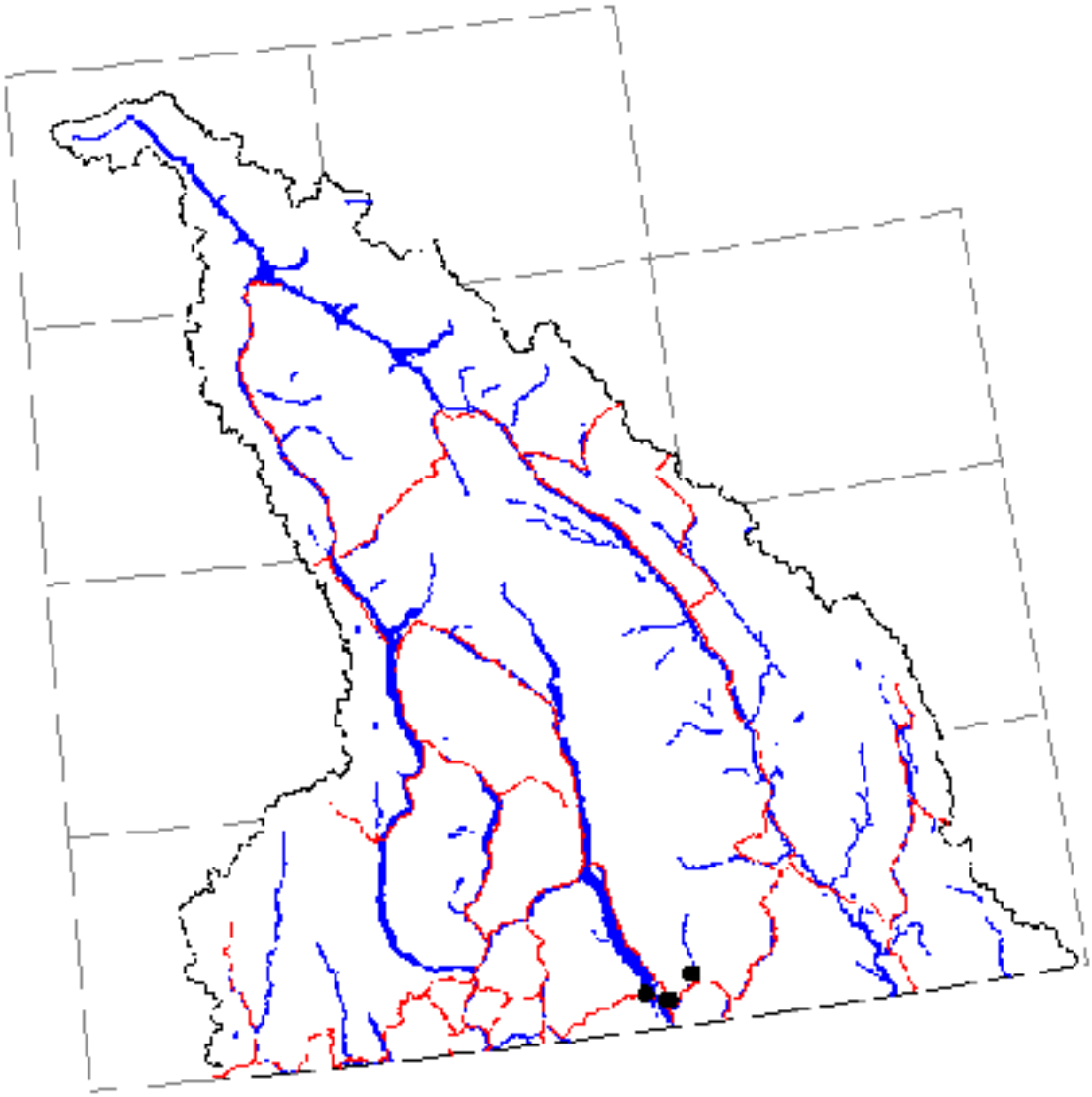
Global Distribution
Southern British Columbia east to Nova Scotia; south to Virginia, Tennessee, Colorado and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological Information
A. constricta is an uncommon species typical of small ponds and open, nutrient rich, warm marshes dominated by cattails and bulrushes. Its preference for habitats that are often threatened by human development place it on the vulnerable list. Walker (1958) surmises that, in Ontario, the larvae often develop in creeks where the stream flows "slowly and imperceptibly" through open marsh. The adults will fly far from water, where mating also takes place. Along with *A. tuberculifera*, the females mimic males in colouration and behaviour; they are also the only species of *Aeshna* in the Columbia Basin that regularly lays eggs above the water in emergent vegetation. Records in British Columbia are primarily from August (Cannings and Stuart 1977); the latest date is 3 October (S.G. Cannings, unpubl. data) and emergence likely begins in July (Cannings and Stuart 1977). Records from Washington State are from 9 July to 28 September (Paulson 1999). The Creston records range from 14 to 22 August.

Management and Protection Considerations
Wetlands, particularly in low-lying areas, always run the risk of being drained, filled for development or polluted; and undoubtedly many wetlands from the southern interior already have been lost. Management practices that ensure the continued viability of wetlands should be followed. Remaining wetlands that appear suitable for this species should ideally be protected or at least have impacts minimized, including livestock trampling or runoff. The water levels and flow of the marshes at Creston are highly regulated and often artificially and dramatically altered. The location of this species

within the Creston marshes should be pinpointed, and its well-being taken into consideration when management actions are being contemplated.

Aeshna constricta (Say)



Aeshnidae

Aeshna constricta (Say)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Creston	19340822	Buckell, E. Ronald	1	1	0	2
Creston	19910814	Cannings, Robert A.; Nadel, Hannah	0	1	0	1
Creston; Summit Creek	19910814	Cannings, Robert A.; Nadel, Hannah	0	1	0	1
Kitchener; Goat River	19990817	Nicholson, Dean	0	1	0	1
Kootenay Total			**1**	**4**	**0**	**5**

Aeshna eremita Scudder
Lake Darner

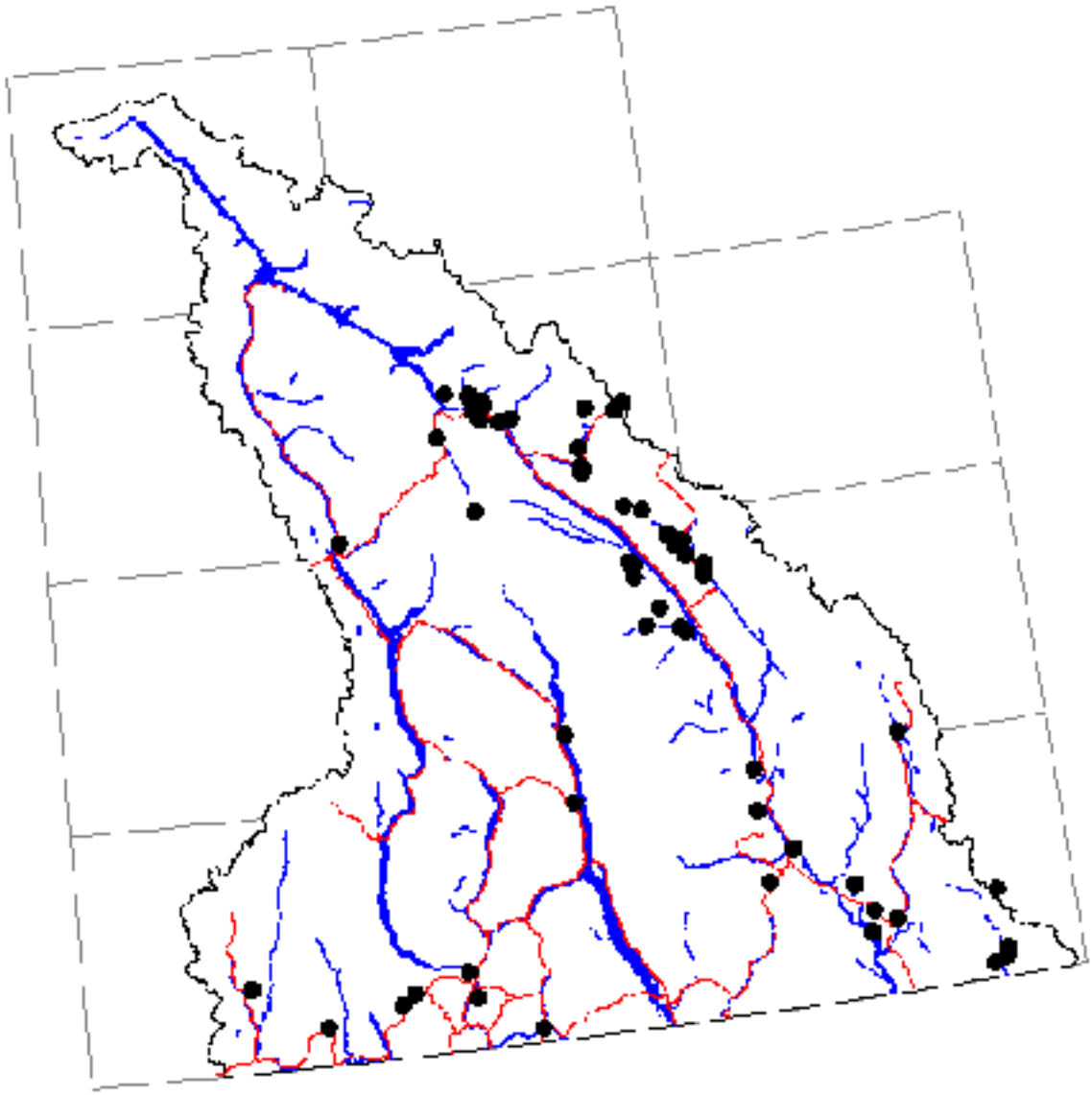
Provincial Status
CDC rank: S5
Widespread over the whole province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to New York, Michigan, North Dakota, Colorado, Utah and Washington (Bick and Mauffray 2000). Faunal element: Widespread Boreal (see Appendix 2).

Biological Information
A. eremita is the largest *Aeshna* in Canada and one of the most ubiquitous dragonflies in the northern forests of North America. In British Columbia it is found at all elevations, but is most common around forest lakes at mid and high elevations. It especially prefers lakeshores with little emergent vegetation. Records from British Columbia range from 19 June to 14 October (Cannings and Stuart 1977; S.G. Cannings, unpubl. data).

Aeshna eremita (Scudder)



Aeshnidae
Aeshna eremita (Scudder)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Cleland Lake	19980807	Cannings, Robert A.	0	0	1	1
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	2	0	2
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	1	2
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	2	2	0	4
Castlegar	19740916	Merilees, William J.	0	1	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	1	0	1
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Christina Lake; Bonanza Pass	19990818	Hatter, Ian	0	3	0	3
Christina Lake; Bonanza Pass	19990818	Ramsay, Leah	0	3	0	3
Cranbrook; Elizabeth Lake	19800706	Cannings, Robert A.	0	0	1	1
Elkford	19990731	Cannings, Sydney G.	1	2	0	3
Elkford	19990822	Ramsay, Leah	2	2	0	4
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	1	3	0	4
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	1	2	0	3
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	1	0	1
Fort Steele	19800705	Cannings, Robert A.	0	0	1	1
Fort Steele	19800706	Cannings, Robert A.	0	0	2	2
Galloway	19990828	Nicholson, Dean	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Cannings, Sydney G.	0	0	2	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724		0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1
Golden; Blaeberry	19970901	Cannings, Sidney G.	1	2	0	3
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	1	0	1
Golden; Blaeberry	19980704	Cannings, Robert A.	0	0	2	2
Golden; Blaeberry	19980804	Cannings, Robert A.	0	4	0	4
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	1	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	0	3	0	3
Golden; Donald	19970902	Cannings, Sydney G.	1	3	0	4
Golden; Donald	19980625	Ramsay, Leah	0	0	3	3
Golden; Donald	19980802	Cannings, Robert A.	0	2	0	2
Golden; Donald	19980802	Hutchings, Gordon E.	0	2	0	2
Golden; Donald	19980805	Cannings, Robert A.	0	1	3	4
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	3	2	5
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	0	0	2	2
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	0	2	0	2
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	1	1	0	2
Golden; Donald; Susan Lake	19980805	Cannings, Robert A.	0	0	2	2
Golden; Donald; Susan Lake	19980805	Hutchings, Gordon E.	0	1	0	1

Aeshnidae
Aeshna eremita (Scudder)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Kicking Horse River	19980804	Archard, Gabrielle A.	1	1	0	2
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	2	2
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	0	0	2	2
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	2	3
Harrogate; Kootenay River	19980804	Archard, Gabrielle A.	0	1	1	2
Harrogate; Kootenay River	19980804	Ramsay, Leah	0	2	0	2
Invermere; Horsethief Creek; Haultain Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Eileen	19980808	Hutchings, Gordon E.	0	1	0	1
Invermere; Lake Enid	19980815	Nicholson, Dean	0	1	0	1
Kaslo	19320814	Buckell	0	0	3	3
Kikomun Creek Park; Jaffray; Kikomun Park; Surveyor's Lake	19990828	Nicholson, Dean	1	0	0	1
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	2	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	2	1	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	4	0	0	4
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	5	0	5
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	1	3	0	4
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	1	4	0	5
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Ramsay, Leah	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980725	Ramsay, Leah	0	1	0	1
Radium Hot Springs; Foster Creek; Frances Creek	19980808	Cannings, Robert A.	0	2	0	2

Aeshnidae

Aeshna eremita (Scudder)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Rock Creek; Taurus Lake	19990829	Hatter, Ian	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	0	1	0	1
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Ta Ta Lake	19881002	Taylor, M. Elizabeth	0	1	0	1
Torrent; Larchwood Lake	19880920	Taylor, M. Elizabeth	0	1	0	1
Trail; Champion Lakes	19990806	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980726	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	1	1	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980731	Ramsay, Leah	0	4	0	4
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	0	1	0	1
Kootenay Total			**22**	**123**	**34**	**179**

Aeshna interrupta Walker
Variable Darner

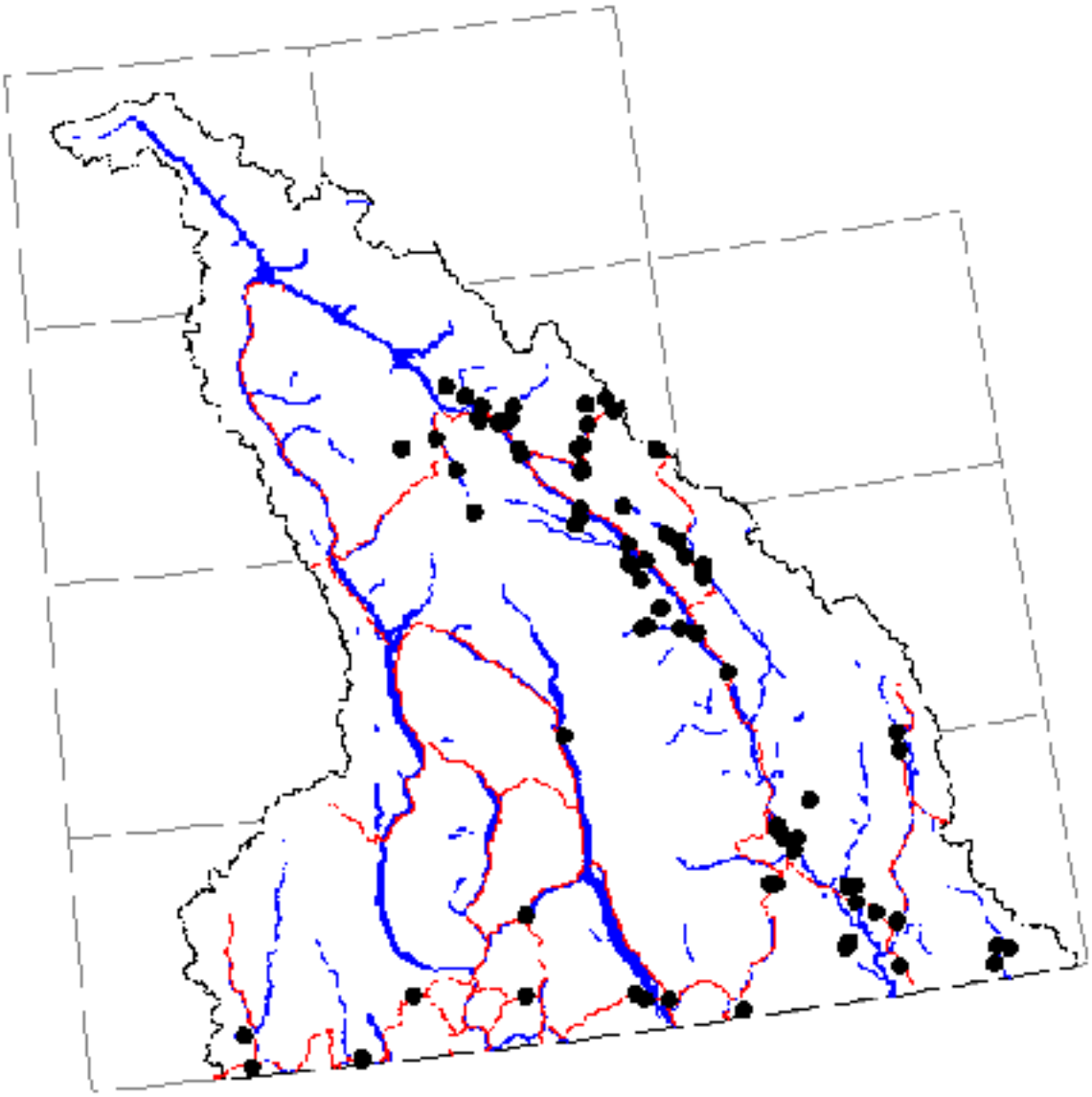
Provincial Status
CDC rank: S5
Widespread and common over the whole province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Newfoundland; south to West Virginia, Wisconsin, Iowa, Nebraska, New Mexico and California (Bick and Mauffray 2000). Faunal element: Southern Boreal (see Appendix 2).

Biological Information
A. interrupta is named after the distinctive broken stripes on the sides of the thorax of many male specimens. In British Columbia, most such specimens are from the coast; Kootenay populations normally have complete stripes. This variation is what gives the species its common name, Variable Darner. It lives in many habitats from northern and mountain peatlands to cattail marshes and temporary pools. It is the characteristic species of grassland ponds. Flight records in British Columbia range from 27 May (most do not emerge until July) to 30 October (Cannings and Stuart 1977; S.G. Cannings, unpubl. data).

Aeshna interrupta Walker



Aeshnidae
Aeshna interrupta Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Blaeberry; Willowbank Mountain	19980627	Cannings, Sydney G.	1	0	0	1
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Cleland Lake	19980807	Cannings, Robert A.	0	0	1	1
Brisco; Hall Lakes	19990726	Ramsay, Leah	1	0	0	1
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	0	2	2
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	0	2	0	2
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	2	0	2
Conkle Lake Park; Osoyoos; Conkle Lake	19990728	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Cranbrook	19910815	Cannings, Robert A.; Nadel, Hannah	0	1	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	2	0	2
Cranbrook; Elizabeth Lake	19800706	Cannings, Robert A.	0	0	4	4
Creston	19790606	Askevold, Ingolf	0	0	1	1
Creston	19890718	Guppy, Crispin S.	0	2	0	2
Creston; Summit Creek	19980620	Cannings, Richard J.	0	1	0	1
Elkford	19990731	Cannings, Sydney G.	1	0	0	1
Elkford	19990822	Ramsay, Leah	0	1	0	1
Fairmont Hot Springs	19760821	Ricker, William E.	1	0	0	1
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	5	0	5
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	1	5	0	6
Fernie; Jaffray; Edwards Lakes	19990823	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Gold Creek	19990823	Ramsay, Leah	1	1	0	2
Fernie; Jaffray; Little Sand Creek	19990821	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	3	2	0	5
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Flathead; Beryl Creek	19990801	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Fort Steele	19800705	Cannings, Robert A.	0	0	1	1
Fort Steele	19990724	Ramsay, Leah	0	2	0	2
Fort Steele; Brewery Creek	19980718	Nicholson, Dean	2	1	0	3
Fort Steele; Wildhorse River	19990724	Ramsay, Leah	1	4	0	5
Galloway	19990828	Nicholson, Dean	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	1	1	0	2
Glacier National Park; Rogers Pass; Beaver River	19980722	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	Woods, John	1	0	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	2	0	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Cannings, Sydney G.	0	0	2	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	0	1	1

Aeshnidae

Aeshna interrupta Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	0	3	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	1	0	0	1
Golden	19380814	Whitehouse, Frank C.	0	1	0	1
Golden	19980806	Cannings, Robert A.	0	1	0	1
Golden	19980806	Hutchings, Gordon E.	0	1	0	1
Golden; Blaeberry	19970901	Cannings, Sidney G.	2	1	0	3
Golden; Blaeberry	19970901	Cannings, Sydney G.	2	2	0	4
Golden; Blaeberry	19980804	Cannings, Robert A.	2	5	0	7
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	2	0	2
Golden; Donald	19970902	Cannings, Sydney G.	1	0	0	1
Golden; Donald	19980802	Cannings, Robert A.	2	1	0	3
Golden; Donald	19980802	Hutchings, Gordon E.	1	1	0	2
Golden; Donald	19980805	Cannings, Robert A.	0	2	0	2
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	1	0	1
Golden; Kicking Horse River	19980804	Ramsay, Leah	2	2	0	4
Golden; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	4	0	4
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	1	2
Grand Forks; Gilpin	19990817	Hatter, Ian	0	3	0	3
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	4	0	4
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	0	1	0	1
Invermere; Athalmer	19820821	Cannings, Robert A.	0	1	1	2
Invermere; Athalmer	19830820	Cannings, Robert A.	1	2	0	3
Invermere; Athalmer	19980808	Cannings, Robert A.	0	2	0	2
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek; Gopher Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Invermere; Lake Enid	19980816	Nicholson, Dean	0	2	0	2
Jaffray	19820811	Cannings, Sydney G.	0	1	0	1
Kimberley; Bummers Flats	19990729	Ramsay, Leah	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	3	5	0	8
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	2	0	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	3	0	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	4	1	0	5
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	1	1	0	2
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	3	0	0	3
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Ramsay, Leah	1	1	0	2

Aeshnidae

Aeshna interrupta Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	2	0	0	2
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Coates, Sally E.	1	3	0	4
Nelson	19210727	Whitehouse, Frank C.	0	1	0	1
Parson	19980806	Cannings, Robert A.	2	2	0	4
Radium Hot Springs; Foster Creek; Frances Creek	19980808	Cannings, Robert A.	1	1	0	2
Radium Hot Springs; Foster Creek; Frances Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Salmo; Erie Lake	19990806	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990828	Ramsay, Leah	0	1	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	5	0	5
Yahk	19880808	Halverson, Larry	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	1	1	0	2
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	1	2	0	3
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	2	0	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Coates, Sally E.	1	0	0	1
Yoho National Park; Golden; Leanchoil	19980627	Ramsay, Leah	0	0	2	2
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Ramsay, Leah	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	1	3	0	4
Yoho National Park; Golden; Sherbrooke Lake; Sherbrooke Creek	19980801	Cannings, Sydney G.	2	0	0	2
Kootenay Total			**64**	**136**	**17**	**217**

Aeshna juncea (Linnaeus)
Sedge Darner

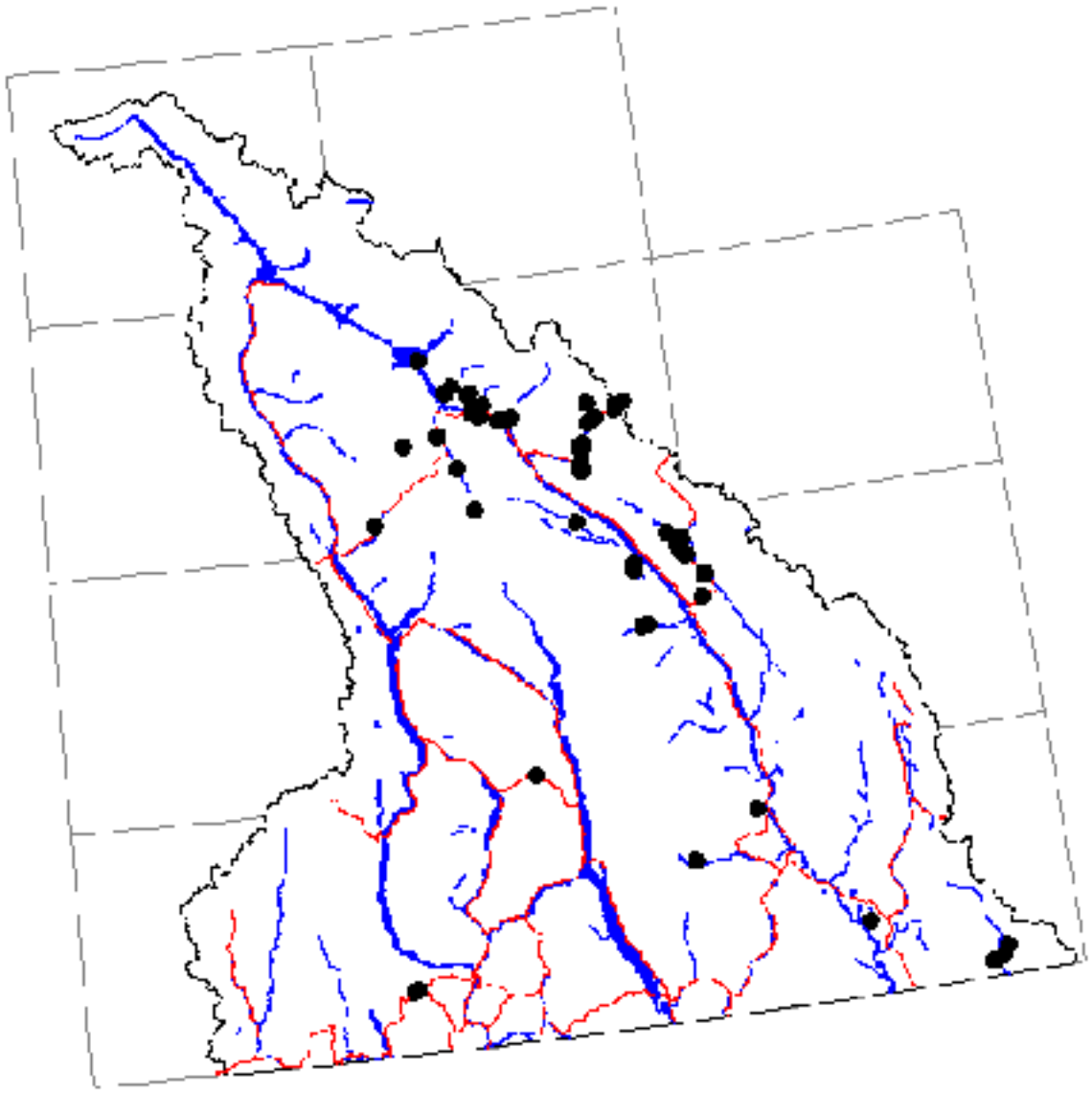
Provincial Status
CDC rank: S5
Widespread over the whole province, but least common in warm southern valleys.

Columbia-Kootenay Distribution
Widespread in the region; most common in mountain areas.

Global Distribution
Alaska east to Labrador and Newfoundland; south to New Hampshire, Michigan, Manitoba, Alberta and south along the mountains to New Mexico and Oregon (Bick and Mauffray 2000). Faunal element: Widespread Boreal; Holarctic (see Appendix 2).

Biological Information
This colourful darner of northern and mountainous regions lives in a variety of habitats, mainly containing acidic waters, but reaches its greatest abundance in peatlands dominated by extensive stands of sedges (*Carex*). Kootenay flight dates are 29 June to 2 October.

Aeshna juncea (Linnaeus)



Aeshnidae
Aeshna juncea (Linnaeus)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	0	1	0	1
Brisco; Twin Lakes	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Twin Lakes	19980807	Hutchings, Gordon E.	0	1	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	0	3	0	3
Castlegar; Mud Lake	19990818	Hatter, Ian	1	2	0	3
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	4	0	5
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	0	0	1
Field	19380809	Whitehouse, Frank C.	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	0	3	0	3
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	0	0	1
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	4	0	4
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	McGillis, Doreen	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	Ramsay, Leah	0	4	0	4
Glacier National Park; Rogers Pass; Beaver River	19980722	Woods, John	1	2	0	3
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	1	2	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Archard, Gabrielle A.	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Coates, Sally E.	2	1	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Archard, Gabrielle A.	0	2	0	2
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	1	4	2	7
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Coates, Sally E.	0	4	0	4
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Woods, John	0	4	0	4
Golden; Blaeberry	19970901	Cannings, Sidney G.	1	0	0	1
Golden; Blaeberry	19970901	Cannings, Sydney G.	1	0	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	0	1	0	1
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	1	0	1
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ramsay, Leah	0	1	0	1
Golden; Donald	19970902	Cannings, Sydney G.	1	2	0	3
Golden; Donald	19980802	Cannings, Robert A.	0	1	0	1
Golden; Donald	19980802	Hutchings, Gordon E.	0	4	0	4
Golden; Donald	19980805	Cannings, Robert A.	0	2	0	2
Golden; Donald	19980805	Hutchings, Gordon E.	0	2	0	2
Golden; Donald; Blackwater Creek	19950725	Cannings, Sydney G.	0	0	1	1
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	1	0	1

Aeshnidae

Aeshna juncea (Linnaeus)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	2	1	0	3
Golden; Donald; Susan Lake	19980805	Hutchings, Gordon E.	0	0	1	1
Golden; Kicking Horse River	19980804	Archard, Gabrielle A.	1	0	0	1
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Golden; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	1	1	0	2
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	1	0	0	1
Invermere; Horsethief Creek	19980808	Hutchings, Gordon E.	0	2	0	2
Invermere; Horsethief Creek; Gopher Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980629	Cannings, Sydney G.	0	0	1	1
Kaslo	19980809	Cannings, Robert A.	0	1	0	1
Kaslo	19980809	Hutchings, Gordon E.	0	1	0	1
Kikomun Creek Park; Jaffray; Kikomun Park	19990828	Nicholson, Dean	0	1	0	1
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	2	1	0	3
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Ramsay, Leah	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	1	0	1
Kootenay National Park; Radium Hot Springs; Kimpton Creek	19760702	Merilees, William J.	1	0	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Ramsay, Leah	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Cannings, Sydney G.	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980723	Ramsay, Leah	0	1	0	1

Aeshnidae

Aeshna juncea (Linnaeus)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Parson	19980806	Cannings, Robert A.	2	2	0	4
Ta Ta Lake	19881002	Taylor, M. Elizabeth	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	4	0	4
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Archard, Gabrielle A.	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	0	2	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Shank, Chris	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	2	3	0	5
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19950725	Cannings, Sidney G.	0	0	2	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	1	2	0	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	4	0	4
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	0	1	0	1
Kootenay Total			**36**	**122**	**7**	**165**

Aeshna multicolor Hagen
Blue-eyed Darner

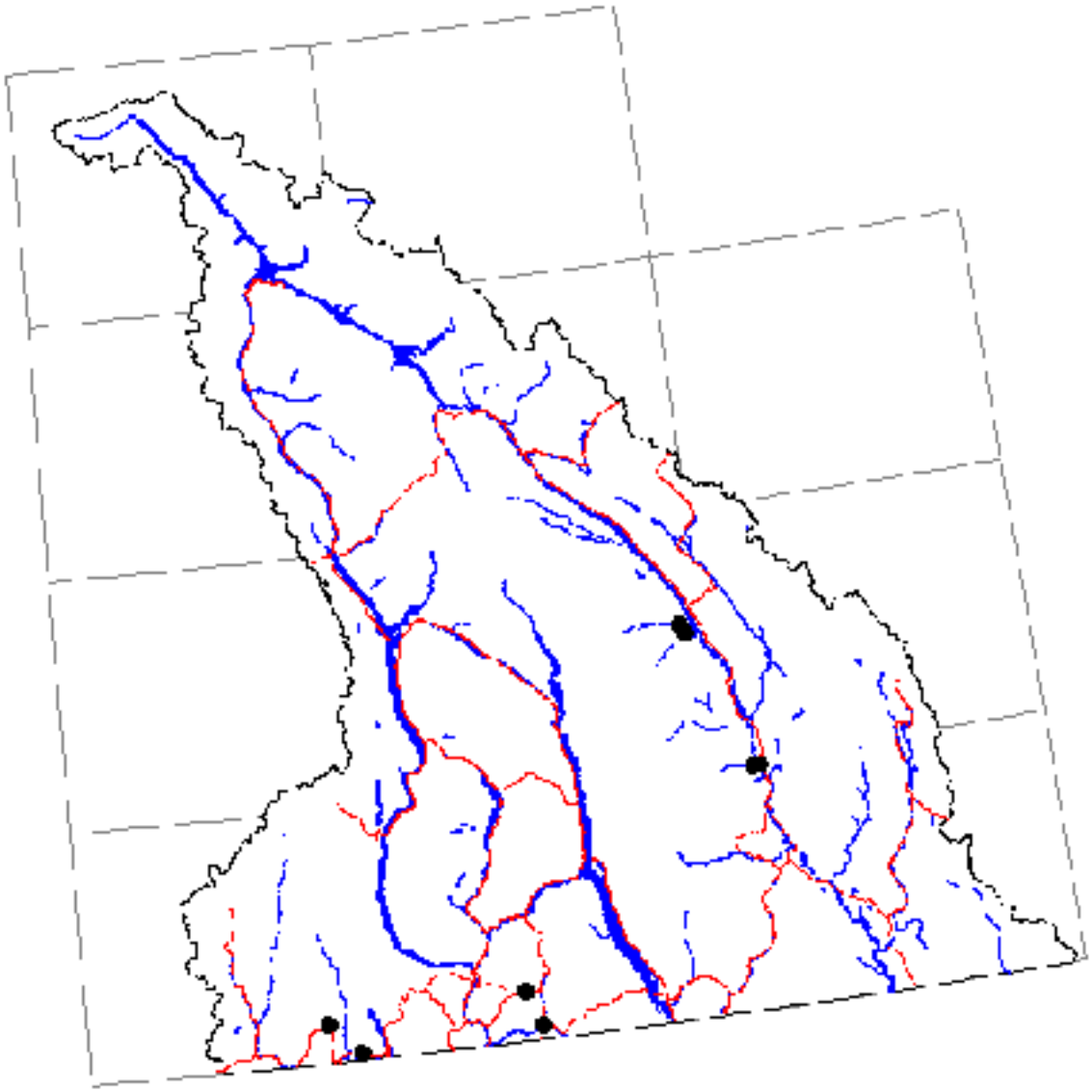
Provincial Status
CDC rank: S5
Known as far north as McBride, but widespread and common only in valleys south of about 51ºN.

Columbia-Kootenay Distribution
Widespread in southern valleys.

Global Distribution
British Columbia east to Alberta; south to Montana, Iowa, Oklahoma, Texas, Mexico and California. Also recorded in Massachusetts (Bick and Mauffray 2000). Faunal element: Western (see Appendix 2).

Biological Information
The habitat of *A. multicolor* in midsummer is marshy ponds and cattail and bulrush marshes in the southern valleys. With its brilliant sky-blue eyes it is unmistakable. British Columbia flight records range from 18 May to 16 October (Cannings and Stuart 1977).

Aeshna multicolor Hagen



Aeshnidae

Aeshna multicolor Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Grand Forks; Gilpin	19990817	Ramsay, Leah	0	1	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Invermere; Lake Enid	19980816	Nicholson, Dean	0	1	0	1
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	0	0	1	1
Invermere; Lillian Lake	19980630	Ramsay, Leah	0	1	0	1
Nelway; Rosebud Lake	19990721	Ramsay, Leah	0	4	0	4
Salmo; Erie Lake	19990828	Ramsay, Leah	0	1	0	1
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Skookumchuck; Johnson Lake	19980610	Nicholson, Dean	0	2	0	2
Skookumchuck; Johnson Lake	19980711	Nicholson, Dean	0	1	0	1
Torrent; Larchwood Lake	19890718	Guppy, Crispin S.	1	4	0	5
Kootenay Total			**1**	**23**	**1**	**25**

Aeshna palmata Hagen
Paddle-tailed Darner

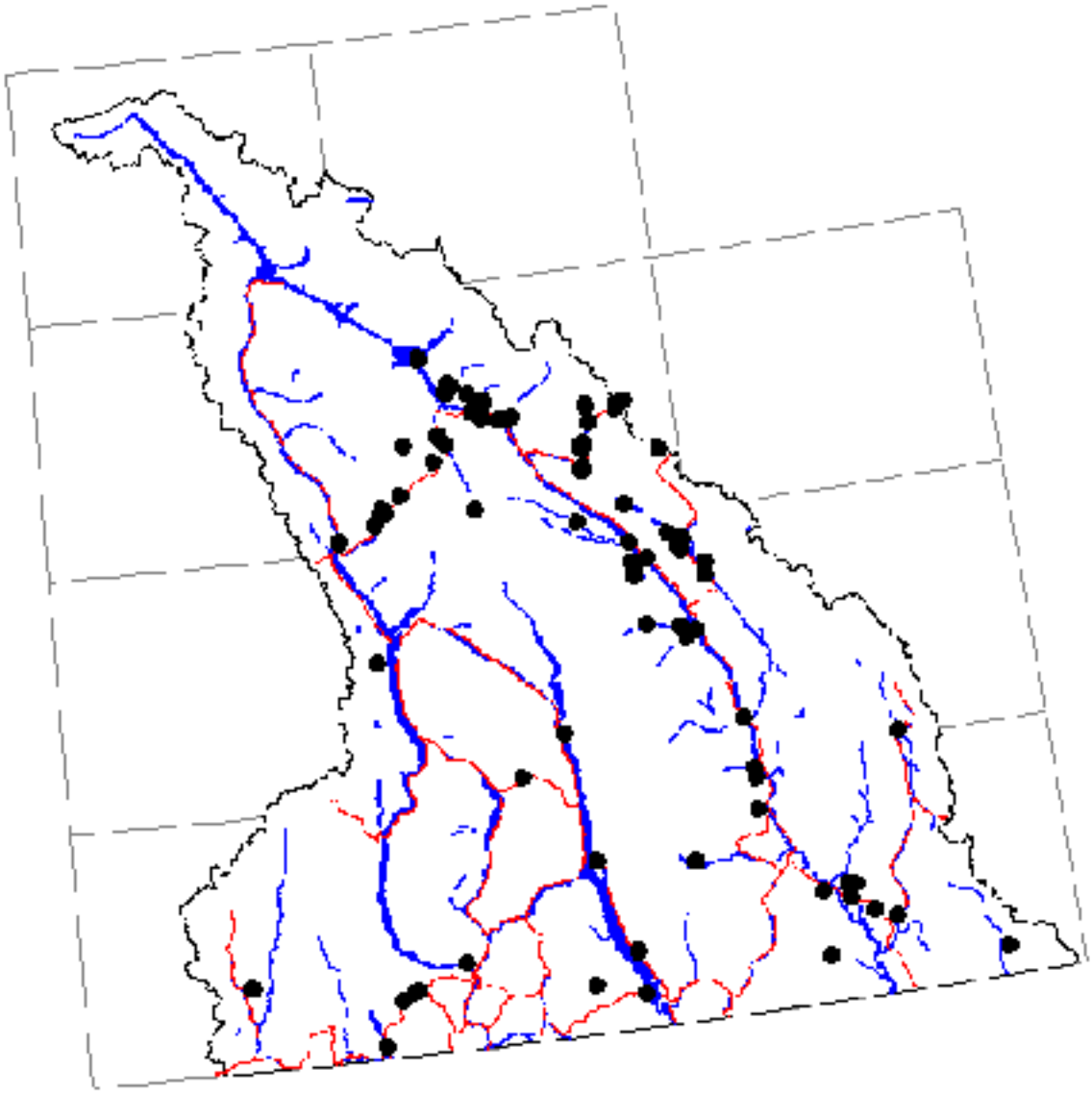
Provincial Status
CDC rank: S5
One of the most widespread and abundant dragonflies throughout the province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to the Rockies, but with outliers in the foothills and in the Cypress Hills of Alberta and Saskatchewan; south to Nebraska, New Mexico and California (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological Information
The abundance of *A. palmata* may be the result of its tolerance of a wide range of larval habitats, but typically it breeds in lakes and ponds in, or near, woodland. Kootenay records of flying adults range from 24 June to 10 October; British Columbia records range from May 22 (unusual) to November 1 (Cannings and Stuart 1977).

