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The Dragonflies and Damselflies (Insecta: Odonata) of Canada: species list, geographical distribution, status, and conservation ranks

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Dedication

Canada has lost three important odonatologists since the first edition of this list was published in 2005: Gordon Pritchard, University of Calgary biology professor and internationally active odonate researcher (Cannings 2013); Paul Brunelle, leader of the massive inventory of Odonata in the Maritime Provinces (McAlpine 2020a, b, c) and co-author of the first edition of this checklist; and Raymond Hutchinson, who made huge contributions to Québec and Canadian odonatology over the past five decades (Savard 2021). We dedicate this work to them.

Abstract

As of August 2023, 220 species in 57 genera and 10 families of damselflies and dragonflies (Insecta: Odonata) are recorded for Canada. Since the publication of the first edition in 2005, 14 species have been added to the list; one, *Neurocordulia obsoleta* (Say) has been removed because of a misidentification and another, *Sympetrum occidentale*, has been to synonymy. Conservation ranks are given for species in all 13 provinces and territories. English and French names for all listed species are included. Literature sources are discussed and presented, as is information on species status and the addition and exclusion of species. Sections on taxonomy and variation, subspecies, presumed hybrids, the introduction of exotic species, notable range extensions and observations, and conservation and protection are also provided.

Key words: Odonata, dragonflies and damselflies, Canada, species status and distribution, conservation ranks, checklist, faunistics, nomenclature

Résumé

En date d'août 2023, 220 espèces de 57 genres et 10 familles de libellules (Insecta: Odonata) sont répertoriées pour le Canada. Depuis la publication de la première édition en 2005, 14 espèces s'ajoutent à la liste alors que deux sont retirées

de celle-ci, *Neurocordulia obsoleta* (Say) et *Sympetrum occidentale* respectivement en raison d'une identification erronée et de la synonymie. Les rangs de priorité pour la conservation des espèces à l'échelle infranationale sont indiqués pour les 13 provinces et territoires. Des noms anglais et français ont été attribués à toutes les espèces répertoriées. Les sources documentaires sont discutées et présentées, tout comme les additions et les exclusions d'espèces pour chaque province et territoire. Des précisions sont données sur les changements taxonomiques au niveau de l'espèce, l'introduction d'espèces exotiques, les extensions notables de l'aire de répartition, l'observation de variations géographiques et le signalement d'hybrides présumés.

Mots clés: Canada, conservation, nomenclature, Odonata, richesse spécifique

Introduction

This is an extensive revision and update of the first annotated checklist of the Odonata of Canada (Catling *et al.* 2005). The new list of 220 species of Canadian Odonata is current as of August 2023. With a few exceptions, it uses the scientific nomenclature and English names of the North American list (Paulson & Dunkle 2021), sponsored by the Dragonfly Society of the Americas and Odonata Central. The French common names have been revised under the auspices of Entomofaune du Québec, including all the Canadian fauna, for the purposes of the present checklist (Savard *et al.* 2022). According to usage among authors, ligatures are applied in the writing of French names, but not for English and scientific names. The author(s) of a taxon is given with the scientific name in the list; it is indicated in the text when a taxon is first mentioned, but only if the species is not on the list.

We have used "larva" in the past for the developing aquatic stages of the Odonata because of its widespread international use and because Corbet (1999) argued forcefully for it over "nymph": the basic idea was to recognize that aquatic stages of Odonata (and a few other aquatic orders) are radically different morphologically from the terrestrial adult. However, we use "naiad" here as recommended in the paper by Bybee *et al.* (2015) because it clarifies the difference between it and "nymph" and is an attempt to standardize these terms once and for all.

We include information accumulated since 2004: new occurrence records and conservation status ranks for Canada and its 13 subnational jurisdictions, other range extensions and notable observations, and new information relating to regional variation and taxonomy.

Intercepted alien species are not included in the Canadian list. However, we note that the risk of introduction and establishment of non-native species is real and, depending on the species involved, could affect aquatic communities and the conservation of biological diversity. No alien Odonata have ever become established in Canada, but three Asian species have been recorded emerging from containers of imported aquatic plants inside a commercial building in the city of Québec: *Crocothemis servilia* (Drury) (Perron *et al.* 2003); *Anax guttatus* (Burmeister) and *Ischnura senegalensis* (Rambur) (Perron *et al.* 2004). See also "Species Excluded from Canadian List" section.

This list treats only the modern fauna. However, the reader should be aware that several extinct families, genera, species, and even a suborder of Odonata are known from lands that are now part of Canada (Wighton & Wilson 1986; Archibald & Cannings 2019, 2022; Archibald *et al.* 2021).

The 2005 annotated list was published in the *Bulletin of American Odonatology*, but that list was based on the original submitted version rather than the manuscript revised after review; the work was incomplete. A brief update of the list was published (Catling *et al.* 2006a). Corrections resulting from the improper publication were posted on the Dragonfly Society of the Americas website (see notice: Catling *et al.* 2006b) but are now unavailable there; in response, these changes were recently published in a more permanent form (Catling *et al*. 2022). That information is included herein; thus, this present version is a complete revision of the 2005 list. Some of the material from the 2005 list, such as parts of the documentation of subspecies and hybrids, is repeated and updated here for the sake of completeness.

References and Resources

The list of references is not intended to be a comprehensive compilation of the literature covering Canadian Odonata. However, it includes much of the published basis for the rankings and many of the significant sources of occurrence data, including new national and provincial/territorial records published since the previous list. Additional subjects

covered include notable range extensions and observations within jurisdictions, taxonomy and variation, subspecies, hybrids, and conservation and protection.

Many publications not specific to the Canadian fauna, but relevant to it, mainly identification guides, have appeared since 2004. Foremost among these are the superb field guides by Dennis Paulson (2009, 2011a) covering North America, the authoritative revised editions of the damselflies of North America (Westfall & May 2006) and dragonflies of North America (Needham *et al.* 2014), the keys and taxonomic summaries of the genera of the New World dragonflies and damselflies (Garrison *et al*. 2006, 2010), and the keys and illustrations of North American Odonata naiads (Tennessen 2019). Other guides most relevant to Canada include Acorn (2004), Lam (2004), Dubois (2005, 2010), Hudson & Armstrong (2010), Hutchings & Halstead (2011), Kerst & Gordon (2011), Jones *et al.* (2013), Hutchinson & Ménard (2014), and Mead (2017). Other valuable publications include the outline of world diversity of Odonata (Kalkman *et al.* 2008), discussions on the phylogeny of Odonata (Bybee *et al*. 2008, 2021, Carle *et al.* 2015, Pilgrim & von Dohlen 2007a), the conservation status of Odonata on a worldwide basis detailed by Clausnitzer *et al.* (2009), and the higher classification summary of Dijkstra *et al*. (2013).

Publications summarizing regional and local faunas are also useful, providing baseline information for future studies (see also Status and Monitoring section below). The areas treated range from those as large as all Canadian grasslands (Cannings 2014), whole ecozones (Brunelle 2010, Cannings & Cannings 2011), provinces or territories (Catling *et al*. 2000–2007, Catling *et al.* 2004, Giberson *et al.* 2023, Rice 2000, Savard 2011), large parts of provinces (Cannings *et al.* 2008), to counties and similar small regions (Jones 1999, Buidin & Rochepault 2007, Cannings 2012a, Pratt 2014, Savard *et al.* 2018), parks (Jones & Holder 2000, Jobin & Perron 2004, Perron *et al*. 2005, Mochon 2015, 2017) and specific sites (Mochon & Savard 2018, Perron & Ruel 2002, Simaika & Cannings 2006). General ecological works include those dealing with climate warming (Beatty *et al*. 2010, Savard 2023a), grassland grazing (Foote & Rice 2005), saltmarsh habitats (Catling *et al*. 2006, Catling 2009), Odonata and wetland plant associations (Cannings 2023), and Odonata community structure (Cerini *et al*. 2021). Many papers deal with rare species (e.g., Savard 2016, Turgeon 2016, Klymko & Weigensberg 2018).

The use of online data and image portals has become popular with scientists and naturalists and has contributed greatly to the knowledge of odonate distribution. Many of these, for example, BugGuide (https://bugguide.net) and iNaturalist (https://inaturalist.ca), offer photograph identification services. Data associated with the photographs are available, as are distribution maps for each species. Cellphone applications are popular; some are based on data from OdonataCentral (https://www.odonatacentral. org/#/), the premier site for Odonata distributional information in North America.

As well as literature reports, collections and databases provide an essential foundation for the Canadian list and conservation status rankings. Major Odonata collections include the Canadian National Collection at Agriculture and Agri-food Canada in Ottawa (see Hutchinson & Catling (2005) for the history and composition of the collection), the University of Montréal's Ouellet-Robert Entomological Collection (Favret *et al.* 2019), the Royal Ontario Museum in Toronto, and the Royal British Columbia Museum in Victoria. Some of these collections are databased; for example, the University of Montréal's contains about 32,000 records from the province of Québec (Favret *et al.* 2020) (although many data are not validated) and the Royal British Columbia Museum's has approximately 47,500 records, 42,700 of which are from Canada. Important databases include those at Conservation Data Centres (see https://www.natureserve.org/). The Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry maintains the Ontario Odonata Atlas Database, which contains more than 96,000 records dating back to 1886. Entomofaune du Québec, with its *Initiative pour un atlas des libellules du Québec* (IALQ) is currently working on updating a database for this province (Savard 2011, 2023b). This is the source of most of the validated data used for the species listed for this province (observers cited and source indicated by the initials IALQ). Paul Brunelle amassed a dataset of records and inspired many of the region's naturalists to collect data through the Atlantic Dragonfly Inventory Program (ADIP), which he launched in the early 1990s. That dataset contains 38,068 records (including historical ones) and has vastly improved our understanding of species distribution and status in eastern Canada. Much of the data are available through the Atlantic Canada Conservation Data Centre and, soon will be housed, along with the specimens, at the New Brunswick Museum.

The online sites mentioned above (e.g., iNaturalist) provide thousands of authoritatively identified Canadian records for faunistic analyses. "Research Grade" records in iNaturalist are uploaded to the Global Biodiversity Information Facility (GBIF) at www.gbif.org.

Status and Monitoring

The first comprehensive published annotated list of Canadian Odonata, Catling *et al.* (2005), listed 208 species and included the first general status ranks produced by the *General Status of Species in Canada* program of Environment and Climate Change Canada. This program ranks species in all Canadian provinces and territories through the National General Status Working Group (NGSWG), although several provinces and territories had already been maintaining species lists and associated conservation status ranks.