Aeshna palmata Hagen



Aeshnidae

Aeshna palmata Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Albert Canyon	19830822	Cannings, Robert A.	0	2	0	2
Albert Canyon	19830822	Fisher, Jennifer G.	1	0	0	1
Albert Canyon	19980730	Cannings, Sydney G.	2	2	0	4
Albert Canyon	19980730	Coates, Sally E.	0	1	0	1
Albert Canyon; Illecillewaet	19980730	Coates, Sally E.	0	1	0	1
Albert Canyon; Illecillewaet	19980730	Ramsay, Leah	0	2	0	2
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Cannings, Robert A.	1	1	1	3
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	0	1	0	1
Canal Flats	19760806	Ricker, William E.	0	1	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	0	2	0	2
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	0	1	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	3	0	3
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	1	0	1
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	1	0	1
Creston; John Bull Mountain; Blazed Creek	19990721	Blades, David C.A.; Sendall, Kelly A.	0	0	9	9
Creston; Summit Creek	19800413	Askevold, Ingolf	0	0	1	1
Elkford	19990822	Ramsay, Leah	1	1	0	2
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	1	1	0	2
Fernie; Jaffray; Caven Creek	19990823	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Little Sand Creek	19990821	Ramsay, Leah	0	2	0	2
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Galloway	19990828	Nicholson, Dean	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	0	1	0	1
Glacier National Park; Golden; Rogers Pass	19980629	Archard, Gabrielle A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980723	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	2	4	1	7
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	1	4	0	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Cannings, Sydney G.	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Ramsay, Leah	2	2	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	1	2	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	0	3	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Woods, John	0	2	0	2
Golden; Blaeberry	19970901	Cannings, Sidney G.	1	1	0	2
Golden; Blaeberry	19970901	Cannings, Sydney G.	2	3	0	5
Golden; Blaeberry	19980704	Cannings, Robert A.	0	0	1	1
Golden; Blaeberry	19980804	Cannings, Robert A.	0	3	0	3
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	1	0	1
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ramsay, Leah	0	3	0	3

Aeshnidae

Aeshna palmata Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Donald	19970902	Cannings, Sydney G.	1	1	0	2
Golden; Donald	19980802	Cannings, Robert A.	0	5	0	5
Golden; Donald	19980802	Hutchings, Gordon E.	0	4	0	4
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	0	3	0	3
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	2	0	2
Golden; Donald; Blackwater Creek	19980626	Ramsay, Leah	0	0	1	1
Golden; Donald; Blackwater Creek	19980728	Ferguson, Bob	0	5	0	5
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	2	0	2
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	3	0	3
Golden; Donald; Susan Lake	19950725	Cannings, Sidney G.	0	0	1	1
Golden; Donald; Susan Lake	19980805	Cannings, Robert A.	0	2	3	5
Golden; Donald; Susan Lake	19980805	Hutchings, Gordon E.	0	2	0	2
Golden; Kicking Horse River	19980804	Archard, Gabrielle A.	0	2	0	2
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	2	0	2
Golden; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	1	0	0	1
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	1	2	0	3
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980729	Coates, Sally E.	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Cannings, Sydney G.	0	2	0	2
Invermere; Athalmer	19830820	Cannings, Robert A.	0	5	0	5
Invermere; Athalmer	19980808	Hutchings, Gordon E.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	3	0	3
Invermere; Lake Eileen	19980808	Hutchings, Gordon E.	1	1	0	2
Invermere; Lake Enid	19980815	Nicholson, Dean	0	1	0	1
Invermere; Lillian Lake	19980808	Cannings, Robert A.	0	1	0	1
Jaffray	19980810	Nicholson, Dean	0	1	0	1
Kaslo	19980809	Hutchings, Gordon E.	0	1	0	1
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	2	0	2
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	1	0	1
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	0	3	0	3
Kootenay Lake; Kuskonook	19881008	Taylor, M. Elizabeth	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	1	1	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	1	0	1

Aeshnidae

Aeshna palmata Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	4	0	4
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Ramsay, Leah	0	1	0	1
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	1	0	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Archard, Gabrielle A.	1	0	0	1
Mount Revelstoke National Park; Mount Revelstoke National Park	19980802	Cannings, Richard J.	0	1	0	1
Mount Revelstoke National Park; Mount Revelstoke National Park	19980802	Cannings, Russell C.	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Ramsay, Leah	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980721	Ramsay, Leah	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980723	Ramsay, Leah	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980624	Cannings, Sydney G.	0	0	1	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980725	Ramsay, Leah	0	1	0	1
Norns Creek	19990810	P.M. Troffe	0	1	0	1
Parson	19980806	Cannings, Robert A.	1	1	0	2
Parson	19980806	Hutchings, Gordon E.	0	2	0	2
Rock Creek; Taurus Lake	19990829	Hatter, Ian	0	2	0	2
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	0	3	0	3
Rogers Pass; Connaught Creek	19980730	Cannings, Sydney G.	0	1	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	1	0	1
Ta Ta Lake	19881002	Taylor, M. Elizabeth	0	1	0	1
Tamarack Lake	19880929	Taylor, M. Elizabeth	0	1	0	1
Torrent; Larchwood Lake	19881004	Taylor, M. Elizabeth	0	2	0	2
Upper Arrow Lake	19990803	P.M. Troffe	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980726	Ramsay, Leah	1	1	0	2
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	1	4	0	5
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	0	1	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	0	2	0	2

Aeshnidae

Aeshna palmata Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Shank, Chris	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	3	0	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	2	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	2	1	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Kootenay Total			**29**	**187**	**22**	**238**

Aeshna sitchensis Hagen
Zigzag Darner

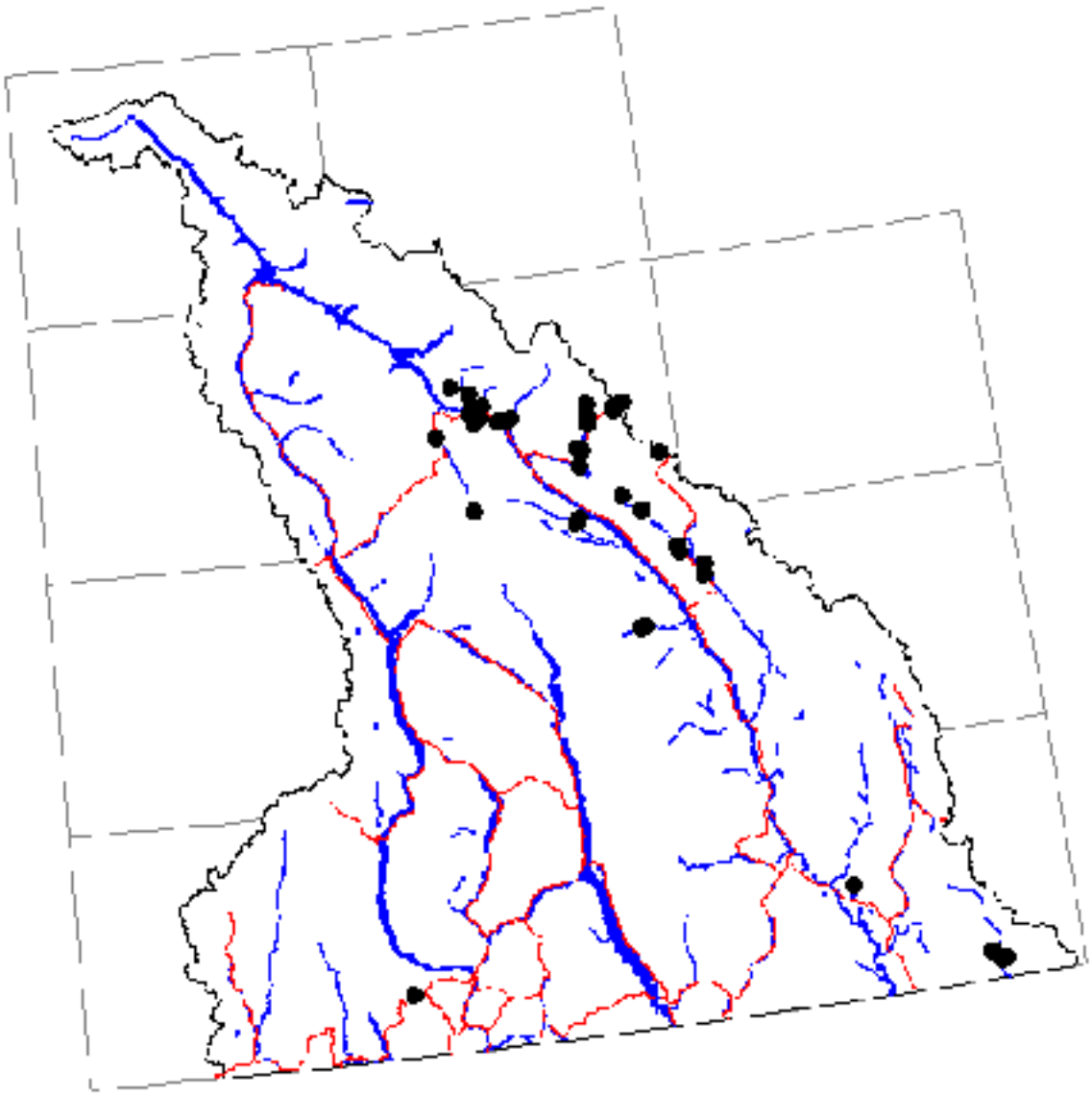
Provincial Status
CDC rank: S5
Widespread, but restricted to rather specific peatland conditions.

Columbia-Kootenay Distribution
Widespread in the region. Apparently much more common in the north, but typical peatland habitat at mid and high elevations was explored more thoroughly in the upper Columbia River region than elsewhere.

Global Distribution
Alaska east to Labrador and Newfoundland; south to Maine, Michigan, Minnesota, Montana, Wyoming, Utah and Washington (Bick and Mauffray 2000).
Faunal element: Widespread Boreal (see Appendix 2).

Biological Information
This small *Aeshna* can be abundant in its widely scattered pockets of peatland habitat. It prefers bogs or fens where the surface is mossy or evenly and sparsely vegetated with short sedges. Open water is usually reduced to small puddles, if it is present at all. Columbia Basin records range from 24 June to 2 September; the latest British Columbia record is 29 September (Delta) (S.G. Cannings, unpubl. data). The closely related and very similar *A. septentrionalis* Burmeister (Azure Darner) also lives in peatland habitats, but prefers those with more open water. It has yet to be found in southern British Columbia, but should be looked for in the subalpine of the southeastern mountains, especially in the Rockies, where it has been found in close to the border in Banff National Park (Walker 1958).

Aeshna sitchensis Hagen



Aeshnidae

Aeshna sitchensis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Mud Lake	19990818	Hatter, Ian	2	3	0	5
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	5	0	5
Castlegar; Mud Lake	19990826	Ramsay, Leah	2	2	0	4
Flathead	19990802	Cannings, Sydney G.	2	4	0	6
Flathead	19990802	Ramsay, Leah	1	1	0	2
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	2	0	3
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	1	0	1
Galloway; Sand Lake	19990823	Nicholson, Dean	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	2	5	0	7
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Cannings, Sydney G.	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	0	2	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Archard, Gabrielle A.	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	1	2	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Coates, Sally E.	2	1	0	3
Golden; Blaeberry	19970901	Cannings, Sidney G.	1	0	0	1
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	2	0	2
Golden; Blaeberry	19980804	Cannings, Robert A.	0	2	0	2
Golden; Blaeberry	19980804	Hutchings, Gordon E.	1	0	0	1
Golden; Donald	19830822	Cannings, Robert A.	0	2	0	2
Golden; Donald	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald	19980802	Cannings, Robert A.	0	2	0	2
Golden; Donald	19980802	Hutchings, Gordon E.	0	4	0	4
Golden; Donald	19980805	Cannings, Robert A.	0	1	0	1
Golden; Donald; Blackwater Creek	19980626	Cannings, Sydney G.	0	0	3	3
Golden; Donald; Blackwater Creek	19980805	Ramsay, Leah	1	0	0	1
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	2	0	2
Harrogate; Beaverfoot River; Dainard Creek	19980727	Ramsay, Leah	1	2	0	3
Harrogate; Kootenay River	19980804	Archard, Gabrielle A.	0	1	0	1
Harrogate; Kootenay River	19980804	Ramsay, Leah	1	0	0	1
Invermere; Horsethief Creek; Gopher Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek; Gopher Creek	19980808	Hutchings, Gordon E.	0	2	0	2

Aeshnidae

Aeshna sitchensis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Invermere; Horsethief Creek; Haultain Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	0	2	0	2
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Halverson, Larry	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	1	1	0	2
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	0	1	0	1
Parson	19980806	Cannings, Robert A.	1	3	0	4
Parson	19980806	Hutchings, Gordon E.	1	1	0	2
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Coates, Sally E.	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	0	1	1
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980803	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980803	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	1	5	0	6
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Kootenay Total			**25**	**88**	**8**	**121**

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Victoria, British Columbia
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Aeshna subarctica Walker
Subarctic Darner

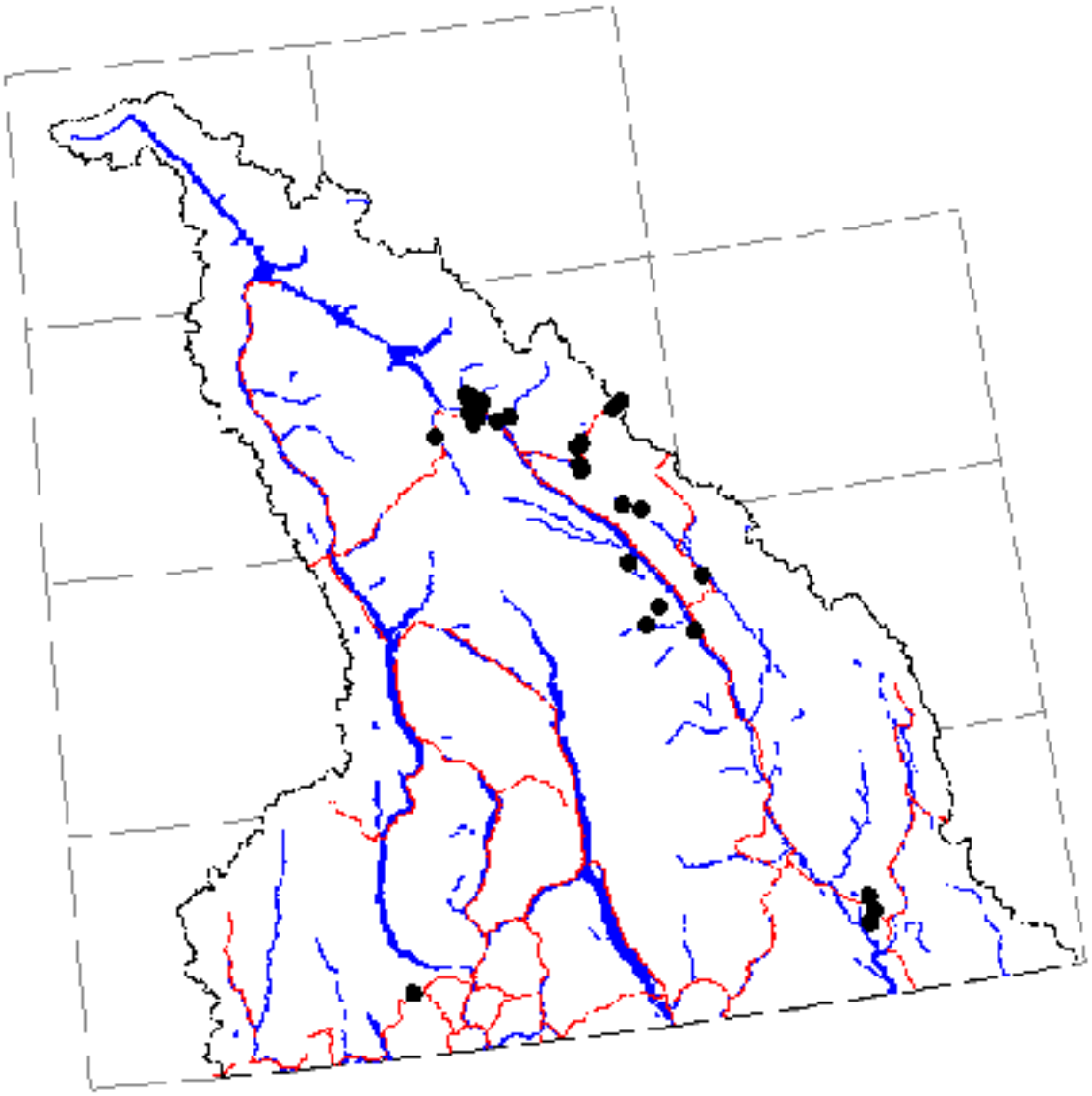
Provincial Status
CDC rank: S5
Widespread in peatland habitats.

Columbia-Kootenay Distribution
Probably more widespread in the region than records indicate. Apparently much more common in the north, but typical peatland habitat at mid and high elevations was explored more thoroughly in the upper Columbia River region than elsewhere.

Global Distribution
Eurasia; Alaska east to Newfoundland; south to Massachusetts, Michigan, Wyoming and Oregon (Bick and Mauffray 2000). Faunal element: Widespread Boreal; Holarctic (see Appendix 2).

Biological Information
A. subarctica normally lives in bogs and deep fens that are dominated by aquatic mosses. Flight records in the Kootenays range from 25 June to 2 September. The latest British Columbia record is 29 September (Delta) (S.G. Cannings, unpubl. data).

Aeshna subarctica Walker



Aeshnidae

Aeshna subarctica Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	0	0	1
Galloway	19980709	Nicholson, Dean	0	2	0	2
Galloway	19990828	Nicholson, Dean	2	1	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	2	2	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Coates, Sally E.	0	3	0	3
Golden; Blaeberry	19970901	Cannings, Sidney G.	0	1	0	1
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	3	0	3
Golden; Donald	19830822	Cannings, Robert A.	0	3	0	3
Golden; Donald	19970902	Cannings, Sydney G.	1	7	0	8
Golden; Donald	19980802	Cannings, Robert A.	2	6	0	8
Golden; Donald	19980802	Hutchings, Gordon E.	0	8	0	8
Golden; Donald	19980805	Cannings, Robert A.	3	4	0	7
Golden; Donald	19980805	Hutchings, Gordon E.	4	3	0	7
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	4	0	4
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	0	0	1	1
Golden; Donald; Bluewater Creek	19980626	Ramsay, Leah	0	0	2	2
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	3	4	0	7
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	2	6	1	9
Golden; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1
Harrogate; Kootenay River	19980804	Archard, Gabrielle A.	0	1	1	2
Harrogate; Kootenay River	19980804	Ramsay, Leah	0	3	0	3
Invermere; Athalmer	19820821	Cannings, Sydney G.	0	1	0	1
Invermere; Horsethief Creek	19980629	Ramsay, Leah	0	0	1	1
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	1	2	0	3
Invermere; Horsethief Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Kikomun Creek Park; Jaffray; Kikomun Park	19990828	Nicholson, Dean	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Ramsay, Leah	0	1	0	1
Radium Hot Springs; Dogsleg Lake	19980629	Cannings, Sydney G.	0	0	4	4
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980628	Cannings, Sydney G.	0	0	2	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Archard, Gabrielle A.	1	0	0	1
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	0	3	0	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	1	0	0	1

Aeshnidae

Aeshna subarctica Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Coates, Sally E.	1	0	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Kootenay Total			**27**	**76**	**13**	**116**

Aeshna tuberculifera Walker*
Black-tipped Darner

Provincial Status
CDC rank: S2S3Blue List
A sparsely distributed dragonfly of peatland pools and peat-margined lakes across the moister regions of southern British Columbia.

Columbia-Kootenay Distribution
Known only from eight localities in the moister Columbia region (Revelstoke and Radium Hot Springs and north).

Global Distribution
Although *A. tuberculifera* appears to have western and eastern disjunct populations, both forming a narrow latitudinal band in transition forests, the species is probably transcontinental. The known western range consists of scattered records across southern British Columbia, Washington, central Alberta, and northwestern Montana (not known from Idaho); the eastern records range from Minnesota and Ontario east to Nova Scotia and south to Iowa and Virginia (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

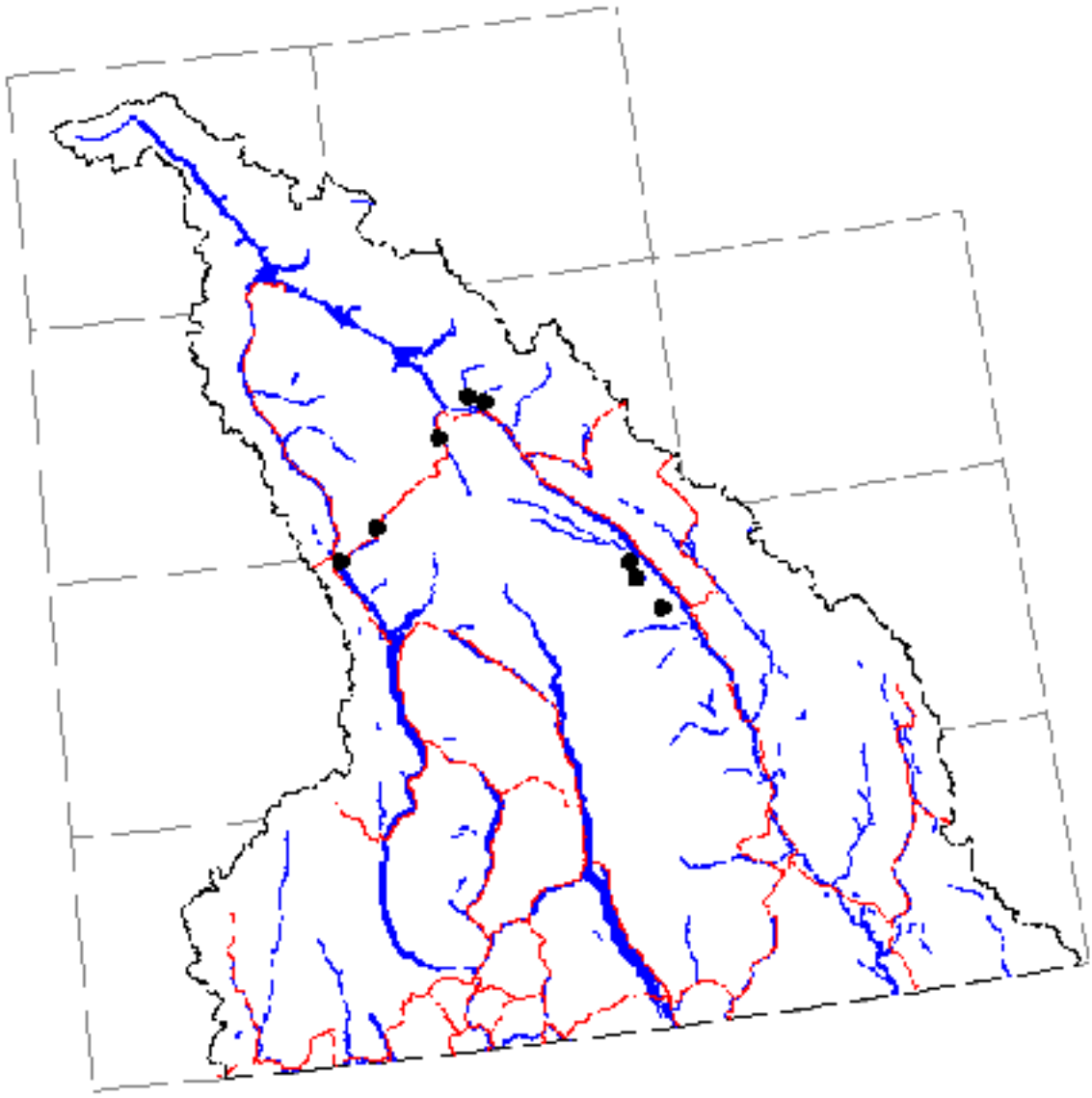
Biological Information
A. tuberculifera is apparently a rare darner that is seldom encountered in southern British Columbia. Larvae develop in pools, ponds, or small lakes; usually in peatland situations. Adults are not often seen by surveyors and may not spend much time at the sites where they have developed. For example, on 24 June 1998, many exuviae (including one emerging adult) were found surrounding one fen pool in the Beaver River Valley, Glacier National Park, but adults were never collected there on several subsequent visits. Rob Cannings saw, but did not collect, a female ovipositing in a *Scirpus lacustris* stem at this site on 5 August 1998.

Females, unlike most others in the genus, often oviposit in vegetation above the waterline. The two dates above represent the recorded flight period of the species in the Kootenays. All the other records are of the distinctive larvae. In British Columbia, the flight period is presumed to last from mid June to well into September (present study, Cannings and Stuart 1977).

Management and Protection Considerations

In general, peatland pools and peat-margined lakes should be managed to maintain water and littoral habitat quality. Development that may affect the hydrology of a catchment area should be managed to minimize impacts. The spring-fed fen pool in the Beaver River Valley where many individuals of *A. tuberculifera* emerged is adjacent to Highway 1, and may be threatened by future road widening.

Aeshna tuberculifera Walker



Aeshnidae
Aeshna tuberculifera Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Cleland Lake	19980807	Cannings, Robert A.	0	0	1	1
Brisco; Halfway Lake	19980807	Hutchings, Gordon E.	0	0	1	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980624	Cannings, Sydney G.	0	1	8	9
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	0	2	2
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	0	0	2	2
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Ramsay, Leah	0	0	1	1
Radium Hot Springs; Dogsleg Lake	19980629	Cannings, Sydney G.	0	0	1	1
Revelstoke; Williamson Lake	19980624	Ramsay, Leah	0	0	2	2
Kootenay Total			**0**	**1**	**18**	**19**

Aeshna umbrosa Walker
Shadow Darner

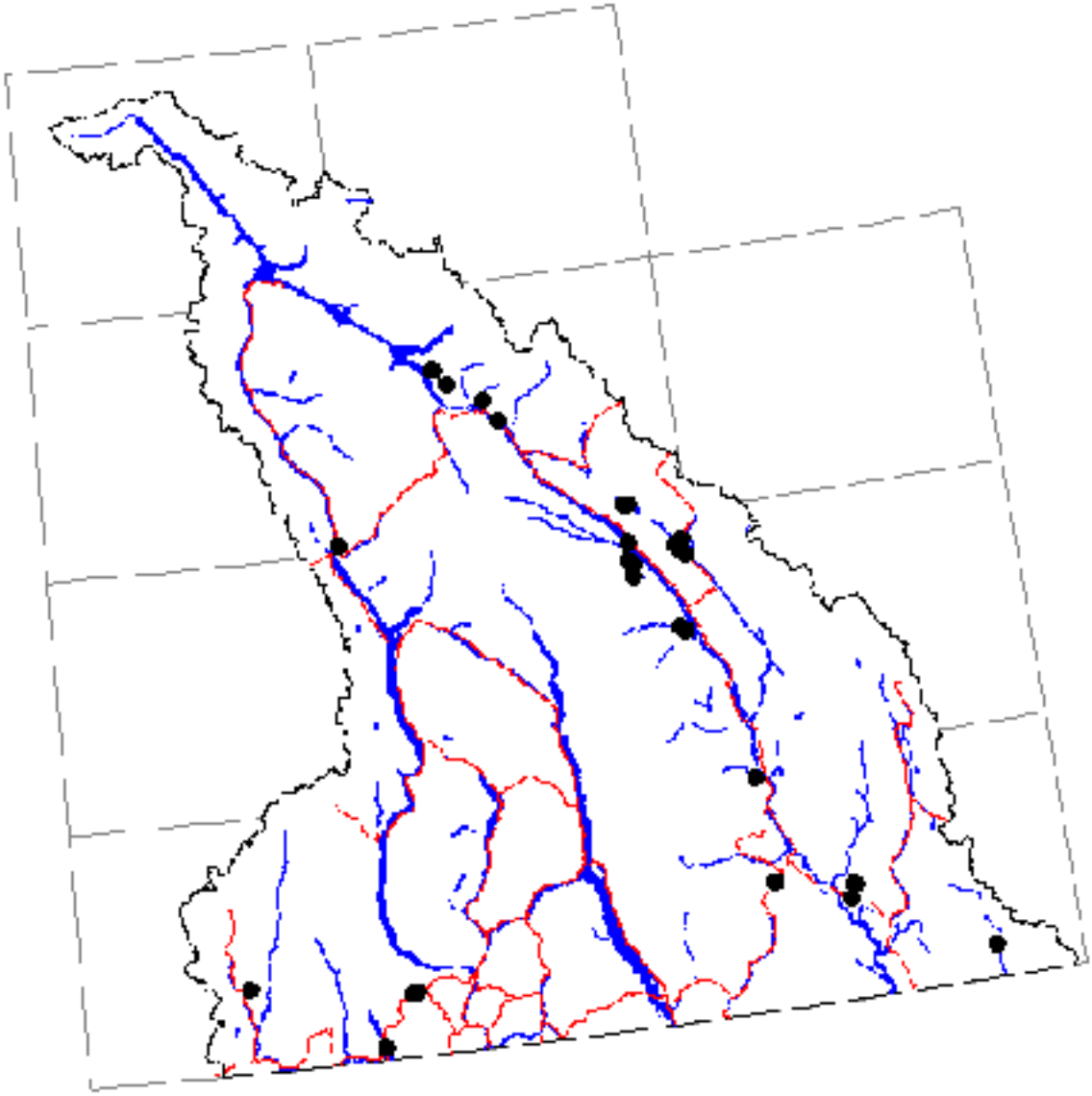
Provincial Status
CDC rank: S5
Widespread in the province, but apparently more common in the south than in the north.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Yukon and British Columbia east to Labrador and Newfoundland; south to Alabama, Oklahoma, New Mexico and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological Information
A. umbrosa shows up in a variety of habitats, but is partial to forest lakes and slow-moving streams. It is often found alongside its close, but usually more common, relative, *A. palmata*. As its name suggests, the Shadow Darner likes shady habitats. Throughout British Columbia, the species is one of the latest flying species. In the south, in some years, it is active well into November. Kootenay records range from 16 July to 29 September; British Columbia records range from 7 July to the end of October (Cannings and Stuart 1977).

Aeshna umbrosa Walker



Aeshnidae

Aeshna umbrosa Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Cleland Lake	19980806	Cannings, Robert A.	1	0	0	1
Brisco; Cleland Lake	19980807	Cannings, Robert A.	0	0	1	1
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	1	2
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	0	1	0	1
Castlegar; Mud Lake	19990818	Hatter, Ian	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	1	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	2	0	2
Cranbrook	19910815	Cannings, Robert A.; Nadel, Hannah	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	0	1	0	1
Flathead; Beryl Creek	19990802	Cannings, Sydney G.	0	1	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	0	2	0	2
Golden; Aid Lake	19950726	Cannings, Sydney G.	0	0	1	1
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ferguson, Bob	1	0	0	1
Harrogate; Kootenay River	19980727	Ramsay, Leah	0	1	0	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Enid	19980716	Nicholson, Dean	0	1	0	1
Invermere; Lake Enid	19980815	Nickolson, Dean	0	1	0	1
Invermere; Lake Enid	19980816	Nicholson, Dean	0	1	0	1
Kikomun Creek Park; Surveyors Lake	19980809	Nicholson, Dean	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	5	0	5
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	3	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	1	0	1
Mount Revelstoke National Park; Mount Revelstoke National Park	19980801	Cannings, Richard J.	0	1	0	1
Rock Creek; Taurus Lake	19990829	Hatter, Ian	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	0	1	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	2	0	2
Spillimacheen; Columbia River	19820821	Cannings, Sydney G.	0	1	0	1
Tamarack Lake	19880929	Taylor, M. Elizabeth	0	1	0	1
Kootenay Total			**3**	**41**	**3**	**47**

Anax Leach

Four species of this cosmopolitan genus live in North America, but only *Anax junius* reaches Canada from the south. It is one of our largest dragonflies, with a wingspan of almost 12 cm. The thorax of the adult is unmarked and green, unlike the striped sides of *Aeshna* species.

Anax junius (Drury)
Green Darner

Provincial Status

CDC rank: S5
Uncommon across the southern half of the province; most often encountered in the extreme south.

Columbia-Kootenay Distribution

The only specimen collected is from the Creston marshes on 21 June 1998. (see Appendix 3). There are two sight records, one at Creston marshes on 22 June 1998 (Richard Cannings) and one at Echoes Lakes near Skookumchuck on 14 September 1999 (Dean Nicholson).

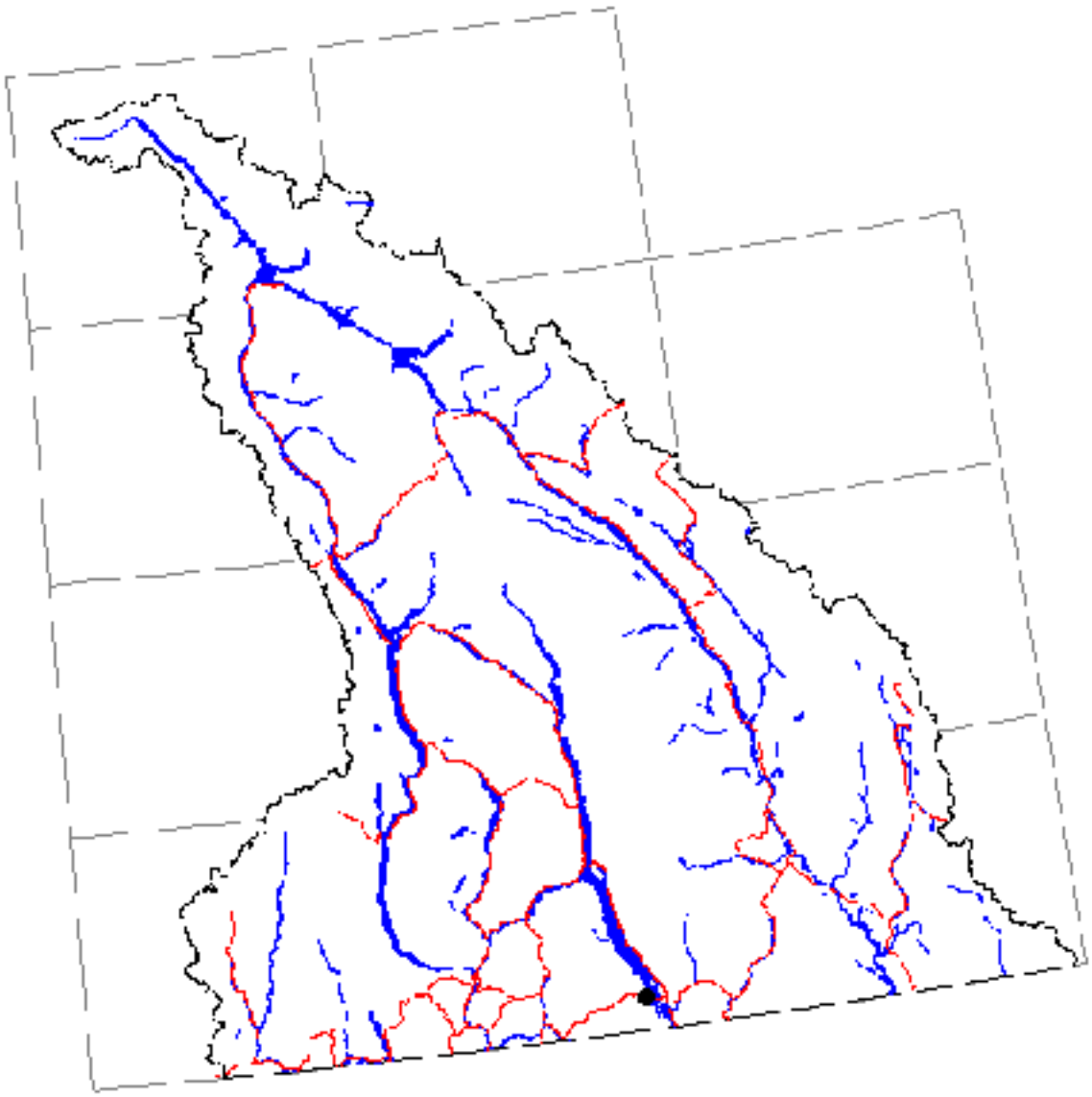
Global Distribution

Southern British Columbia east to Nova Scotia; south throughout all the USA, northern Mexico and the Caribbean.
(Bick and Mauffray 2000).
Faunal element: Austral; also in parts of Asia and Oceania (see Appendix 2).

Biological Information

A. junius develops in warm marshes and ponds at low elevations in the southern valleys of British Columbia. In southern Canada, it apparently has two populations. One evidently migrates, with immigrants moving north in the spring and their offspring flying south in August and September. Other populations of *A. junius* are resident. Specimen and sight records in British Columbia range from 29 April to 14 September.

Anax junius (Drury)



Aeshnidae
Anax junius (Drury)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Creston; Creston Marsh	19980621	Cannings, Richard J.	0	1	0	1
Kootenay Total			**0**	**1**	**0**	**1**

Family Gomphidae (Clubtails)

The Gomphidae is a large family that is poorly represented in the Columbia Basin. Only four species in three genera -- *Gomphus, Ophiogomphus* and *Stylurus* -- occur. Gomphids are not commonly seen in the region, but when they are encountered they are readily recognized by their widely separated eyes and their green or yellow bodies striped in brown and black.

Females lack an ovipositor and drop their eggs directly into clear streams and along the sandy shallows of larger lakes. The larvae burrow in the bottom sediments of these water bodies.

Genus:
Gomphus
Ophiogomphus
Stylurus

Gomphus Leach

Gomphos means bolt in Greek, and refers to the similarity of the shape of the dragonfly's body to the arrow of a crossbow. This is an old and frequent allusion in the English language. The genus is a large one, but only a single, rare species enters British Columbia in the extreme south.

Gomphus graslinellus Walsh*
Pronghorn Clubtail

Provincial Status

CDC rank: S2
Red List
Gomphus graslinellus is a rare species of warm lakeshores and streams in a few valleys in southern British Columbia.

Columbia-Kootenay Distribution

In the Kootenays *G. graslinellus* is known only from Christina and Wasa lakes. Dean Nicholson, a project volunteer, discovered the Wasa Lake population in 1998. The Christina Lake population was known in Whitehouse's day (Whitehouse 1941) and a male was photographed there in 1980 (G. Doerksen, RBCM collection), but we did not find the species during the 1998/1999 survey. It probably still lives around Christina Lake; the early-season collecting there in 1999 was hampered by inclement weather.

Global Distribution

Southern British Columbia east to Ontario; south to Ohio, Texas and Washington State (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological Information

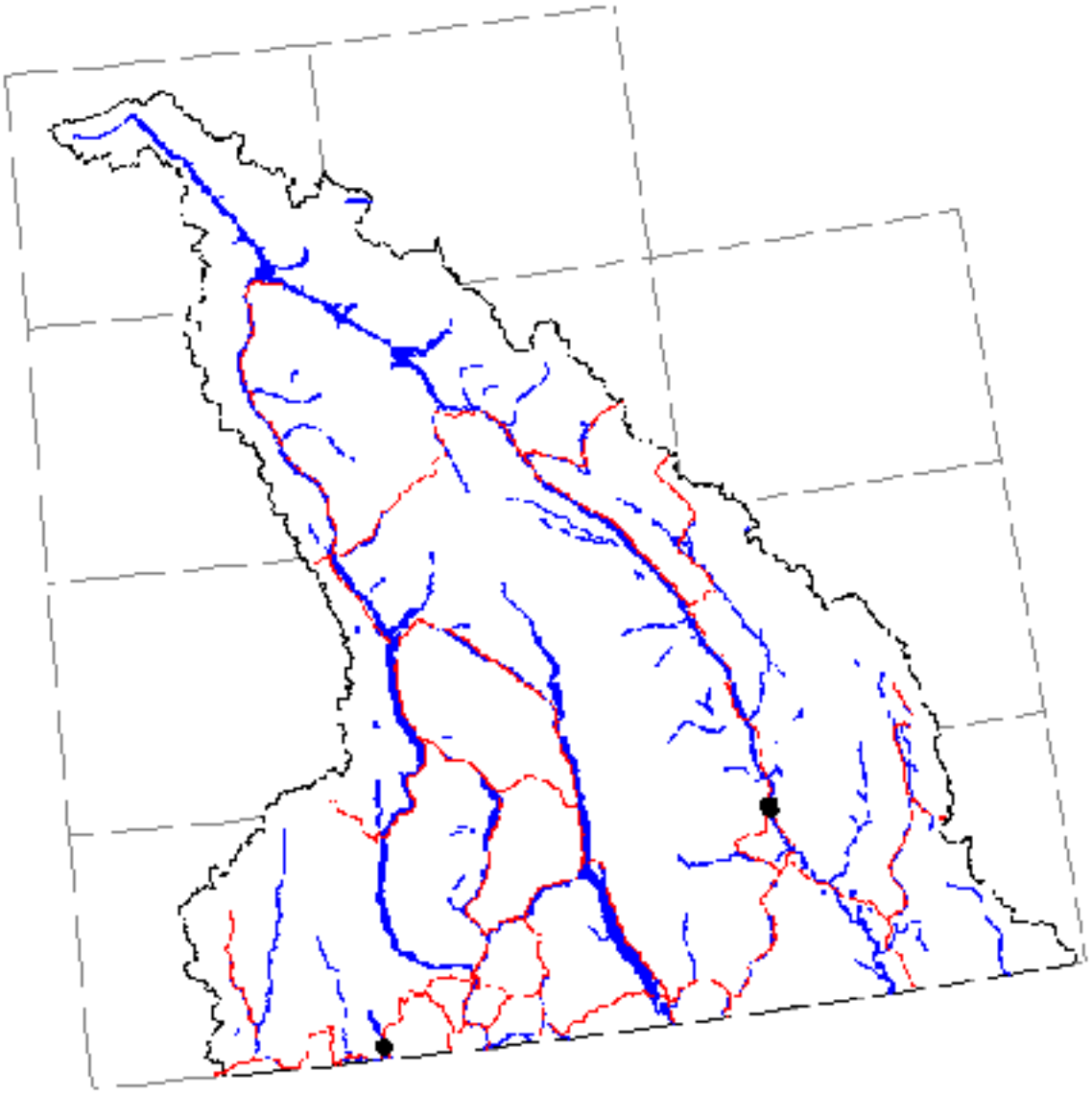
The larvae burrow in the sand and silt along wave-washed shores, and when ready to emerge, they crawl only a few inches away from the edge of the water on the sand or gravel where they metamorphose. The adults bask on sunny beaches, roads and paths near the water. They have a characteristic undulating flight. Kootenay dates range from 3 June to 20 July; the recorded flight period in British Columbia is 3 June to 25 July (Cannings and Stuart 1977, present study).

Management and Protection Considerations

More precise knowledge of larval distribution would assist in making decisions bearing on the health of *G. graslinellus* and other lacustrine species -- but its shoreline habitat is often shared with intensive human recreation use. Marina developments,

pollution from power boats and popular swimming beaches all have potential impact on larval survival. The areas around Christina Lake where Whitehouse (1941) found *G. graslinellus* in 1921 and 1938 have been developed with vacation homes and marinas. Any remaining natural beaches should be protected where possible. In the riverine environment, the impact of introduced predatory fish (especially bass) on this scarce dragonfly is also of concern, but no data concerning this situation are available.

Gomphus graslinellus Walsh



Gomphidae
Gomphus graslinellus Walsh

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake	19210708	Whitehouse, Frank C.	0	1	0	1
Christina Lake	19380711	Whitehouse, Frank C.	1	0	0	1
Christina Lake	19380712	Whitehouse, Frank C.	1	0	0	1
Christina Lake	19380713	Whitehouse, Frank C.	0	1	0	1
Wasa Park; Wasa Lake	19980720	Nicholson, Dean	0	1	0	1
Wasa Park; Wasa; Wasa Lake Provincial Park Beach	19980603	Nicholson, Dean	1	0	0	1
Kootenay Total			**3**	**3**	**0**	**6**

Ophiogomphus Selys

The genus *Ophiogomphus* is most speciose in eastern North America. The three British Columbia species live along clear streams and lakeshores and are uncommon in settled areas, at least partly because the larvae are sensitive to changes in water flow and siltation.

Species:

Ophiogomphus occidentis
Ophiogomphus severus

Ophiogomphus occidentis Hagen
Sinuous Snaketail

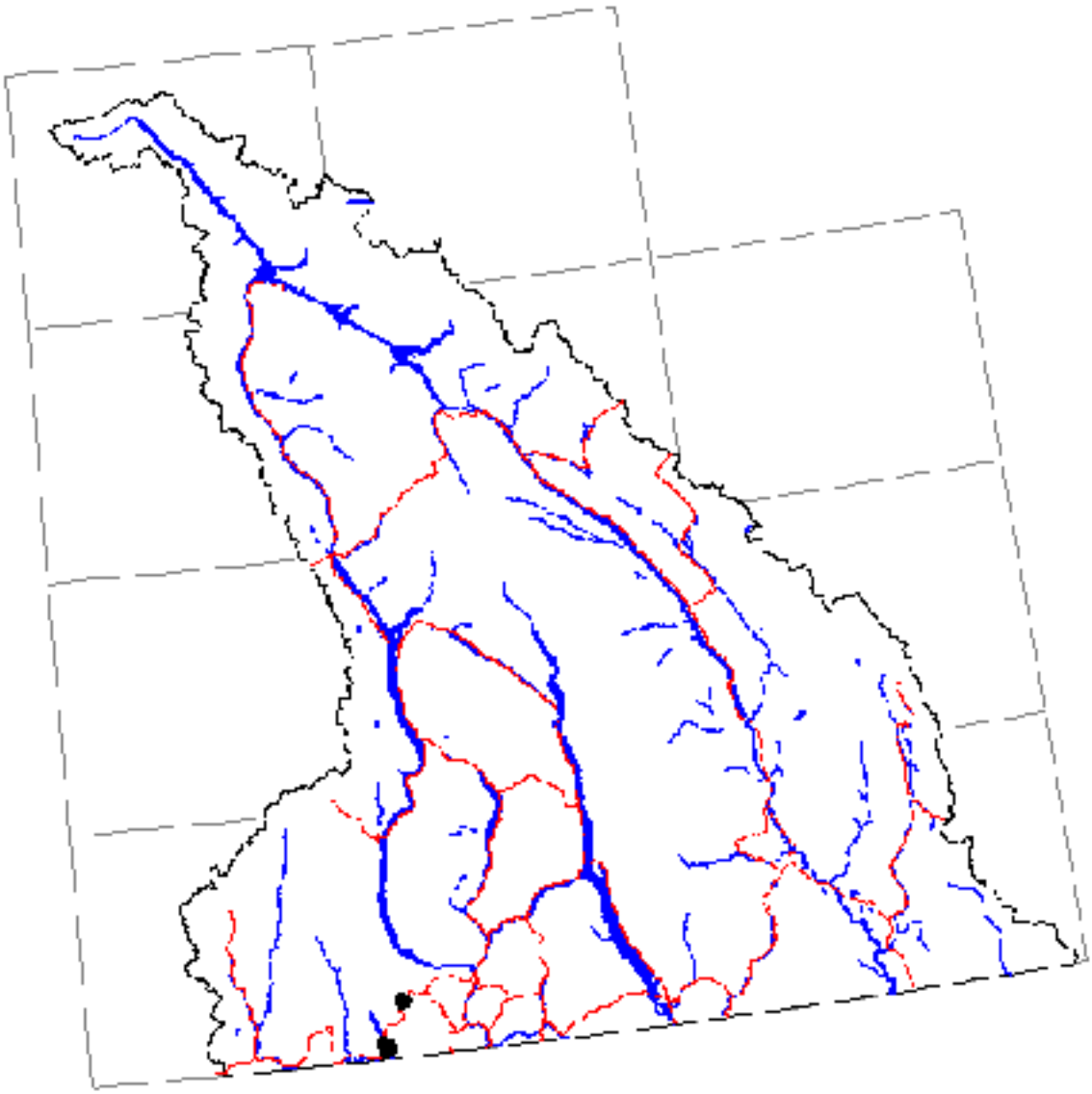
Provincial Status
CDC rank: S4
Widespread but uncommon south of about 51ºN.

Columbia-Kootenay Distribution
RBCM records are from only three localities in the extreme southwest of the region: two sites near Christina Lake and at Bonanza Pass on Hwy 3. There is a published record from Nelson on 22 August 1921 (Whitehouse 1941).

Global Distribution
British Columbia south to California (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological Information
A denizen of sunny streambanks and sandy lakeshore beaches. Adult *O. occidentis* have been recorded in British Columbia from 8 June to 1 October (Cannings and Stuart 1977).

Ophiogomphus occidentis Hagen



Gomphidae

Ophiogomphus occidentis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	1	1	0	2
Christina Lake; Christina Creek	19990719	Ramsay, Leah	0	6	0	6
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	1	0	1	2
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	2	3	0	5
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	3	0	3
Christina Lake; Christina Creek	19990817	Ramsay, Leah	1	0	0	1
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	2	0	2
Christina Lake; Kettle River	19990807	Ramsay, Leah	0	1	0	1
Kootenay Total			**5**	**16**	**1**	**22**

Ophiogomphus severus Hagen
Pale Snaketail

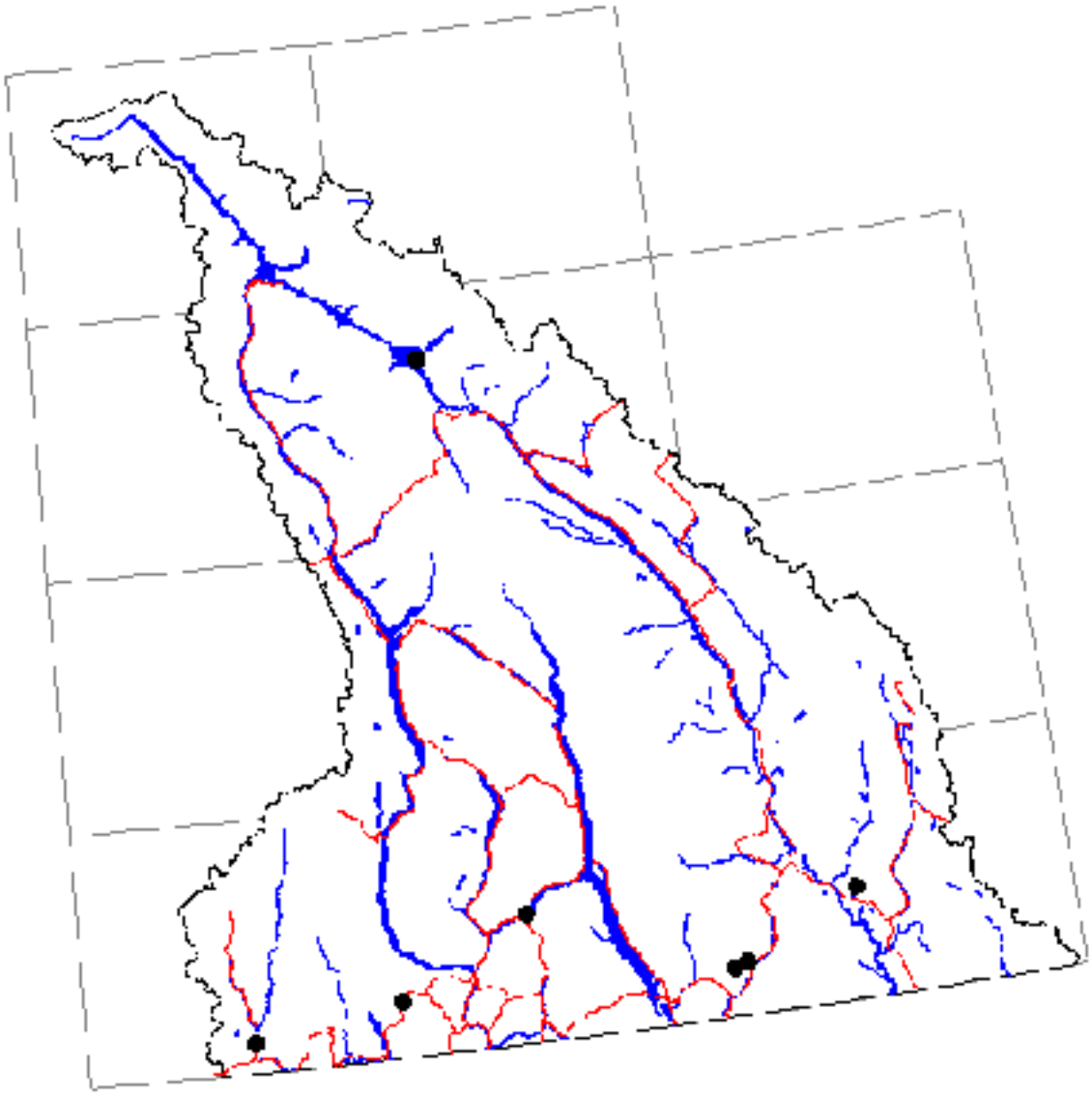
Provincial Status
CDC rank: S5
Widespread but uncommon throughout most of British Columbia east of the Coast Mountains. Not yet recorded from the northwestern part of the province.

Columbia-Kootenay Distribution
Uncommon, but probably found throughout the region. Most records are from the extreme south. In addition to the mapped RBCM specimens, there is a series of photographs of a male emerging at Bonanza Creek, outlet of Summit Lake southeast of Nakusp on 9 July 1979 (G. Doerksen, RBCM collection). Whitehouse (1941) also records the species from Crawford Bay on Kootenay Lake.

Global Distribution
British Columbia east to Saskatchewan; south to Arkansas, Kansas, New Mexico and California (Bick and Mauffray 2000). Faunal element: Western (see Appendix 2).

Biological Information
Most records are from clear streams, but the species also develops in lakes. The male in the photographs taken near Nakusp (see C-K Distribution) was emerging on a floating leaf of a waterlily *(Nuphar)*. Adult specimen and sight records from the Kootenays range from 9 July to 3 September; British Columbia records range from 14 June to September 5 (Cannings and Stuart 1977).

Ophiogomphus severus Hagen



Gomphidae

Ophiogomphus severus Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	1	1	0	2
Cranbrook; Moyie Lake; Moyie River	19990813	Nicholson, Dean	1	1	0	2
Fernie; Jaffray; Little Sand Creek	19990730	Ramsay, Leah	0	1	0	1
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ferguson, Bob	0	1	0	1
Nelson	19210821	Whitehouse, Frank C.	1	0	0	1
Rock Creek; Kettle River Provincial Recreation Area; Kettle River	19990829	Hatter, Ian	0	3	0	3
Kootenay Total			**3**	**7**	**0**	**10**

Stylurus Needham

Stylurus is closely allied to *Gomphus*. Only one of the seven Canadian species occurs in British Columbia.

Stylurus olivaceus (Selys)*
Olive Clubtail

Provincial Status

CDC rank: S2
Red List
In British Columbia, *Stylurus olivaceus* is known only from warm streams and lakeshores in the Thompson-Okanagan and Boundary regions.

Columbia-Kootenay Distribution

Known only along Christina Creek. This population was discovered during the present study.

Global Distribution

Western North America from southern British Columbia south to Arizona and California (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological information

S. olivaceus inhabits sandy or muddy edged rivers or lakeshores in hot, dry areas. Christina Creek, the only location where this species was found in this study, has large sections of bank consisting of both pebbly/cobbled and sandy/muddy substrates. Adults fly over the riffles and land along the shore (present study; Cannings and Stuart 1977): they also rest on riparian vegetation. Kennedy (1917) noted that females may rest on bushes well away from the water, where they are less likely to be observed than the males along the river. Adults were recorded at Christina Creek on 7 and 28 August 1999. The range of recorded British Columbia flight dates is 28 July to 1 October (Cannings and Stuart 1977). Washington State flight records range from 8 July to 26 October (Paulson 1999).

Management and protection considerations

More research is needed to develop management recommendations for *S. olivaceus*, but its lakeshore and streamside habitat, like that of other gomphids and Macromia, is often shared with intensive human recreation use. Marina developments, pollution from power boats, and popular swimming beaches all have potential impact on larval survival. More precise knowledge of larval distribution would assist in making decisions

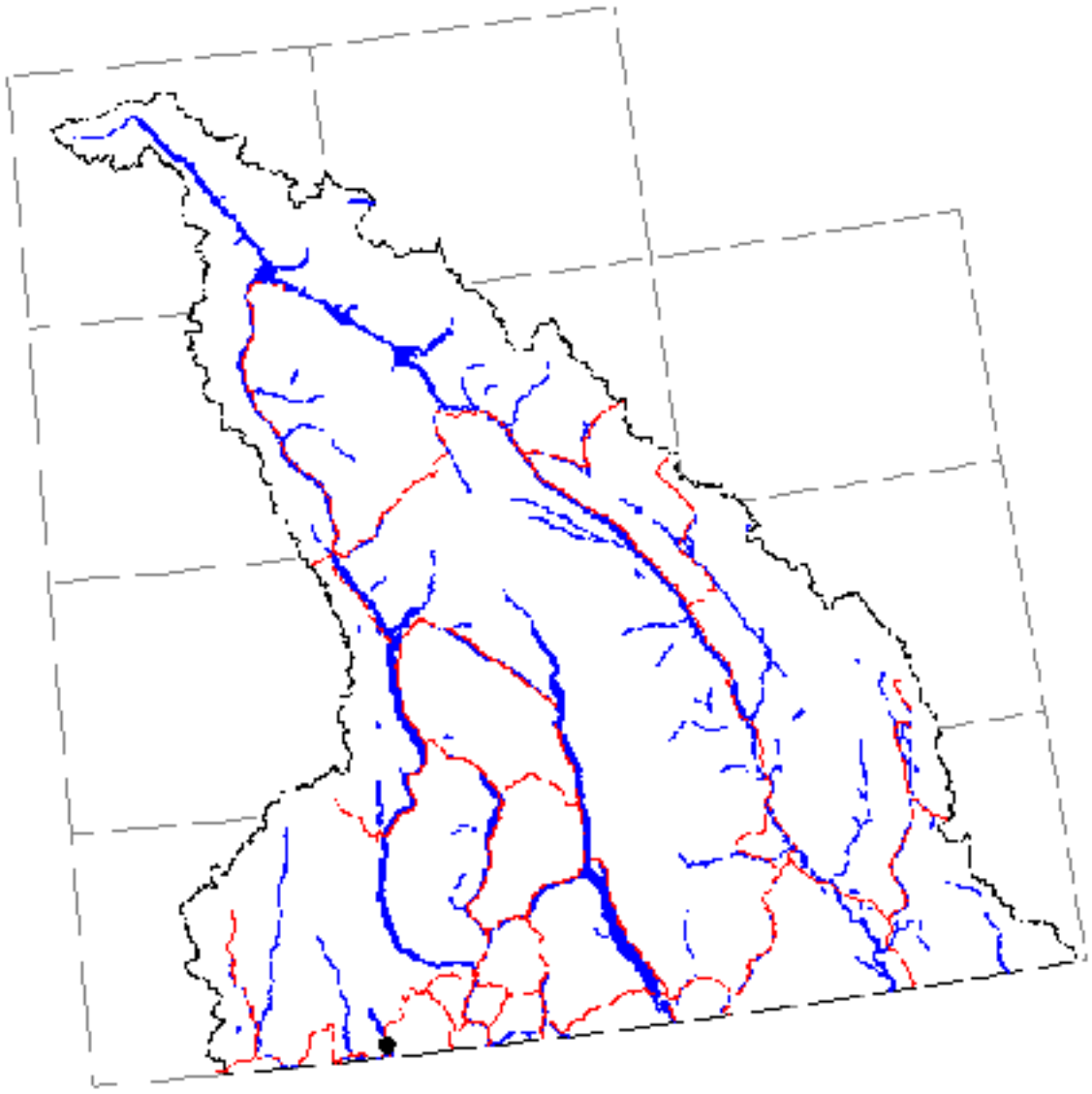
bearing on the health of this dragonfly.

The protection of the riparian zone and the maintenance of a relatively undisturbed edge along Christina Creek is vital for this species. Samways and Steytler (1996) provide recommendations for the width of riparian buffers and vegetation heterogeneity for species assemblages. Although these recommendations treat different odonate assemblages, the life requirements of the dragonfly species are similar. *Stylurus* uses habitat away from the river's edge; the area needed by this species remains to be determined.

Control of the amount and type of recreation in the habitat is also important. Of particular concern is the use of personal watercraft (i.e. Jet Ski) along the shallow creek where this species lives. The wakes from these craft break down the banks (observed directly in this study) and ultimately collapse the streamside vegetation.

The impact of introduced predatory fish, especially bass, on this rare dragonfly is unknown, but definitely of concern.

Stylurus olivaceus (Selys)



Gomphidae

Stylurus olivaceus (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Christina Lake; Christina Creek	19990828	Hatter, Ian	0	2	0	2
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	1	0	1
Kootenay Total			**0**	**4**	**0**	**4**

Family Cordulegastridae (Spiketails)

The Cordulegastridae is a family of large black and yellow dragonflies. Unlike those of other dragonfly families in British Columbia, the eyes of the adult meet at a single point on top of the head. The female ovipositor is formed differently than that of the Aeshnidae; it is long and spadelike, designed for ovipositing in streambeds rather than in plant tissue. The large, squat, hairy larvae bury themselves in the sediment to await their prey. The labium of the larva -- with its palps deeply and irregularly toothed -- is distinctive.

Genus:
Cordulegaster

Cordulegaster Leach

Cordulegaster contains eight species in North America, but *Cordulegaster dorsalis* is the only representative of the Cordulegastridae in the Columbia Basin and in British Columbia. It is black and yellow with blue-grey eyes; and it is one of our largest dragonflies. It is most common on coastal streams, but is also a rare inhabitant of small streams, especially spring-fed ones, in the Columbia Basin. Adults patrol these streams, and the female, while hovering vertically, shoves eggs in the sand and silt of the streambed with her spadelike ovipositor.

Cordulegaster dorsalis Hagen
Pacific Spiketail

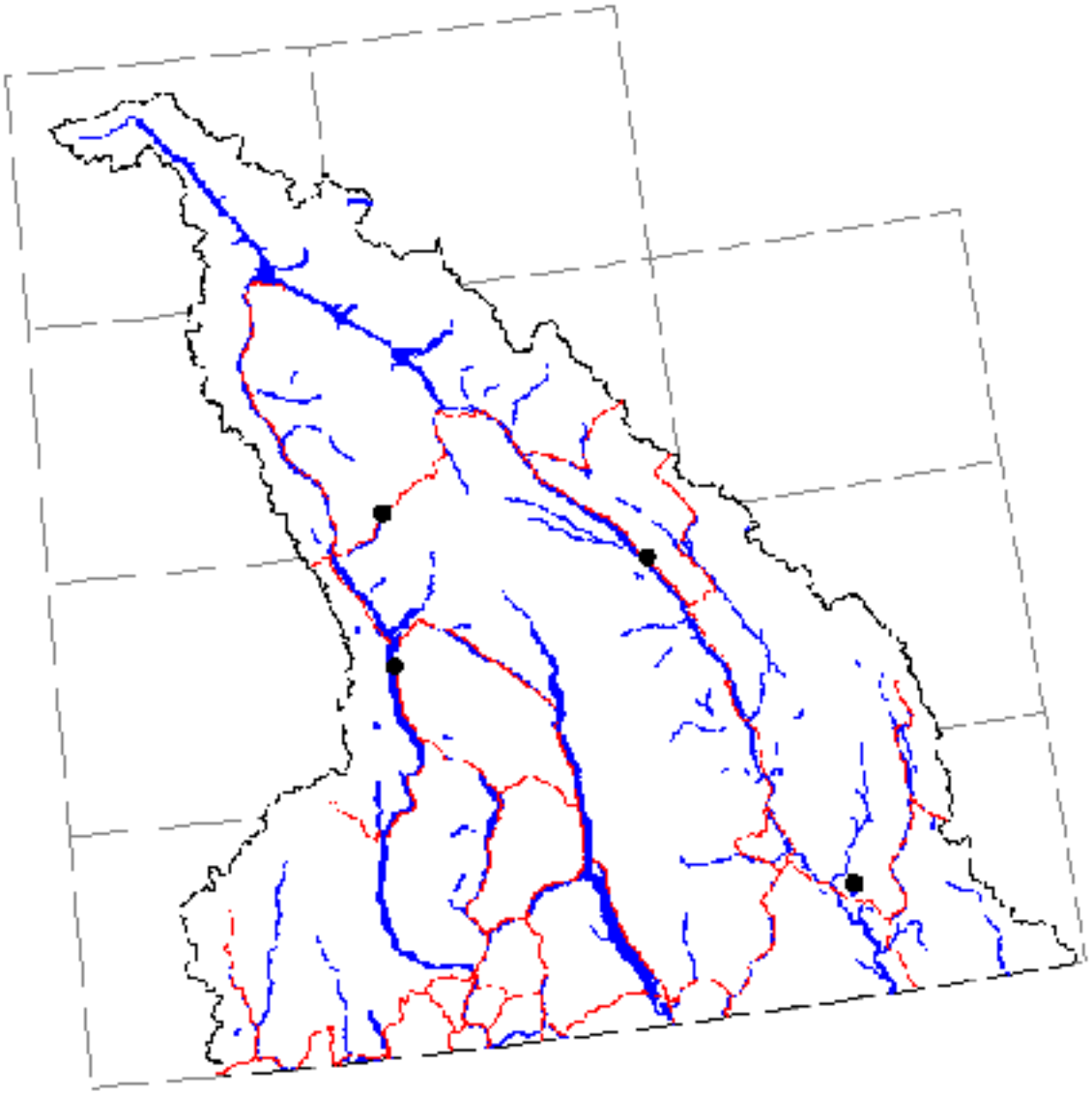
Provincial Status
CDC rank: S5
Fairly common on coastal streams, but unknown from the Queen Charlotte Islands. Rare east of the Coast Mountains.

Columbia-Kootenay Distribution
Adults have been collected at only Brisco and Sand Lake near Galloway. Larvae come from Halcyon Hot Springs and Albert Canyon near Revelstoke. There are photographs of a female ovipositing in Bonanza Creek near the outlet of Summit Lake southeast of Nakusp on 9 July 1979 (G. Doerksen, RBCM collection).

Global Distribution
Alaska and British Columbia south to Montana, Colorado, Utah and California (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological information
See comments under *Cordulegaster*. Flight dates in the Columbia Basin range from 18 May to 23 August. The female photographed on 9 July 1979 near Nakusp was laying eggs -- as was one seen by Syd Cannings at Sand Creek (the outlet of Sand Lake) on 30 July 1999.

Cordulegaster dorsalis Hagen



Cordulegastridae
Cordulegaster dorsalis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19950518	Crebs, T.	0	0	1	1
Fernie; Jaffray; Little Sand Creek	19990730	Cannings, Sydney G.	1	0	0	1
Galloway; Sand Lake	19990823	Nicholson, Dean	1	0	0	1
Halcyon Hotsprings	19850425	Pritchard, Gordon	0	0	1	1
Revelstoke; Albert Canyon	19850813	Pitchard, Gordon	0	0	1	1
Revelstoke; Albert Canyon	19860426	Pritchard, Gordon	0	0	1	1
Revelstoke; Albert Canyon	19860604	Pritchard, Gordon	0	0	1	1
Kootenay Total			**2**	**0**	**5**	**7**

Family Macromiidae (Cruisers)

The Macromiidae are large yellow and black dragonflies inhabiting the rivers and wave-washed shores of lakes, where the adults fly rapidly out over the water. The thorax is encircled between the wings by a distinctive, oblique, yellow band. The larvae sprawl on the bottom silt and sand; their long spiderlike legs and the hornlike projection between the eyes are characteristic. Some entomologists do not give these dragonflies family rank, placing them in the Subfamily Macromiinae within the Corduliidae.

Genus:
Macromia Rambur

Macromia Rambur

At one time there were two species of the Macromiidae recognized in British Columbia, both in the genus *Macromia. M. magnifica* is an uncommon species in southern Interior valleys. *M. rickeri* Walker was described as a scarce species of lowland lakes in the Fraser Valley (Cultus and Kawkawa lakes) and the Shuswap region, but today is considered by most experts to be merely a dark form of *M. magnifica* (D. Paulson, pers. comm.).

Macromia magnifica MacLachlan*
Western River Cruiser

Provincial Status
CDC rank: S3
Blue List
Macromia is restricted to warm, wave-washed lake margins and sandy rivers in southern Interior valleys.

Columbia-Kootenay Distribution
Known only from Christina Lake and its outlet stream, Christina Creek (Whitehouse 1941, present study).

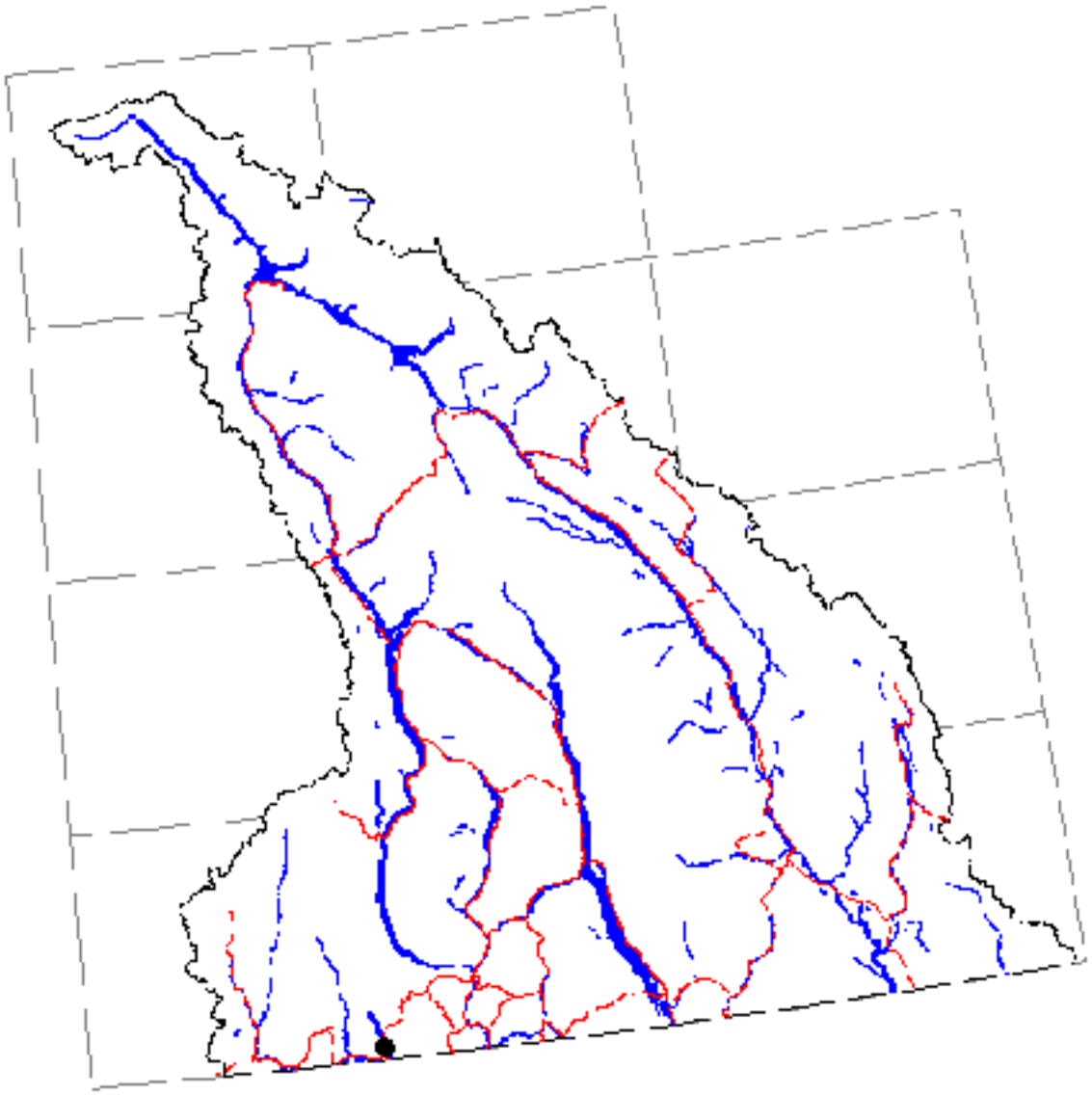
Global Distribution
Western North America; southern British Columbia south to California and Arizona (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological information
The preferred larval habitat is among stones, tree roots, sand or silt in stream pools or in bays of large, warm lakes. Males patrol low over the water, in swift, direct flight -- but they are often seen hawking in open areas at considerable distances from their breeding habitat. Females lay eggs by striking their abdomens on the water surface every 1 to 2 metres. The only adult specimen in the RBCM was collected at Christina Lake on 8 July 1938 (Whitehouse); although Whitehouse collected the species as early as 3 July there. Syd Cannings and Leah Ramsay saw adults at Christina Creek on 19 July and 7 August 1999. In the Okanagan Valley, the known flight period is 13 June to 8 September (S. Cannings, unpubl. data).

Management and protection considerations

This species' lacustrine habitat, like that of the gomphids, is often shared with intensive human recreation use. Marina developments, pollution from power boats, and popular swimming beaches all have potential impact on larval survival. More precise knowledge of larval distribution would assist in making decisions bearing on the health of this and other lacustrine dragonflies (e.g. *Gomphus graslinellus*). In the riverine environment, the impact of introduced predatory fish (especially bass) is also of concern, but no data are available.

Macromia magnifica Mclachlan



Macromiidae
Macromia magnifica Mclachlan

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake	19380708	Whitehouse, Frank C.	1	0	0	1
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Kootenay Total			**1**	**0**	**1**	**2**

Family Corduliidae (Emeralds)

In the Columbia Basin the Corduliidae is a family best seen around lakes, boggy streams and peatlands in the mountains or in the north. Seven of ten species are boreal in distribution. The adults of *Cordulia* and *Somatochlora,* the most often encountered genera, are medium-sized dragonflies with metallic blackish-green or brassy bodies and green eyes. *Epitheca* individuals are mainly brown. Corduliid larvae are usually squat and rather hairy; they live in the bottom detritus.

Genus:
Cordulia Leach
Epitheca Burmeister
Somatochlora Selys

Cordulia Leach

Cordulia is remarkably similar to *Somatochlora*. The genus is small, but the species are widespread and common. *Cordulia* is represented by a single species pair -- *C. aenea* in Eurasia and *C. shurtleffi* in North America.

Cordulia shurtleffi Scudder
American Emerald

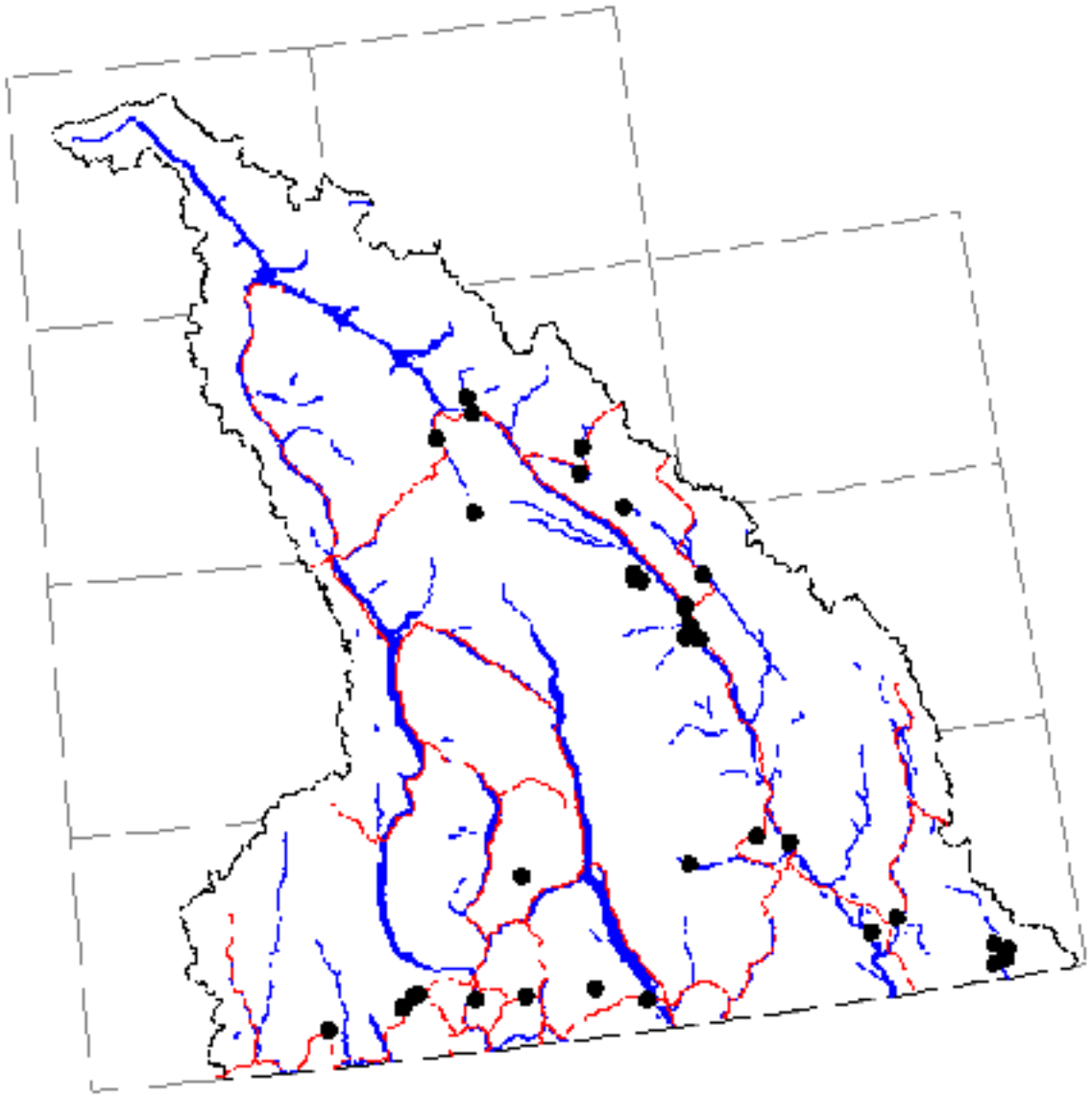
Provincial Status
CDC rank: S5
Common and widespread.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to Virginia, Michigan, Minnesota, Saskatchewan, and in the mountains to Colorado and California (Bick and Mauffray 2000). Faunal element: Widespread Boreal (see Appendix 2).

Biological information
Cordulia shurtleffi is the most common member of the Corduliidae in British Columbia. It flies early in the summer around forest lakes and peatlands. Columbia Basin flight records range from 7 May to 26 August.

Cordulia shurtleffi Scudder



Corduliidae

Cordulia shurtleffi Scudder

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Halfway Lake	19980807	Cannings, Robert A.	0	0	5	5
Brisco; Hall Lakes	19990726	Ramsay, Leah	0	1	0	1
Brisco; Twin Lakes	19980630	Cannings, Sydney G.	2	2	0	4
Canal Flats; Findlay Creek; Bear Lake	19990711	Nicholson, Dean	0	1	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	1	0	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	2	0	2
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	0	2	0	2
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Christina Lake; Bonanza Pass	19990818	Hatter, Ian	0	4	0	4
Christina Lake; Bonanza Pass	19990818	Ramsay, Leah	1	1	0	2
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	1	0	1
Creston	19790507	Askevold, Ingolf	1	0	0	1
Creston	19790515	Askevold, Ingolf	1	0	0	1
Creston; John Bull Mountain; Blazed Creek	19990721	Blades, David C.A.; Sendall, Kelly A.	0	0	7	7
Fernie; Elko; Silver Spring Lakes	19990805	Ramsay, Leah	1	0	0	1
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Ramsay, Leah	0	3	0	3
Flathead; Marl Lake	19990801	Ramsay, Leah	0	2	0	2
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	1	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	0	3	0	3
Golden; Donald	19980625	Cannings, Sydney G.	0	0	1	1
Golden; Donald; Bluewater Creek	19980626	Cannings, Sydney G.	1	0	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	0	0	1	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	0	2	2
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	0	2	0	2
Kikomun Creek Park; Elko	19990615	Ramsay, Leah	1	1	0	2
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	0	1	0	1
Kimberly; Mather Creek	19880531	Cannings, Robert A.	1	0	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	2	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	1	2	0	3

Corduliidae
Cordulia shurtleffi Scudder

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Halverson, Larry	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Ramsay, Leah	0	2	0	2
Nelson; Willow Point; Six Mile Lakes	19990722	Blades, David C.A.; Sendall, Kelly A.	0	6	0	6
Radium	19760604	Merilees, William J.	1	0	0	1
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	2	0	0	2
Salmo; Erie Lake	19990806	Cannings, Sydney G.	0	1	0	1
Wilmer	19820616	Sargent, Randy	1	3	0	4
Wilmer; Columbia River	19880602	Cannings, Robert A.	7	14	0	21
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	1	0	0	1
Kootenay Total			**24**	**70**	**17**	**111**

Epitheca Burmeister

Epitheca contains two species in British Columbia, and the more common of the two, *E. spinigera*, lives in the Columbia Basin. The adults are rather more stout and hairy than those of *Somatochlora* and *Cordulia*, and they are brown and yellow rather than greenish black. Females lay eggs in gelatinous strands, and many individuals may contribute to communal egg masses. The larvae are less hairy than those of other corduliids, and have prominent dorsal and lateral spines on the broad abdomen.