The general status list is produced every five years. The 2010 assessment listed 211 species; in 2015, four were added to the list and two were removed, giving a total of 213. In 2020, the list had grown to 219, but this included the three alien species mentioned earlier that were detected in Québec, so the actual number should have been 216. However, Cannings (2019), in his overview of the Canadian fauna, gave the number as 214, having inadvertently missed the record of *Somatochlora filosa* (Savard *et al*. 2017) and omitting *Stylurus plagiatus* (see note under "Species Retained in the Canadian List"). The texts and tabular databases (i.e, provincial/territorial species lists, and status ranks for each species) for these reports are available at Canadian Endangered Species Conservation Council (2016a, b; 2022a, b). Thus, these tables are a source of species lists for the individual jurisdictions, although other compilations also exist, e.g., NatureServe lists for the jurisdictions (https://tinyurl.com/y2ql78ae) and Savard (2023b) for the province of Québec. The present publication is an additional source of national and subnational (jurisdictional) status ranks, and has some of the same authors, but it also includes the very extensive basis for occurrence and status information which is essential for scientific research.

Cannings (2019) summarizes the Canadian fauna in relation to a 1979 overview (Corbet 1979). All families show increases in species diversity except the Aeshnidae (unchanged) and the Petaluridae (decrease from 2 to 1 owing to an error in the interpretation of specimen data for *Tachopteryx thoreyi* (Hagen *in* Sélys)). Seven species are considered vagrants or wanderers and presumably do not breed in Canada, although they may appear annually. A few of the Canadian species recently added to the national list are rare, hard-to-find species that probably have been in Canada a long time (e.g., *Somatochlora hineana, Williamsonia lintneri*); some have recently moved northwards from the United States (e.g., *Archilestes californicus*, *Enallagma durum*), while others are newly recorded vagrants (e.g., *Erythemis vesiculosa, Tramea darwini*). See also "Excluded Species" section below.

The monitoring of Odonata populations will increase in importance, and the information provided here will assist in such efforts. Information on changes in conservation status is needed to determine whether species are endangered, threatened, or of special concern, but only a few studies of this kind (e.g, Catling & Brownell 2002, Ramsay & Cannings 2005, Cannings *et al.* 2007, Savard & Mochon 2014, Savard 2022) have been attempted, although the information necessary for such evaluations is rapidly increasing.

One of the most extensive recent Odonata monitoring programs in Canada was led by Paul Catling, Colin Jones, and Paul Pratt, with the publication support of the Toronto Entomological Association. Seven volumes of Ontario Odonata (Catling *et al*. 2000–2007) resulted in the publication and databasing of 40,893 Odonata records over a six-year period. These data were incorporated into the pre-existing Ontario Odonata Atlas Database managed by the Ontario Natural Heritage Information Centre. The *Initiative pour un atlas des libellules du Québec* of Entomofaune du Québec and the Atlantic Dragonfly Survey are noted above.

Bried *et al.* (2020) outlined a proposal for a global volunteer network to document the abundance of Odonata, including organizational structure, advertising and recruiting, and data collection, submission, and synthesis. Such organized activity could help expand past monitoring efforts and create needed new data for our understanding of the status of Canada's Odonata species.

Taxonomy and variation

Aeshna septentrionalis. Schneider *et al*. (2023) make *A. septentrionalis* a subspecies of the Palaearctic *A. caerulea* (Ström), based on molecular data. Walker (1912) had come to the same conclusion in his monograph of *Aeshna* but reversed his decision later after examining more material (Walker 1958), especially with respect to the shape of the male cerci and the shape of the lateral thoracic stripes. He noted that "the differences between [the two species], though slight, appear to be constant." In this case, despite the publishing of the new molecular data, we follow Walker (1958) and maintain *A. septentrionalis* as a species. We believe additional comparative research into the genetic and morphological traits of *A. septentrionalis* and *A. caerulea* populations is required.

We follow Ware *et al.* (2017), who moved the North American clubtails that had remained in the genus *Gomphus* to other genera, based on molecular analyses—*Gomphus* to *Gomphurus* (*G. externus, G. fraternus, G. vastus, and G. ventricosus*), to *Hylogomphus* (*H. abbreviatus, H. adelphus,* and *H. viridifrons*), and to *Phanogomphus* (*P. borealis, P. descriptus, P. exilis, P. graslinellus, P. lividus,* and *P. quadricolor*). As a result, the genus *Gomphus* is now restricted to the Old World.

Enallagma cyathigerum (Charpentier) was once considered the only Holarctic member of the genus *Enallagma* and the family Coenagrionidae, but it has been split into two species, one in the Old World, one in the New World. *Enallagma cyathigerum* is the original Eurasian taxon; the Nearctic populations are now called *E. annexum* (Turgeon *et al.* 2005).

Epiaeschna and *Nasiaeschna* are considered junior synomyms of the monotypic European genus *Brachytron* by Schneider *et al.* (2023) in their study of the molecular phylogeny of the Holarctic Aeshnidae. We prefer to retain *Epiaeschna* and *Nasiaeschna* as distinct genera pending further study.

Sympetrum occidentale is now considered a subspecies of *S. semicinctum* (Pilgrim & von Dohlen 2007b). See the section on subspecies below for additional comment.

Tramea calverti Muttkowski is now a junior synonym of *Tramea darwini* Kirby (Johnson & Tennessen 2021, Lorenzo-Carballa *et al*. 2021).

Zoraena Kirby has been supported by several taxonomists for decades as the proper genus for some species in *Cordulegaster*; see Carle (1983) and Bright (2020) for details. We now accept the genus for *Cordulegater diastatops* based on Tennessen's (2019) recent work on naiads.

Although some of the following reports of morphological and molecular variation are from the United States and Mexico, the issues dealt with might also relate to Canadian populations:

Enallagma annexum, E. vernale. Sibley (2011) discussed size differences in these two related species in New York State that differ from those in other parts of the range.

Gomphurus fraternus. Catling (2008a) reported on variation in Canadian *Gomphurus fraternus* (as *Gomphus*) in relation to the recognition of subspecies *G. f. manitobanus*.

Leucorrhinia hudsonica. In Oregon, Johnson (2008) discovered individuals that lacked abdominal spots. Without close examination, these could be easily confused with smaller than normal *L. glacialis* or *L. proxima* specimens.

Libellula pulchella. Bailowitz & Danforth (2008) documented a male in Sonora, Mexico that lacked black wingtips.

Somatochlora sahlbergi. Kohli *et al*. (2018) analyzed the genetics of this far-northern corduliid from Scandinavia to northwestern Canada and concluded that the species interbreeds across this large range; there is almost no variation in the CO1 gene fragment, which is normally extremely variable.

Sympetrum internum. Catling (2007) reported on variation of hind wing colour and length in Great Plains specimens. See also *Sympetrum janeae* in "New to the Canadian List" below.

Subspecies

Where more than one subspecies occurs in North America or where the nominate subspecies occurs elsewhere (e.g., *Aeshna juncea*) the subspecies occurring in Canada are listed below the species name and indented in the species list. English and French names are seldom given to these subspecies and none are included here. Although there are relatively few subspecies in Canadian Odonata, several pose taxonomic questions that have not yet been resolved. The NGSWG ranks only species. Subspecies are ranked collectively as the species to which they belong. Thus, not all subspecies in the list are included in Table 1.

In some cases, it is clear which subspecies were ranked because only one subspecies occurs in Canada. For example, in Canada, *Argia fumipennis* populations include only members of the subspecies *A. f. violacea*; *Aeshna juncea* is represented only by subspecies *A. j. americana*; *Ophiogomphus mainensis* includes only the subspecies *O. m. mainensis*; and *Macromia illinoiensis* includes only the subspecies *M. i. illinoiensis*.

Populations of *Enallagma traviatum* recently discovered in the province of Québec are *Enallagma traviatum traviatum; Enallagma traviatum westfalli* occurs in southern Ontario. The former subspecies ranges east of the Appalachian Mountains (east of the Mississppi River in the South), the latter west of that region (Paulson 2011a).

The subspecies of *Aeshna interrupta* documented by Walker (1958) are problematic. Populations in Canada

include members of *A. i. interrupta*, *A. i. interna*, and *A. i. lineata,* although they do not form clear, geographically separate populations. What Walker calls *A. i. interrupta* is mostly eastern and *A. i. lineata* is mostly western, the two meeting in northwestern Ontario, but individuals resembling *A. i. lineata* occur at low frequencies in the Atlantic provinces and the populations on the Pacific coast, west of the Cascade and Coast mountains, look like *A. i. interrupta* of the East. This spotted form also mixes with *A. i. lineata* in the interior of British Columbia. Even more confusing, there are occasional specimens with the stripe patterns of each subspecies on either side of the thorax. *Aeshna i. interna,* with relatively broad thoracic stripes, occurs in southeastern British Columbia and in the southern Rocky Mountains of Alberta, but the region is also characterized by intergrades (Cannings & Stuart 1977). Clearly, interesting patterns of variation in thoracic stripes and shape of cerci occur in the species, and this variation requires more study over a broad geographical area. There may be two variable geographic forms, one eastern and one western, each of which has members that look like the other. Alternatively, the colour patterns may be a response to environmental factors such as temperature, precipitation, and/or the salinity of naiad habitat.

The subspecies of *Aeshna umbrosa* are also confusing. The nominate green-marked subspecies, *A. u. umbrosa*, is transcontinental whereas Walker (1958) indicates that the blue-marked subspecies, *A. u. occidentalis*, is strictly western, found in Canada only in southern British Columbia. However, blue-marked individuals do occur in eastern Canada, but a more confusing observation is that both blue- and green-marked forms occur throughout much of British Columbia, often in the same locality (Walker 1958, Cannings & Stuart 1977). See Walker (1958) for additional information on these races and reference to a dark form on Vancouver Island.

Although little studied until recently, *Gomphurus fraternus manitobanus*, a pale form, appears to be discrete in Canada. It ranges from the region of Winnipeg westward and evidently does not overlap with the dark eastern subspecies, *Gomphurus fraternus fraternus* (Catling 2008a).

The relatively dark *Ophiogomphus severus montanus* is the common form of the species in the interior of British Columbia and in the Rocky Mountains of Alberta whereas the lighter *O. s. severus* is the Great Plains form, occurring in British Columbia east of the Rockies and in Alberta and Saskatchewan (Walker 1958).