Epitheca spinigera (Selys) Spiny Baskettail

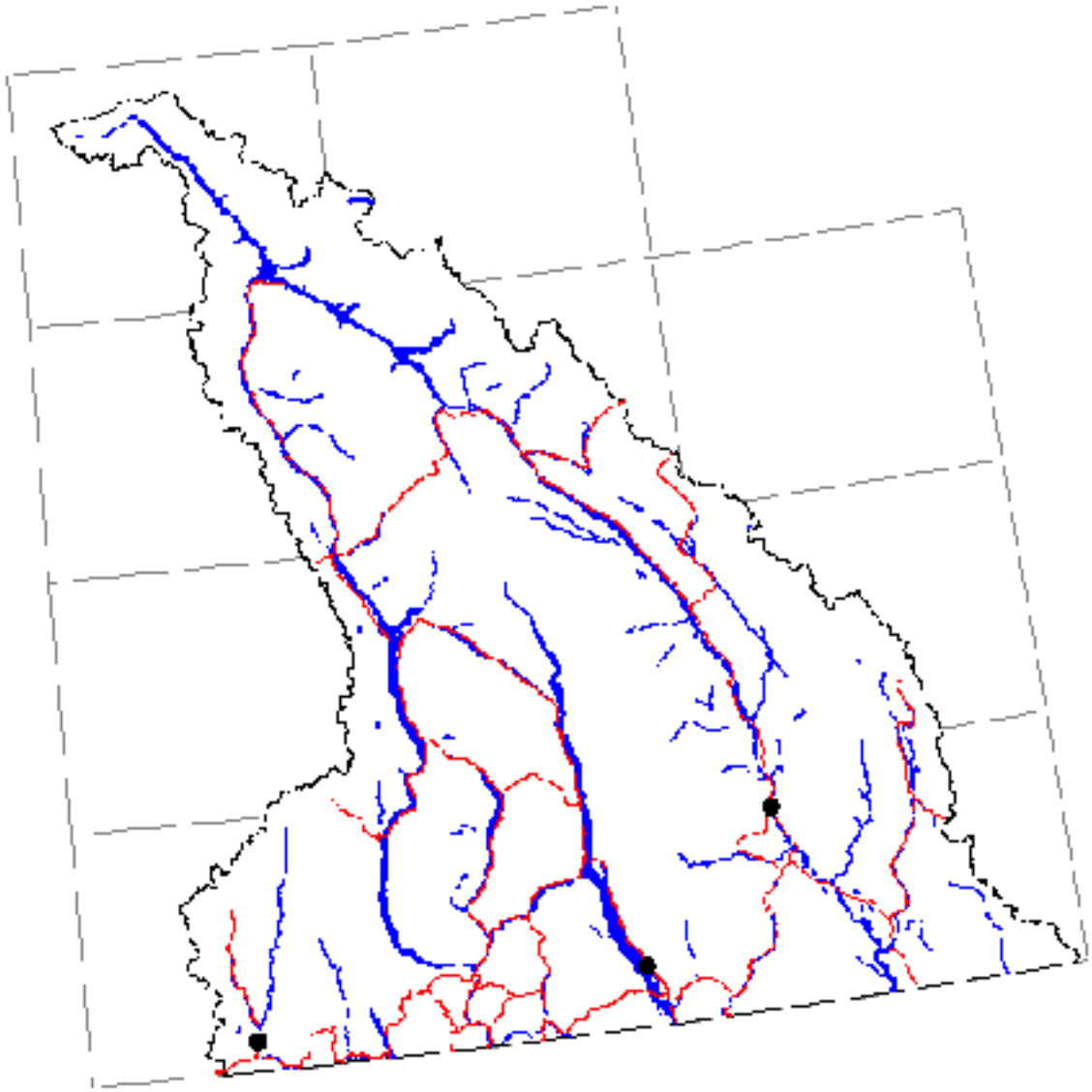
Provincial Status
CDC rank: S5
Widespread but uncommon in southern British Columbia.

Columbia-Kootenay Distribution
Widespread in the region, but recorded in only three places: Rock Creek, Sirdar and Wasa Lake.

Global Distribution
British Columbia east to Nova Scotia; south to New Jersey, Kentucky, Iowa, Montana and California (Bick and Mauffray 2000).
Faunal element: Transition (see Appendix 2).

Biological information
E. spinigera is an early flying species — most British Columbia records are from June. Kootenay records range from 16 May to 17 June. In British Columbia, baskettails live in a variety of ponds, lakes and marshes.

Epitheca spinigera (Selys)



Corduliidae

Epitheca spinigera (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Cranbrook; Wasa Lake	19990614	Nicholson, Dean	0	1	0	1
Rock Creek; Kettle River Provincial Recreation Area; Kettle River	19990617	Cannings, Sydney G.	1	0	0	1
Sirdar	19790516	Askevold, Ingolf	1	0	0	1
Kootenay Total			**2**	**1**	**0**	**3**

Somatochlora Selys

The Greek words *soma*, body, and *khloros*, green, are the source of the name of the largest genus in the Corduliidae. Species of *Somatochlora* are metallic, dark bronzy-green dragonflies with brilliant green eyes. The genus is mostly boreal and Appalachian; ten of the twenty-four North American species are known from British Columbia. Most live around mountain or northern lakes and peatlands.

S. walshii

Species:

Somatochlora albicincta (Burmeister)
Somatochlora cingulata (Selys)*
Somatochlora forcipata (Scudder)*
Somatochlora franklini (Selys)
Somatochlora minor Calvert
Somatochlora semicircularis (Selys)
Somatochlora walshii (Scudder)
Somatochlora whitehousei Walker

Somatochlora albicincta (Burmeister)
Ringed Emerald

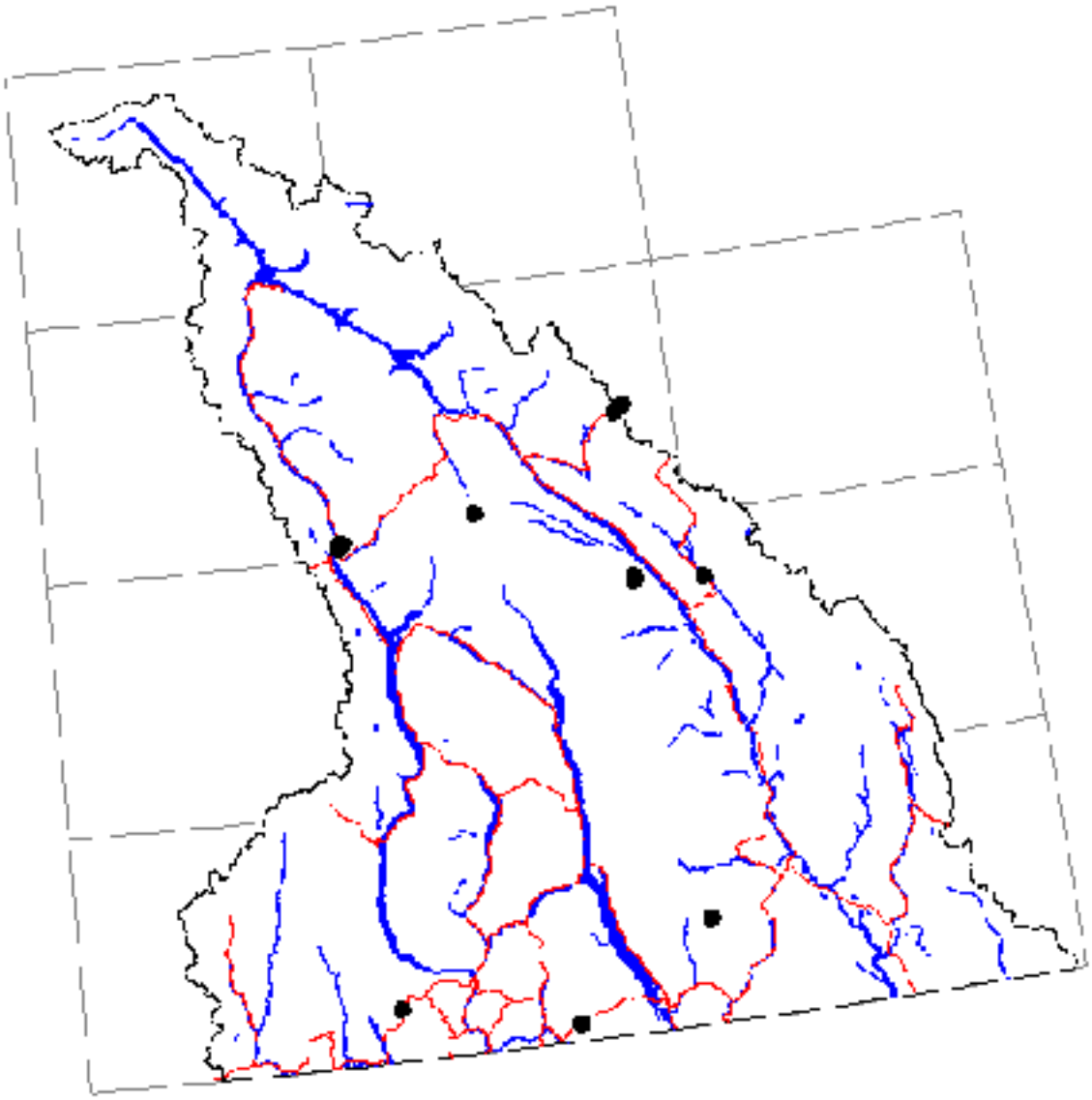
Provincial Status
CDC rank: S5
Widespread in coastal and interior British Columbia.

Columbia-Kootenay Distribution
Widespread in the region, especially at higher elevations.

Global Distribution
Alaska east to Labrador and Newfoundland; south to New Hampshire, New York, Lake Superior, and north of the Great Plains to the Rockies; south through British Columbia and Alberta to Montana and California (Bick and Mauffray 2000). Faunal element: Widespread Boreal (see Appendix 2).

Biological information
This common *Somatochlora* is usually found patrolling the open edges of peatland ponds and slow streams or the peaty margins of forest lakes. Records in the Columbia Basin range from 24 June to 22 August; the latest flight record for British Columbia is 2 October (S.G. Cannings, unpubl. data).

Somatochlora albicincta (Burmeister)



Corduliidae
Somatochlora albicincta (Burmeister)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Twin Lakes	19980630	Cannings, Sydney G.	0	2	0	2
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Cranbrook; Richmond Lake	19980802	Nicholson, Dean	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	7	0	7
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	0	1	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	0	2	0	2
Golden; Stephen	19990727	Cannings, Sydney G.	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	4	0	4
Mount Revelstoke National Park; Heather Lake	19980802	Cannings, Richard J.	0	1	0	1
Mount Revelstoke National Park; Heather Lake	19980802	Cannings, Russell C.	0	1	0	1
Mount Revelstoke National Park; Mount Revelstoke National Park	19980802	Cannings, Richard J.	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Ramsay, Leah	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980624	Cannings, Sydney G.	0	0	11	11
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980725	Archard, Gabrielle A.	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980725	Coates, Sally E.	0	1	4	5
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke, Balsam Lakes	19980725	Ramsay, Leah	0	1	0	1
Revelstoke; Mount Revelstoke	19380803	Whitehouse, Frank C.	1	2	0	3
Revelstoke; Mount Revelstoke	19380813	Whitehouse, Frank C.	1	0	0	1
Stagleap Park; Stagleap Provincial Park	19760812	Ricker, William E.	0	1	0	1
Stagleap Provincial Park	19760822	Ricker, William E.	1	1	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Coates, Sally E.	0	1	0	1
Kootenay Total			**3**	**32**	**16**	**51**

Somatochlora cingulata (Selys)*
Lake Emerald

Provincial Status:
CDC rank: S3
Blue List
An uncommon dragonfly of mountain and plateau lakes in the southern interior of British Columbia.

Columbia-Kootenay Distribution

S. cingulata is known only from the moister Columbia region of the Basin — from the lakes and peatlands in the Rocky Mountain Trench north of Golden, the Beaverfoot River valley and in Yoho National Park. The species was unknown in the Columbia Basin before 1995.

Global Distribution
Ranges across the southern boreal forests from Newfoundland and Labrador to central British Columbia; south to Massachusetts, Minnesota and Wyoming (Bick and Mauffray 2000). More common in eastern North America. Faunal element: Southern Boreal (see Appendix 2).

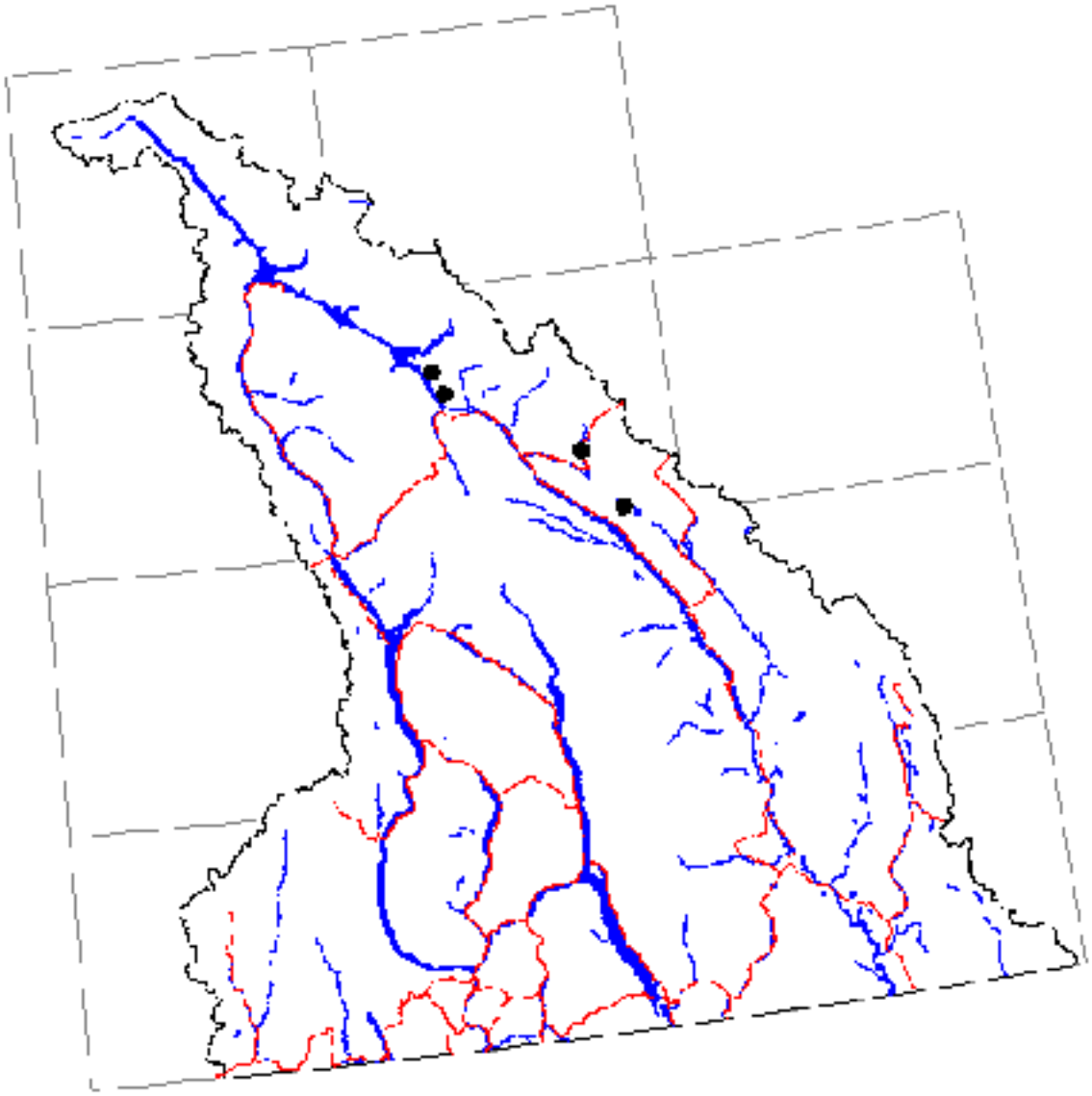
Biological information
S. cingulata, the largest *Somatochlora* in the B.C., inhabits subboreal or lower subalpine lakes. It seems to prefer areas where there is some small movement of water; for example, near the mouth of the outlet stream (Walker and Corbet 1975). In our limited experience, the lakes are often edged with peat, but lakes of 'various types' are inhabited (Walker and Corbet 1975). Adults are often difficult to catch; they usually fly over open water several metres from shore.

Although this survey and a 1995 tour of the Columbia region added four localities to the provincial distribution of the species, it is still rarely seen. Records range from 26 July to 5 August; the 5 August record, from Aid Lake, Golden, is of a larval exuviae, indicating an adult had emerged earlier. The flight period in the rest of Canada is 24 June to 4 September (Walker and Corbet 1975).

Management and protection considerations

In general, peat-margined lakes should be managed to maintain water and littoral habitat quality, especially at the mouth of the outlet stream. Development that may affect the hydrology of a catchment area should be managed to minimize impacts.

Somatochlora cingulata (Selys)



Corduliidae

Somatochlora cingulata (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Aid Lake	19950726	Cannings, Sydney G.	0	0	1	1
Golden; Donald; Susan Lake	19980805	Cannings, Robert A.	0	1	0	1
Golden; Donald; Susan Lake	19980805	Hutchings, Gordon E.	0	1	0	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	0	1	0	1
Kootenay Total			**0**	**4**	**1**	**5**

Somatochlora forcipata (Scudder)*
Forcipate Emerald

Provincial Status
CDC rank: S1
Red List
In British Columbia, the Forcipate Emerald is a very rare dragonfly of spring-fed streamlets and fen pools; known only from three sites in the Park Ranges of the Rocky Mountains in Yoho and Kootenay national parks.

Columbia-Kootenay Distribution
Known from two fens near Emerald Lake and Ross Lake in Yoho National Park, and from one in the Mount Whymper area of Kootenay National Park. The species was first discovered in British Columbia during the present study.

Global Distribution
In eastern North America this species ranges from Manitoba and Labrador south to Minnesota and West Virginia (Bick and Mauffray 2000); in the west it is known from only four localities in the Rocky Mountains of Alberta and British Columbia. Faunal element: Transition (see Appendix 2).

Biological information
In British Columbia, *S. forcipata* lives in shallow, spring-fed streamlets (often only 20-30 cm wide) trickling through subalpine hillside fens, or in pools associated with flowing groundwater in such situations. Females were recorded ovipositing in moss and *Chara* mats in a shallow seep and in a mud-bottomed streamlet pool. Because these sites are usually small in scale, the patrolling males often flew in more or less shady glades in open spruce forests. At the Emerald Lake road site, they avoided the open, sunny fen below the springs.

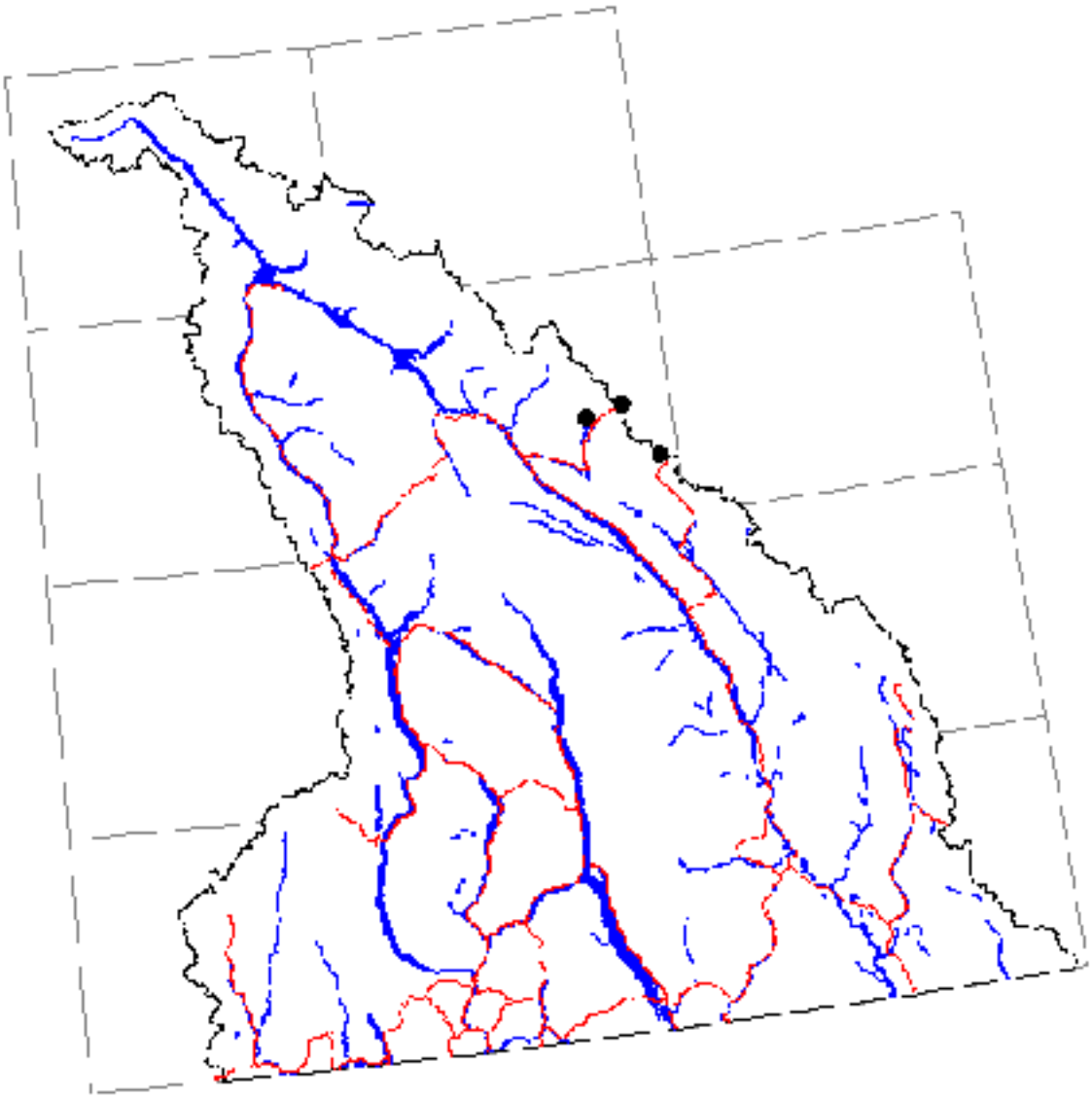
S. forcipata is evidently absent from most peatlands with small streams cutting a winding path through them. In our (albeit limited) experience, the breeding habitat is restricted to very shallow rivulets near the spring source, often separated into small pools by midsummer.

Little is known of the species' phenology in British Columbia; in eastern Canada the flight period ranges from 27 May to 27 August (Walker and Corbet 1975). Records in the Kootenays range from 3 to 12 August (1998).

Management and protection considerations

Because of its attachment to cool, flowing groundwater, this species may be particularly sensitive to changes in local hydrology. There is also a danger that its small breeding sites may be overlooked as wetlands are modified in development plans. These sites appear to be rare, at least along the road corridors sampled in this study, but further inventory is recommended to confirm this impression.

Somatochlora forcipata (Scudder)



Corduliidae
Somatochlora forcipata (Scudder)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	1	0	0	1
Yoho National Park; Field; Emerald Lake	19980805	Cannings, Sydney G.	2	0	0	2
Yoho National Park; Field; Emerald Lake	19980805	Coates, Sally E.	0	2	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	0	3	0	3
Kootenay Total			**5**	**7**	**0**	**12**

Somatochlora franklini (Selys)
Delicate Emerald

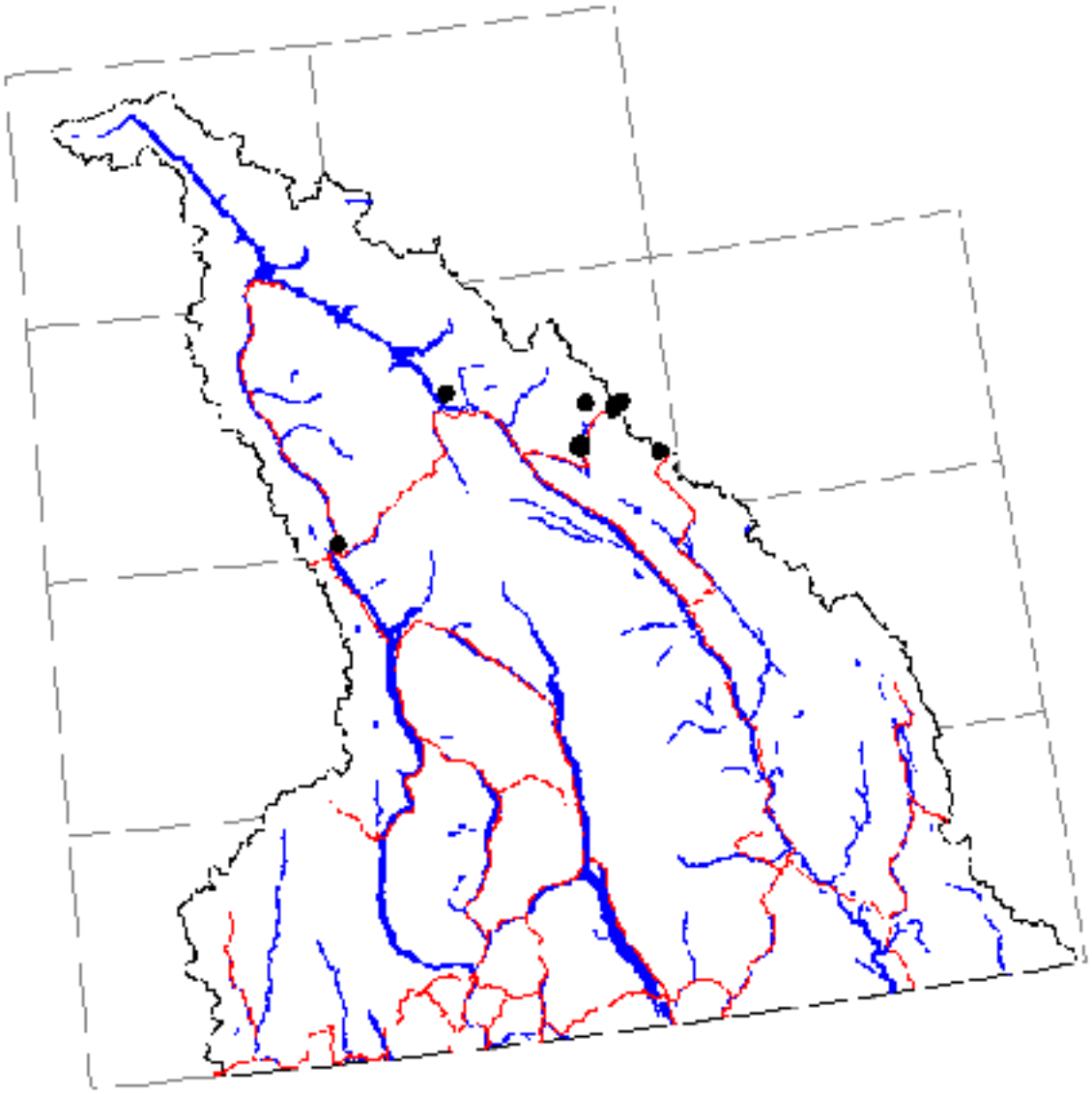
Provincial Status:
CDC rank: S4S5
S. franklini is mainly a species of the north, occurring in southern British Columbia only at higher elevations.

Columbia-Kootenay Distribution
Known from the mountains of the northern part of the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to New Hampshire, New York, Michigan, Minnesota and north of the Great Plains to the mountains of British Columbia and Alberta (Bick and Mauffray 2000).
Faunal element: Widespread Boreal (see Appendix 2).

Biological information
This slender, delicate emerald becomes scarcer the farther south one goes. Its habitat requirements are similar to those of *Aeshna sitchensis*, but in southern British Columbia it is rarer than the darner. It prefers shallow, moss-bottomed, evenly vegetated bogs and fens. In these habitats, open patches of water are usually not visible from a distance. Columbia Basin flight records range from 26 July to 12 August, but adults have been collected throughout British Columbia between 14 July and 27 August (Cannings and Stuart 1977).

Somatochlora franklini (Selys)



Corduliidae

Somatochlora franklini (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Donald; Susan Lake	19950725	Cannings, Sidney G.	0	0	4	4
Golden; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	0	1	0	1
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	1	1	0	2
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Halverson, Larry	1	0	0	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980701	Cannings, Sydney G.	0	0	1	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Archard, Gabrielle A.	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	3	3	0	6
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	0	2	0	2
Kootenay Total			**10**	**13**	**5**	**28**

Somatochlora minor Calvert
Ocellated Emerald

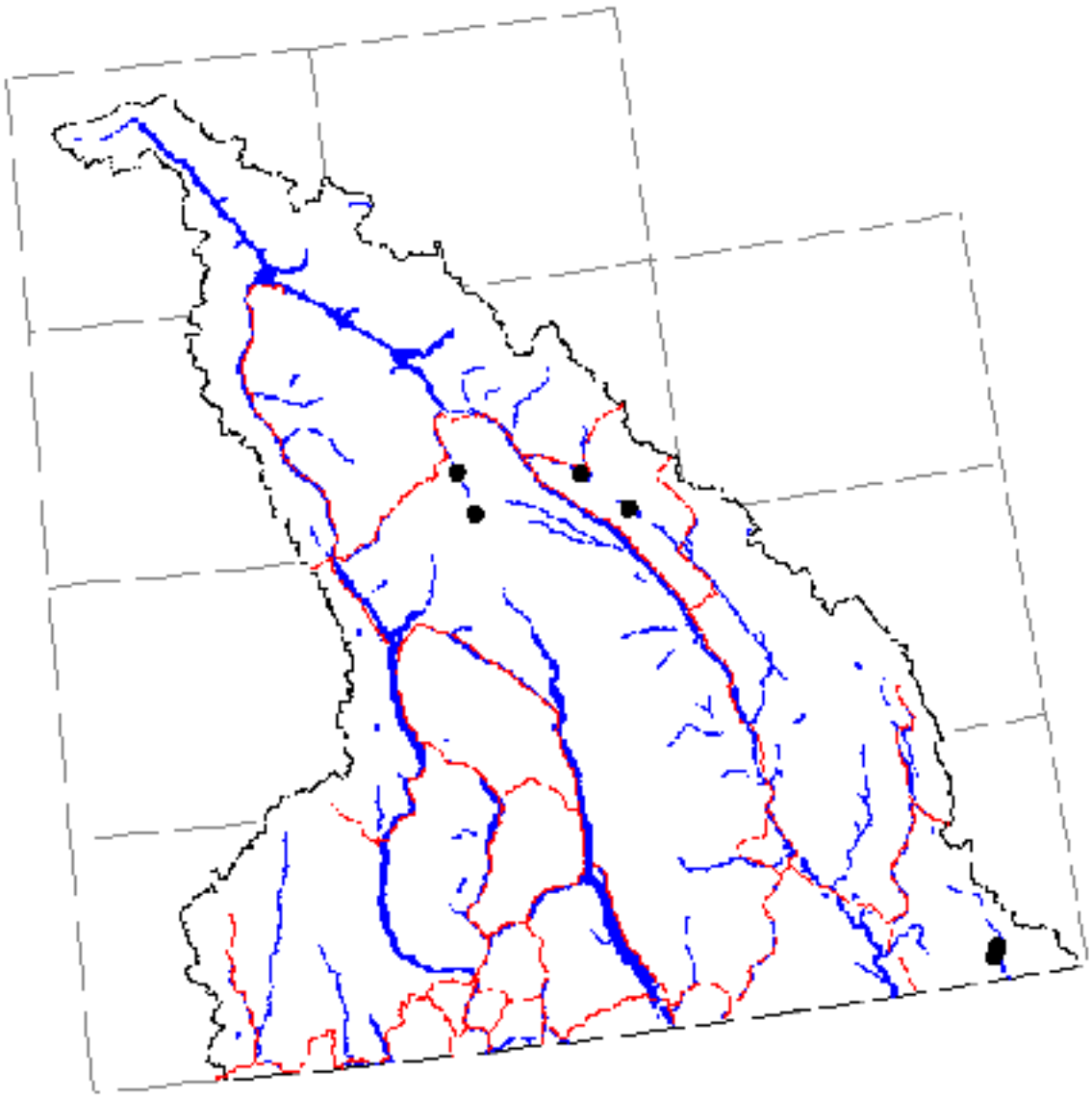
Provincial Status:
CDC rank: S5
Recorded across southern British Columbia south of about 52ºN; in the north known only from the Peace and Liard river systems, but probably occurs throughout.

Columbia-Kootenay Distribution
Collected only in the Selkirk and Rocky mountains and in the Flathead drainage, but probably widespread in the region.

Global Distribution
Yukon and British Columbia east to Labrador and Newfoundland; south to Connecticut, Michigan, Minnesota, South Dakota, Montana, Colorado and Oregon (Bick and Mauffray 2000). Faunal element: Southern Boreal (see Appendix 2).

Biological information
This small emerald is an inhabitant of warm streams, both gently and rapidly flowing ones, in peatlands or forests. Females have a more conspicuous vulvar lamina than other species of *Somatochlora*; this spoutlike egg-laying device is used to stab eggs into water and adjacent moss. The few Columbia Basin records range from 22 July to 2 August. In British Columbia, adults have been collected between 23 June and 17 August (Cannings and Stuart 1977).

Somatochlora minor Calvert



Corduliidae
Somatochlora minor Calvert

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Flathead; Beryl Creek	19990801	Cannings, Sydney G.	0	2	0	2
Flathead; Beryl Creek	19990802	Cannings, Sydney G.	0	2	0	2
Flathead; Beryl Creek	19990802	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	Woods, John	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	0	5	0	5
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	2	0	2
Harrogate; Kootenay River	19980727	Coates, Sally E.	1	2	0	3
Harrogate; Kootenay River	19980727	Ramsay, Leah	0	3	0	3
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	0	1	0	1
Kootenay Total			**1**	**20**	**0**	**21**

Somatochlora semicircularis (Selys)
Mountain Emerald

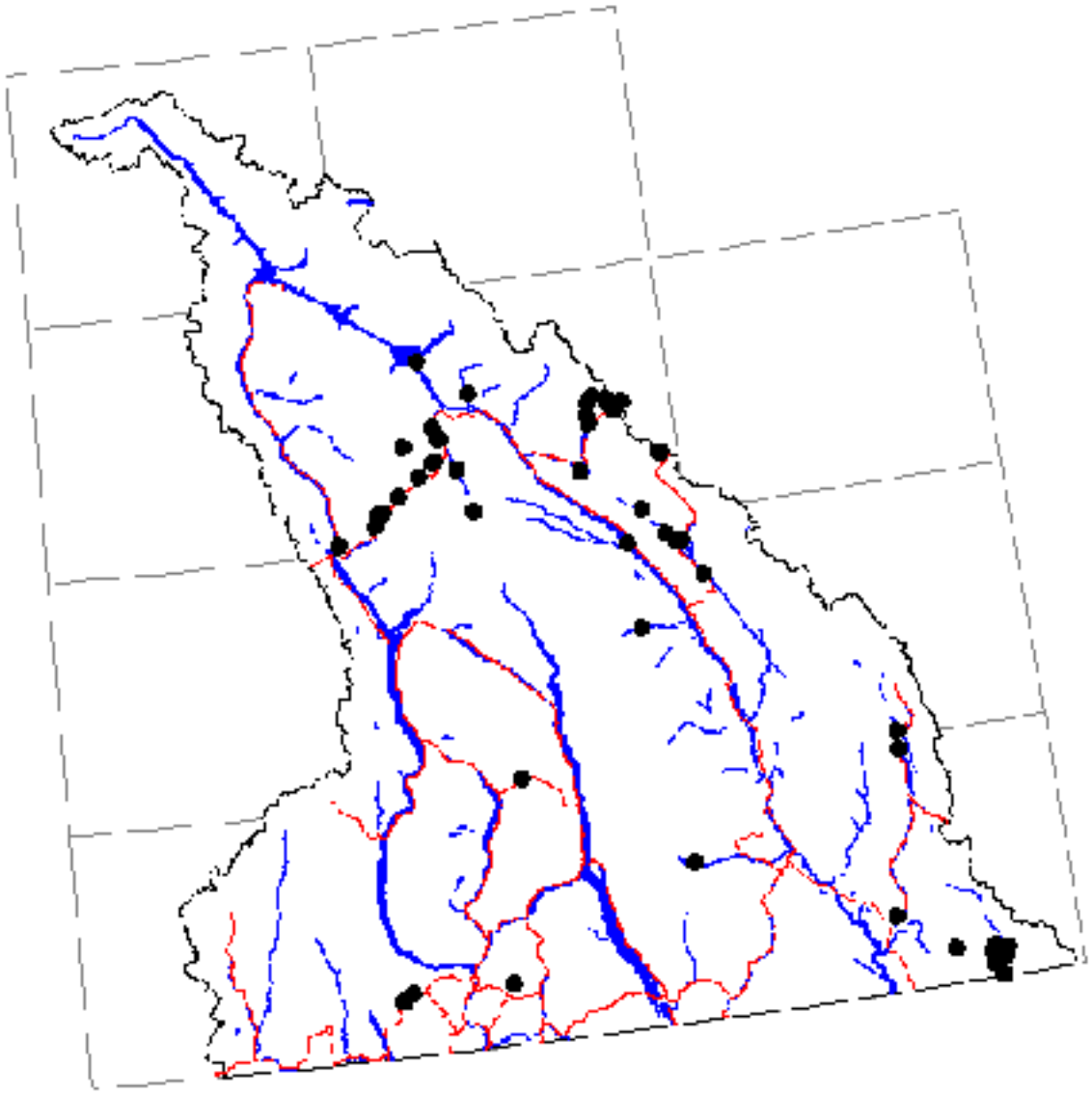
Provincial Status:
CDC rank: S5
Widespread over most of the province, but much more common in the south than in the north.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Yukon, south through British Columbia and western Alberta to New Mexico and California (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2). *S. semicircularis* is the only species in the family belonging to the Cordilleran faunal element.

Biological information
S. semicircularis is a common inhabitant of sedge marshes. Columbia Basin records of adults range from 1 July to 26 August; the known flight season in the province is somewhat longer -- 7 June to 9 September (Cannings and Stuart 1977).

Somatochlora semicircularis (Selys)



Corduliidae

Somatochlora semicircularis (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Albert Canyon	19980730	Cannings, Sydney G.	0	2	0	2
Albert Canyon	19980730	Coates, Sally E.	0	1	0	1
Albert Canyon	19980730	Ramsay, Leah	0	1	0	1
Castlegar	19820806	Cannings, Richard J.	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	0	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	1	0	0	1
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Elkford	19990822	Ramsay, Leah	0	5	0	5
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	1	0	0	1
Flathead	19890726	Guppy, Crispin S.	0	6	0	6
Flathead	19990802	Cannings, Sydney G.	3	7	0	10
Flathead	19990802	Ramsay, Leah	2	2	0	4
Flathead; Beryl Creek	19990802	Cannings, Sydney G.	0	1	0	1
Flathead; Cabin Creek	19990801	Cannings, Sydney G.	0	3	0	3
Flathead; Cabin Creek	19990801	Ramsay, Leah	0	1	0	1
Flathead; Cabin Pass; Cabin Creek	19990804	Cannings, Sydney G.	1	1	0	2
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Glacier	19980730	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	McGillis, Doreen	0	4	0	4
Glacier National Park; Rogers Pass; Beaver River	19980722	Ramsay, Leah	3	4	0	7
Glacier National Park; Rogers Pass; Beaver River	19980722	Woods, John	1	4	0	5
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	2	6	0	8
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	2	3	0	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Archard, Gabrielle A.	0	5	0	5
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Cannings, Sydney G.	1	6	0	7
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Coates, Sally E.	0	5	0	5
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Woods, John	0	3	0	3
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ramsay, Leah	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	1	0	1

Corduliidae
Somatochlora semicircularis (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Kicking Horse River	19980804	Ramsay, Leah	1	0	0	1
Golden; Sherbrooke Lake	19980801	Cannings, Sydney G.	0	3	0	3
Harrogate; Kootenay River	19980804	Ramsay, Leah	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Cannings, Sydney G.	2	1	0	3
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Coates, Sally E.	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Ramsay, Leah	0	2	0	2
Invermere; Horsethief Creek; Gopher Creek	19980808	Hutchings, Gordon E.	0	1	0	1
Kaslo	19980809	Hutchings, Gordon E.	0	1	0	1
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	1	1	0	2
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	1	3	0	4
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Halverson, Larry	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	1	3	0	4
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	0	1	0	1
Mount Revelstoke National Park; Mount Revelstoke National Park	19980802	Cannings, Richard J.	0	2	0	2
Mount Revelstoke National Park; Mount Revelstoke National Park	19980802	Cannings, Russell C.	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Cannings, Sydney G.	0	5	0	5
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980723	Ramsay, Leah	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980624	Cannings, Sydney G.	0	0	11	11
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980701	Cannings, Sydney G.	2	0	2	4
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980701	Ramsay, Leah	0	0	10	10
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Archard, Gabrielle A.	1	4	0	5
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Coates, Sally E.	1	3	0	4
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Ramsay, Leah	0	3	0	3

Corduliidae

Somatochlora semicircularis (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Rogers Pass; Connaught Creek	19980701	Cannings, Sydney G.	0	1	0	1
Rogers Pass; Connaught Creek	19980806	Cannings, Sydney G.	1	1	0	2
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980726	Ramsay, Leah	0	3	0	3
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	2	4	0	6
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	2	0	2
Yoho National Park; Field; Emerald Lake	19980805	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	1	0	0	1
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980805	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Whisky-jack Falls	19980802	Cannings, Sydney G.	0	5	0	5
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Cannings, Robert A.	0	2	0	2
Yoho National Park; Golden; Hector; Wapta Lake	19980803	Shank, Chris	0	1	0	1
Yoho National Park; Golden; Sherbrooke Lake; Sherbrooke Creek	19980801	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	3	8	0	11
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	3	0	3
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	0	2	0	2
Yoho National Park; Stephen; Summit Lake	19980803	Cannings, Robert A.	0	2	0	2
Kootenay Total			**37**	**168**	**23**	**228**

Somatochlora walshii (Scudder)
Brush-tipped Emerald

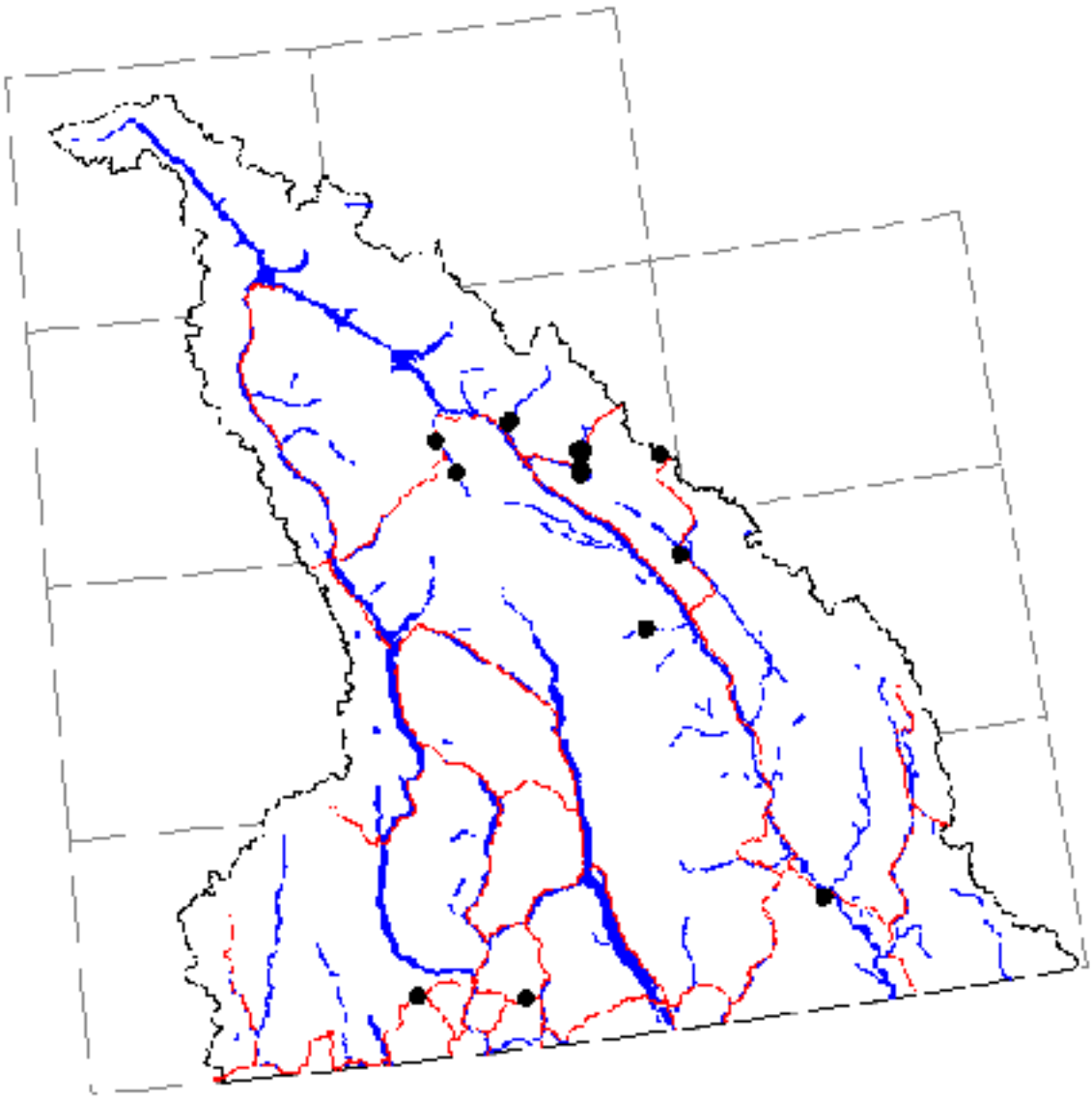
Provincial Status:
CDC rank: S4
Uncommon but widespread in the province south of the Peace and Skeena river basins.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
British Columbia east to Newfoundland; south to New Jersey, Michigan, Minnesota, Montana and Oregon (Bick and Mauffray 2000). Faunal element: Southern Boreal (see Appendix 2).

Biological information
S. walshii breeds in small, clear, slowly flowing streams in marshy or peaty places. In the Columbia Basin and in British Columbia, adults have been collected between 1 July and 26 August (present study, see Appendix 3). These dates are earlier and later, respectively, than the earliest and latest flight dates previously recorded in the province (Cannings and Stuart 1977).

Somatochlora walshii (Scudder)



Corduliidae
Somatochlora walshii (Scudder)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	0	3	0	3
Cranbrook; Wardner; Haha Lake	19990730	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; Beaver River	19980722	McGillis, Doreen	0	1	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724		0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	1	3	0	4
Golden; Blaeberry	19980804	Cannings, Robert A.	0	2	0	2
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980808	Cannings, Robert A.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	2	0	2
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Halverson, Larry	1	0	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	2	0	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	0	1	0	1
Kootenay Total			**6**	**25**	**0**	**31**

Somatochlora whitehousei Walker
Whitehouse's Emerald

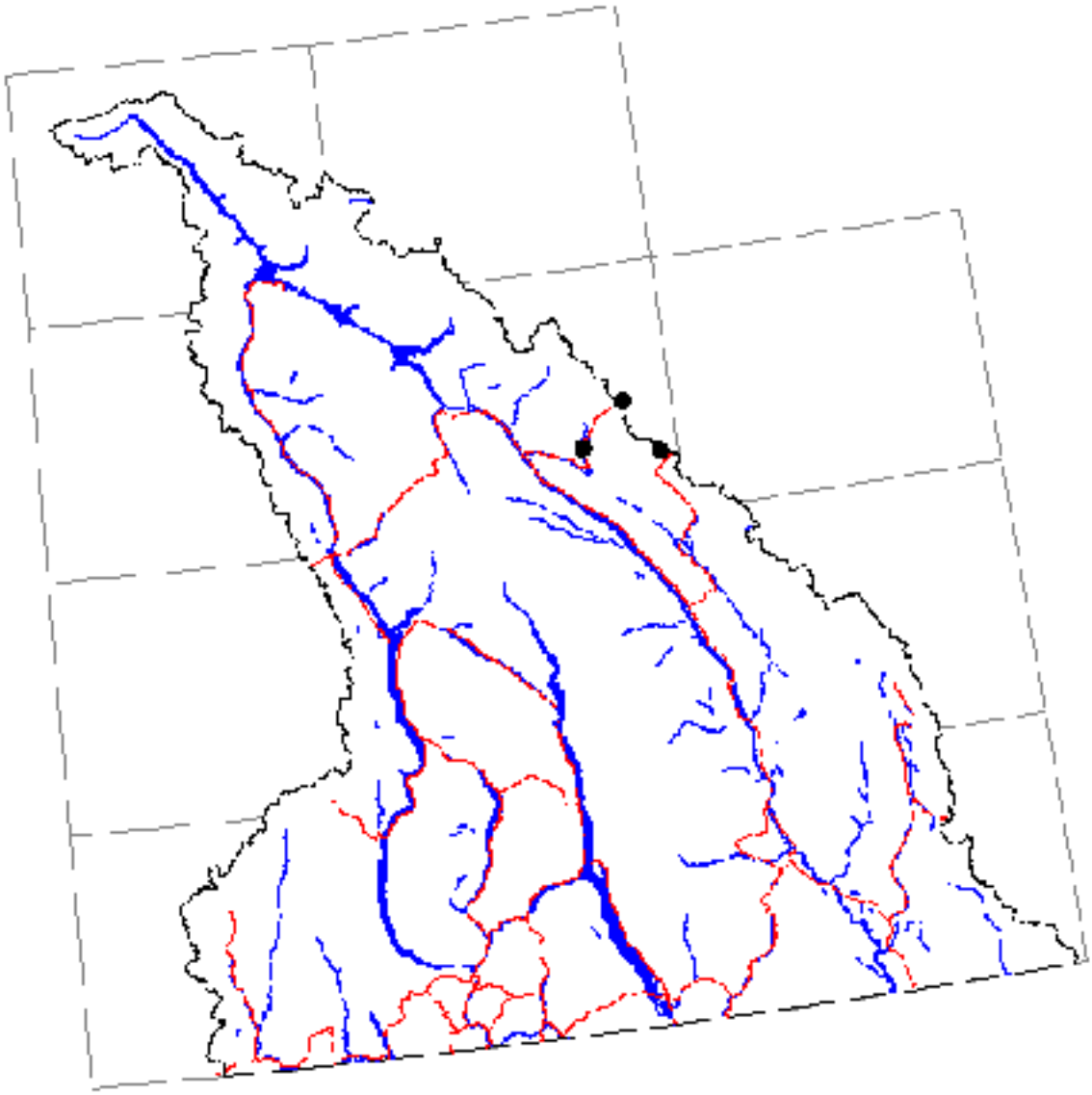
Provincial Status:
CDC rank: S4
S. whitehousei is a northern species known from a few scattered records from the far northwest to the Rocky Mountains in the southeastern part of the province. Not known south of 51°N.

Columbia-Kootenay Distribution
Collected in three localities in Kootenay and Yoho parks during the study. There is a historical record from Revelstoke Mountain (Walker and Corbet 1975; not mapped).

Global Distribution
Yukon and British Columbia east to Labrador and Newfoundland (Bick and Mauffray 2000). Faunal element: Widespread Boreal (see Appendix 2).

Biological information
S. whitehousei is an uncommon species that prefers shallow sedge/moss fens for breeding. Males patrol around, and females oviposit in small, shallow puddles. The dates of British Columbia specimens range from 7 July to 12 August (Cannings and Stuart 1977). Those in this study were from 1 to 12 August.

Somatochlora whitehousei Walker



Corduliidae

Somatochlora whitehousei Walker

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Coates, Sally E.	0	1	0	1
Kootenay National Park; Mount Whymper; Vermilion Pass	19980812	Halverson, Larry	0	1	0	1
Yoho National Park; Golden; Kicking Horse River; Ottertail River	19980803	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Coates, Sally E.	1	0	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	8	0	8
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	0	1	0	1
Kootenay Total			**2**	**12**	**0**	**14**

Family Libellulidae (Skimmers)

The Libellulidae is the largest dragonfly family in the Columbia Basin, containing three genera and nineteen species there. These dragonflies are most common around ponds, marshy lakeshores and sluggish streams where the adults dart about and spend much time perched horizontally in the sun. Females oviposit alone or in the company of guarding males, by dipping the abdomen in the water to release the eggs. The larvae, like those of the Corduliidae, move sluggishly or squat on the bottom mud.

Genus:
Leucorrhinia Brittinger
Libellula Linnaeus
Sympetrum Newman

Leucorrhinia Brittinger

Leucorrhinia species are small, black, white-faced dragonflies usually marked with red in males and yellow (or sometimes red) in females. Four of the five Columbia Basin species are boreal and are most prevalent in the mountains or in the north around the marshy shores of lakes in the late spring or early summer. *L. intacta* is the anomaly in the genus, preferring cattail marshes in warm valley bottoms.

Species:
Leucorrhinia borealis Hagen
Leucorrhinia glacialis Hagen
Leucorrhinia hudsonica (Selys)
Leucorrhinia intacta (Hagen)
Leucorrhinia proxima Calvert

Leucorrhinia borealis Hagen
Boreal Whiteface

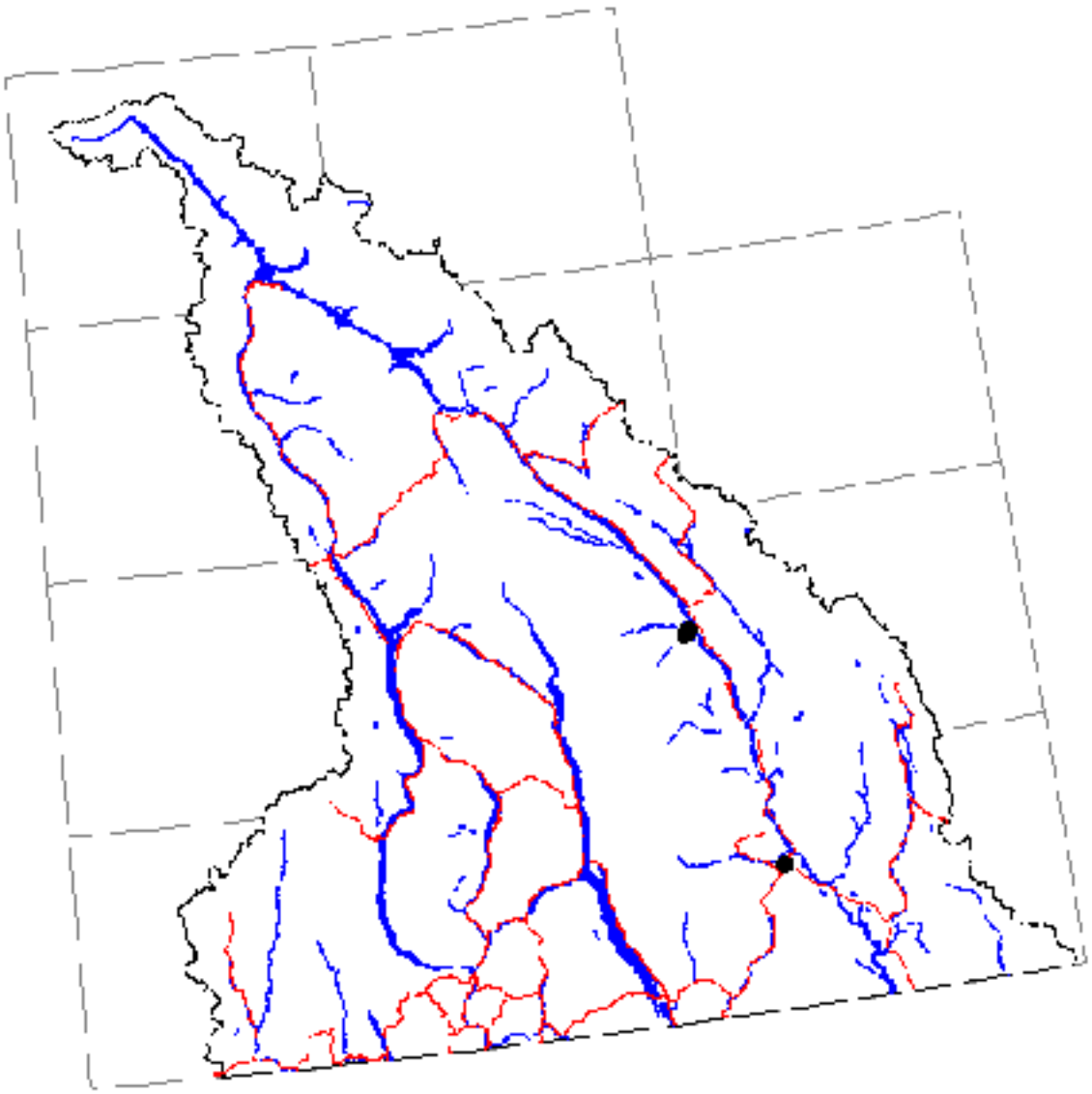
Provincial Status:
CDC rank: S5
Common in the dry southern interior and the far northeast; scattered in the northwest (Cannings and Stuart 1977; L. Ramsay, unpubl. data).

Columbia-Kootenay Distribution
Known only from the Rocky Mountain Trench in the region; collections made at Cranbrook, Wilmer and Lillian Lake near Invermere. Probably more widespread in lowland localities than these three sites suggest.

Global Distribution
Yukon and British Columbia east to Labrador and Newfoundland; south to Minnesota, North Dakota and Colorado and Utah (Bick and Mauffray 2000). Faunal element: Western Boreal (see Appendix 2).

Biological information
L. borealis is primarily a species of the ponds and sloughs of the northern prairies (Cannings and Stuart 1977). It is an early season species; flight records for British Columbia range from 21 May to 27 July (Cannings and Stuart 1977). The three Kootenay records are from 1 May to 30 June.

Leucorrhinia borealis Hagen



Libellulidae
Leucorrhinia borealis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Cranbrook	19990531	Nicholson, Dean	1	0	0	1
Invermere; Lillian Lake	19980630	Ramsay, Leah	0	1	0	1
Wilmer	19820616	Sargent, Randy	1	0	0	1
Kootenay Total			**2**	**1**	**0**	**3**

Leucorrhinia glacialis Hagen
Crimson-ringed Whiteface

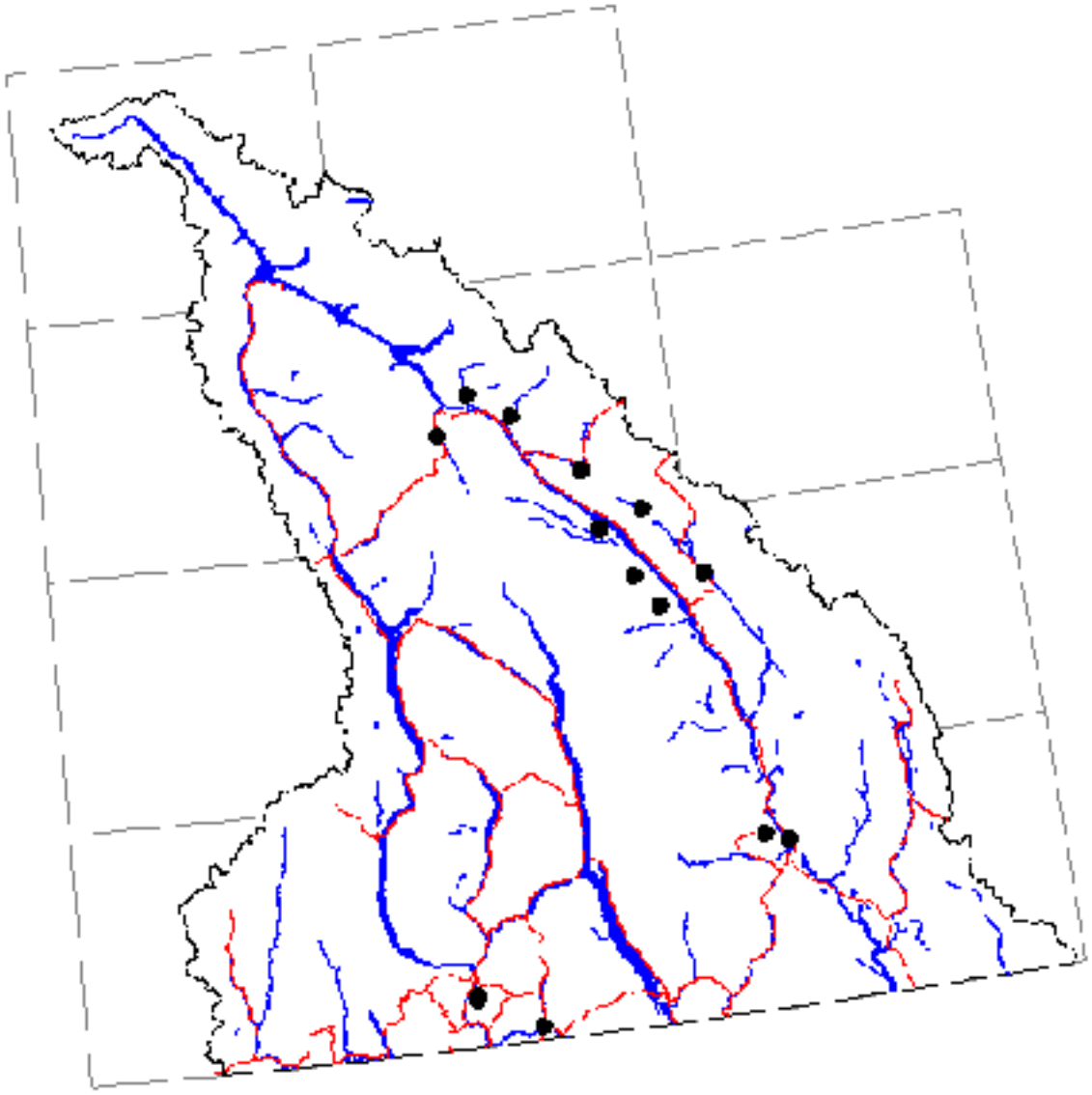
Provincial Status:
CDC rank: S5
Widespread and common in southern and central British Columbia.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Southeastern Alaska and British Columbia east to Labrador and Newfoundland; south in the East to Maryland, West Virginia, Michigan and Minnesota; south in the western mountains to Wyoming, Nevada and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological information
This is a dragonfly most abundant at peatlands and peat-margined lakes (Cannings and Stuart 1977). Kootenay flight dates range from 15 June to 7 August; British Columbia flight records are 7 June to 22 August (Cannings and Stuart 1977).

Leucorrhinia glacialis Hagen



Libellulidae

Leucorrhinia glacialis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Halfway Lake	19980807	Hutchings, Gordon E.	0	0	4	4
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	3	6	0	9
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	1	2	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	0	3	0	3
Golden; Blaeberry	19980804	Cannings, Robert A.	1	0	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	1	0	0	1
Golden; Donald; Bluewater Creek	19980626	Ramsay, Leah	0	2	0	2
Harrogate; Kootenay River	19980804	Ramsay, Leah	0	2	0	2
Kimberley; Bartholomew Lake	19990615	Ramsay, Leah	1	3	0	4
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	2	2	0	4
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	3	0	3
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Ramsay, Leah	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Ramsay, Leah	1	1	0	2
Nelway; Rosebud Lake	19990721	Ramsay, Leah	0	1	0	1
Parson; Bittern Lake	19990620	Nicholson, Dean	1	1	0	2
Radium Hot Springs; Dogsleg Lake	19980629	Cannings, Sydney G.	0	1	0	1
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Trail; Champion Lakes	19990806	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19950725	Cannings, Sidney G.	0	0	1	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Kootenay Total			**11**	**38**	**5**	**54**

Leucorrhinia hudsonica (Selys)
Hudsonian Whiteface

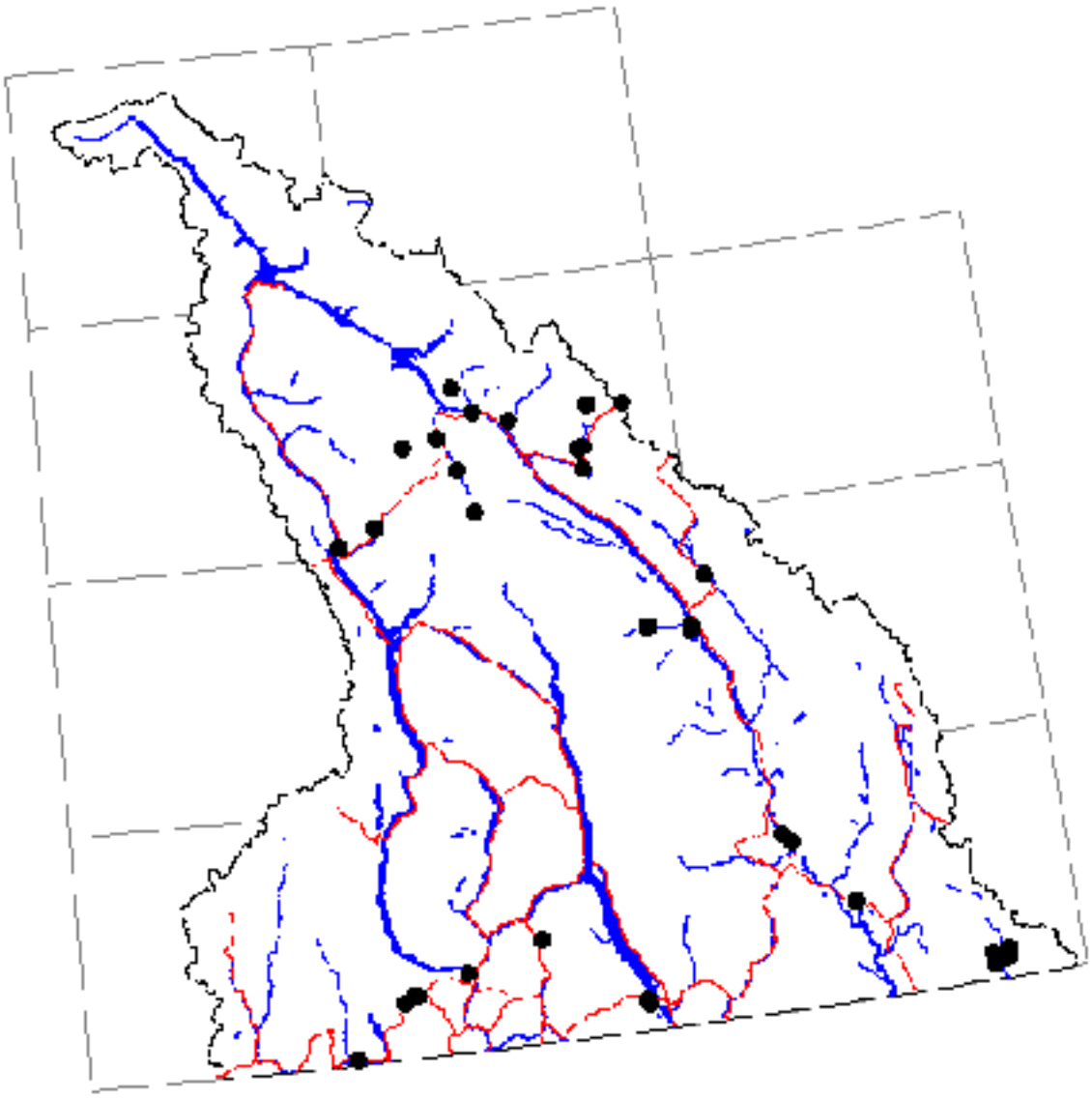
Provincial Status:
CDC rank: S5
Common throughout the province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to Virginia, Nebraska, and California (Bick and Mauffray 2000). Faunal element: Widespread Boreal (see Appendix 2).

Biological information
A small dragonfly most abundant in mountain and northern peatlands. The flight season begins early, and most individuals disappear by mid-August. Kootenay records range from 8 May to 18 August -- the recorded dates for B.C. are 7 May to 26 August (Cannings and Stuart 1977).

Leucorrhinia hudsonica (Selys)



Libellulidae

Leucorrhinia hudsonica (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar	19740727	Merilees, William J.	0	1	0	1
Castlegar; Mud Lake	19990818	Hatter, Ian	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	0	0	1
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	1	3	4
Creston	19790508	Askevold, Ingolf	1	0	0	1
Creston	19990722	Ramsay, Leah	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	0	2	0	2
Flathead	19990802	Ramsay, Leah	1	1	0	2
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Ramsay, Leah	1	0	0	1
Fort Steele	19800705	Cannings, Robert A.	1	0	0	1
Glacier National Park; Rogers Pass; Beaver River	19980722	McGillis, Doreen	2	1	0	3
Glacier National Park; Rogers Pass; Beaver River	19980722	Ramsay, Leah	1	1	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Archard, Gabrielle A.	3	6	0	9
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Cannings, Sydney G.	2	1	0	3
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Coates, Sally E.	0	5	0	5
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	1	3	0	4
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	1	6	0	7
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Ramsay, Leah	1	2	0	3
Glacier National Park; Rogers Pass; Ventego Lake; Mountain Creek	19980723	Woods, John	0	1	0	1
Golden; Blaeberry	19980625	Cannings, Sydney G.	1	1	0	2
Golden; Donald	19980625	Cannings, Sydney G.	0	1	0	1
Golden; Donald	19980625	Ramsay, Leah	0	1	0	1
Golden; Donald; Blackwater Creek	19980626	Cannings, Sydney G.	0	1	0	1
Grand Forks; Gilpin	19990616	Cannings, Sydney G.	0	1	0	1
Invermere; Horsethief Creek	19980629	Cannings, Sydney G.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980629	Cannings, Sydney G.	0	0	1	1
Jaffray	19800706	Cannings, Robert A.	0	3	0	3
Kimberley; Bummers Flats	19990616	Ramsay, Leah	0	1	0	1
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	2	3	0	5
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	1	0	1
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Halverson, Larry	0	2	0	2

Libellulidae

Leucorrhinia hudsonica (Selys)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Radium Hot Springs; Lookout Point	19990617	Ramsay, Leah	0	4	0	4
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980701	Cannings, Sydney G.	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Coates, Sally E.	0	1	0	1
Nelson; Hall	19990722	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Rossland; Nancy Greene Lakes	19990726	Blades, David C.A.; Sendall, Kelly A.	1	1	0	2
Wilmer	19760515	Merilees, William J.	0	1	0	1
Wilmer	19820616	Sargent, Randy	1	2	0	3
Wilmer; Columbia River	19880602	Cannings, Robert A.	7	1	0	8
Yoho National Park; Field; Emerald Lake	19980627	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Field; Emerald Lake	19980627	Ramsay, Leah	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980726	Archard, Gabrielle A.	0	3	0	3
Yoho National Park; Field; Emerald Lake	19980726	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	3	1	0	4
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Archard, Gabrielle A.	0	4	0	4
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	2	0	2
Yoho National Park; Golden; Leanchoil	19980731	Cannings, Sydney G.	1	2	0	3
Yoho National Park; Golden; Leanchoil	19980731	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Ross Lake	19990727	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Golden; Ross Lake	19990727	Ramsay, Leah	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980801	Cannings, Sydney G.	1	1	0	2
Yoho National Park; Stephen; Ross Lake	19980801	Coates, Sally E.	1	2	0	3
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Hutchings, Gordon E.	1	0	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Shank, Chris	1	0	0	1
Kootenay Total			**40**	**87**	**4**	**131**

Leucorrhinia intacta (Hagen)
Dot-tailed Whiteface

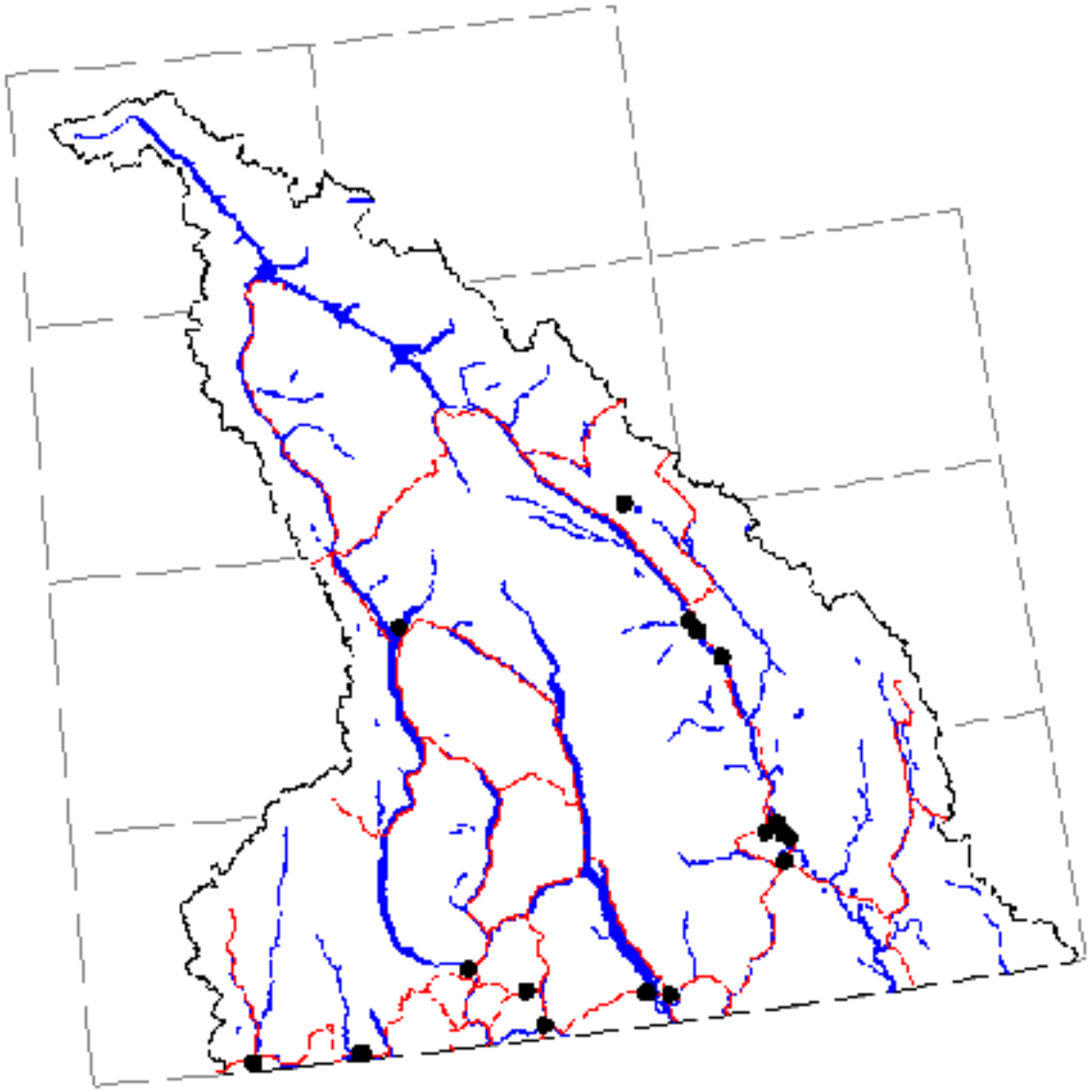
Provincial Status:
CDC rank: S5
Common in the southern lowlands (Cannings and Stuart 1977); very rare in the far northeast (L. Ramsay, unpubl. data).

Columbia-Kootenay Distribution
Widespread in the region's valleys.

Global Distribution
British Columbia east to Nova Scotia; south to Virginia, Tennessee, Missouri, Kansas, Colorado and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological information
Unlike other local *Leucorrhinia* species, *L. intacta* is most at home in warm, lowland waters. Although the known flight period in British Columbia is from 1 May to 25 August (Cannings and Stuart 1977; S. Cannings, unpubl. data), Kootenay records of adults range from only 15 June to 29 July.

Leucorrhinia intacta (Hagen)



Libellulidae

Leucorrhinia intacta (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Castlegar	19740727	Merilees, William J.	1	1	0	2
Cranbrook	19990619	Nicholson, Dean	0	1	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	2	4	0	6
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	1	2	0	3
Creston	19790606	Askevold, Ingolf	0	0	7	7
Creston	19790708	Askevold, I.	0	0	1	1
Creston	19980620	Cannings, Richard J.	1	2	0	3
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	4	2	0	6
Fort Steele	19990724	Ramsay, Leah	1	2	0	3
Galena Bay	19810701	Cannings, Robert A.	0	1	0	1
Grand Forks	19990615	Cannings, Sydney G.	1	2	0	3
Grand Forks; Gilpin	19990616	Cannings, Sydney G.	0	1	0	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	0	1	1
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	1	0	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	1	1	0	2
Kimberley; Bartholomew Lake	19990615	Ramsay, Leah	1	0	0	1
Kimberley; Bummers Flats	19990616	Ramsay, Leah	3	0	0	3
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	1	0	0	1
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	1	2	0	3
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Wilmer	19980719	Cannings, Robert A.	0	1	0	1
Windermere Lake	19760715	Merilees, William J.	0	1	0	1
Kootenay Total			**20**	**24**	**9**	**53**

Leucorrhinia proxima Calvert
Red-waisted Whiteface

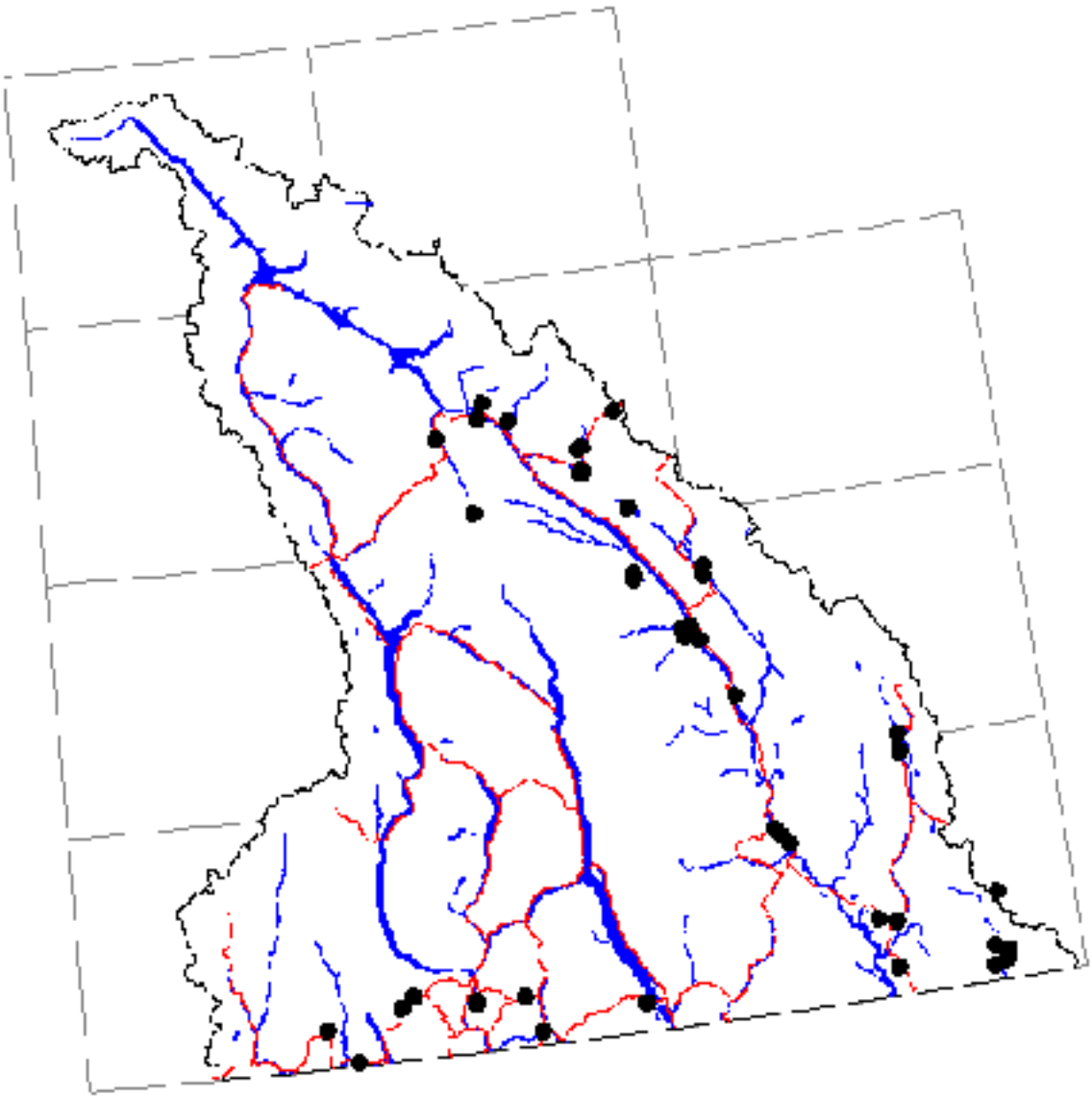
Provincial Status:
CDC rank: S5
Common throughout the province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Newfoundland; south to Virginia, Pennsylvania, Michigan, Minnesota, Montana, Colorado and California (Bick and Mauffray 2000). Faunal element: Southern Boreal (see Appendix 2).

Biological information
A widespread dragonfly most abundant in warm boreal and sub-boreal lakes and peatlands. Columbia Basin flight records range from 2 June to 23 August; provincially, these dates are 15 May to 23 August (Cannings and Stuart 1977; this study).