Macromia magnifica rickeri was designated a subspecies by Cannings *et al*. (2006). Although identical structurally to *M. m. magnifica*, subspecies *M. m. rickeri* is a dark-coloured form endemic to southern British Columbia. The yellow bands on abdominal segments 3–6 of the nominate subspecies are reduced in *M. m. rickeri* and divided into two spots. *Macromia m. rickeri* is restricted to the Fraser River Valley (south coast) and Shuswap Lake region (south-central interior). These populations occur in cooler and wetter environments than the paler, more wide-ranging *M. m. magnifica*, which inhabits the drier and warmer Okanagan and Kettle valleys of the southern interior of British Columbia. The ranges of the two subspecies do not overlap.

Using genetic and morphological data, Pilgrim & von Dolen (2007b) determined that the western *Sympetrum occidentale* Bartenev is a subspecies of the eastern *Sympetrum semicinctum*. The list followed herein (Paulson & Dunkle 2021) accepts this decision. Pilgrim & von Dolen (2007b) also indicated that the subspecies of *S. occidentale—S. o. occidentale* Walker in British Columbia, *S. o. fasciatum* Walker on the Great Plains, and *S. o. californicum* Walker in California and Nevada (Walker 1951, Walker & Corbet 1975)—should not be given formal subspecies rank because characters used to distinguish them overlap. Paulson (2007), however, noted "that populations that have been considered *semicinctum, occidentale, californicum*, and *fasciatum* do in fact possess distinctive characteristics and point to an interesting example of geographic variation in a widespread and common species. This information should not be lost by the suppression of the names." Most authorities do synonymize these names with *S. s. occidentale* (e.g., Needham *et al.* 2014). Examination of naiads of these taxa give inconclusive results concerning relationships (Tennessen 2019).

A similar situation exists with the eastern *Erythemis simplicicollis* and the western *E. collocata* (Donnelly 2004c) and the eastern *Amphiagrion saucium* and the western *A. abbreviatum* (Paulson 2011a). We follow Paulson & Dunkle (2021) and Tennessen (2019) in maintaining these taxa as separate species pending more study.

Other species have recognizable forms but are not currently treated as subspecies either because they previously have been placed in synonymy (e.g., *Somatochlora albicincta massettensis* Whitehouse) or the variations within Canada have not been recognized taxonomically (e.g., *Epitheca cynosura, Epitheca princeps, Leucorrhinia proxima*).

Species Excluded from the Canadian List

1. Unestablished alien species

In 2001–2003, three Asian species emerged inside a commercial building in the city of Québec from containers of imported aquatic plants. *Crocothemis servilia*, a libellulid native to Asia and introduced to, and established in, Florida and the larger Caribbean islands, is the only alien odonate species with viable wild populations in the New World (Paulson 2011a). Specimens emerged in 2001 and 2002 (Perron *et al.* 2003). In the same commercial establishment, adults of *Ischnura senegalensis* emerged in June 2002 and a single male of *Anax guttatus* emerged in September 2003 (Perron *et al.* 2004).

As no wild populations of these species were established, the records were excluded by Catling *et al.* (2005) and, although *Crocothemis servilia* is listed in *Wild Species 2015* (Canadian Endangered Species Conservation Council 2016a, b) as the first alien species in Canada, it and the two other species are not accepted in the Québec lists (Savard 2023b, Favret *et al*. 2020). These three species are excluded from the Canadian list for the same reason that they were in 2005.

2. Native species

Neurocordulia obsoleta (Say). Listed in Catling *et al.* (2005) from New Brunswick and from the same province by Paulson & Dunkle (2021) but deleted from Wild Species 2015 because it was based on a misidentification (Canadian Endangered Species Conservation Council 2016a, b) as explained in detail by Brunelle (2010, p. 354). The original records from the Saint John River and Mactaquac Lake are discussed by Sabine *et al*. (2004).

Species Excluded from Provincial Lists

Aeshna septentrionalis was reported from Nova Scotia by Hagen (1861) and was included in the Nova Scotia list by Catling *et al.* (2005). Brunelle (2010) treats this historical report as doubtful, and we do not include it on the Nova Scotia list.

Brunelle (2010) reported *Enallagma vernale* from New Brunswick based on a single sighting. This bluet is so like *E. annexum* that we consider its presence unconfirmed in the province, pending the collection of a specimen.

Epitheca cynosura was reported from Prince Edward Island by Brunelle (2010). A single exuvia collected near Stanhope, Queens Co. was identified using morphological characters. The naiads of *E. cynosura* and *E. spinigera* are extremely similar and adults of the latter species are regularly collected in the Stanhope area. Pending further evidence of the presence of *E. cynosura* on Prince Edward Island, we consider the species there reported but unconfirmed.

Hylogomphus abbreviatus was listed for Nova Scotia by Catling *et al.* (2005), based on naiad specimens that have been reidentified as *H. adelphus* (Brunelle 2010).

When critically examined, all putative specimens of *Sympetrum rubicundulum* from the Maritimes proved to be *S. internum* (Pfeiffer *et al.* 2021). Therefore, *S. rubicundulum* is removed from the species lists of New Brunswick, Nova Scotia, and Prince Edward Island.

Cannings (2015) rejected six species that had been listed for Alberta in some provincial lists. Some of these almost certainly occur in Alberta, e.g., *Lestes forcipatus* and *Leucorrhinia patricia,* but no acceptable records have yet been examined. John Acorn (pers. comm.) explains that the presence of these species on provincial lists mostly results from unsubstantiated identifications of young naiads (a risky undertaking at any time) by undergraduate students decades ago. These species are: *Lestes forcipatus*, *Enallagma civile, E. vernale, Ophiogomphus rupinsulensis, Leucorrhinia patricia*, and *Pachydiplax longipennis.* The *Lestes* and *Pachydiplax* were listed in Catling *et al.* (2005) as "5" (undetermined); the others were not listed.

We have rejected several species mapped in the "Dot Map Project" on Odonata Central from the Manitoba list: *Celithemis eponina, Neurocordulia yamaskanensis, Ophiogomphus carolus,* and *Sympetrum rubicundulum.* The species were also mapped in Manitoba by Paulson (2009, 2011a) in his popular guides; he took the records

directly from Odonata Central (D. Paulson, pers. comm.). Likewise, one or two *Anax junius* records mapped along the Yukon– Alaska border, perhaps actually in Yukon, are rejected. None of these records have any associated data. The Dot Map Project resulted in numerous incorrectly mapped records, most of which have been corrected over the years.

Species Retained in the Canadian List

Stylurus plagiatus (Sélys) is known in Canada only from Pelee Island, Ontario (one record of newly emerged male, 1924) (Walker 1958) and is now considered "possibly extirpated" from Ontario and Canada (SH and NH respectively, Canadian Endangered Species Conservation Council 2022a, 2022b, Ontario Natural Heritage Information Centre 2022). However, it is retained in this Canadian list: (1) so that we have a complete modern list; (2) it is only "possibly extirpated"; (3) it still occurs on the western Lake Erie Islands and locations very close to Canada (e.g. "abundant" 5 km west of Canada on Detroit River (Craves 2007) making its continued occurrence here very likely, and (4) the 40 or 50 years of absence rule upon which its "possibly extirpated" is partly based is not appropriate for many insects without a directed search; and (5) improvements in the quality and biodiversity content of western Lake Erie water suggest that this dragonfly may now survive there (Kraus 2015).

Species New to the National and Provincial/Territorial Lists

1. Species New to the Canadian List

Since the classic works on Canadian Odonata by Walker (1953, 1958) and Walker & Corbet (1975), 27 species have been added to the Canadian fauna. The 14 additions to the 2005 checklist, in alphabetical order, are:

Archilestes californicus McLachlan (California Spreadwing / Le leste de la Californie). Cannings & Pym (2017) document the first records (photographs) of this damselfly in Canada at three sites from Osoyoos north to Okanagan Falls in the Okanagan Valley, British Columbia, on 26 and 27 September 2016 (Fig. 1). The species has moved northward through Washington State since the 1990s. On 31August 2019, it was photographed by Cameron Eckert at the Osoyoos Desert Centre (iNaturalist 31901027) and, in 2021, it was found at two of the localities where it was first recorded in 2016 (iNaturalist 95556812, 93933820).

Cordulegaster erronea Hagen *in* Selys (Tiger Spiketail / Le cordulégastre tigré). This spiketail was first discovered on 27 July 2011 by Adam Timpf in the Long Point area of Norfolk County, Ontario (Ontario Odonata Atlas Database 134844). Individuals have been seen at this location nearly every year since (e.g., iNaturalist 30970472, Fig. 2). It is now also known from two other localities in southern Ontario, one in the Goderich area of Huron County (iNaturalist 50904480) and one in Halton County (iNaturalist 13529423).

Enallagma durum (Hagen) (Big Bluet / L'agrion costaud). Alain Mochon (2023) discovered a population of this damselfly in Missisquoi Bay, Lake Champlain, at Saint-Armand, Québec (Fig. 3). Several dozen reproducing individuals were recorded on 1 August (iNaturalist 181049142), 17 August (iNaturalist 181049145), and 31 August 2023 (iNaturalist 181145855). On the latter date, Mochon noted about ten teneral individuals on their maiden flight. Voucher specimens are available. These observations represent a recent northward expansion along the axis of the Hudson River Valley, with the first mention of an individual at Lake Champlain, Shelburne, Vermont, in 2014 (iNaturalist 861935).

Enallagma pictum Morse (Scarlet Bluet / L'agrion écarlate). McAlpine *et al.* (2017) document the discovery of this damselfly mating and ovipositing on 24 July 2016 at Cranberry Lake, Charlotte County, New Brunswick, and the collection of specimens at five lakes in the region. Other records have since accumulated (Fig. 4). These Canadian records represent a range extension of this rare species, probably recent, of about 180 km northeast of the nearest site in Maine.

FIGURE 1. *Archilestes californicus*, male. Vaseux Lake, British Columbia, 27 September 2016. Photo: Russ Pym (Cannings and Pym 2017); used with permission.

FIGURE 2. *Cordulegaster erronea*, male. Long Point area, Ontario, July 2012. Photo: Kyle Holloway (iNaturalist 30970472); used with permission.

FIGURE 3. *Enallagma durum*, male. Saint-Armand, Québec, 17 August 2023. Photo: Alain Mochon; used with permission.

FIGURE 4. *Enallagma pictum*, pair ovipositing. Douglas Lake, Welsford, New Brunswick, 21 August 2019. Photo: Jim Bell (iNaturalist 31261049); used with permission.

Epitheca costalis (Selys) (Slender Baskettail / L'épithèque cintrée). A population of this baskettail was discovered by Rob Tymstra on Pelee Island, Essex County, Ontario on 1 June 2022 (iNaturalist 119866180, 119866712, and 119866886). Voucher specimens were collected on 2 June (2 males) and 4 June (1 male, 1 female). The specimens are housed in the collection at the Natural Heritage Information Centre, Ontario Ministry of Natural Resources and Forestry. Subsequently, individuals were seen at the same locality until at least 6 June 2022 (iNaturalist 121016761).