Leucorrhinia proxima Calvert



Libellulidae

Leucorrhinia proxima Calvert

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Twin Lakes	19980630	Cannings, Sydney G.	0	2	0	2
Canal Flats; Findlay Creek; Bear Lake	19990711	Nicholson, Dean	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	1	0	1
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	0	3	0	3
Champion Lakes Park; Trail; Champion Lakes	19990724	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	5	0	5
Christina Lake; Bonanza Pass	19990818	Ramsay, Leah	1	2	0	3
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Cannings, Sydney G.	0	1	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	4	0	4
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	1	0	1
Creston	19990623	Nicholson, Dean	0	1	0	1
Elkford	19990822	Ramsay, Leah	0	1	0	1
Elkford; Line Creek	19990614	Ramsay, Leah	0	1	0	1
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	1	0	1
Fernie; Jaffray; Edwards Lakes	19990823	Ramsay, Leah	0	1	0	1
Flathead	19990801	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	2	4	0	6
Flathead	19990802	Ramsay, Leah	3	2	0	5
Flathead; Marl Lake	19990801	Cannings, Sydney G.	2	3	0	5
Flathead; Marl Lake	19990801	Ramsay, Leah	1	2	0	3
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	1	1	0	2
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	3	0	3
Flathead; Sage Creek	19990803	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; Beaver River Valley	19980724	Morris, Mike	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980701	Cannings, Sydney G.	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	0	1	0	1
Golden; Blaeberry	19980625	Cannings, Sydney G.	0	1	0	1
Golden; Brisco; Halfway Lake	19990726	Ramsay, Leah	1	3	0	4
Golden; Donald	19980805	Cannings, Robert A.	1	0	0	1
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	1	0	0	1
Golden; Kicking Horse River	19980804	Ramsay, Leah	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	7	7
Harrogate; Kootenay River	19980727	Coates, Sally E.	0	1	0	1
Invermere; Lake Enid	19980816	Nicholson, Dean	0	1	0	1
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	1	1	0	2
Jaffray	19990619	Nicholson, Danielle; Harris, Valerie	0	1	0	1
Kimberley; Bummers Flats	19990616	Ramsay, Leah	1	0	0	1

Libellulidae

Leucorrhinia proxima Calvert

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	2	0	2
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	0	1	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	1	4	0	5
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Salmo; Nelway; Rosebud Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Trail; Champion Lakes	19990806	Cannings, Sydney G.	1	2	0	3
Trail; Champion Lakes	19990806	Ramsay, Leah	0	3	0	3
Wilmer	19820616	Sargent, Randy	2	2	0	4
Wilmer; Columbia River	19880602	Cannings, Robert A.	1	11	0	12
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980627	Cannings, Sydney G.	0	2	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Ramsay, Leah	0	2	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Archard, Gabrielle A.	0	2	0	2
Yoho National Park; Field; Narao Lakes; Cataract Brook	19980803	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Archard, Gabrielle A.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980802	Ramsay, Leah	0	2	0	2
Kootenay Total			**22**	**106**	**7**	**135**

Libellula Linnaeus

The genus *Libellula* contains five large, striking species in British Columbia and the Columbia Basin. Most have banded or spotted wings, and in most species, the males sport white, pruinose abdomens. They are showy insects, perching, hovering and skimming over the waters of ponds and sluggish rivers. Females oviposit alone, dipping the abdomen onto the water's surface.

Species:
Libellula forensis Hagen
Libellula julia Uhler
Libellula lydia Drury
Libellula pulchella Drury*
Libellula quadrimaculata Linnaeus

Libellula forensis Hagen
Eight-spotted Skimmer

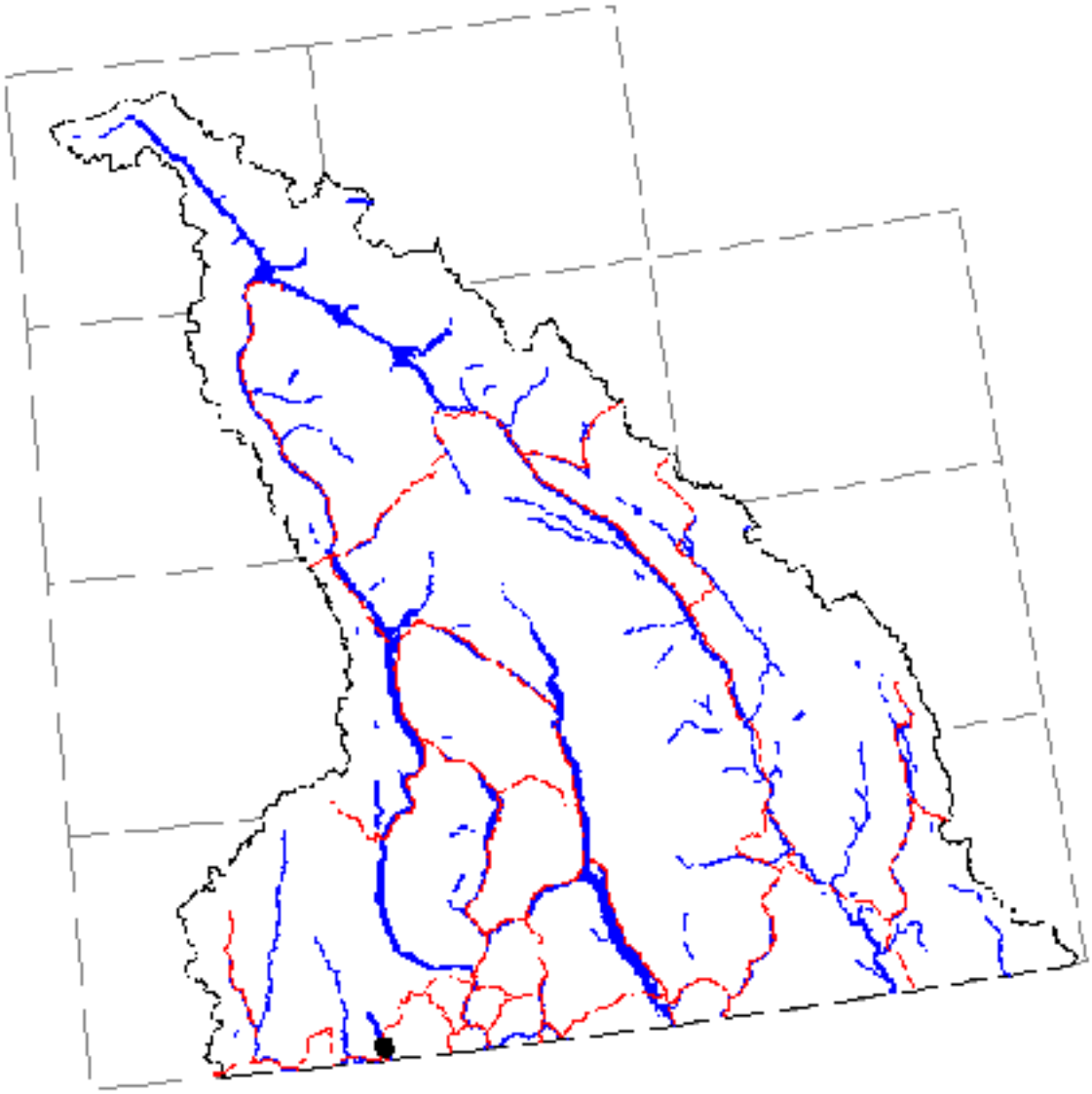
Provincial Status:
CDC rank: S5
Common south of about 51ºN, at least in the southwest; apparently rare in most of the Kootenay region.

Columbia-Kootenay Distribution
Within the region it has been collected at Kootenay Lake and Christina Creek, the outlet of Christina Lake. During the present study it was collected only at the latter site between 26 July to 28 August (see Appendix 3). The only evidence of the species in the East Kootenays is a sighting of a male by Rob Cannings at Brisco on 7 August 1998.

Global Distribution
Southern British Columbia south to New Mexico, Arizona and California; records on the Great Plains from Nebraska and South Dakota (Bick and Mauffray 2000). Faunal element: Cordilleran (see Appendix 2).

Biological information
L. forensis is found in lakes and ponds over a relatively long flight period. In B.C. it has been recorded from 6 May until 28 October (Cannings and Stuart 1977).

Libellula forensis Hagen



Libellulidae

Libellula forensis Hagen

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990817	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	0	1	1
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990817	Hatter, Ian	0	1	0	1
Christina Lake; Christina Creek	19990828	Hatter, Ian	1	0	0	1
Kootenay Total			**1**	**8**	**1**	**10**

Libellula julia Uhler
Chalk-fronted Skimmer

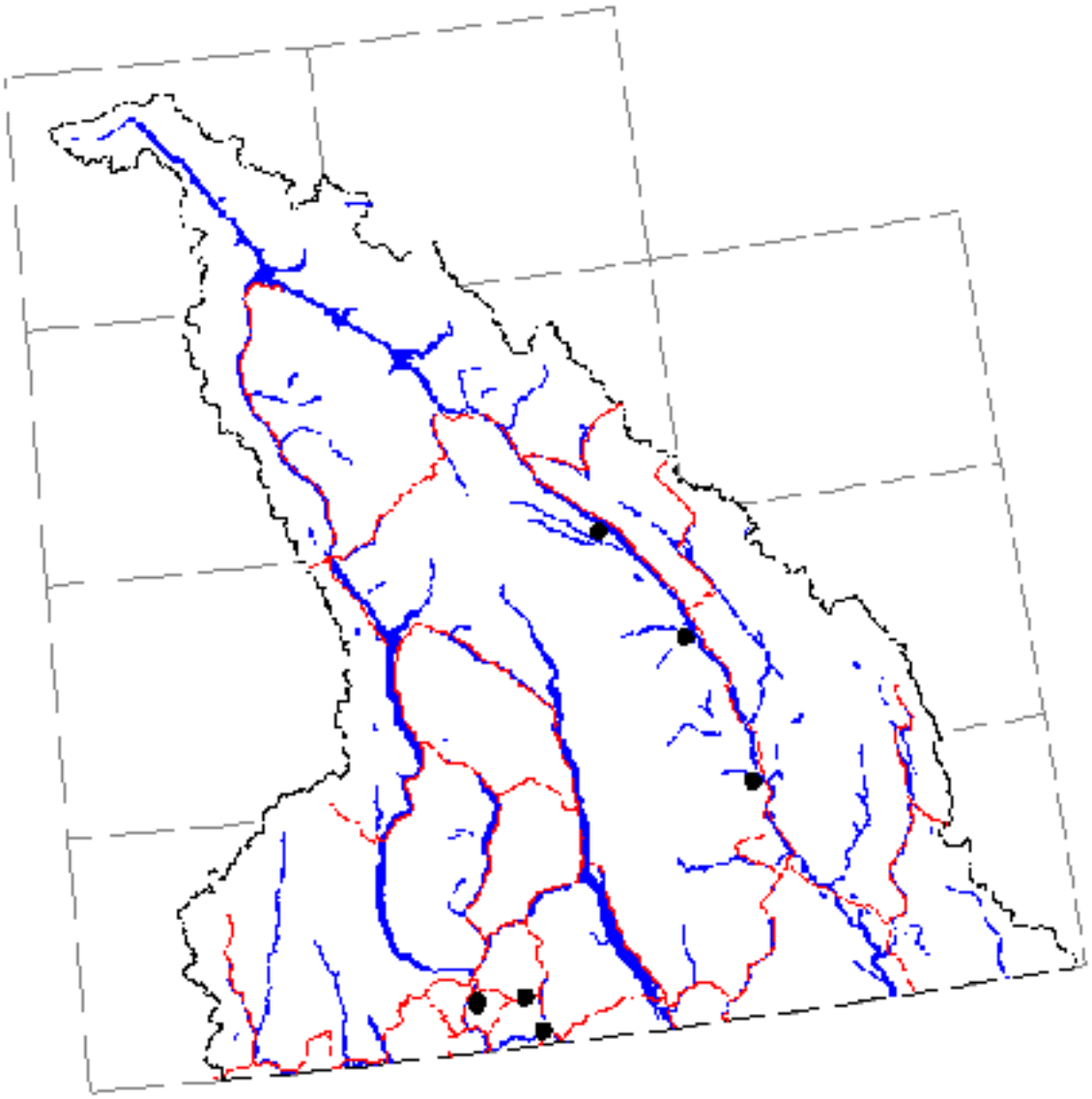
Provincial Status:
CDC rank: S5
Widespread in the southern half of the province.

Columbia-Kootenay Distribution
Found in a few scattered localities along the Trench and in the Trail area. When Cannings and Stuart wrote their book in 1977, *L. julia* was known in the Columbia Basin from Christina Lake only.

Global Distribution
Southern British Columbia east to Nova Scotia; south to Virginia, Pennsylvania, Michigan, Minnesota, Montana, Wyoming, Utah and California (Bick and Mauffray 2000).
Faunal element: Transition (see Appendix 2).

Biological information
L. julia tends to be found in boggy ponds and swampy bays where it favours acidic conditions. It is often seen resting on rocks, logs or the bare ground (Walker and Corbet 1975). The species is more common in early summer than later; Columbia Basin records range from 20 June to 6 August. In the province as a whole, adults have been found flying from 3 June to 26 August (Cannings and Stuart 1977).

Libellula julia Uhler



Libellulidae

Libellula julia Uhler

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	0	4	0	4
Champion Lakes Park; Trail; Champion Lakes	19990724	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	0	2	0	2
Invermere; Lillian Lake	19980630	Ramsay, Leah	0	2	0	2
Parson; Bittern Lake	19990620	Nicholson, Dean	1	0	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Salmo; Nelway; Rosebud Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Skookumchuck; Tamarack Lake	19980711	Nicholson, Dean	0	1	0	1
Trail; Champion Lakes	19990806	Cannings, Sydney G.	1	3	0	4
Kootenay Total			**2**	**19**	**0**	**21**

Libellula lydia Drury
Common Whitetail

Provincial Status:
CDC rank: S4
Restricted to areas south of about 50° N.

Columbia-Kootenay Distribution
Collected at six scattered localities in the southern Kootenays. There are also sight records of this distinctive dragonfly from Halfway Lake (Brisco) and Rosebud Lake.

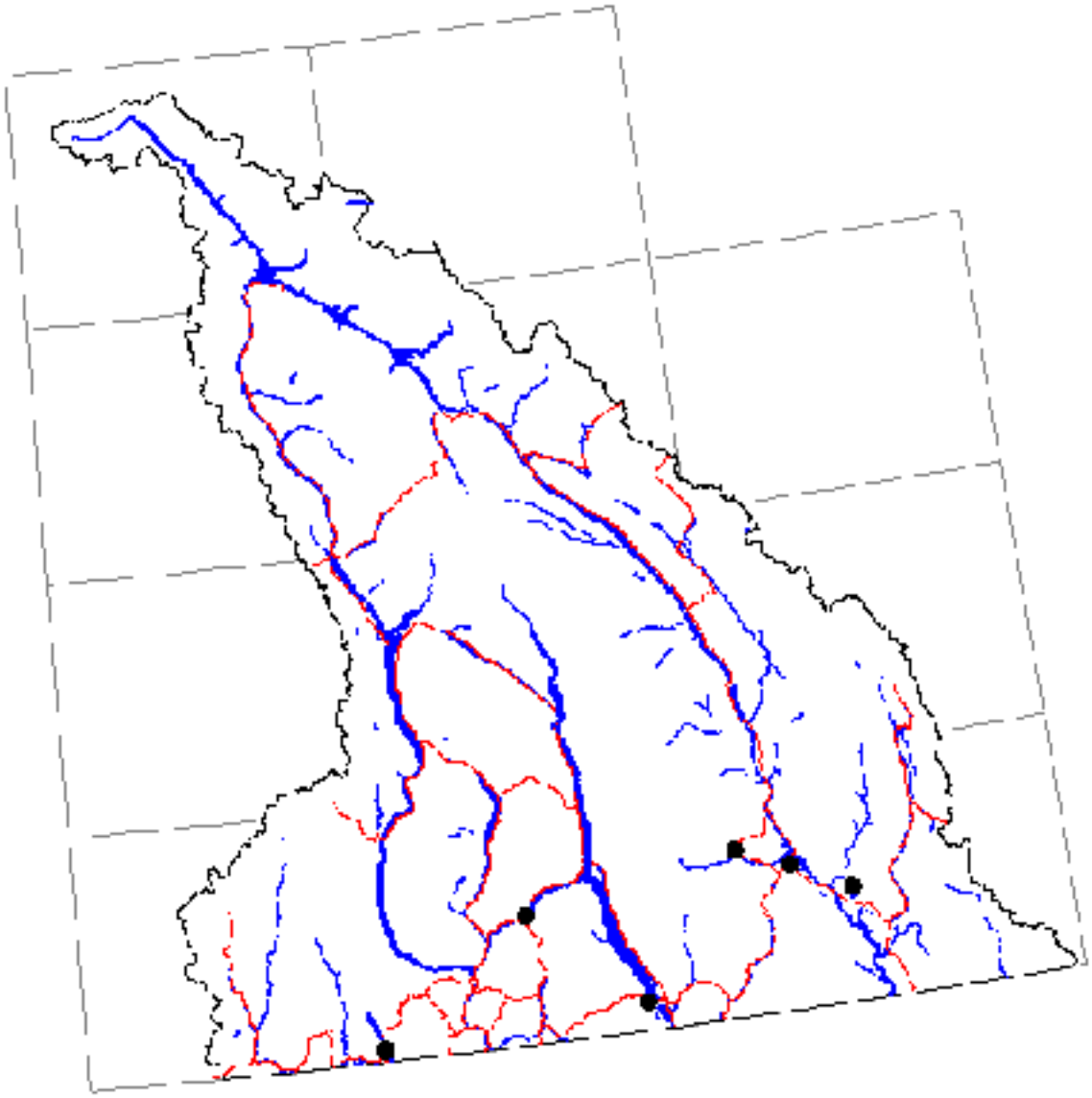
Global Distribution
British Columbia east to Newfoundland (excluding the prairie provinces); south through all contiguous states and into north eastern Mexico (Bick and Mauffray 2000).
Faunal element: Austral (see Appendix 2).

Biological information
L. lydia lives in ponds, pools in streams, marshes and quiet corners of lakes. It tolerates very shallow water, including sites that have been trampled by livestock. Columbia Basin adult records range from 4 July to 11 August; British Columbia records range from 14 May to 24 September (Cannings and Stuart 1977).

Male

Female

Libellula lydia Drury



Libellulidae

Libellula lydia Drury

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Cranbrook	19990704	Nicholson, Dean	0	1	0	1
Creston; Creston Marsh	19990720	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Galloway; Sand Lake	19990811	Nicholson, Dean	1	0	0	1
Kimberley; Mark Creek	19990716	Nicholson, Dean	0	1	0	1
Nelson	19800510	Askevold, Ingolf	0	0	1	1
Kootenay Total			**2**	**4**	**1**	**7**

Libellula pulchella Drury*
Twelve-spotted Skimmer

Provincial Status:
CDC rank: S3
Blue List
L. pulchella lives only in the warmest parts of the valleys of southcentral and southeastern British Columbia. Most of its habitat has been drained and filled in the past century.

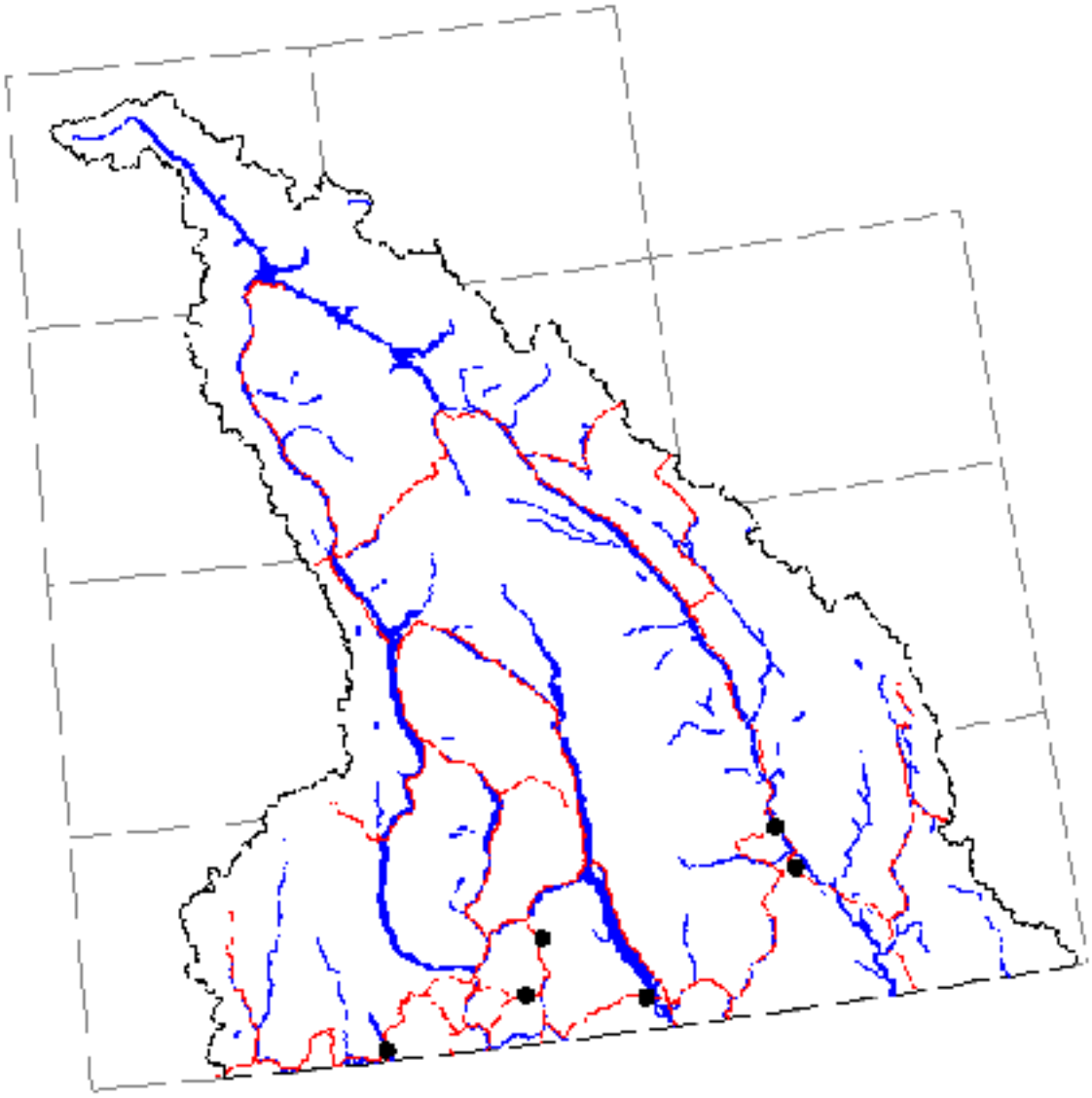
Columbia-Kootenay Distribution
Found in six localities in the lowlands including Tobacco Plains, Revelstoke, Creston and Cranbrook.

Global Distribution
L. pulchella is uncommon in most of southern Canada; it ranges south throughout the USA (Bick and Mauffray 2000). It is not found in coastal British Columbia or Washington. Faunal element: Austral (see Appendix 2).

Biological information
This large and boldly patterned *Libellula* lives in exposed, nutrient-rich marshy lakes and ponds mainly in calcareous soils. The species avoids peaty waters (Walker and Corbet 1975). Females oviposit, like all Libellulidae, directly into the water, but place eggs in areas where submerged vegetation grows. Adult males are aggressively territorial, often driving away other dragonflies -- which sometimes includes ovipositing females -- from an area (Walker and Corbet 1975). The flight period in British Columbia is from 5 June to 21 August although it is probably longer (Cannings and Stuart 1977, Cannings 1998), particularly as the flight period in Washington runs from 6 May to 17 September (Paulson 1999). Columbia Basin records range from 12 July to 15 August.

Management and protection considerations
Wetlands, particularly in low lying areas, always run the risk of being drained, filled for development or polluted; undoubtedly many wetlands from the southern interior have already been lost. Management practices that ensure the continued viability of wetlands should be followed. Remaining ponds and marshes that appear suitable for this species should be protected. The impacts of development, livestock trampling and harmful water runoff should be minimized.

Libellula pulchella Drury



Libellulidae
Libellula pulchella Drury

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Cranbrook	19910815	Cannings, R.A.; Nadel, H.	0	1	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	1	0	1
Creston	19800712	Cannings, Robert A.	1	0	0	1
Creston	19890718	Guppy, Crispin S.	1	1	0	2
Nelson; Hall	19990722	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Kootenay Total			**2**	**6**	**0**	**8**

Libellula quadrimaculata Linnaeus
Four-spotted Skimmer

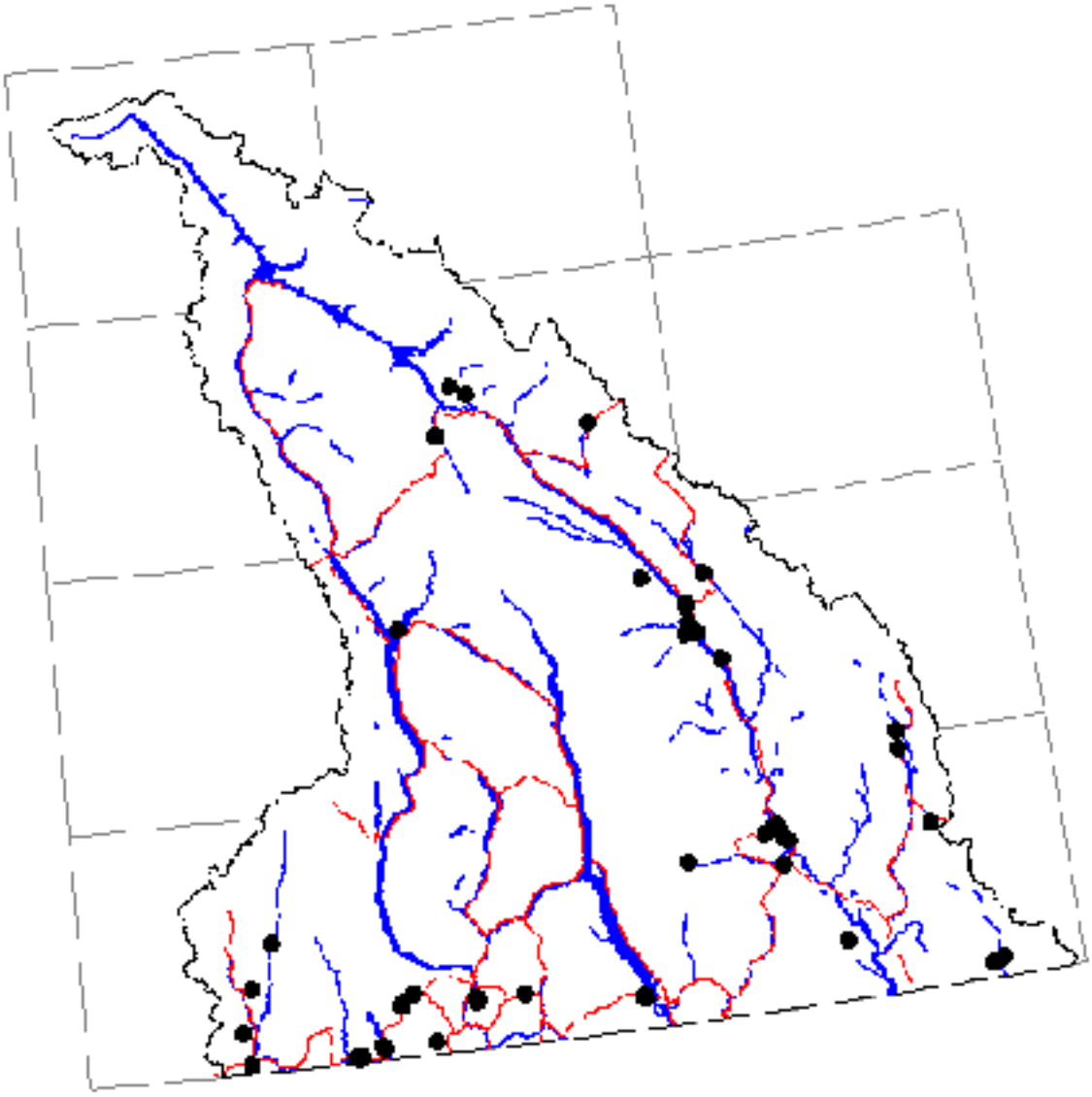
Provincial Status:
CDC rank: S5
Common throughout British Columbia.

Columbia-Kootenay Distribution
Widespread throughout the region.

Global Distribution
L. quadrimaculata is one of the most widespread dragonflies on the globe. It is found throughout Canada including the Yukon and Northwest Territories, south to New Jersey, West Virginia, Ohio, Kansas, Texas and Arizona; also in northern Europe and Asia (Bick and Mauffray 2000, Cannings and Stuart 1977). Faunal element: Widespread Holarctic (see Appendix 2).

Biological information
L. quadrimaculata is found everywhere from northern bogs to alkaline ponds and most marsh-edged waters. Kootenay records range from 8 May to 19 August; B.C. records range from 2 May to 29 September (Cannings and Stuart 1977).

Libellula quadrimaculata Linnaeus



Libellulidae

Libellula quadrimaculata Linnaeus

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Hall Lakes	19990726	Ramsay, Leah	0	2	0	2
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	1	0	1
Champion Lakes Park; Trail; Champion Lakes	19990721	Ramsay, Leah	0	4	0	4
Champion Lakes Park; Trail; Champion Lakes	19990724	Blades, David C.A.; Sendall, Kelly A.	0	8	0	8
Christina Lake; Bonanza Pass	19990726	Blades, David C.A.; Sendall, Kelly A.	0	8	0	8
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	0	5	0	5
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	1	0	1
Christina Lake; Christina Creek	19990828	Hatter, Ian	1	0	0	1
Conkle Lake Park; Osoyoos; Conkle Lake	19990728	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Cranbrook	19990531	Nicholson, Dean	1	0	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	2	1	0	3
Cranbrook; Campbell Lake	19990616	Ramsay, Leah	0	1	0	1
Cranbrook; Campbell Lake	19990729	Ramsay, Leah	0	1	0	1
Creston	19790508	Askevold, Ingolf	1	0	0	1
Creston	19790510	Askevold, Ingolf	0	1	0	1
Creston	19890718	Guppy, Crispin S.	1	0	0	1
Creston	19980620	Cannings, Richard J.	0	1	0	1
Elkford	19990822	Ramsay, Leah	0	2	0	2
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	0	1	0	1
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Galena Bay	19800701	Cannings, Robert A.	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	0	1	0	1
Golden; Donald; Blackwater Creek	19980626	Ramsay, Leah	0	0	2	2
Golden; Donald; Bluewater Creek	19980626	Ramsay, Leah	0	0	1	1
Grand Forks	19990615	Cannings, Sydney G.	0	2	0	2
Grand Forks; Gilpin	19990616	Cannings, Sydney G.	0	1	0	1
Grand Forks; Gilpin	19990817	Hatter, Ian	0	0	1	1
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	1	0	0	1
Invermere; Lillian Lake	19980630	Cannings, Sydney G.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	0	1	0	1
Kelowna; Christian Valley	19990728	Blades, David C.A.; Sendall, Kelly A.	0	5	0	5
Kimberley; Bartholomew Lake	19990615	Ramsay, Leah	0	1	0	1
Kimberley; Bummers Flats	19990616	Ramsay, Leah	3	0	0	3
Kimberley; Bummers Flats	19990729	Ramsay, Leah	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	1	0	0	1
Kimberley; St. Mary Lake	19990615	Ramsay, Leah	1	1	0	2
Kootenay National Park; Edgewater; Nixon Creek	19990728	Ramsay, Leah	0	1	0	1

Libellulidae

Libellula quadrimaculata Linnaeus

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Radium Hot Springs; Lookout Point	19990728	Cannings, Sydney G.	0	1	0	1
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	1	3	0	4
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Rock Creek; Taurus Lake	19990829	Hatter, Ian	1	0	0	1
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	0	4	0	4
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	1	2	0	3
Salmo; Erie Lake	19990806	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990828	Hatter, Ian	0	1	0	1
Salmo; Erie Lake	19990828	Ramsay, Leah	0	2	0	2
Sparwood; Michel Creek	19990613	Ramsay, Leah	0	3	0	3
Trail; Champion Lakes	19990806	Cannings, Sydney G.	0	1	0	1
Trail; Champion Lakes	19990806	Ramsay, Leah	0	1	0	1
Wilmer; Columbia River	19880602	Cannings, Robert A.	3	3	0	6
Windermere Lake	19760715	Merilees, William J.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	0	1	0	1
Kootenay Total			**18**	**84**	**4**	**106**

Sympetrum Newman

Sympetrum species are mostly small, red dragonflies abundant as adults especially in late summer and fall. The nine species are especially common in marshy lowland habitats. The black and yellow colours of *S. danae* are unusual in this genus.

Species:
Sympetrum corruptum (Hagen)
Sympetrum costiferum (Hagen)
Sympetrum danae (Sulzer)
Sympetrum internum Montgomery
Sympetrum madidum (Hagen)
Sympetrum obtrusum (Hagen)
Sympetrum occidentale Bartenev
Sympetrum pallipes (Hagen)
Sympetrum vicinum (Hagen)*

***S. pallipes* mating**

Sympetrum corruptum (Hagen)
Variegated Meadowhawk

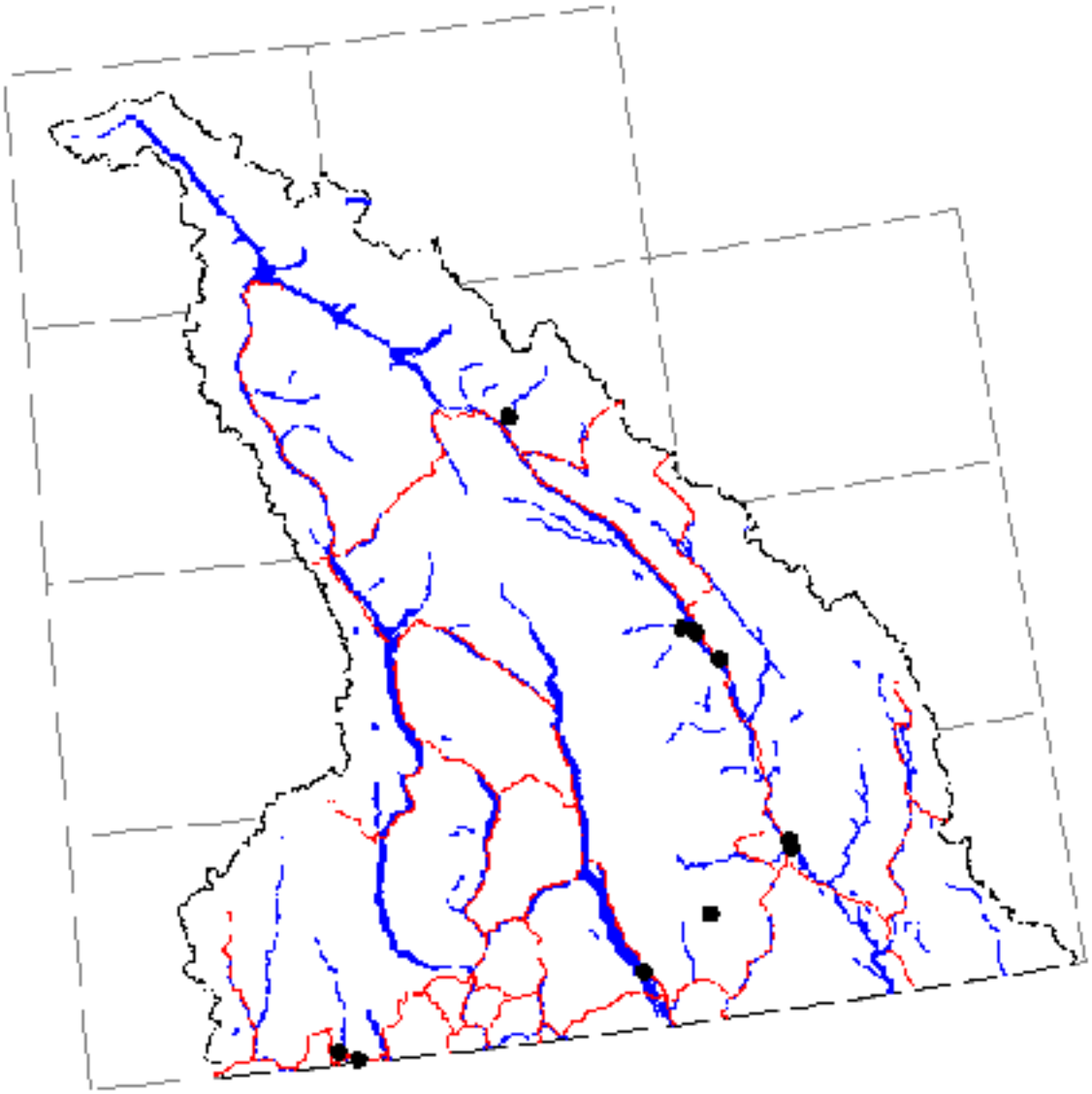
Provincial Status:
CDC rank: S5
Widespread in southern British Columbia.

Columbia-Kootenay Distribution
Widely scattered in the region.

Global Distribution
British Columbia east to Nova Scotia, south to Florida and Mexico. It is also found in northeastern Asia (Bick and Mauffray 2000, Cannings and Stuart 1977). Faunal element: Widespread (see Appendix 2).

Biological information
S. corruptum lives around ponds of various sorts, often ones that are sandy or gravelly. It can be common in semi-arid habitats. Kootenay records range from 16 June to 4 September; in British Columbia the dates are 3 May to 2 October (S.G. Cannings, unpubl. data).

Sympetrum corruptum (Hagen)



Libellulidae

Sympetrum corruptum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Cranbrook; Richmond Lake	19990904	Nicholson, Dean	1	1	0	2
Creston; Duck Lake	19980621	Cannings, Richard J.	0	1	0	1
Fort Steele	19800705	Cannings, Robert A.	0	2	0	2
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	1	0	1
Grand Forks	19990616	Cannings, Sydney G.	0	4	0	4
Grand Forks; Gilpin; Manly Creek	19990616	Cannings, Sydney G.	1	0	0	1
Invermere; Athalmer	19820821	Cannings, Robert A.	1	0	0	1
Invermere; Lake Eileen	19980630	Cannings, Sydney G.	1	3	0	4
Invermere; Lake Eileen	19980630	Ramsay, Leah	1	0	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Ramsay, Leah	0	3	0	3
Windermere Lake	19760715	Merilees, William J.	0	2	0	2
Kootenay Total			**5**	**17**	**0**	**22**

Sympetrum costiferum (Hagen)
Saffron-winged Meadowhawk

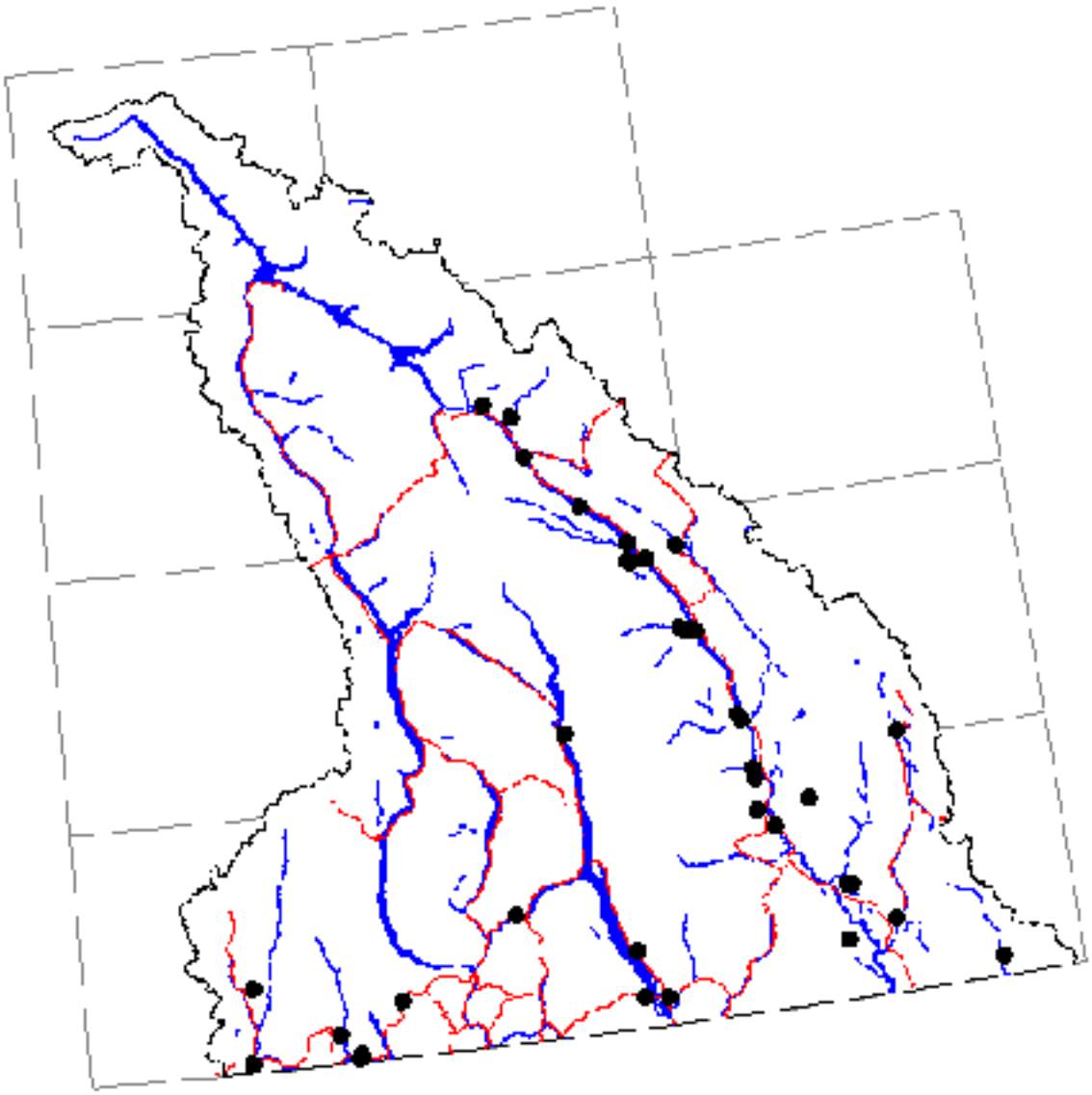
Provincial Status:
CDC rank: S5
Common in southern British Columbia.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
British Columbia east to Newfoundland; south to New Jersey, Kentucky, Missouri, Nebraska, New Mexico and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological information
S. costiferum lives in marshes, marshy lakeshores and ponds. It also lives in saline ponds in the region, and may be the most tolerant *Sympetrum* of alkaline conditions (Walker and Corbet 1975). Columbia Basin records of adults range from 18 July to 18 October; dates for all of British Columbia are 8 July to 1 November (Cannings and Stuart 1977).