Erythrodiplax umbrata (Linnaeus) (Band-winged Dragonlet / L'érythrodiplax ombré). Steve Pike first recorded this species in Canada at Point Pelee National Park, Essex County, Ontario, on 17 September 2008 (Anon. 2008, Ontario Odonata Atlas Database 134859). That occurrence was associated with the remnants of Hurricane Ike, which may have brought the dragonfly north. Later Ontario records, including those of females, are described by Lamond (2015).

Erythemis vesiculosa (Fabricius) (Great Pondhawk / L'érythème émeraude). Rob Tymstra photographed a Great Pondhawk on Pelee Island, Ontario, on 20 October 2021 (iNaturalist 98810434). This resulted in Scott Connop realizing that he may too have seen this species a week before on 13 October 2021 in Forest, Ontario. He posted his photo on iNaturalist and it was later confirmed as *E. vesiculosa* (iNaturalist 98789147).

Lanthus vernalis Carle (Southern Pygmy Clubtail / Le gomphule printanier). In Kings County, New Brunswick, on 7 July 2007, Bob Harding collected two males of this gomphid, which is mostly an inhabitant of primary Appalachian streams. They have been deposited at the New Brunswick Museum and the Canadian National Collection in Ottawa (Harding 2007). Brunelle (2013) details additional New Brunswick records, including that of an adult male collected by Anthony Thomas in York County in 2004. More recent records are found in iNaturalist, e.g., 86230992 (Fig. 5).

FIGURE 5. *Lanthus vernalis*, male, Notre-Dame, Kent County, New Brunswick, 5 July 2021. Photo: Stuart Tingley (iNaturalist 86230992); used with permission.

Lestes australis Walker (Southern Spreadwing / Le leste austral). The status of this spreadwing in Ontario and Canada is confusing given that most of the examined specimens referenced in the literature were considered misidentifications (Catling 2004b). The single possible specimen of *L. australis* referenced in Catling (2004b) was accidentally destroyed and so cannot be re-examined. Once considered a subspecies of *Lestes disjunctus*, *L. australis* was not included in Catling *et al*. (2005). Since then, it has been raised to the level of species (Paulson & Dunkle 2021). Given that the species occurs relatively commonly in Ohio and that there is at least one specimen that was considered a possible *L. australis*, we include the species here but as "reported but unconfirmed". Its status in Canada requires additional study.

Somatochlora filosa (Hagen) (Fine-lined Emerald / La cordulie tricoteuse). Savard *et al*. (2017) record the collection of a female naiad collected by Majella Larochelle on 7 September 2016 at Sainte-Catherine-de-Hatley, in the region of Estrie, province of Québec; an adult emerged ten days later (Fig. 6). The breeding site is only the second described. The locality is 575 km north of the closest known occurrence in New Jersey, USA.

FIGURE 6. *Somatochlora filosa*, female. Reared from a naiad collected by Majella Larochelle on 7 September 2016 at Sainte-Catherine-de-Hatley, province of Québec. Photo: M. Savard.

Somatochlora hineana Williamson (Hine's Emerald / La cordulie du Midwest). This corduliid was discovered by Chris Evans at Minesing Wetlands, Simcoe County, Ontario on 20 June 2007 (iNaturalist 72120809) and subsequently identified by Colin Jones as *Somatochlora hineana*. The location remains the only one known in Canada (COSEWIC 2011b), although the species has been recorded there many times (see Observations · iNaturalist Canada).

Sympetrum janeae Carle (Jane's Meadowhawk / Le sympétrum de Jane). Since this taxon was described (Carle 1993), its validity has been frequently questioned. It is usually considered a synonym of *S. internum* (Paulson

2011a) and was rejected from the Canadian list (Catling *et. al.* 2005). Although it is accepted by Needham *et al.* (2014), *S. janeae* has never been included in the DSA list (Paulson & Dunkle 2021), a position bolstered by Pilgrim & von Dohlen (2007b) who state: "Further studies are necessary to test the species status of *S. janeae* and its close relatives", which were classified in the subgenus *Kalosympetrum* by Carle (1993). *Sympetrum janeae* was recognized in southern Québec as "forme *janeae*" by Pilon and Lagacé (1998, p. 315) but now Québec experts, particularly those participating in the Québec Atlas project, consider it morphologically distinctive and worthy of species rank. The populations of *S. janeae* are abundant and they appear to be restricted to the lowlands east of the St. Lawrence River where *S. internum* is rare. The specific habitat also seems to differ, one frequenting temporary pools of open marshes (*S. janeae*), the other rather shaded, shrubby swamps (*S. internum*). Carle's description and biogeographical interpretation in eastern North America applies to the province of Québec. Furthermore, the separation of the naiads of *S. internum* and *S. janeae* is not difficult, according to Carle (1993) and supported by Tennessen (2019). We conclude that *S. janeae* is present as a species in southern Québec and, plausibly, throughout other areas of eastern Canada (New Brunswick, Nova Scotia, Prince Edward Island, and the St. Lawrence River Region of eastern Ontario). The status of *S. janeae* requires more clarification over all its potential range but, in Canada, is accepted as a species at this time. References to hybridization among these *Sympetrum* species (e.g., Carle 1993, Paulson 2011a, Needham *et al.* 2014) also deserve further examination.

Tramea darwini Kirby (Striped Saddlebags / La traméa rayée). A single female was photographed at Point Pelee National Park, Ontario, on 29 September 2010 (Craves and O'Brien 2011) and others at the same location on 4 and 8 October (Lamond 2010a, b). During the late summer of 2010 this wandering neotropical dragonfly moved northward in North America and there were several reports from the Great Lakes region (Craves & O'Brien 2011). There are 12 photographic records between 6 September 2014 (iNaturalist 30908609) (Fig. 7) and 17 October 2021 (iNaturalist 1194772), all from the Point Pelee area except the latter, which is from Toronto. See also following section (Species New to Provincial and Territorial Lists: Atlantic Provinces).

FIGURE 7. *Tramea darwini*, male. Point Pelee, Ontario, 6 September 2014. Photo: Kyle Holloway (iNaturalist 30908609); used with permission.

Williamsonia lintneri Hagen *in* Sélys (Ringed Boghaunter / La corduliette tigrée). Greg Rand photographed a single female on 11 May 2016 at a site in Manitoulin District, Ontario. Colin Jones, Peter Burke, and Mike Burrell visited the area on 17 May 2017 (iNaturalist 6258399, Fig. 8) where they witnessed a mass emergence at two separate sites, confirming an Ontario breeding population. In May 2022, an individual was photographed on the Bruce Peninsula (iNaturalist 119669252).

FIGURE 8. *Williamsonia lintneri*, freshly emerged female. Manitoulin District, Ontario, 17 May 2017. Photo: Colin Jones (iNaturalist 6258399).

2. Species New to Provincial and Territorial Lists

Atlantic Provinces (33 new provincial records)

Amphiagrion saucium. Prince Edward Island. John Klymko discovered a colony near Caledonia, Queens Co., on 11 June 2022 (iNaturalist 121505319).

Celithemis eponina. New Brunswick. Scott Makepeace recorded a female at Tennants Cove, Kings Co., on 21 August 2013, the first report from the Atlantic Provinces. In August 2016, more were observed in Charlotte Co. (Makepeace *et al.* 2017). Newfoundland and Labrador. An individual lacking much of the orange wash on the wings was photographed at Gander on 5 August 2022 by Ryan Menchion (iNaturalist 129623557). This location is about 940 km northeast of the Kings Co., New Brunswick record. Nova Scotia. Mic Shaw photographed an adult male at the Malay Falls Flowage on 26 August 2022 (OdonataCentral 2388972).

Celithemis martha. New Brunswick. John Klymko collected a female near Round Lake, Kings Co., on 9 August 2006 (Klymko 2007).

Enallagma anna. New Brunswick. On 23 September 2017 Scott Makepeace collected a male at Belleisle Creek, Kings Co. This is an easterly range extension of about 500 km (Makepeace & Lewis 2020).

Enallagma geminatum. Nova Scotia. John Klymko and Miranda Weigensberg collected this damselfly at four lakes in Lunenburg and Queens counties in 2017 (ACCDC 2021).

Enallagma pictum. New Brunswick. See "Species New to the Canadian List" above.

Enallagma vernale. Prince Edward Island. A specimen collected on 25 July 2002 by Rosalyn Sellick, Rosemary Curley, and Jacob Harding at O'Keefes Lake, Queens Co. is the basis of the report from Prince Edward Island by Brunelle (2010). It was subsequently collected in 2013 near Mount Vernon, Queens Co., by Bob Harding and others.

Erythemis simplicicollis. New Brunswick. Anthony Thomas collected two adults, including a teneral individual, in Nashwaaksis, York Co., on 25 and 28 June 2012 (ACCDC 2023).

Erythrodiplax berenice. New Brunswick. Dwayne Sabine collected several adults in a salt marsh at Maces Bay, Charlotte Co., on 25 July 2020 (iNaturalist 55789653). It was found in several salt marshes in the Lower Bay of Fundy later in 2020 (Mary Sabine, pers. comm.).

Gomphaeschna furcillata. Prince Edward Island. A recently emerged female was collected by Bob Harding at Village Green, Queens Co., on 15 June 2005 (Harding 2006).

Ischnura hastata. Nova Scotia. Three males were collected on Sable Island on 26 August 2009, extending the range 730 km northeast of Maine localities (Catling *et al*. 2009). New Brunswick. On 16 September 2015, Jake Lewis recorded a male at Black Beach, Saint John Co. (Makepeace *et al.* 2017).

Ischnura kellicotti. New Brunswick. John Klymko and Miranda Weigensberg first collected this damselfly on 10 July 2017 at Douglas Lake; it was found at several other localities that month (Klymko *et al.* 2019).

Ischnura posita. Prince Edward Island. Clayton and Bob Harding collected the first provincial record on 13 June 2009 at Eastern Kings, Kings Co.; they recorded it again in 2014 in Queens Co. (Harding 2014).

Lanthus vernalis. New Brunswick. See "Species New to the Canadian List" above. Nova Scotia. Sean Blaney discovered the species at Fairmont on 18 June 2011 and exuviae were collected at several locations on the West Saint Mary's River later that month (Klymko *et al.* 2019).

Lestes rectangularis. Prince Edward Island. Jake Harding collected one adult on 20 July 2021 and two adults on 27 July 2021, both in Kings Co. (Harding 2021; iNaturalist 88112656 and 92999646).

Libellula luctuosa. New Brunswick. Scott Makepeace (pers. comm.) found a population in Queens Co. on 11 July 2019 and it has since been found in York and Charlotte counties.

Libellula pulchella. Prince Edward Island. Paul Brunelle observed a mature adult on 23 July 2008 (Brunelle pers. obs). The species is a recent colonist, now found across the province (Harding 2019).

Neurocordulia michaeli. Nova Scotia. John Klymko and Sarah Robinson collected exuviae at numerous sites in the Saint Mary's River system in June 2011 and JK found adults there on 8 June 2012 (Klymko & Robinson 2013).

Ophiogomphus anomalus. Nova Scotia. John Klymko collected exuviae at eight sites along a 14 km stretch of the Medway River, Queens Co., on 18 June and 20 July 2010 (Klymko 2011).

Pachydiplax longipennis. Nova Scotia. Jim Edsall observed an adult at Maynard Lake in Dartmouth, Halifax Co., on 21 July 2013 (ACCDC 2023). It has since been confirmed breeding in Halifax Co., and adults have been reported to iNaturalist from Shelburne Co. and Kings Co.

Perithemis tenera. Nova Scotia. Amanda Lavers photographed a teneral male on Kejimkujik Lake on 15 July 2017 (Anon. 2017). New Brunswick. Scott Makepeace (pers. comm.) collected a male at Waltons Lake, Kings Co., on 30 August 2019, and it has since been found at other sites in Charlotte Co.

Rhionaeschna mutata. Nova Scotia. Although this darner is included in the first edition of this checklist (Catling *et al.* 2005) and thus is not new to Nova Scotia, the information of the initial record provided by Cook & Bridgehouse (2005) was not noted— Derek Bridgehouse collected a female at Eastern Passage, Halifax Co., on 13 September 2003.

Somatochlora tenebrosa. Prince Edward Island. A naiad was collected by Michelle Dobrin near Stanhope, Queens Co., on 2 June 1997 and is deposited in the New Brunswick Museum. This is the only known record for the province and is the basis of the report from Prince Edward Island by Brunelle (2010). Dwayne Sabine re-examined the specimen in 2021 and confirmed the identification (Dwayne Sabine, pers. comm.).

Stylurus notatus. New Brunswick. On 7 October 2022, Kelly Kretchmer photographed a male at Miramichi (iNaturalist 138454557). This is the first record in Atlantic Canada.

Sympetrum corruptum. New Brunswick. Stuart Tingley photographed an adult female of this wandering species at Petit-Cap, Westmorland Co., on 3 August 2012 (iNaturalist 10156797).

Tramea darwini. Nova Scotia. Rita Viau photographed a female in River Bourgeois on 16 August 2020 (iNaturalist 56800469).

Tramea lacerata. Nova Scotia. Derek Bridgehouse captured two specimens on 28 July and 4 August 2008 at Eastern Passage, Halifax Co. (Bridgehouse 2008). New Brunswick. On 24 September 2017, Scott Makepeace photographed a male at Belleisle Creek, Kings Co. (Makepeace & Lewis 2020).

Zoraena diastatops (as *Cordulegaster*). Newfoundland and Labrador. Michael Lynch photographed a male on 26 June 2016 at J.T. Cheeseman Provincial Park (iNaturalist 3684235).

Québec (17 new provincial records)

Anax longipes. Two patrolling males were photographed on 5 July 2012 at Saint-Lazare in the region of Montérégie by Mark Dennis (IALQ; photograph in Savard 2013b; iNaturalist 10271535), and a male and female on 29 June and 3 July 2019 at the same locality by Roxanne Sarah Bernard and Félix Brassard (IALQ; iNaturalist 35407777). The recent influx of this migrant in the province is a possible result of climate warming in the American Midwest.

Argia apicalis. Daniel Cloutier (IALQ) photographed a male on 15 August 2019 at Danville in the region of Estrie (http://entomofaune.qc.ca/Bulletin/Bulletin_54.pdf?1; iNaturalist 35336728). A recent expansion of the species northward along the axis of the Richelieu River is possible.

Enallagma anna. On 30 July 2012, Mark Dennis (IALQ) discovered a population at Saint-Lazare in the region of Montérégie (iNaturalist 10271154) and, in 2014, Alain Côté, Guy Lemelin, and Maurice Raymond (IALQ) recorded a second at Irlande in the region of Chaudière-Appalaches. In the same region, a male was collected on 25 July 2015 at Parc national de Frontenac (Mochon 2017). Subsequently, other individuals were recorded in the lowlands along the St. Lawrence River, north to Saint-Raphaël in the region of Chaudières-Appalaches in 2020 and to the city of Québec in 2022. Surprisingly, a few were found in the highlands of the Lac Jacques-Cartier massif in 2019 and 2022 (Alain Côté, Peter Lane, Guy Lemelin, Alain Mochon, Isabelle Pothier, and Maurice Raymond, IALQ; Mariano J. Feldman, iNaturalist 131374275). These records represent a recent, strong extension of the species' range eastward in agricultural areas, probably associated with the phosphorus enrichment of water bodies.

Enallagma durum. See "Species New to the Canadian List" above.

Enallagma traviatum. Populations were discovered in 2013 in natural habitat at Dunham in the region of Estrie by Roxanne Sarah Bernard (IALQ; Savard 2013c), in 2015 at Parc national du Mont-Saint-Bruno and Rougemont in the region of Montérégie by Mario Comtois (IALQ), in 2018 at Farnham, and in 2021 at Granby in the region of Estrie by Alain Mochon (IALQ; iNaturalist 179614934). A single male captured on 28 August 2023 at Sherbrooke by Alain Mochon (IALQ; iNaturalist 180695785) possibly indicates another population. These isolated populations are considered relics in the province of Québec. The specimens from Dunham, Parc national du Mont-Saint-Bruno and Rougemont, are the nominate subspecies, *E. t. traviatum*.

Hetaerina americana. Although this damselfly was once reported from the city of Montréal (Calvert 1908) and was listed as "Accidental" in Catling *et al*. (2005), specimens are unknown (Pilon and Lagacé 1998). However, individuals were collected on 12 September 2009 along the Yamaska River at Bromont and more were observed in 2010 (Mochon 2011). Four other sites were subsequently discovered: in 2010 on the Yamaska-Nord River, in 2014 on Chateauguay River (near Montréal), in 2018 on Yamaska River at Farnham, and in 2019 on Noire River, always in places little disturbed by human activities (Alain Mochon, Mario Comtois, and Roxanne Sarah Bernard, IALQ). The species is locally established in the regions of Montérégie and Estrie; this change in status is not linked to global warming but to the quality of natural and restored habitats not explored before.

Ischnura hastata. Several teneral and mature specimens of this widespread southern damselfly were collected on 13 September 2008 at Trois-Rivières in the region of Mauricie (Charest 2009). Appararently, there was a northward movement of this species in 2008; it also reached a new northern limit in Ontario (Catling 2008b).

Libellula semifasciata. A male was photographed on 4 June 2014 at Saint-Hugues in the region of Montérégie (Brodeur *et al.* 2014), and one or two males were seen from May 29 to June 25 at Parc national de Frontenac in the region of Chaudière-Appalaches (Mochon 2017). On 9 June 2019, a dozen individuals were reported at Roxton Pond in the region of Estrie but they disappeared after 16 June (Alain Mochon, IALQ). All these probably were migrants. The recent presence of this facultative migrant species in the province of Québec could be the result of climate warming.

Neurocordulia michaeli. The first exuvia (a female) was collected on 10 June 2012 on the Batiscan River at Saint-Adelphe in the region of Mauricie (Charest & Savard 2014) and others were frequently found there in the following years (Pierrette Charest, IALQ). Exuviae were also collected in 2013 along the Trenche River (Charest & Savard 2014), and regularly since 2014 at the mouth of the Ashuapmushuan River in the region of Saguenay–Lac-Saint-Jean (Lise Chiricota, IALQ). An adult female was captured on 25 June 2016 along the Daaquam River at Saint-Just-de-Bretenières in the region of Chaudière-Appalaches by Alain Côté (IALQ, iNaturalist 39352272). This secretive species seems well established in the province.

Pachydiplax longipennis. A significant population was first discovered on 9 July 2011 along Castagne Brook at Saint-Joachim-de-Shefford in the region of Estrie; individuals were seen until 23 August (Mochon 2012). A male was also captured on 5 July 2013 at Parc national du Mont-Saint-Bruno in the region of Montérégie (Mochon 2015). The species is now well-established in the southern part of the province (Piché and Hutchinson 2016) and, since 2019, northward to Leclercville in the region of Chaudière-Appalaches (Alain Côté, Peter Lane, and Maurice Raymond, IALQ). This is clearly a recent northern range extension, associated with the phosphorus enrichment of water bodies and climate warming.

Perithemis tenera. A single female was collected on 15 August 2007 at Boivin Lake, Granby, in the region of Estrie; many more of both sexes were observed in 2008 (Bernard 2010). The species is now well established in the southern part of the province of Québec (Piché & Hutchinson 2016). By 2017, it had spread north to Bécancour in the region of Centre-du-Québec (Alain Côté, Guy Lemelin, and Maurice Raymond, IALQ), and reached Château-

Richer and Lévis in the vicinity of the city of Québec in 2018 (Alain Côté and Guy Lemelin, IALQ). This recent northern range extension is likely associated with the phosphorus enrichment of water bodies and global warming.

Phanogomphus quadricolor. A male exhibiting breeding behavior was photographed on 10 July 2021 in de l'Aigle River at Montcerf-Lytton in the region of Outaouais; this is the most northerly record in Canada (Pothier 2022a). A breeding population in this locality was confirmed at the end of June 2022 with the collection of about 30 exuviae and naiads (Savard *et al.* 2023). About 325 km eastwards, in the region of Estrie, a single exuvia was collected on 26 May 2021 in the Saint-François River at Melbourne (Alain Mochon and Michel Savard, IALQ), and five exuviae were found on 13 June 2021 in the Nicolet Sud-Ouest River at Danville (Isabelle Pothier and Michel Savard, IALQ). In 2023, flourishing populations in these two tributaries of the St. Lawrence River were confirmed (Isabelle Pothier and Alain Mochon, IALQ). These discoveries extend the known range of the species northward by 110 to 130 km.