Sympetrum costiferum (Hagen)



Libellulidae

Sympetrum costiferum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Cleland Lake	19980806	Cannings, Robert A.	0	1	0	1
Brisco; Cleland Lake	19980807	Cannings, Robert A.	0	0	2	2
Brisco; Cleland Lake	19980807	Hutchings, Gordon E.	0	0	3	3
Brisco; Jade Lake	19980807	Cannings, Robert A.	1	2	1	4
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	1	0	2
Canal Flats	19760806	Ricker, William E.	1	0	0	1
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	1	0	0	1
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	1	0	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	1	0	1
Creston	19790606	Askevold, Ingolf	0	0	2	2
Creston	19790708	Askevold, I.	0	0	4	4
Creston	19890718	Guppy, Crispin S.	0	1	0	1
Elkford	19990822	Ramsay, Leah	1	2	0	3
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990821	Ramsay, Leah	2	1	0	3
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	1	2	0	3
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Fort Steele; Wildhorse River	19990724	Ramsay, Leah	1	0	0	1
Galloway; Sand Lake	19990823	Nicholson, Dean	0	1	0	1
Golden	19980806	Cannings, Robert A.	1	0	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	1	0	0	1
Golden; Donald	19970902	Cannings, Sydney G.	1	2	0	3
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	6	6
Grand Forks; Gilpin	19990817	Hatter, Ian	0	1	0	1
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	0	0	6	6
Grand Forks; Niagara	19990725	Blades, David C.A.; Sendall, Kelly A.	0	0	7	7
Invermere; Athalmer	19820821	Cannings, Robert A.	0	2	0	2
Invermere; Athalmer	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	2	0	2
Invermere; Lake Enid	19980815	Nicholson, Dean	0	1	0	1
Kootenay Lake; Argenta	19990825	Ramsay, Leah	1	2	0	3
Kootenay Lake; Kuskonook	19881008	Taylor, M. Elizabeth	0	1	0	1
Kootenay Lake; West Arm	19871018	Guppy, Crispin S.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	3	0	3
Parson	19980806	Cannings, Robert A.	1	0	0	1
Rock Creek; Myers Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	0	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	1	0	1
Spillimacheen; Columbia River	19820822	Cannings, Robert A.	0	1	0	1
Ta Ta Lake	19881002	Taylor, M. Elizabeth	2	7	0	9
Tamarack Lake	19880929	Taylor, M. Elizabeth	0	3	0	3
Torrent; Larchwood Lake	19880920	Taylor, M. Elizabeth	2	2	0	4
Torrent; Larchwood Lake	19890718	Guppy, Crispin S.	1	2	0	3
Wilmer	19820821	Cannings, Robert A.	0	4	0	4
Kootenay Total			**21**	**52**	**32**	**105**

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Sympetrum danae (Sulzer)
Black Meadowhawk

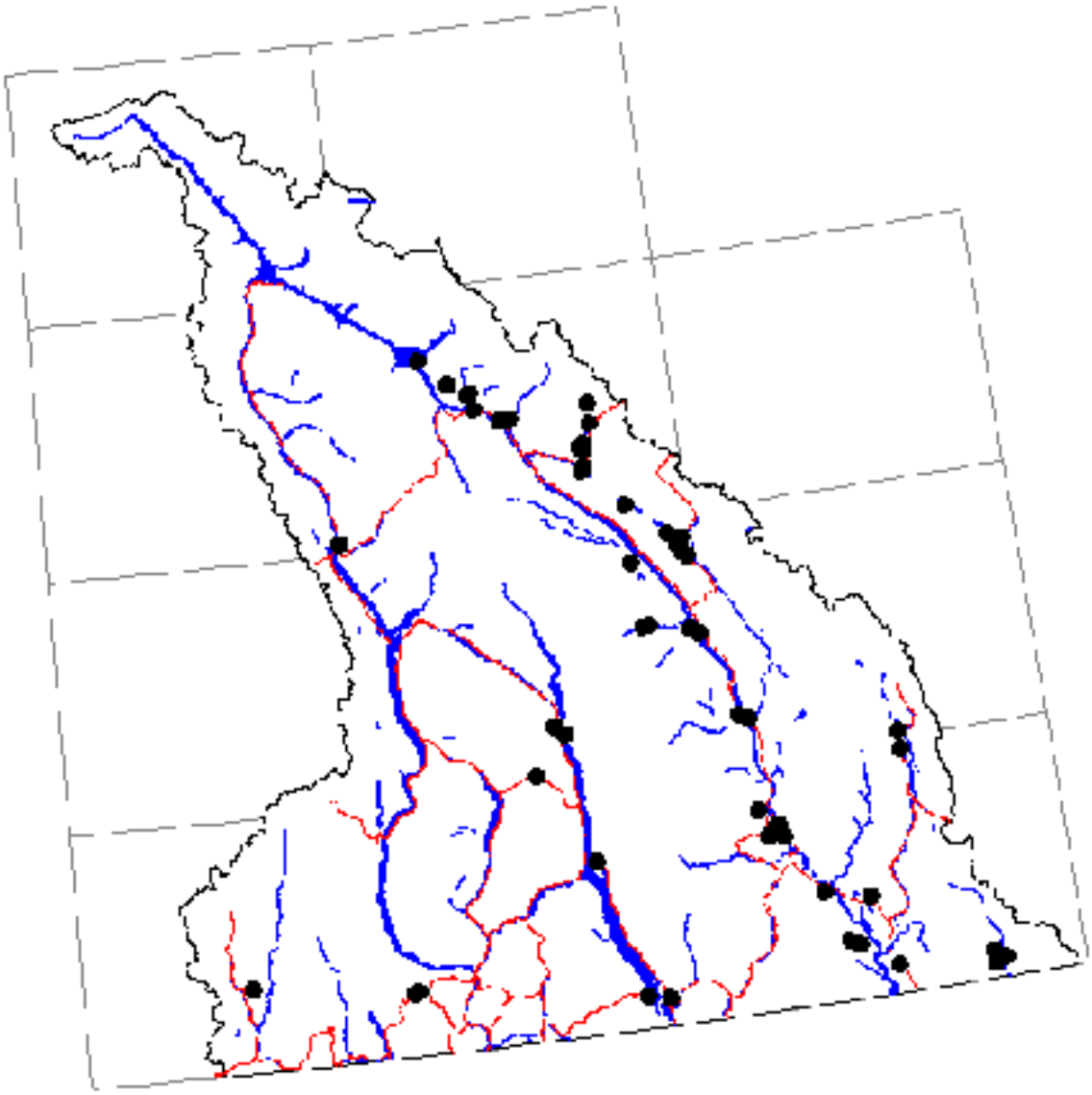
Provincial Status:
CDC rank: S5
Common throughout the province.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Labrador and Newfoundland; south to Kentucky, Michigan, Iowa, Montana, New Mexico and California. It is also found in northern Europe and Asia (Bick and Mauffray 2000, Walker and Corbet 1975). Faunal element: Widespread, Boreal Holarctic (see Appendix 2).

Biological information
This species has a wide ecological tolerance and lives from mountain peatlands to lowland marshes. Flight records in the Kootenays range from 21 July to 19 October; dates in British Columbia are 14 June to 22 October (Cannings and Stuart 1977, S.G. Cannings unpubl. data).

Sympetrum danae (Sulzer)



Libellulidae

Sympetrum danae (Sulzer)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	0	2	0	2
Castlegar; Mud Lake	19990818	Hatter, Ian	1	0	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	1	0	1
Castlegar; Mud Lake	19990826	Ramsay, Leah	0	2	0	2
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	1	1	0	2
Columbia River	19871019	Guppy, Crispin S.	1	5	0	6
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	1	0	0	1
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	1	0	1
Creston	19790708	Askevold, I.	0	0	1	1
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
East Kootenay Valley, Waldo	19970930	Cannings, Robert A.	1	0	0	1
Elkford	19990822	Ramsay, Leah	4	9	0	13
Fernie; Jaffray; Edwards Lakes	19990823	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	3	2	0	5
Flathead	19990802	Cannings, Sydney G.	0	3	0	3
Flathead	19990802	Ramsay, Leah	1	0	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Galloway	19980809	Nicholson, Dean	0	1	0	1
Golden; Blaeberry	19970901	Cannings, Sidney G.	1	1	0	2
Golden; Blaeberry	19970901	Cannings, Sydney G.	1	0	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	1	2	0	3
Golden; Blaeberry	19980804	Hutchings, Gordon E.	0	2	0	2
Golden; Columbia Reach; Bush Arm; Succour Creek	19980728	Ramsay, Leah	0	1	0	1
Golden; Donald	19980802	Hutchings, Gordon E.	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ramsay, Leah	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	0	2	0	2
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	0	3	0	3
Golden; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	1	1	0	2
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	1	3	0	4
Harrogate; Kootenay River	19980802	Ramsay, Leah	1	1	0	2
Invermere; Athalmer	19820821	Cannings, Robert A.	2	2	0	4
Invermere; Athalmer	19820821	Cannings, Sydney G.	0	1	0	1
Invermere; Athalmer	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	1	1	0	2
Invermere; Horsethief Creek; Gopher Creek	19980808	Cannings, Robert A.	0	2	0	2
Invermere; Horsethief Creek; Gopher Creek	19980808	Hutchings, Gordon E.	0	1	0	1
James Chabot Park; Invermere; Windermere Lake	19990728	Cannings, Sydney G.	0	1	0	1
Kaslo	19980809	Cannings, Robert A.	0	1	0	1
Kimberley	19990723	Ramsay, Leah	1	1	0	2
Kimberley; Bummers Flats	19990820	Ramsay, Leah	0	5	0	5
Kootenay Lake; Argenta	19990825	Ramsay, Leah	2	0	0	2
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	1	2	0	3
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Archard, Gabrielle A.	0	1	0	1

Libellulidae

Sympetrum danae (Sulzer)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	0	3	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	1	3	0	4
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Coates, Sally E.	1	2	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	0	1	0	1
Meadow Creek	19990723	Sendall, Kelly	0	1	0	1
Mount Revelstoke National Park; Revelstoke; Mount Revelstoke	19980725	Coates, Sally E.	0	1	0	1
Rock Creek; Taurus Lake	19990829	Hatter, Ian	0	1	0	1
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	1	0	2
Ta Ta Lake	19881002	Taylor, M. Elizabeth	1	1	0	2
Ta Ta Lake	19881005	Taylor, M. Elizabeth	2	4	0	6
Wilmer	19820821	Cannings, Robert A.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Cannings, Sydney G.	0	1	0	1
Yoho National Park; Field; Emerald Lake	19980804	Coates, Sally E.	0	1	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Field; Kicking Horse River	19980802	Coates, Sally E.	3	3	0	6
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	1	1	0	2
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980804	Coates, Sally E.	0	2	0	2
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil	19980731	Archard, Gabrielle A.	1	1	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	0	1	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Ramsay, Leah	0	1	0	1
Kootenay Total			**41**	**103**	**1**	**145**

Sympetrum internum Montgomery
Cherry-faced Meadowhawk

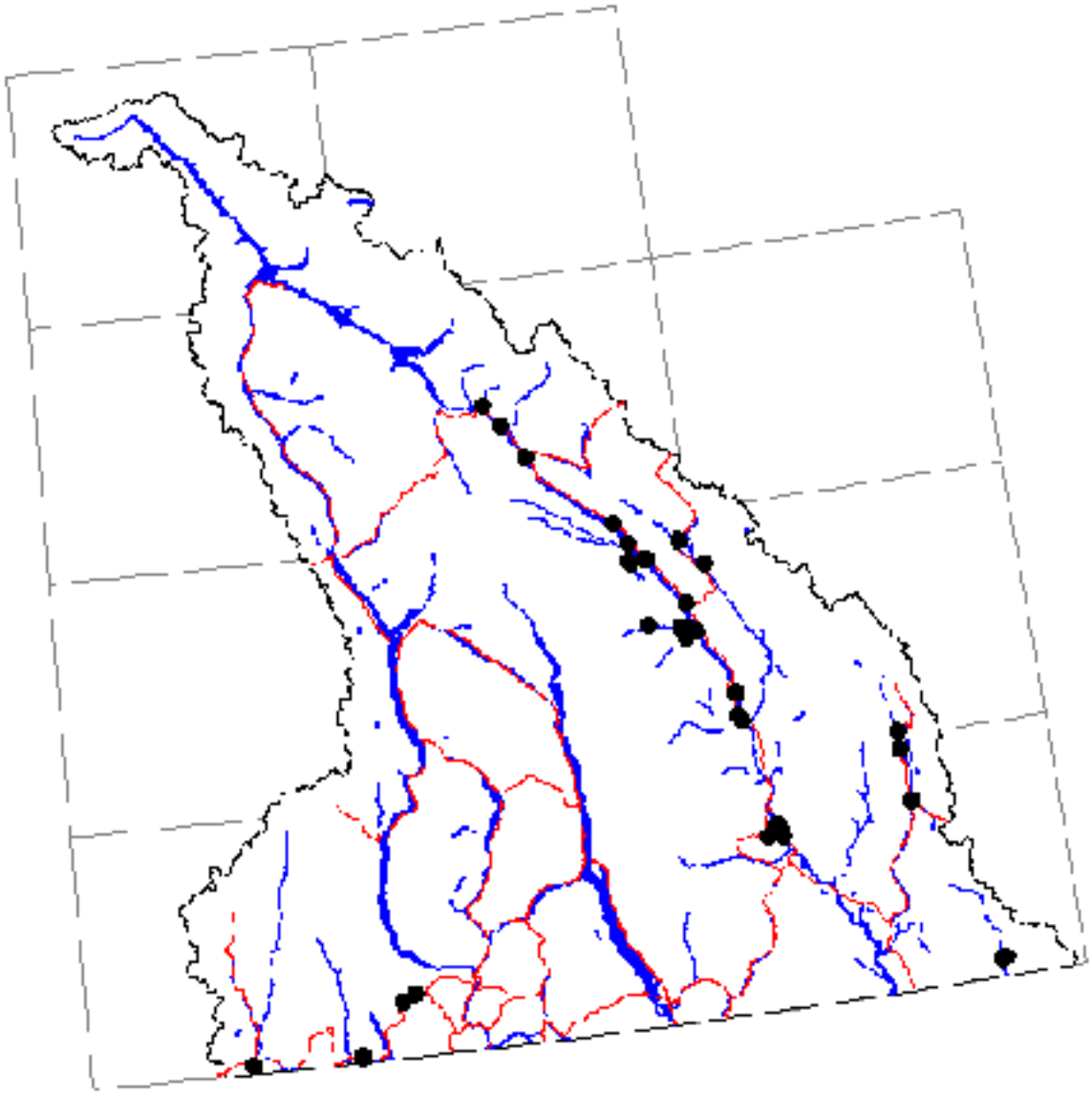
Provincial Status:
CDC rank: S5
Common over most of the province, especially in the south; not known from the coastal islands.

Columbia-Kootenay Distribution
Widespread in the region.

Global Distribution
Alaska east to Newfoundland; south to Kentucky, Missouri, New Mexico and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological information
S. internum lives in marshes and around ponds and slow streams. It is tolerant of a wide range of conditions including shallow cattle-trodden ponds, sphagnum bogs and sedge marshes. The species is often found in very high numbers (Walker and Corbet 1975). Kootenay records range from 29 June to 3 September, while the flight period in the province as a whole is recorded from 14 June to 11 October (Cannings and Stuart 1977, S.G. Cannings unpubl. data).

Sympetrum internum Montgomery



Libellulidae

Sympetrum internum Montgomery

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	0	2	0	2
Brisco; Cleland Lake	19980806	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Canal Flats	19760806	Ricker, N.	1	0	0	1
Canal Flats	19760806	Ricker, William E.	0	1	0	1
Castlegar; Bonanza Pass	19880903	Guppy, Crispin S.	0	1	0	1
Castlegar; Mud Lake	19990818	Hatter, Ian	0	1	0	1
Castlegar; Mud Lake	19990818	Ramsay, Leah	0	1	0	1
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	2	4	0	6
Columbia Lake; Canal Flats; Armstrong Bay	19990729	Cannings, Sydney G.	0	1	0	1
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	1	1	0	2
Elkford	19990822	Ramsay, Leah	6	9	0	15
Flathead	19990802	Cannings, Sydney G.	0	3	0	3
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Proctor Lake	19990803	Cannings, Sydney G.	0	1	0	1
Flathead; Proctor Lake	19990803	Ramsay, Leah	0	2	0	2
Golden	19980806	Cannings, Robert A.	1	4	0	5
Golden	19980806	Hutchings, Gordon E.	1	1	0	2
Golden; Donald	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Moberly	19950724	Cannings, Sydney G.	1	0	0	1
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	4	3	0	7
Grand Forks	19990727	Blades, D; Sendall, K.	0	4	0	4
Grand Forks; Gilpin	19990817	Ramsay, Leah	1	1	0	2
Harrogate; Hot Creek	19980806	Cannings, Robert A.	1	0	0	1
Invermere; Athalmer	19820821	Cannings, Robert A.	1	1	0	2
Invermere; Athalmer	19820821	Cannings, Sydney G.	1	2	0	3
Invermere; Athalmer	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Athalmer	19980808	Hutchings, Gordon E.	0	1	0	1
Invermere; Horsethief Creek	19980629	Archard, Gabrielle A.	1	0	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	2	1	0	3
Invermere; Lake Enid	19980816	Nicholson, Dean	0	1	0	1
Invermere; Lillian Lake	19980808	Cannings, Robert A.	1	0	0	1
Kimberley; Bummers Flats	19990727	Cannings, Sydney G.	1	0	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	2	8	0	10
Kimberley; Mather Creek	19990721	Ohanjanian, Penny	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	1	2	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Mcleod Meadows	19980808	Coates, Sally E.	0	1	0	1
Radium Hot Springs; Columbia River Valley	19880704	Halverson, Larry	1	1	0	2
Radium Hot Springs; Columbia River Valley	19880731	Halverson, Larry	1	0	0	1
Rock Creek; Myers Lake	19990727	Blades, D; Sendall, K.	1	0	0	1
Sparwood	19800711	Cannings, Robert A.	0	1	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	1	1	0	2
Wilmer	19820821	Cannings, Robert A.	1	1	0	2
Kootenay Total			**35**	**67**	**0**	**102**

Sympetrum madidum (Hagen)
Red-veined Meadowhawk

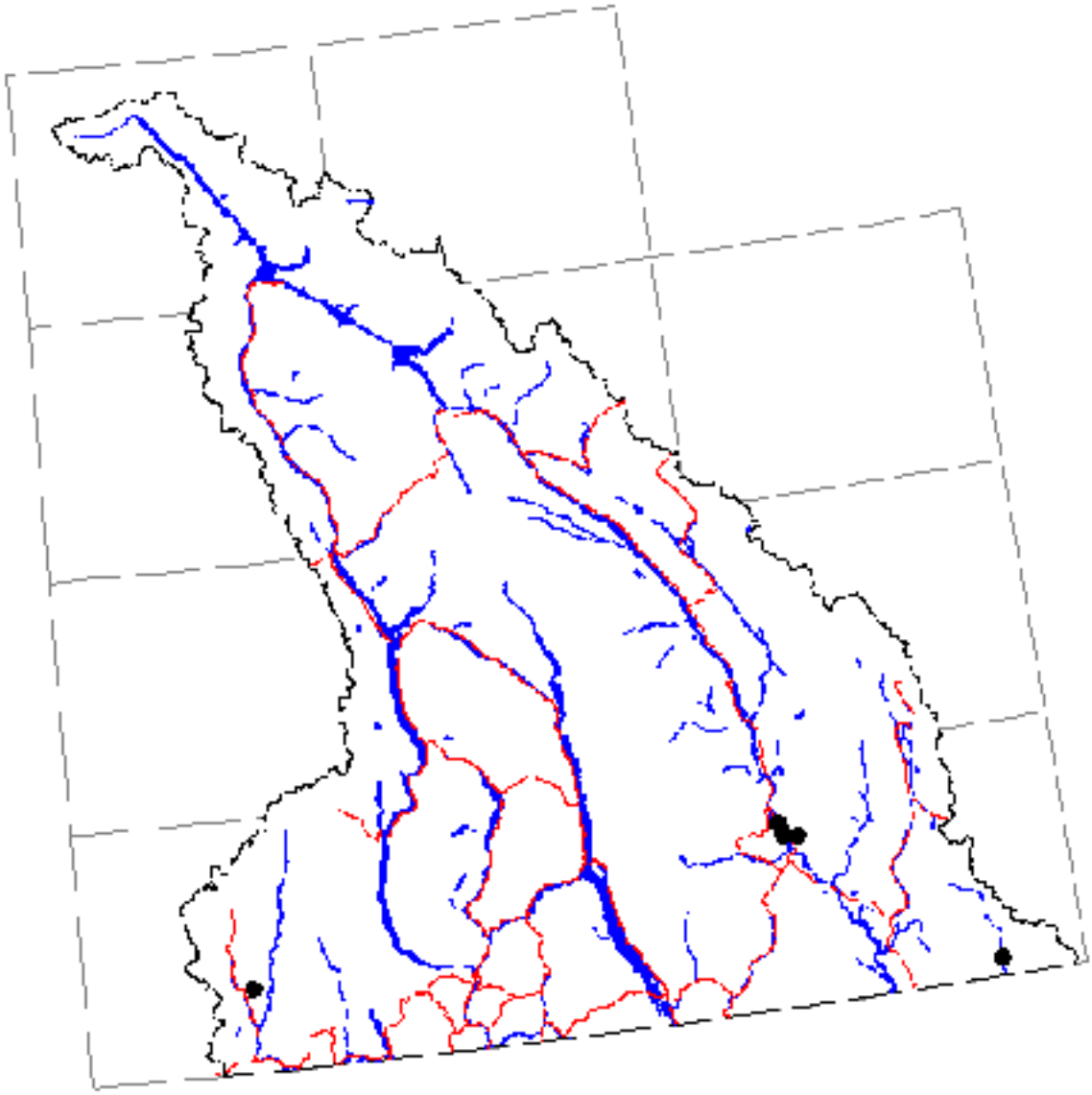
Provincial Status:
CDC rank: S4
Widespread south of 52° N; not known from northern British Columbia, but records from the Yukon and Northwest territories indicate that this species is probably sparsely distributed throughout the northern half of the province.

Columbia-Kootenay Distribution
Known from five localities in the southern half of the region, but is undoubtedly more widespread.

Global Distribution
Yukon east to Manitoba, south to Missouri, Oklahoma, Colorado and California (Bick and Mauffray 2000). Faunal element: Western (see Appendix 2).

Biological information
S. madidum develops in a variety of still-water habitats, including sedge fens and grassland ponds and marshes; these sites are often ephemeral. Cannings (1980b, 1981) described the larva and the ecological preferences of *S. madidum* on the Chilcotin Plateau. The flight period in British Columbia ranges from 26 May to 9 September (Cannings and Stuart 1977), but the known Kootenay dates are much more restricted -- 19 July to 29 August.

Sympetrum madidum (Hagen)



Libellulidae
Sympetrum madidum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Fort Steele	19990724	Ramsay, Leah	1	1	0	2
Fort Steele; Brewery Creek	19980719	Nicholson, Dean	1	0	0	1
Kimberley; Bummers Flats	19990727	Cannings, Sydney G.	0	1	0	1
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	0	3	0	3
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	0	0	1
Kootenay Total			**3**	**7**	**0**	**10**

Sympetrum obtrusum (Hagen)
White-faced Meadowhawk

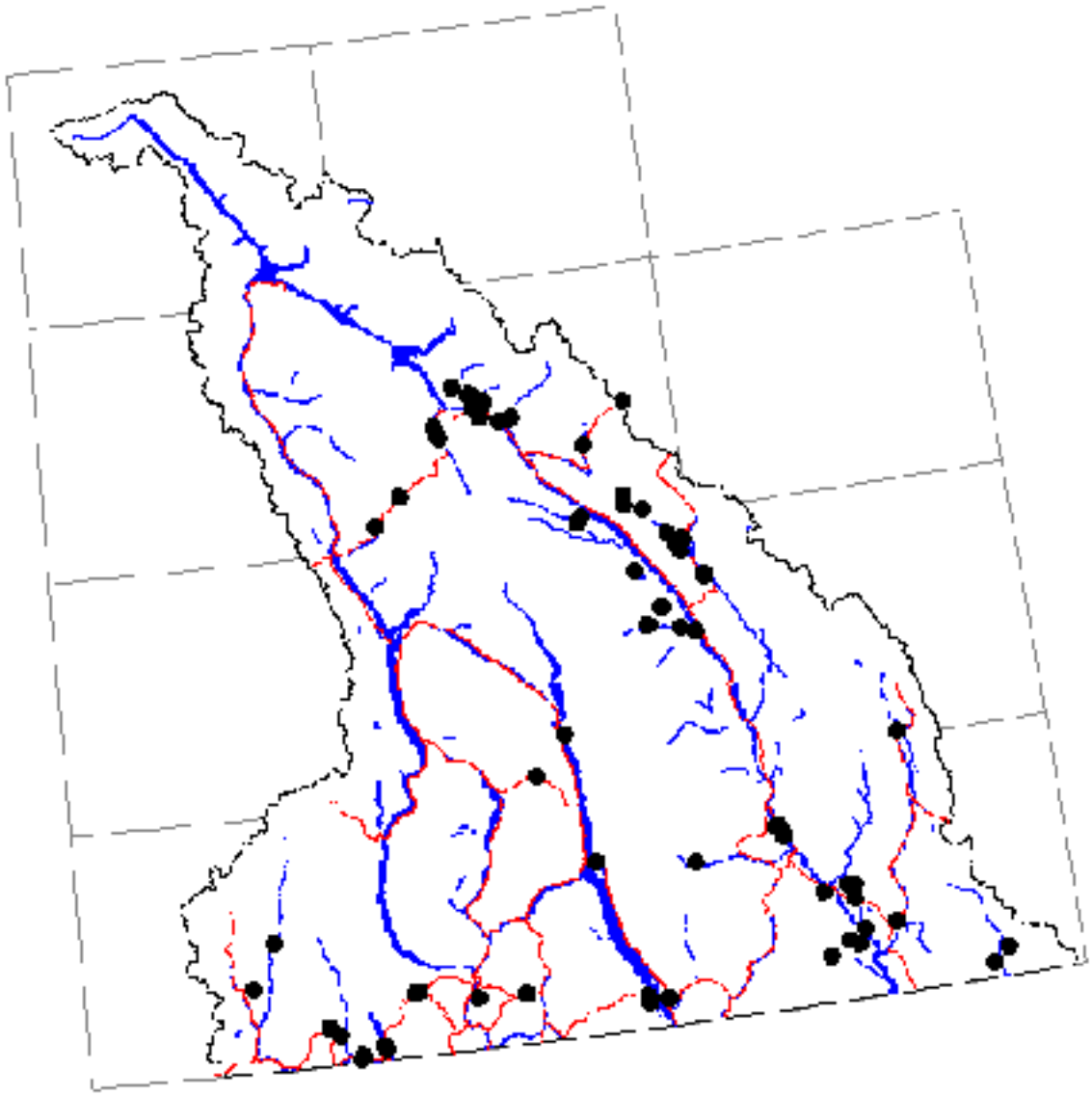
Provincial Status:
CDC rank: S5
S. obtrusum is probably the most common *Sympetrum* in southern British Columbia. It is rare in the far northeast, and remains unknown north of the Skeena valley (Kitwanga) (Cannings and Stuart 1977; L. Ramsay, unpubl. data; S. Cannings, unpubl. data).

Columbia-Kootenay Distribution
Widespread and common in the region.

Global Distribution
British Columbia and southwestern Northwest Territories east to Nova Scotia; south to North Carolina, Kentucky, Kansas, New Mexico and California (Bick and Mauffray 2000). Faunal element: Transition (see Appendix 2).

Biological information
S. obtrusum inhabits a wide variety of ponds, marshes and peatlands in the valleys and mountains. Columbia Basin dates for flying adults are 25 June to 30 September, but known dates for all of British Columbia range from 24 June to 19 October (Cannings and Stuart 1977).

Sympetrum obtrusum (Hagen)



Libellulidae

Sympetrum obtrusum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco; Twin Lakes	19980807	Hutchings, Gordon E.	1	0	0	1
Castlegar; Blueberry Creek	19990826	Ramsay, Leah	2	3	0	5
Castlegar; Mud Lake	19990818	Hatter, Ian	2	1	0	3
Castlegar; Mud Lake	19990818	Ramsay, Leah	1	1	1	3
Castlegar; Mud Lake	19990826	Ramsay, Leah	2	3	0	5
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	2	5	0	7
Christina Lake; Christina Creek	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	7	7
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Christina Lake; Christina Creek	19990807	Ramsay, Leah	0	2	0	2
Christina Lake; Christina Creek	19990828	Hatter, Ian	0	2	0	2
Christina Lake; Christina Creek	19990828	Ramsay, Leah	0	2	0	2
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	1	0	1
Cranbrook; Wardner; Haha Lake	19990730	Cannings, Sydney G.	0	3	0	3
Cranbrook; Wardner; Haha Lake	19990730	Ramsay, Leah	0	1	0	1
Creston	19800712	Cannings, Robert A.	2	2	0	4
Creston	19990722	Lupichuk, Jennifer	2	0	0	2
Creston; Creston Marsh	19990720	Blades, David C.A.; Sendall, Kelly A.	2	1	0	3
Creston; Creston Marsh	19990721	Blades, David C.A.; Sendall, Kelly A.	0	13	0	13
East Kootenay Valley, Waldo	19970930	Cannings, Sydney G.	0	2	0	2
Elkford	19990822	Ramsay, Leah	1	3	0	4
Fernie; Elko; Silver Spring Lakes	19990805	Cannings, Sydney G.	0	1	0	1
Fernie; Jaffray; Caven Creek	19990823	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Little Sand Creek	19990821	Ramsay, Leah	0	1	0	1
Fernie; Jaffray; Sand Lake	19990821	Ramsay, Leah	3	5	0	8
Fernie; Jaffray; Twin Lake	19990823	Ramsay, Leah	1	3	0	4
Flathead	19990802	Cannings, Sydney G.	0	1	0	1
Flathead	19990802	Ramsay, Leah	0	1	0	1
Flathead; Sage Creek	19990803	Ramsay, Leah	0	1	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980625	Ramsay, Leah	1	0	0	1
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980723	Ramsay, Leah	0	3	0	3
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724		3	2	0	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980724	Ramsay, Leah	1	4	0	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Archard, Gabrielle A.	1	4	0	5
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Cannings, Sydney G.	0	2	0	2
Glacier National Park; Rogers Pass; East Gate; Beaver River	19980806	Coates, Sally E.	1	2	0	3
Golden; Blaeberry	19970901	Cannings, Sydney G.	0	2	0	2
Golden; Blaeberry	19980804	Cannings, Robert A.	0	2	0	2
Golden; Blaeberry	19980804	Hutchings, Gordon E.	1	0	0	1
Golden; Donald	19970902	Cannings, Sydney G.	3	4	0	7

Libellulidae

Sympetrum obtrusum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Golden; Donald	19980802	Cannings, Robert A.	0	1	0	1
Golden; Donald	19980802	Hutchings, Gordon E.	0	1	0	1
Golden; Donald; Abetibie Lake	19970902	Cannings, Sydney G.	0	1	0	1
Golden; Donald; Abetibie Lake	19980729	Ramsay, Leah	0	1	0	1
Golden; Donald; Blackwater Creek	19980728	Ferguson, Bob	0	2	0	2
Golden; Donald; Blackwater Creek	19980805	Ramsay, Leah	0	1	0	1
Golden; Donald; Bluewater Creek	19980805	Archard, Gabrielle A.	0	5	0	5
Golden; Donald; Bluewater Creek	19980805	Ramsay, Leah	1	3	0	4
Grand Forks	19990725	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Grand Forks	19990727	Blades, David C.A.; Sendall, Kelly A.	2	10	0	12
Grand Forks; Gilpin	19990817	Hatter, Ian	0	2	0	2
Grand Forks; Gilpin	19990817	Ramsay, Leah	1	2	0	3
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	0	1	0	1
Grand Forks; Niagara	19990725	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Grand Forks; Wilgress Lake	19990727	Blades, David C.A.; Sendall, Kelly A.	0	0	1	1
Harrogate; Beaverfoot River; Dainard Creek	19980727	Coates, Sally E.	1	2	0	3
Harrogate; Beaverfoot River; Dainard Creek	19980727	Ramsay, Leah	0	2	0	2
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	2	0	2
Harrogate; Kootenay River	19980804	Ramsay, Leah	0	1	0	1
Illecillewaet; Illecillewaet River; Jumping Creek	19980730	Ramsay, Leah	1	0	0	1
Invermere; Athalmer	19980808	Cannings, Robert A.	0	2	0	2
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Horsethief Creek; Haultain Creek	19980808	Hutchings, Gordon E.	0	2	0	2
Invermere; Lake Enid	19980816	Nicholson, Dean	0	1	0	1
Jaffray	19800706	Cannings, Robert A.	1	1	0	2
Kaslo	19980809	Cannings, Robert A.	0	2	0	2
Kelowna; Christian Valley	19990728	Blades, David C.A.; Sendall, Kelly A.	0	3	0	3
Kikomun Creek	19820811	Cannings, Robert A.	1	1	0	2
Kimberley; Bummers Flats	19990729	Cannings, Sydney G.	1	0	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	0	5	0	5
Kimberley; St. Mary Lake	19990824	Ramsay, Leah	0	3	0	3
Kootenay Lake; Argenta	19990825	Ramsay, Leah	0	2	0	2
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	2	3	0	5
Kootenay National Park; Edgewater; Nixon Creek	19990728	Cannings, Sydney G.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980807	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	0	1	0	1

Libellulidae

Sympetrum obtrusum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Coates, Sally E.	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980807	Ramsay, Leah	0	2	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	0	5	0	5
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	2	4	0	6
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	0	6	0	6
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	0	2	0	2
Kootenay National Park; Radium Hot Springs; Lookout Point; Kootenay River	19980807	Archard, Gabrielle A.	0	2	0	2
Mount Revelstoke National Park; Revelstoke; Lauretta; Illecillewaet River	19980723	Ramsay, Leah	0	1	0	1
Parson	19980806	Cannings, Robert A.	0	2	0	2
Parson	19980806	Hutchings, Gordon E.	0	1	0	1
Radium Hot Springs; Foster Creek; Frances Creek	19980808	Cannings, Robert A.	0	3	0	3
Rock Creek; Taurus Lake	19990829	Hatter, Ian	3	5	0	8
Rock Creek; Taurus Lake	19990829	Ramsay, Leah	1	1	0	2
Salmo; Erie Lake	19990720	Blades, David C.A.; Sendall, Kelly A.	1	1	0	2
Salmo; Erie Lake	19990724	Blades, David C.A.; Sendall, Kelly A.	0	2	0	2
Salmo; Erie Lake	19990806	Ramsay, Leah	0	1	0	1
Salmo; Erie Lake	19990828	Hatter, Ian	0	3	0	3
Salmo; Erie Lake	19990828	Ramsay, Leah	1	1	0	2
Trail; Champion Lakes	19990806	Cannings, Sydney G.	0	1	0	1
Windermere	19740731	Merilees, William J.	0	1	0	1
Yoho National Park; Field; Kicking Horse River; Ottertail River	19980726	Coates, Sally E.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	2	0	2
Kootenay Total			**53**	**204**	**9**	**266**

Sympetrum occidentale Bartenev
Western Meadowhawk

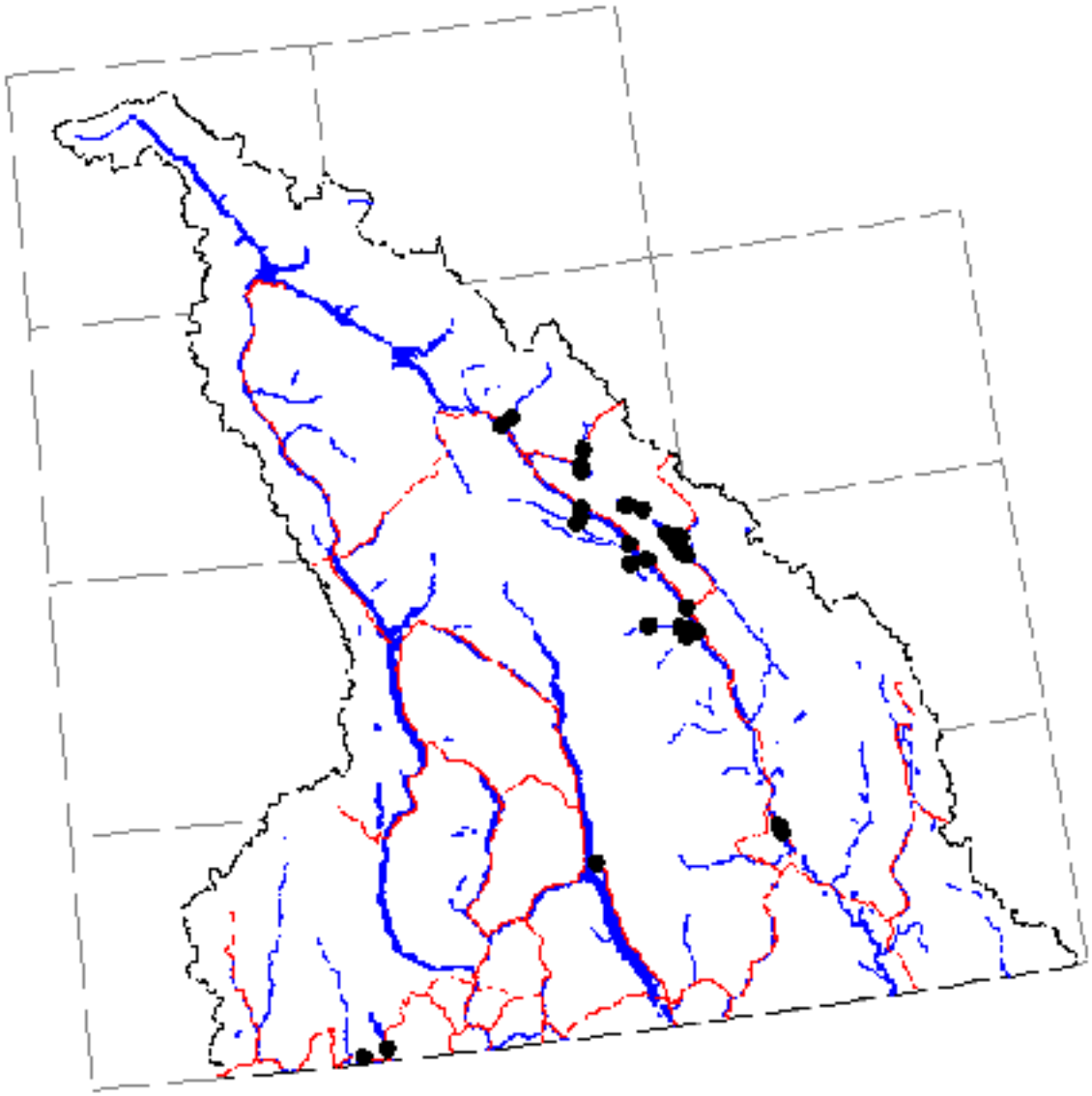
Provincial Status:
CDC rank: S5
Common and widespread south of 52° N.