Progomphus obscurus. Two naiads were first collected in 2016 in the Désert River near Maniwaki in the region of Outaouais (Ménard & Hutchinson 2016). Several breeding adults were reported from 2018 to 2021 in various places upstream of Désert Lake (e.g., Roxanne Sarah Bernard (iNaturalist 18850522); Alain Côté, Maurice Raymond, Peter Lane, and Richard Yank, IALQ). Many exuviae and reproducing adults were recorded from 5 to 11 July 2021 and 25 to 30 June 2022 in de l'Aigle River at Montcerf-Lytton (Pothier 2022b; Michel Savard, Alain Côté, Nathalie Desrosiers, Francis Lessard, Lyne McAllister, Benoît Ménard, and Isabelle Pothier, IALQ). These records represent a significant local population in the Gatineau Valley, the most northerly in Canada.

Rhionaeschna mutata. Alain Mochon collected a male on 30 June 2012 at Parc national du Mont-Saint-Bruno in the region of Montérégie and, in 2013, confirmed the presence of a population with the collection of exuviae and naiads (Mochon 2013, 2015). The species was still present and abundant during an investigation in 2022, indicating a self-sustaining satellite population in this locality (Mochon & Savard 2023, Savard & Mochon 2023).

Somatochlora filosa. See "Species New to the Canadian List" above.

Somatochlora linearis. Savard *et al.* (2017) authenticate the occurrence of this species from a teneral female specimen collected in 1877 by Léon Provancher at Saint-Hyacinthe in the region of Montérégie. The species has not been found recently at the Provancher site (which is now heavily disturbed by human activities) and is possibly extirpated from the province of Québec.

Sympetrum janeae. See "Species New to the Canadian List" above.

Ontario (11 new provincial records)

See "Species New to the Canadian List" above for Ontario records of *Cordulegaster erronea, Epitheca costalis, Erythemis vesiculosa, Erythrodiplax umbrata, Lestes australis, Somatochlora hineana, Tramea darwini,* and *Williamsonia lintneri.*

Ophiogomphus howei. Ilka Milne collected an exuvia on the Namakan River on 23 June 2007 but subsequent surveys on the river have not produced additional records (COSEWIC 2018).

Somatochlora brevicincta. Colin Jones identified three females collected between 2009-2013 from three different locations in Ontario's Hudson Bay Lowland during field surveys conducted by Ontario Ministry of Natural Resources and Forestry staff. The records are 10 July 2009 by Zaid Jumean from the Moose River Estuary; 28 June 2013 by Alex Howard from the Kaneesose Lake area; 11 July 2013 by John Ringrose from the Little Current River area. The specimens are housed in the Natural Heritage Information Centre, Peterborough, Ontario. Subsequently, Peter Burke and Eva Lee found a single male on 25 July 2014 at Wenebegon River Provincial Park, Sudbury District. Since 2018, this emerald has been found at several additional sites in appropriate habitat (patterned fens) across northern Ontario.

Sympetrum madidum. Kim Mann photographed a male at Laclu, Ontario, near the Manitoba border, on 13 July 2008 (Odonata Central 431925).

Manitoba (6 new provincial records)

Argia apicalis. James Reist photographed a male in Winnipeg on 28 August 2016 (Reist 2017). Coordinated searches later in 2016 failed to detect the species, but records from subsequent years are posted on iNaturalist.

Celithemis elisa. Reist *et al*. (2018) reported large colonies, first discovered in 2016, in Sandilands Provincial Forest.

Enallagma antennatum. James Reist photographed several males on the Seine River about 125 m upstream of its outlet in the Red River on 25 July 2019 (Odonata Central 500095).

Enallagma exsulans. James Reist photographed several males on the Roseau River at Stuartburn on 11 August 2019 (Odonata Central 501602).

Epitheca princeps. Lance Barber collected adults and exuviae at Lyons Lake on 10 July 2004; a male was photographed near East Braintree on 12 July 2009 (De Marsh & Taylor 2011).

Phanogomphus lividus. Donnelly (2004a) mapped a record from the Whiteshell Lake Provincial Park area. The species occurs nearby in Ontario and Minnesota, so it is not unexpected in southeastern Manitoba.

Saskatchewan (4 new provincial records)

Dorocordulia libera. Cary Kerst collected a single female during the Dragonfly Society of the Americas Annual Meeting in 2013: on the road to Stanley Mission north of La Ronge, 17 July 2013 (D. Halstead, pers. comm.).

Gomphurus externus. On 9 June 2015, Fran Kerbs photographed a female of this clubtail 2 km south of Fairy Hill Marsh, Qu'Appelle Valley (BugGuide 1081886, OdonataCentral 432021).

Gomphurus fraternus. Kim Mann and Fran Kerbs observed a female on 7 June 2016 at the same Fairy Hill Marsh site as above (OdonataCentral 456844) and Mann collected a male nearby on 1 July 2022 (OdonataCentral 506347; specimen in Royal Saskatchewan Museum: RSKM_ENT_E-172057).

Plathemis lydia. On 5 July 2017, Lorne Duczek recorded two males in Grasslands National Park near Val Marie (OdonataCentral 474595).

Alberta (3 new provincial records)

Argia emma. Ken Allen photographed an adult female at Writing-on-Stone Provincial Park, 1 July 2010 (BugGuide 430351, Cannings 2015). Cameron Eckert found the species common at the Writing-on-Stone campground on 20 July 2022 (iNaturalist 141759199, 141761168, …71, …72) and, a day later, photographed two individuals along the Milk River at the town of Milk River, about 34 km west of Writing-on-Stone (iNaturalist 141191556, …57).

Rhionaeschna californica. Robert Benn photographed a female on 19 May 2021 near Medicine Hat (iNaturalist 88737014).

Stylurus notatus. Jeremy Gatten photographed several individuals, including some emerging, on the Clearwater River near Fort McMurray on 30 June 2012 (Gatten 2012b).

British Columbia (1 new provincial record)

Archilestes californicus. See "Species New to the Canadian List" above.

Yukon (3 new territorial records)

Lestes congener. Cameron Eckert discovered this damselfly in the lower La Biche River valley of southeastern Yukon on 9 July 2005 (C. Eckert, pers. comm.).

Leucorrhinia glacialis. Cameron Eckert recorded large numbers of this whiteface on 25 and 26 June 2013 at Watson Lake Government Campground near Watson Lake (iNaturalist 18565887 and others); the species was photographed in the same area in 2019–21.

Somatochlora cingulata. Cameron Eckert collected and photographed a male at Blind Lake, 11 July 2021 (iNaturalist 87088244), 550 km north of the most northerly British Columbia record. Syd Cannings photographed and collected others 21 km north of Watson Lake on 28 July 2021 (iNaturalist 89286455) and Joachim Bertrands found them at the same place in 2022 (iNaturalist 128935679). The species was common at both these sites; whether this represents the recent discovery of a long-established population or a recent range expansion is not known.

Northwest Territories (4 new territorial records)

Calopteryx aequabilis. Doug Tate saw a female at Jean Marie River, southeast of Fort Simpson, on 24-25 June 2009 and Paul Catling and Brenda Kostiuk recorded the species on the Kakisa River (Mackenzie Highway bridge) on 10 July 2010 (Catling *et al*. 2011).

Leucorrhinia glacialis. Catling (2003) did not include this whiteface, noting that although it was listed from Niven Lake near Yellowknife (C. Shank, 2 July 1997) in the Royal British Columbia Museum database, a specimen could not be found. Subsequent lists for the territory (e.g., Catling *et al.* 2004, Catling 2016a) also omitted the species. However, Donnelly (2004b) mapped it for the territory, probably based on the RBCM data; Paulson (2009) also included it on his species map. In 2008, Paul Catling collected specimens at three locations: White Beach on Great Slave Lake on 24 June, Yellowknife Visitor Centre, and Madeleine Lake, Ingraham Trail on 26 June.

Somatochlora cingulata. Franco Alo took a series of photographs of an emerging adult at Scotty Creek, about 50 km south of Fort Simpson, on 12 June 2014 (https://www.enr.gov.nt.ca/species-search/somatochlora-cingulata).

Stylurus notatus. Exuviae were collected at Hay River (Catling *et al.* 2004), but the record was not included in Catling *et al.* (2005).

See also Catling (2021) for a recent list of Northwest Territories species.

Nunavut (5 new territorial records)

Records below are documented in Cannings (2015).

Aeshna eremita. This darner was inadvertently omitted from Nunavut in the 2005 list; it had been reported from Arviat (Eskimo Point) by Walker (1958).

Aeshna septentrionalis. A female was collected at Mouse Lake south of Kugluktuk, 9 July 2008, by Donna Giberson (Catling *et al*. 2019). A record from Cape Hope Islands, James Bay, 28 July 1934 is listed from the province of Québec in Walker (1958).

Aeshna sitchensis. Two males in the US National Museum were collected on Akimiski Island, James Bay, 21 July 1957 (previously unpublished).

Somatochlora albicincta. Photographed at Kugluktuk in 2008 by Chris Hotson (Syd Cannings, pers. comm.).

Leucorrhinia hudsonica. Ten specimens in the US National Museum were collected on Akimiski Island, James Bay, on 5 and 10 July 1957 (previously unpublished).

Other range extensions and notable observations

General. Catling *et al.* (2017) noted many observations of migrating dragonflies in eastern Canada in an illustrated guide enabling identification of the migratory species. Paulson (2011b) discusses the unusual abundance of several odonate species, including *Libellula quadrimaculata* and *Cordulia shurtleffii*, in Riding Mountain National Park, Manitoba, 16–18 June 2011.

Aeshna interrupta. The most northerly individual recorded in the Yukon was photographed by Cameron Eckert at Herschel Island-Qikiqtaruk Territorial Park, 7 August 2017 (Catling *et al.* 2019). Catling and Kostiuk (2008) reported a massive migration and roadkill of *A. interrupta* in southern Manitoba.

Aeshna juncea. A dead male *was* photographed by Ryan Lucas on the shore of the Beaufort Sea west of Marie Sachs settlement, southern Banks Island, Nunavut, in late summer 2017. Residents of Sachs Harbour report that this is the first dragonfly ever seen there (Catling *et al*. 2019). Probably this was a wandering individual, but the record represents a northerly extension of the species' distribution in Nunavut to the arctic islands, about 1800 km northwest

of the only other location (Arviat). The Banks Island location is about 400 km northeast of the Tuktoyaktuk area, the closest mainland location where the species is known.

Aeshna septentrionalis. Catling *et al*. (2019) reported about 100 individuals of *A. septentrionalis* between 15 and 21 July 2018 at the Daring Lake Tundra Ecological Research Station, NT, within the Southern Arctic Ecozone. Relict populations were discovered from 2017 to 2022 at altitudes above 800 m in the highlands of the Lac Jacques-Cartier massif in the province of Québec (Alain Côté, Guy Lemelin, and Michel Savard, IALQ; Lemelin 2017), the most southerly known record in Canada.

Aeshna sitchensis. Although already known from the island of Newfoundland, this darner had not been found in Labrador before Erica Oberndorfer photographed a teneral male on 21 July 2013 at Makkovik (iNaturalist 98301179).

Aeshna subarctica. Cameron Eckert photographed a male at Herschel Island-Qikiqtaruk Territorial Park on 7 August 2017; this is the most northerly record in Yukon (Catling *et al.* 2019).

Aeshna tuberculifera. A huge area of western British Columbia once lacking records of this darner now has a few: Jamie Fenneman photographed a male near Riske Creek on 8 August 2009 (iNaturalist 49029355) and, in 2021, individuals were recorded from Heckman Pass near Anahim Lake north to the Kitimat region (iNaturalist 90595375, 93917624, and others).

Anax junius. Rothfels & Catling (2005) reported a major migration at Hamilton, Ontario. Catling (2004a) reported *A. junius* overwintering in eastern Ontario and, in the extreme south of the province of Québec, Savard (2014) recorded the emergence of overwintering populations in June and early July.

Anax longipes. Although there has been evidence that this species may breed in Ontario (e.g., records of ovipositing females), until recently there was nothing conclusive. In 2021, however, Stanley Caveney found several exuviae at a dugout pond on his property in Elgin County (email correspondence to Colin Jones, 15 July 2021).

Calopteryx aequabilis. Cannings (2010, 2012b) summarized the status in northwestern Canada, especially in British Columbia. He reported range extensions from the original British Columbia locality at Christina Creek, far to the south near the US border: two new sites near Fort Nelson in the northeastern corner of the province and another at 100 Mile House in the Cariboo region. Subsequently, this damselfly was collected on the Petitot River, just south of the BC–NT border, in 2014 (RBCM specimens ENT016-005283, 005311).

Celithemis eponina. Northernmost records in the province of Québec include adults seen on 8 and 25 August 2018 at Lévis in the region of Chaudière-Appalaches (Guy Lemelin, Maurice Raymond, and Peter Lane, IALQ) and, surprisingly, an erratic adult observed 16 August 2021 at 845 m altitude at a bog near Beloeil Lake in the highlands of the Lac Jacques-Cartier massif (Michel Savard, IALQ).

Celithemis martha. McAlpine *et al.* (2017) documented the increase in records of this species in 2016 on the Atlantic Coastal Plain of southwestern New Brunswick, ten years after it was first found in the province in Saint John Co. (Klymko 2007).

Enallagma traviatum. Originally a species apparently restricted to extreme southwestern Ontario, there are now Ontario records as far north as Grey County (iNaturalist 14116219) and as far east as Tweed, Hastings County (e.g., iNaturalist 8518070).

Epiaeschna heros. On 14 August 2017, Jake Lewis collected a female at Spednic Lake, New Brunswick. This is the first provincial record since 1899 (Makepeace and Lewis 2020). For the first time in 25 years, a specimen was captured in the province of Québec: on 24 June 2013 at Lac-Brome, in the Montérégie region (Savard and Mochon 2014). In 2019, a migratory movement was observed for the first time in the valley of the St. Lawrence River , reaching north to Lévis in the region of Chaudière-Appalaches (Roxanne Sarah Bernard, Félix Brassard, Alain Côté, Peter Lane, Guy Lemelin, and Maurice Raymond, IALQ).

Epitheca cynosura. Catling (2005a) reported observations of possible migrations in Ontario and New York. In the province of Québec, healthy populations occur as far north as 49.1°N in the ZEC Chute-des-Passes (Michel Savard and Sylvain Boivin, IALQ).

Erythrodiplax berenice. Bridgehouse (2007) collected this saltmarsh inhabitant in Halifax County, Nova Scotia, about 75 km farther northeast than the previous northerly records in adjacent Lunenburg County.

Gomphaeschna furcillata. The status of this darner is somewhat mysterious. Despite his extensive collecting in Ontario, Walker (1958) reported it from only a single Canadian location in Nova Scotia. The first Ontario specimens were not recorded until 1996 when Colin Jones and Peter Burke collected two near Julian Lake, Peterborough County. Since then, it has been found in dozens of locations throughout south-central

Ontario. Given that the species is not particularly difficult to detect and that Walker never recorded it during his field studies, it may have expanded its range northward, perhaps due to climate change. However, in the province of Québec, new records are considered the result of a lack of knowledge and there is no suggestion of a northward expansion.

Hetaerina americana. Catling (2005b) postulated global warming as a potential explanation for the extension of the known range in Ontario. In the province of Québec, currently known local populations are associated with natural and restored habitats of high quality (see "New to Provinces and Territories" above).

Ischnura hastata. Catling (2008b) reported a new northern limit in Ontario and, farther north in the same year, Charest (2009) reported a temporary population at Trois-Rivières in Québec, possibly the result of climate warming.

Ischnura kellicotti. In Canada, this damselfly was originally known only from the Point Pelee marsh in Ontario. James Holdsworth discovered two new Ontario populations: Fowlers Pond near Woodstock, Oxford County, in 2017 (Ontario Odonata Atlas Database 154348; and, Pinery Provincial Park, Lambton County in 2020 (e.g., iNaturalist 49867323). All three locations are widely separated; the species likely occurs at other suitable waterbodies in the region.

Lestes forcipatus. Cannings and Simaika (2005) examined the newly discovered distribution of the damselfly in British Columbia in relation to that of its much more common and widespread close relative, *L. disjunctus.*

Libellula incesta. In the province of Québec, since the 1960s, this skimmer was known only in the region of Outaouais, where it is abundant in the Gatineau Valley and along the Ottawa River (Hutchinson & Ménard 1994; Savard 2011). It was first found in the lowlands of the St. Lawrence River near Sherbrooke in 2011 and in the Parc national du Mont-Saint-Bruno in 2012 (Mochon 2015, IALQ). Since then, this dragonfly has spread north to 46˚N (Jean Girard, Peter Lane, Alain Mochon, Isabelle Pothier, and Michel Savard, IALQ), mainly in the Laurentian and Appalachian foothills lakes. The species apparently has continued its move northward; a vagrant male was captured on 1 August 2020 at Saint-Adelphe in the region of Mauricie (Pierrette Charest, IALQ).

Libellula pulchella. Cannings *et al.* (2016) documented range expansions in western Canada of this libellulid and discussed moisture regime changes and human habitat modification as possible reasons for these distributional shifts. Lucas and Brunelle (2016) reported the first adult records from Sable Island, Nova Scotia; the collection of an exuvia by John Klymko in 2019 confirms they breed there.

Nehalennia irene. In 2009, Cameron Eckert (iNaturalist 18586112) discovered that a population known from central Alaska extends into the western Yukon along the Forty Mile River at Clinton Creek. This population, 775 km northwest of the nearest known Canadian occurrence at Watson Lake, Yukon, was again documented in 2020 and 2021.

Pachydiplax longipennis and *Perithemis tenera.* The northward range extension of these two species into the Ottawa Valley, eastern Ontario, and southern Québec, was attributed by Catling (2016b) and Hutchinson *et al.* (2014a, b) to climate warming.

Pantala hymenaea. Since Rob Cannings' (1988) initial record of this wandering species in British Columbia, there are five more, two on southern Vancouver Island, e.g., Gatten (2012a) and three in the Vancouver area (e.g., Khelifa 2021, iNaturalist 95576233) (Cannings 2022). On 18 August 2023, Daniel Lee collected and identified two final-instar naiads at a pond at the University of BC in Vancouver, one of which produced a female adult in the lab on 29 August. Other recently emerged adults and exuviae were observed at the site. This is the first record of successful breeding in Canada west of Ontario.

Phanogomphus graslinellus. Included as an "undetermined" species in Saskatchewan in Catling *et al*. (2005) the status of this clubtail along the Red Deer River near Armit (where it was collected by John Kozial on 27 June 2004 and 29 June 2006) was clarified by Halstead (2013).

Somatochlora albicincta. Catling *et al.* (2019) documented a population of this widespread boreal species at an arctic tundra pond near Daring Lake, NT. A recently emerged female with an associated exuvia confirmed it, for the first time*, as* a breeding species in the Southern Arctic Ecozone.

Somatochlora brevicincta. Bridgehouse (2006) recorded the most southerly location in Canada (44.7°N) in Nova Scotia and documented other records from the Atlantic provinces known at the time. Moreover, Mochon (2017) recorded the most southerly location in the province of Québec (45.96°N) and Buidin & Rochepault (2008) offered information on the habitat of the naiad, a work that also included a map showing the recently recorded, widespread distribution of the species across Canada. For many decades this peatland dragonfly was known only

from the type locality at Mistassini Lake in the province of Québec. In British Columbia, Joachim Bertrands found the species at the Williams Creek Ecological Reserve southeast of Terrace on 2 August 2021, well west of the last provincial records documented 20 years before in the Rocky Mountain region (iNaturalist 89745247).

Somatochlora williamsoni. Hutchings and Halstead (2006) discussed range extensions in Saskatchewan and considered if the emerald was extending its range north and west or if it had simply been overlooked in the past. The latter is the more likely explanation.

Stylurus amnicola. Previously only known from Manitoba, two creeks in Norfolk County, Ontario, and seven rivers in Québec. Subsequently, it has been recorded from four additional rivers in Ontario: three in the Sudbury District, and one in Muskoka District.

Stylurus notatus. Nicole Pilipow discovered 37 naiads of this rare gomphid in benthic samples collected by David Halstead and Scott Lipsitt along the North Saskatchewan River at Prince Albert, Saskatchewan. Although the species was reported twice from the province before, it has never been recorded in such large numbers (Halstead 2013).

Stylurus olivaceus. For decades, almost all the records of this clubtail in Canada have come from only three rivers in the southern interior of British Columbia: the Okanagan, the Thompson near Kamloops, and Christina Creek. It occasionally develops along lakeshores in the Okanagan Valley (Cannings & Stuart 1977, iNaturalist 128702564). However, Janice Arndt photographed a female above the north shore of Kootenay Lake at Nelson, British Columbia, on 25 September 2022 (iNaturalist 142970496). This individual could have developed in Kootenay Lake, although it more likely came from the more distant Kootenay River downstream from Nelson, which, although dammed, does have appropriate naiad habitat .