Columbia-Kootenay Distribution
Widespread in the region's valleys.

Global Distribution
Southern British Columbia and Alberta east to Minnesota; south to Missouri, Oklahoma, New Mexico, Arizona and California (Bick and Mauffray 2000). Faunal element: Western (see Appendix 2).

Biological information
S. occidentale lives in a wide variety of ponds, marshes and lakes. Kootenay records range from 30 June to 27 August while the known flight period for the province is 20 June (most emerge after the middle of July) to 11 October (Cannings and Stuart 1977; S.G. Cannings, unpubl. data).

Sympetrum occidentale Bartenev



Libellulidae

Sympetrum occidentale Bartenev

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Brisco	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Cannings, Robert A.	0	1	0	1
Brisco; Jade Lake	19980807	Hutchings, Gordon E.	1	0	0	1
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	1	0	0	1
Golden; Blaeberry	19980804	Cannings, Robert A.	0	1	0	1
Golden; Moberly	19950724	Cannings, Sydney G.	1	0	0	1
Grand Forks; Gilpin	19990817	Hatter, Ian	0	1	0	1
Harrogate; Kootenay River	19980727	Coates, Sally E.	1	0	0	1
Harrogate; Kootenay River	19980802	Archard, Gabrielle A.	2	2	0	4
Harrogate; Kootenay River	19980802	Ramsay, Leah	0	1	0	1

Libellulidae

Sympetrum occidentale Bartenev

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Harrogate; Kootenay River	19980804	Archard, Gabrielle A.	2	0	0	2
Harrogate; Kootenay River	19980804	Ramsay, Leah	2	0	0	2
Invermere; Athalmer	19820821	Cannings, Robert A.	3	3	0	6
Invermere; Athalmer	19820821	Cannings, Sydney G.	1	0	0	1
Invermere; Athalmer	19980630	Ramsay, Leah	0	1	0	1
Invermere; Athalmer	19980808	Cannings, Robert A.	1	1	0	2
Invermere; Athalmer	19980808	Hutchings, Gordon E.	1	0	0	1
Invermere; Horsethief Creek	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Eileen	19980808	Cannings, Robert A.	0	1	0	1
Invermere; Lake Enid	19980815	Nicholson, Dean	1	0	0	1
Invermere; Lillian Lake	19980808	Cannings, Robert A.	0	1	0	1
Kimberley; Bummers Flats	19990820	Ramsay, Leah	4	3	0	7
Kootenay Lake; Crawford Bay	19990827	Ramsay, Leah	1	3	0	4
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Archard, Gabrielle A.	2	0	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980809	Coates, Sally E.	2	0	0	2
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Archard, Gabrielle A.	3	1	0	4
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	2	1	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980811	Archard, Gabrielle A.	3	0	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Archard, Gabrielle A.	1	0	0	1
Kootenay National Park; Kootenay Crossing; Kootenay River	19980814	Coates, Sally E.	0	1	0	1
Parson	19980806	Cannings, Robert A.	4	4	0	8
Parson	19980806	Hutchings, Gordon E.	2	1	0	3
Radium	19760811	Merilees, William J.	0	1	0	1
Spillimacheen; Columbia River	19820821	Cannings, Robert A.	0	1	0	1
Wilmer	19820821	Cannings, Robert A.	1	1	0	2
Yoho National Park; Golden; Kicking Horse River Valley	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Archard, Gabrielle A.	1	1	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980727	Coates, Sally E.	1	1	0	2
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Cannings, Sydney G.	1	0	0	1
Yoho National Park; Golden; Leanchoil; Kicking Horse River	19980805	Coates, Sally E.	1	0	0	1
Kootenay Total			**48**	**34**	**0**	**82**

Sympetrum pallipes (Hagen)
Striped Meadowhawk

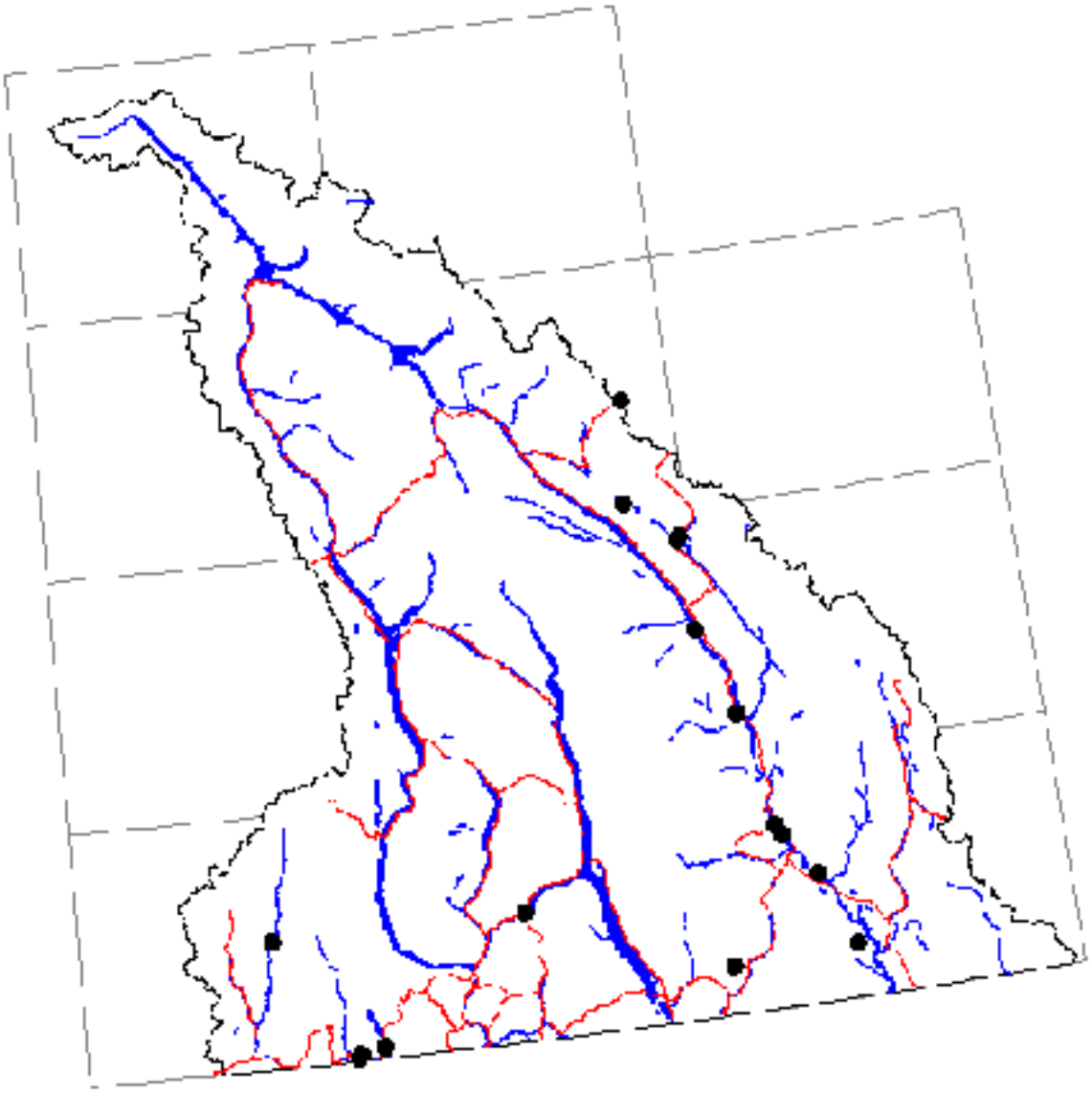
Provincial Status:
CDC rank: S5
Common in the southern half of British Columbia.

Columbia-Kootenay Distribution
Scattered throughout the region. The present study did not find it abundant in the Columbia region, but Cannings and Stuart (1977) state that it is "perhaps the commonest *Sympetrum"* in the Nelson area.

Global Distribution
British Columbia east to Saskatchewan and Minnesota, south to Texas, Arizona and California (Bick and Mauffray 2000). Faunal element: Western (see Appendix 2).

Biological information
S. pallipes usually develops in semi-permanent ponds (Cannings and Stuart 1977). Columbia Basin records are 11 July to 3 September; British Columbia flight records range from 6 June to 17 October (Cannings and Stuart 1977).

Sympetrum pallipes (Hagen)



Libellulidae

Sympetrum pallipes (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Christina Lake; Christina Creek	19990726	Blades, David C.A.; Sendall, Kelly A.	1	2	0	3
Christina Lake; Christina Creek	19990807	Cannings, Sydney G.	0	1	0	1
Columbia Lake; Canal Flats	19990820	Ramsay, Leah	1	0	0	1
Cranbrook; Alkaline Lake	19800711	Cannings, Robert A.	1	1	0	2
Cranbrook; Bummers Flats	19890721	Guppy, Crispin S.	0	2	0	2
Cranbrook; Moyie Lake; Moyie River	19990813	Nicholson, Dean	0	1	0	1
East Kootenay Valley, Waldo	19970930	Cannings, Sydney G.	1	1	0	2
Grand Forks; Gilpin	19990817	Hatter, Ian	0	1	0	1
Grand Forks; Gilpin	19990817	Ramsay, Leah	1	4	0	5
Grand Forks; Gilpin; Manly Creek	19990725	Blades, David C.A.; Sendall, Kelly A.	1	0	0	1
Harrogate; Kootenay River	19980802	Ramsay, Leah	1	0	0	1
Kelowna; Christian Valley	19990728	Blades, David C.A.; Sendall, Kelly A.	2	0	0	2
Kimberley; Bummers Flats	19990820	Ramsay, Leah	0	1	0	1
Kootenay National Park; Kootenay Crossing; Kootenay Pond	19980813	Coates, Sally E.	1	2	0	3
Kootenay National Park; Kootenay Crossing; Kootenay River	19980810	Coates, Sally E.	1	0	0	1
Nelson	19760809	Cannings, Robert A.	0	0	4	4
Windermere	19740731	Merilees, William J.	0	1	0	1
Yoho National Park; Stephen; Ross Lake	19980803	Cannings, Robert A.	0	1	0	1
Kootenay Total			**11**	**18**	**4**	**33**

Sympetrum vicinum (Hagen)*
Yellow-legged Meadowhawk

Provincial Status
CDC rank: S3S4
Blue List
S. vicinum is rare in the southern interior of British Columbia; it is known only from the southern Okanagan Valley and the Kootenay Valley at Creston. It is more common on the south coast.

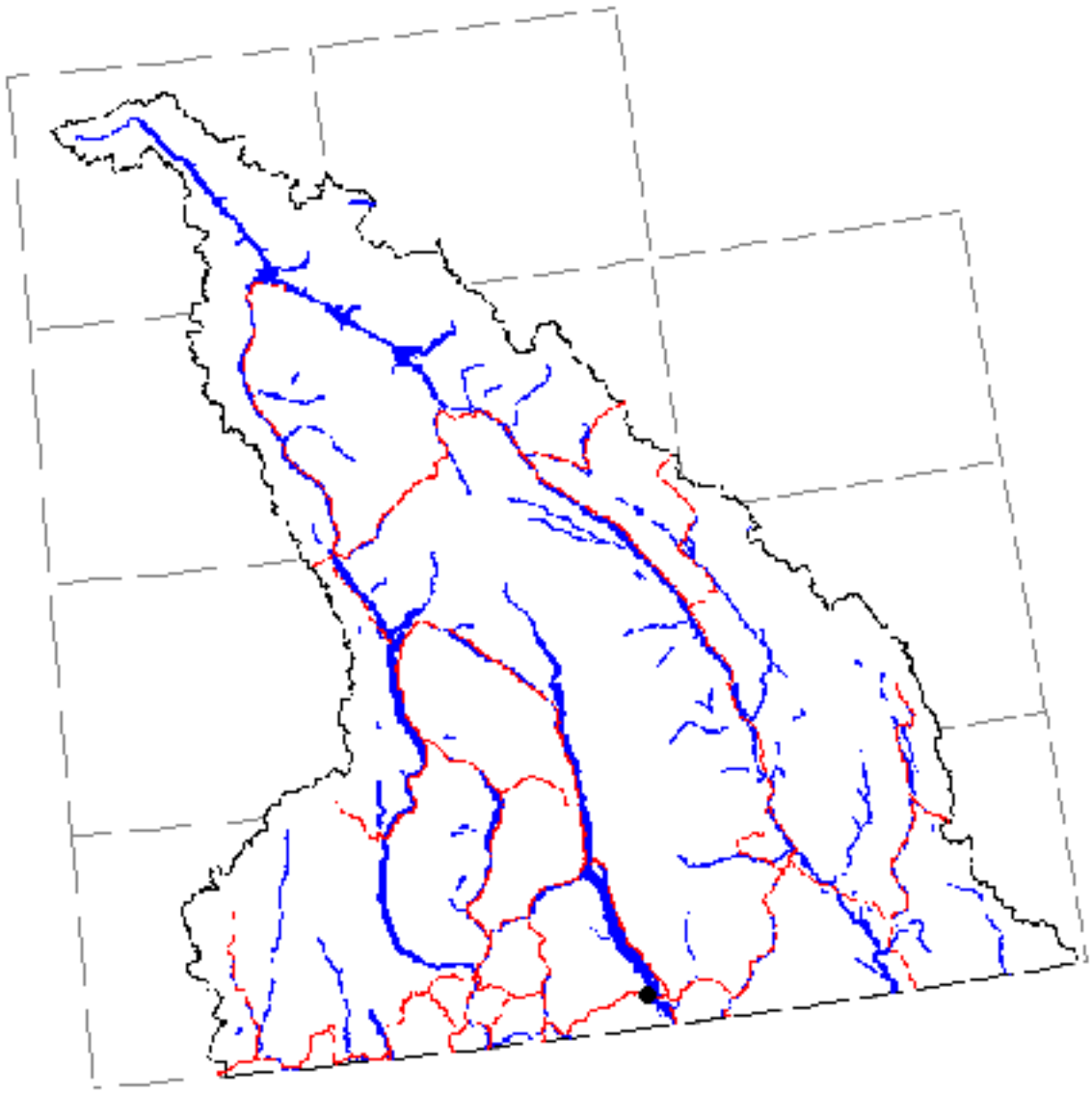
Columbia-Kootenay Distribution
S. vicinum is known only from the Creston marshes.

Global Distribution
S. vicinum ranges throughout southeastern Canada and the eastern United States. West of Ontario and the Mississippi River, records are sporadic except in the Pacific Northwest where, especially along the Pacific Coast, it is common. Faunal element: Austral (see Appendix 2).

Biological information
S. vicinum lives in ponds, slow streams and lakes with dense emergent vegetation. While in tandem, the female deposits her eggs along the banks in moss or vegetation very close to, or in, the water. The eggs will not hatch until submerged in water (Cannings and Stuart 1977). The adults rest on bushes, tall herbs and grasses (Walker and Corbet 1975). This species has the latest flight period of any species in British Columbia, or North America, for that matter. In British Columbia, records are from 20 July to 12 November (Cannings and Stuart 1977, Cannings 1998). The only Columbia Basin date is 7 October 1988 (E. Taylor, see Appendix 3).

Management and protection considerations
Wetlands, particularly in low lying areas, always run the risk of being drained, filled for development or polluted. Undoubtedly many wetlands in the southern interior of the province have already been lost. Management practices that ensure the continued viability of wetlands should be followed. Remaining wetlands that appear suitable for this species should be protected or at least the impacts of disturbance such as livestock trampling or polluted runoff should be minimized. Disturbance by cattle and waterside development are of particular concern for this species because it lives critical parts of its life at the very edge of the wetland.

Sympetrum vicinum (Hagen)



Libellulidae
Sympetrum vicinum (Hagen)

Location	Yyyymmdd	Collector	Females	Males	Juv	Total
Creston	19881007	Taylor, M. Elizabeth	0	1	0	1
Kootenay Total			**0**	**1**	**0**	**1**

The Effects of Human Activity on Dragonfly Populations

Most changes in species occurrence and abundance have not been documented in the Columbia Basin, and their causes can usually only be assumed -- and we assume that most changes are the result of human activities.

The most serious historic anthropogenic stress on dragonfly populations has been the alteration of their freshwater habitats. Most destructive has been the draining and filling of marshes. This has not eliminated any species from the region, but it has surely reduced the populations of many species, including *Enallagma boreale, E. cyathigerum, E. ebrium, Ischnura cervula, I. perparva, Aeshna californica, A. constricta, A. interrupta, A. multicolor, A. canadensis, Somatochlora semicircularis, Libellula forensis, L. pulchella, Leucorrhinia intacta, Sympetrum corruptum, S. costiferum, S. danae, S. internum, S. madidum, S. obtrusum, S. occidentale, S. pallipes, S. vicinum* and others.

Large hydroelectric and flood control dams have flooded 102,000 hectares of wetlands in the Columbia Basin, including many wetlands along the Columbia, Canoe, Pend d'Oreille and Kootenay rivers (Cannings and Cannings 1996). These reservoirs have probably eliminated populations of almost all dragonfly species on the Basin list. Dams not only inundate wetlands, lakes and streams upstream, but completely alter the natural flow regime downstream. Since Montana's Libby Dam eliminated the spring freshet of the Kootenay River through the Creston Valley, the large marshes that remain along the river are now artificially maintained in a series of diked impoundments, and their insect communities are undoubtedly different from those before the dam was built. The modification of the shores of the Kootenay and Columbia rivers has eliminated much habitat for *Argia emma, Ophiogomphus occidentis* and *Macromia magnifica*.

Many smaller, high elevation dams built to supply water to lowland communities have flooded peatlands, ponds, shallow lakes and slow streams, creating larger lake habitat and causing a reduction in odonate diversity. This habitat loss has eliminated populations of dragonflies such as *Coenagrion interrogatum, Aeshna sitchensis, A. subarctica, Somatochlora minor, S. franklini* and many others, and -- assuming shorelines lack extensive marshy or peatland edges -- replaced them with a few species characteristic of montane lakeshores: *Aeshna eremita, A. umbrosa* and *Somatochlora albicincta*.

Fish are major predators of odonate larvae (Corbet 1962, Hilton 1987), and the ener

getic programs to release sport fish into almost 2,000 lakes in the Montane Cordillera (many originally fish-free) (S. Billings, pers. comm.) must have had a significant effect on both the abundance of Odonata and the composition of the communities in these lakes. No data is available to document this supposition but, in an experimental study in North Carolina, ten times as many dragonfly larvae were found within fish exclusion cages as outside them (Morin 1984). The poisoning of aquatic communities to prepare lakes for sport fish introductions also has likely had a significant impact on dragonfly populations.

The aquatic communities of many systems that historically contained fish have also been altered by the purposeful or accidental introduction of non-native fish species. In the Columbia watershed, 16 species, a full 37% of the entire fish fauna, are introduced. Some of these species not only eat many odonate larvae, but also alter the habitat structure. Carp (*Carpinus carpio*), introduced into the region in the early 1900s, subsequently destroyed or reduced much of the native aquatic vegetation, including *Lemna* and *Potamogeton* (Brooks 1973).

Destruction of natural lakeshore, especially in the southern valleys, for the development of housing and swimming beaches, has reduced habitat available for many lake dwellers, including *Gomphus graslinellus, Ophiogomphus occidentis* and *Macromia magnifica*.

Many species breeding in small, often temporary ponds or spring-fed streams in grasslands and dry forest have been adversely affected by cattle that trample and pollute these habitats. *Argia vivida* is especially vulnerable to these effects; outside of hotsprings, it only lives in a few tiny spring-fed streams, all of which are potentially affected by the activities of livestock.

Hot springs are almost always modified by humans. In the Columbia Basin *Argia vivida* is largely restricted to the outlet streams of hot springs and the small populations are vulnerable. The species has almost certainly been extirpated from some of the developed springs around Fairmont and Radium, although it still occurs where warm streams continue to flow from the springs, for example, at Nakusp and Albert Canyon.

Although there is little evidence to support the assumption, the extensive logging that has affected hundreds of streams in the Basin has probably reduced the populations of dragonflies such as *Ophiogomphus occidentis,O. severus*, *Cordulegaster dorsalis, Somatochlora minor, S. walshii* and perhaps even the rare *Calopteryx aequabilis*

and *Stylurus olivaceus*. Logging and associated road building can result in streams with unstable flows, warmer water temperatures and higher silt loads, all of which negatively affect dragonfly larvae. Logging has also likely affected the community structure in peatlands, marshes and lakes, especially at higher elevations.

Climate change will drastically affect present Odonata distributions as lowland waters dry and water in general becomes scarcer (Hebda 1997). Hebda (1995) outlines the characteristics of several British Columbia Interior localities in the drier and warmer periods that prevailed between 10,000 and 7,000 years ago. A significant component of the diversity of Odonata in the Columbia Basin lives in grassland ponds and marshes and small lakes in the lowlands. Presumably, many of these habitats will disappear in any drying trend. We do not know if dragonfly populations will be able to shift northwards or to higher altitudes if suitable water bodies develop there, but the relatively strong powers of dispersal of many species, should be a major factor in their survival. Similar problems will probably exist when climate change affects the extensive dragonfly populations in montane and northern peatlands.

Recommendation for Future Inventory, Research and Monitoring

Until the 1998/99 *Living Landscapes* project, dragonfly inventory in the Columbia Basin was sparse and sporadic. Even the more systematic inventories undertaken in these two field seasons has not covered the whole region, and there is still much to learn. For example, a comprehensive inventory in 1997 in the Okanagan Basin (the best collected area in the British Columbia Interior) greatly increased our knowledge of the abundance and distribution of many species (Cannings *et al.* 1998). For example, the known range of *Coenagrion interrogatum* was extended from Heckman Pass, Tweedsmuir Park (west-central Interior) south to the Okanagan Highlands four localities for the species were discovered in the Okanagan. The species was recently found in Kootenay National Park (Rocky Mountains) in 1999 -- the result of this *Living Landscapes* project inventory. It is clear that the distribution of this species in the southern Interior remains poorly known. In the Okanagan inventory the number of localities for some uncommon lowland species was also increased significantly: for example, *Argia vivida* localities increased from three to eight and *Argia emma* from five to sixteen.

Several species are known from adjacent areas and may occur within the Columbia Basin. *Tramea lacerata* Hagen, *Pantala hymenaea* (Say), and *P. flavescens* (Fabricius), all well known for their wide-ranging flights, are recorded from central Washington State (Paulson 1997, 1999); the first two have been recorded as wanderers on the south coast of British Columbia (Cannings 1988, 1997). *Aeshna septentrionalis* Burmeister, *Somatochlora hudsonica* (Selys), *S. septentrionalis* (Hagen) and *Leucorrhinia patricia* Walker are northern species that probably occur around mountain lakes, ponds and peatlands in the Columbia Basin. *A. Septentrionalis* is known from Boom Creek, Alberta, only a few hundred metres from the British Columbia border. *Enallagma clausum* Morse, *E. hageni* (Walsh), *Stylurus olivaceus* (Selys), *Epitheca canis* MacLachlan and *Erithemis collocata* (Hagen) live in the southern Interior of British Columbia and may occur in the Columbia Basin.

Increased inventory efforts would especially improve our knowledge of the species that may range widely in the region, but are known from few localities. Examples include *Lestes forcipatus*, *Aeshna tuberculifera,Cordulegaster dorsalis, Somatochlora cingulata* and *S. forcipata*.

No studies examining the effects of human activity in the environment (e.g. siltation and elevated temperatures in streams in logged areas or the effect of dams on dragonfly populations) have been undertaken in the Columbia Basin, and no long-term moni-

toring studies are in place that could detect changes in species composition and abundance of dragonfly populations. Although this study has increased our knowledge of the habitat requirements of a number of the species, our understanding of the needs of most species is rudimentary -- and more ecological studies would be enormously beneficial.

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Appendix 1: Checklist of Columbia Basin Dragonflies

66 species known in region (77% of provincial fauna). At least seven additional species probably occur in the region (total of 73 species or 85% of provincial fauna); these are marked with an asterisk **(*)**. Seventeen of this total of seventy-three dragonfly species are considered rare and potentially threatened, and are marked with double asterisks **(**)** -- 13 of these are recorded from the Columbia Basin.

Order Odonata	
Suborder Zygoptera	**(Damselflies)**
Family Calopterygidae	
(1 species recorded)	**Jewelwings**
Calopteryx aequabilis Say **(**)**	River Jewelwing
Family Lestidae	
(5 species recorded)	**Spreadwings**
Lestes congener Hagen	Spotted Spreadwing
Lestes disjunctus Selys	Common Spreadwing
Lestes dryas Kirby	Emerald Spreadwing
Lestes forcipatus Rambur **(**)**	Sweetflag Spreadwing
Lestes unguiculatus Hagen	Lyre-tipped Spreadwing
Family Coenagrionidae	
(12 species recorded, 3 expected)	**Pond Damsels**
Amphiagrion abbreviatum (Selys)	Western Red Damsel
Argia emma Kennedy **(**)**	Emma's Dancer
Argia vivida Hagen **(**)**	Vivid Dancer
Coenagrion interrogatum (Hagen)	Subarctic Bluet
Coenagrion resolutum (Hagen)	Taiga Bluet
Enallagma boreale Selys	Boreal Bluet
Enallagma carunculatum Morse	Tule Bluet
Enallagma civile (Hagen) **(*/**)**	Familiar Bluet
Enallagma clausum Morse **(*)**	Alkali Bluet
Enallagma cyathigerum (Charpentier)	Northern Bluet
Enallagma ebrium (Hagen)	Marsh Bluet
Enallagma hageni (Walsh) **(*/**)**	Hagen's Bluet
Ischnura cervula Selys	Pacific Forktail
Ischnura perparva Selys	Western Forktail
Nehalennia irene (Hagen) Sedge Sprite	

Suborder Anisoptera

Family Aeshnidae	
(14 species recorded)	**Darners**
Aeshna californica Calvert	California Darner
Aeshna canadensis Walker	Canada Darner
Aeshna constricta Say **(**)**	Lance-tipped Darner
Aeshna eremita Scudder	Lake Darner
Aeshna interrupta Walker	Variable Darner
Aeshna juncea (Linnaeus)	Sedge Darner
Aeshna multicolor Hagen	Blue-eyed Darner
Aeshna palmata Hagen	Paddle-tailed Darner
Aeshna septentrionalis Burmeister **(*)**	Azure Darner
Aeshna sitchensis Hagen	Zigzag Darner
Aeshna subarctica Walker	Subarctic Darner
Aeshna tuberculifera Walker **(**)**	Black-tipped Darner
Aeshna umbrosa Walker	Shadow Darner
Anax junius (Drury)	Common Green Darner

Family Gomphidae	
(4 species recorded)	**Clubtails**
Gomphus graslinellus Walsh **(**)**	Pronghorn Clubtail
Ophiogomphus occidentis Hagen	Sinuous Snaketail
Ophiogomphus severus Hagen	Pale Snaketail
Stylurus olivaceus (Selys) **(**)**	Olive Clubtail

Family Cordulegastridae	
(1 species recorded)	**Spiketails**
Cordulegaster dorsalis Hagen	Pacific Spiketail

Family Macromiidae	
(1 species recorded)	**Cruisers**
Macromia magnifica MacLachlan **(**)**	Western River Cruiser

Family Corduliidae	
(10 species recorded, 2 expected)	**Emeralds**
Cordulia shurtleffi Scudder	American Emerald
Epitheca canis MacLachlan **(*/**)**	Beaverpond Baskettail
Epitheca spinigera (Selys)	Spiny Baskettail
Somatochlora albicincta (Burmeister)	Ringed Emerald
Somatochlora cingulata (Selys) **(**)**	Lake Emerald
Somatochlora forcipata (Scudder) **(**)**	Forcipate Emerald
Somatochlora franklini Selys	Delicate Emerald
Somatochlora hudsonica (Selys) **(*)**	Hudsonian Emerald
Somatochlora minor Calvert	Ocellated Emerald
Somatochlora semicircularis (Selys)	Mountain Emerald
Somatochlora walshii (Scudder)	Brush-tipped Emerald
Somatochlora whitehousei Walker	Whitehouse's Emerald

Family Libellulidae (19 species recorded, 1 expected)	**Skimmers**
Erythemis collocata **(*/**)**	Western Pondhawk
Leucorrhinia borealis Hagen	Boreal Whiteface
Leucorrhinia glacialis Hagen	Crimson-ringed Whiteface
Leucorrhinia hudsonica (Selys)	Hudsonian Whiteface
Leucorrhinia intacta (Hagen)	Dot-tailed Whiteface
Leucorrhinia proxima Calvert	Red-waisted Whiteface
Libellula forensis Hagen	Eight-spotted Skimmer
Libellula julia Uhler	Chalk-fronted Corporal
Libellula lydia Drury	Common Whitetail
Libellula pulchella Drury **(**)**	Twelve-spotted Skimmer
Libellula quadrimaculata Linnaeus	Four-spotted Skimmer
Sympetrum corruptum (Hagen)	Variegated Meadowhawk
Sympetrum costiferum (Hagen)	Saffron-winged Meadowhawk
Sympetrum danae (Sulzer)	Black Meadowhawk
Sympetrum internum Montogomery	Cherry-faced Meadowhawk
Sympetrum madidum (Hagen)	Red-veined Meadowhawk
Sympetrum obtrusum (Hagen)	White-faced Meadowhawk
Sympetrum occidentale Bartenev	Western Meadowhawk
Sympetrum pallipes (Hagen)	Striped Meadowhawk
Sympetrum vicinum (Hagen) **(**)**	Yellow-legged Meadowhawk

Appendix 2: Columbia Basin Dragonflies and Their Faunal Elements

(H) = Holarctic (transcontinental in both North America and Eurasia) in distribution.

Suborder Zygoptera	**Damselflies**
Family Calopterygidae	**Jewelwings**
Calopteryx aequabilis Say	Transition
Family Lestidae	**Spreadwings**
Lestes congener Hagen	Widespread
Lestes disjunctus Selys	Widespread
Lestes dryas Kirby	(H) Widespread
Lestes forcipatus Rambur	Austral
Lestes unguiculatus Hagen	Widespread
Family Coenagrionidae	**Pond Damsels**
Amphiagrion abbreviatum (Selys)	Western
Argia emma Kennedy	Cordilleran
Argia vivida Hagen	Cordilleran
Coenagrion interrogatum (Hagen)	Northern Boreal
Coenagrion resolutum (Hagen)	Widespread Boreal
Enallagma boreale Selys	Widespread Boreal
Enallagma carunculatum Morse	Austral
Enallagma cyathigerum (Charp.)	(H) Widespread Boreal
Enallagma ebrium (Hagen)	Transition
Ischnura cervula Selys	Cordilleran
Ischnura perparva Selys	Western
Nehalennia irene (Hagen)	Southern Boreal
Suborder Anisoptera	**Dragonflies**
Family Aeshnidae	**Darners**
Aeshna californica Calvert	Cordilleran
Aeshna canadensis Walker	Transition
Aeshna constricta Say	Transition
Aeshna eremita Scudder	Widespread Boreal
Aeshna interrupta Walker	Southern Boreal
Aeshna juncea (Linnaeus)	(H) Widespread Boreal
Aeshna multicolor Hagen	Western
Aeshna palmata Hagen	Cordilleran
Aeshna sitchensis Hagen	Widespread Boreal
Aeshna subarctica Walker	(H) Widespread Boreal
Aeshna tuberculifera Walker	Transition
Aeshna umbrosa Walker	Transition
Anax junius (Drury)	Austral (also in parts of Asia and Oceana)
Family Gomphidae	**Clubtails**
Gomphus graslinellus Walsh	Transition
Ophiogomphus occidentis Hagen	Cordilleran
Ophiogomphus severus Hagen	Western
Stylurus olivaceus (Selys)	Cordilleran

Family Cordulegastridae	**Spiketails**
Cordulegaster dorsalis Hagen	Cordilleran
Family Macromiidae	**Cruisers**
Macromia magnifica MacLachlan	Cordilleran
Family Corduliidae	**Emeralds**
Cordulia shurtleffi Scudder	Widespread Boreal
Epitheca spinigera (Selys)	Transition
Somatochlora albicincta (Burmeister)	Widespread Boreal
Somatochlora cingulata (Selys)	Southern Boreal
Somatochlora forcipata (Scudder)	Transition
Somatochlora franklini (Selys)	Widespread Boreal
Somatochlora minor Calvert	Southern Boreal
Somatochlora semicircularis (Selys)	Cordilleran
Somatochlora walshii (Scudder)	Southern Boreal
Somatochlora whitehousei Walker	Widespread Boreal
Family Libellulidae	**(Skimmers)**
Leucorrhinia borealis Hagen	Western Boreal
Leucorrhinia glacialis Hagen	Transition
Leucorrhinia hudsonica (Selys)	Widespread Boreal
Leucorrhinia intacta (Hagen)	Transition
Leucorrhinia proxima Calvert	Southern Boreal
Libellula forensis Hagen	Cordilleran
Libellula julia Uhler	Transition
Libellula lydia Drury	Southern
Libellula pulchella Drury	Southern
Libellula quadrimaculata Linnaeus	(H) Widespread
Sympetrum corruptum (Hagen)	Widespread (also in far eastern Russia)
Sympetrum costiferum (Hagen)	Transition
Sympetrum danae (Sulzer)	(H) Widespread Boreal
Sympetrum internum Montgomery	Transition
Sympetrum madidum (Hagen)	Western
Sympetrum obtrusum (Hagen)	Transition
Sympetrum occidentale Bartenev	Western
Sympetrum pallipes (Hagen)	Western
Sympetrum vicinum (Hagen)	Southern

Appendix 3: Project Participants

Project leaders:

Dr Rob Cannings (Curator of Entomology, Royal B.C. Museum, Victoria, 250-356-8242) has studied dragonflies for 25 years and is the author of *The Dragonflies of British Columbia*. For a number of years he was an interpretive biologist for BC Parks. He has developed the insect collections and led entomological research at the RBCM since 1980. Project activities: project development; fundraising; field collections (1998); specimen curation and identifications; report writing; Web page writing; preparation of educational slide lecture packages and interpretive products.

Syd Cannings (Program Zoologist, Conservation Data Centre, Ministry of Environment, Lands and Parks, Victoria, 250-387-6250) was curator of the Spencer Entomological Museum at the University of B.C. for 11 years. At the Conservation Data Centre Syd assembles and analyzes data on rare and endangered species and habitats. He is co-author of *British Columbia: A Natural History*. Project activities: project development, fundraising, field collections (1998/99), specimen identifications, regional interpretation programs 1998/99.

Dr John Woods (Faunal Specialist/ Wildlife Biologist, Parks Canada, Revelstoke and Glacier National Parks, Revelstoke, 250-837-7527) has worked with Parks Canada for 26 years. John is a former Chief Park Naturalist in Revelstoke and Glacier, and has extensive experience in wildlife research and nature interpretation. Project activities: project development, funding and logistic support in National Parks.

Major participants:

David Blades (Entomology Collections Manager, Royal B.C. Museum, Victoria). Database creation and management, distribution map and collection information Web pages production, specimen curation, field collections (1999).

Leah Ramsay (Assistant Program Zoologist, B.C. Conservation Data Centre, Ministry of Environment, Lands and Parks, Victoria). Fieldtrip coordination and field collections (1998/99), specimen identification, report writing.

Other co-operators:

Gabrielle Archard (student volunteer from the University of Bristol, U.K). Field collec

tions, specimen identification (1998).

Richard Cannings (Biologist, Naramata). Field Collections (1998).

Sally Coates (student volunteer from the University of Bristol, U.K). Field collections, specimen identification (1998).

Alan Dibb (Faunal Specialist, Parks Canada, Yoho and Kootenay National parks). Financial and logistical support in National Parks.

Pat Dunn (Parks Canada, Yoho and Kootenay national parks). Field collections (1998).

Bob Ferguson (Biologist, Parson). Logistical support, field collections (1998).

Jeff Green (Co-op student, University of Victoria). Data entry, report writing (1998).

Larry Halverson (Park Naturalist, Kootenay National Park). Logistical support, field collections (1998/99).

Ian Hatter (Biologist, Ministry of Environment, Lands and Parks, Victoria). Field collections (1999).

Anne Huang (Co-op student, Simon Fraser University). Data entry; distribution map production (1998).

Gordon Hutchings (Entomology volunteer, RBCM). Field collections (1998).

Cathy Koot and Tom Foley (Naturalists, Fernie). Logistical support, field collections (1999).

Douglas Leighton (Naturalist, Golden). Logistical support (1998).

Lynn, Chris and Erica Moore (Biologist and family, Cochrane). Field collections (1999).

Gavin and Cameron More (Biologist and family, Calgary). Field collections (1999).

Nancy Newhouse (Biologist, Invermere). Logistical support, field collections (1998).

Dean Nicholson (Naturalist, Cranbrook). Logistical support, field collections, specimen identification (1998/99).

Penny Ohanjanian (Naturalist, TaTa Creek). Logistical support, field collections (1999).

Marla Schwarzfeld (Co-op student, University of Victoria). Data entry (1999).

Kelly Sendall (Invertebrate Collections Manager, RBCM). Field collections (1999).

Chris Shank (Biologist, Cochrane). Field collections (1998).

Tara Steigenberger (Production technician, RBCM). Copyediting, graphics manipulation and Web page production.

Peter Troffe. (Past Curator of Ichthyology, RBCM). Field collections (1999).

Appendix 4: Species Distribution Maps and Collecting Data

Family	Species
Calopterygidae	*Calopteryx aequabilis Say*
Lestidae	*Lestes congener Hagen*
	Lestes disjunctus Selys
	Lestes dryas Kirby
	Lestes forcipatus Rambur
	Lestes unguiculatus Hagen
Coenagrionidae	*Amphiagrion abbreviatum (Selys)*
	Argia emma Kennedy
	Argia vivida Hagen
	Coenagrion interrogatum (Hagen)
	Coenagrion resolutum (Selys)
	Enallagma boreale Selys
	Enallagma carunculatum Morse
	Enallagma cyathigerum (Charpentier)
	Enallagma ebrium (Hagen)
	Ischnura cervula Selys
	Ischnura perparva Selys
	Nehalennia irene (Hagen)
Aeshnidae	*Aeshna californica (Calvert)*
	Aeshna canadensis Walker
	Aeshna constricta (Say)
	Aeshna eremita (Scudder)
	Aeshna interrupta Walker
	Aeshna juncea (Linnaeus)
	Aeshna multicolor Hagen
	Aeshna palmata Hagen
	Aeshna sitchensis Hagen
	Aeshna subarctica Walker
	Aeshna tuberculifera Walker
	Aeshna umbrosa Walker
	Anax junius (Drury)
Gomphidae	*Gomphus graslinellus Walsh*
	Ophiogomphus occidentis Hagen
	Ophiogomphus severus Hagen
	Stylurus olivaceus (Selys)
Cordulegastridae	*Cordulegaster dorsalis Hagen*
Macromiidae	*Macromia magnifica Mclachlan*

Corduliidae	*Cordulia shurtleffi Scudder*
	Epitheca spinigera (Selys)
	Somatochlora albicincta (Burmeister)
	Somatochlora cingulata (Selys)
	Somatochlora forcipata (Scudder)
	Somatochlora franklini (Selys)
	Somatochlora minor Calvert
	Somatochlora semicircularis (Selys)
	Somatochlora walshii (Scudder)
	Somatochlora whitehousei Walker
Libellulidae	*Leucorrhinia borealis Hagen*
	Leucorrhinia glacialis Hagen
	Leucorrhinia hudsonica (Selys)
	Leucorrhinia intacta (Hagen)
	Leucorrhinia proxima Calvert
	Libellula forensis Hagen
	Libellula julia Uhler
	Libellula lydia Drury
	Libellula pulchella Drury
	Libellula quadrimaculata Linnaeus
	Sympetrum corruptum (Hagen)
	Sympetrum costiferum (Hagen)
	Sympetrum danae (Sulzer)
	Sympetrum internum Montgomery
	Sympetrum madidum (Hagen)
	Sympetrum obtrusum (Hagen)
	Sympetrum occidentale Bartenev
	Sympetrum pallipes (Hagen)
	Sympetrum vicinum (Hagen)