Sympetrum internum. This meadowhawk was unknown on Vancouver Island, British Columbia until 2010, when Jeremy Gatten photographed a male near Victoria (Gatten 2012a). Several were photographed in 2022, including two by Mark Wynja: one on Mount Washington, 31 August (iNaturalist 133244227) and another at Qualicum Beach on 7 September (iNaturalist 134191955).

Sympetrum vicinum. An autumn inventory in the lowlands of the region of Saguenay–Lac-Saint-Jean, province of Québec, revealed a northern population, among other notable species (Savard 2013a, 2023).

Tramea carolina. Catling *et al*. (2009) record a female ovipositing on Sable Island, Nova Scotia on 30 July 2008.

Tramea lacerata. This southern species, known from the Victoria region in south coastal British Columbia since 1995, is regularly reported mating and ovipositing in the Parksville/Qualicum Beach area, about 120 km northwest of Victoria. In Nova Scotia, Catling *et al.* (2009) reported four individuals, including an ovipositing pair, on Sable Island, 3 August 2008. This is the second provincial locality and is about 160 km southeast of the mainland. Previously reported only in 1990 and 1991 in the province of Québec (Savard 2011), this libellulid is recorded almost annually since 2008. It is seen mainly in August and September but breeding adults occur as early as June. Alain Maire (IALQ) reported a massive emergence of more than 100 individuals on 16 August 2018 in Neuville, near the city of Québec. The same year, imagos were spotted on 6 and 25 August at Lévis in the region of Chaudière-Appalaches (Guy Lemelin, IALQ). The recent and regular presence of this migrant in the province of Québec is likely the result of climate warming in the American Midwest.

List of Species

Order ODONATA (Damselflies and Dragonflies / Les libellules). 220 species

Suborder ZYGOPTERA (Damselflies / Les zygoptères). 61 species

Family CALOPTERYGIDAE (Broad-winged Damsels / Les caloptérygides). 5 species

Calopteryx aequabilis Say (River Jewelwing / Le caloptéryx tacheté)
Calopteryx amata Hagen (Superb Jewelwing / Le caloptéryx élancé)
Calopteryx maculata (Palisot de Beauvois) (Ebony Jewelwing / Le caloptéryx bistré)

Hetaerina americana (Fabricius) (American Rubyspot / La courtisane d'Amérique)
Hetaerina titia (Drury) (Smoky Rubyspot / La courtisane endeuillée)

Family LESTIDAE (Spreadwings / Les lestides). 12 species

Archilestes californicus McLachlan (California Spreadwing / Le leste de la Californie)
Archilestes grandis (Rambur) (Great Spreadwing / Le leste majestueux)

Lestes australis Walker (Southern Spreadwing / Le leste austral)
Lestes congener Hagen (Spotted Spreadwing / Le leste tardif)
Lestes disjunctus Sélys (Northern Spreadwing / Le leste disjoint)
Lestes dryas Kirby (Emerald Spreadwing / Le leste dryade)
Lestes eurinus Say (Amber-winged Spreadwing / Le leste flamboyant)
Lestes forcipatus Rambur (Sweetflag Spreadwing / Le leste armé)
Lestes inaequalis Walsh (Elegant Spreadwing / Le leste inégal)
Lestes rectangularis Say (Slender Spreadwing / Le leste élancé)
Lestes unguiculatus Hagen (Lyre-tipped Spreadwing / Le leste onguiculé)
Lestes vigilax Hagen *in* Sélys (Swamp Spreadwing / Le leste matinal)

Family COENAGRIONIDAE (Pond Damsels / Les agrionides). 44 species

Amphiagrion abbreviatum (Sélys) (Western Red Damsel / L'amphiagrion courtaud)
Amphiagrion saucium (Burmeister) (Eastern Red Damsel / L'amphiagrion rougeâtre)

Argia apicalis (Say) (Blue-fronted Dancer / L'argie azurée)
Argia emma Kennedy (Emma's Dancer / L'argie d'Emma)
Argia fumipennis Burmeister *violacea* (Hagen, 1861) (Variable Dancer / L'argie violacée)
Argia moesta (Hagen) (Powdered Dancer / L'argie poudrée)
Argia sedula (Hagen) (Blue-ringed Dancer / L'argie annelée)
Argia tibialis (Rambur) (Blue-tipped Dancer / L'argie des pénombres)
Argia translata Hagen *in* Sélys (Dusky Dancer / L'argie sombre)
Argia vivida Hagen *in* Sélys (Vivid Dancer / L'argie vive)

Chromagrion conditum (Hagen *in* Sélys) (Aurora Damsel / Le chromagrion)

Coenagrion angulatum Walker (Prairie Bluet / L'agrion trilobé)
Coenagrion interrogatum (Hagen *in* Sélys) (Subarctic Bluet / L'agrion ponctué)
Coenagrion resolutum (Hagen *in* Sélys) (Taiga Bluet / L'agrion résolu)

Enallagma anna Williamson (River Bluet / L'agrion d'Anna)
Enallagma annexum (Hagen) (Northern Bluet / L'agrion d'Amérique)
Enallagma antennatum (Say) (Rainbow Bluet / L'agrion arc-en-ciel)
Enallagma aspersum (Hagen) (Azure Bluet / L'agrion émaillé)
Enallagma basidens Calvert (Double-striped Bluet / L'agrion rayé)
Enallagma boreale Sélys (Boreal Bluet / L'agrion boréal)
Enallagma carunculatum Morse (Tule Bluet / L'agrion des scirpes)
Enallagma civile (Hagen) (Familiar Bluet / L'agrion civil)
Enallagma clausum Morse (Alkali Bluet / L'agrion halophile)
Enallagma durum (Hagen) (Big Bluet / L'agrion costaud)
Enallagma ebrium (Hagen) (Marsh Bluet / L'agrion enivré)

Enallagma exsulans (Hagen) (Stream Bluet / L'agrion exilé)
Enallagma geminatum Kellicott (Skimming Bluet / L'agrion minime)
Enallagma hageni (Walsh) (Hagen's Bluet / L'agrion de Hagen)
Enallagma minusculum Morse (Little Bluet / L'agrion minuscule)
Enallagma pictum Morse (Scarlet Bluet / L'agrion écarlate)
Enallagma signatum (Hagen) (Orange Bluet / L'agrion orangé)
Enallagma traviatum Sélys (Slender Bluet / L'agrion dévoyé)
    Enallagma traviatum traviatum Sélys
    Enallagma traviatum westfalli Donnelly
Enallagma vernale Gloyd (Vernal Bluet / L'agrion printanier)
Enallagma vesperum Calvert (Vesper Bluet / L'agrion vespéral)

Ischnura cervula Sélys (Pacific Forktail / L'agrion des Rocheuses)
Ischnura damula Calvert (Plains Forktail / L'agrion des Heartlands)
Ischnura erratica Calvert (Swift Forktail / L'agrion vagabond)
Ischnura hastata (Say) (Citrine Forktail / L'agrion citrin)
Ischnura kellicotti Williamson (Lilypad Forktail / L'agrion poinçonneur)
Ischnura perparva McLachlan *in* Sélys (Western Forktail / L'agrion jumeau)
Ischnura posita (Hagen) (Fragile Forktail / L'agrion posé)
Ischnura verticalis (Say) (Eastern Forktail / L'agrion vertical)

Nehalennia gracilis Morse (Sphagnum Sprite / La déesse gracieuse)
Nehalennia irene (Hagen) (Sedge Sprite / La déesse paisible)

Suborder ANISOPTERA (Dragonflies / Les anisoptères). 159 species

Family PETALURIDAE (Petaltails / Les pétalurides). 1 species

Tanypteryx hageni (Sélys) (Black Petaltail / Le pétalure noir)

Family AESHNIDAE (Darners / Les æschnides). 24 species

Aeshna canadensis Walker (Canada Darner / L'æschne de Provancher)
Aeshna clepsydra Say (Mottled Darner / L'æschne clepsydre)
Aeshna constricta Say (Lance-tipped Darner / L'æschne cintrée)
Aeshna eremita Scudder (Lake Darner / L'æschne porte-crosses)
Aeshna interrupta Walker (Variable Darner / L'æschne domino)
    Aeshna interrupta interrupta Walker
    Aeshna interrupta lineata Walker
    Aeshna interrupta interna Walker
Aeshna juncea (Linnaeus) *americana* Bartenev (Sedge Darner / L'æschne des joncs)
Aeshna palmata Hagen (Paddle-tailed Darner / L'æschne palmée)
Aeshna septentrionalis Burmeister (Azure Darner / L'æschne septentrionale)
Aeshna sitchensis Hagen (Zigzag Darner / L'æschne zigzag)
Aeshna subarctica Walker (Subarctic Darner / L'æschne subarctique)
Aeshna tuberculifera Walker (Black-tipped Darner / L'æschne tuberculée)
Aeshna umbrosa Walker (Shadow Darner / L'æschne des pénombres)
    Aeshna umbrosa umbrosa Walker
    Aeshna umbrosa occidentalis Walker
Aeshna verticalis Hagen (Green-striped Darner / L'æschne verticale)

Anax junius (Drury) (Common Green Darner / L'anax précoce)
Anax longipes Hagen (Comet Darner / L'anax ardent)

Basiaeschna janata (Say) (Springtime Darner / La Janata)

Boyeria grafiana Williamson (Ocellated Darner / L'æschne fuligineuse)
Boyeria vinosa (Say) (Fawn Darner/ L'æschne vineuse)

Epiaeschna heros (Fabricius) (Swamp Darner / L'impératrice)

Gomphaeschna furcillata (Say) (Harlequin Darner / L'æschne pygmée)

Nasiaeschna pentacantha (Rambur) (Cyrano Darner / La Cyrano)

Rhionaeschna californica (Calvert) (California Darner / L'æschne de la Californie)
Rhionaeschna multicolor (Hagen) (Blue-eyed Darner / L'æschne multicolore)
Rhionaeschna mutata (Hagen) (Spatterdock Darner / L'æschne des nénuphars)

Family GOMPHIDAE (Clubtails / Les gomphides). 42 species

Arigomphus cornutus (Tough) (Horned Clubtail / Le gomphe cornu)
Arigomphus furcifer (Hagen *in* Sélys) (Lilypad Clubtail / Le gomphe fourchu)
Arigomphus villosipes (Sélys) (Unicorn Clubtail / Le gomphe licorne)

Dromogomphus spinosus Sélys (Black-shouldered Spinyleg / Le gomphe épineux)
Dromogomphus spoliatus (Hagen *in* Sélys) (Flag-tailed Spinyleg / Le gomphe dépouillé)

Gomphurus externus (Hagen *in* Sélys) (Plains Clubtail / Le gomphe des prairies)
Gomphurus fraternus (Say) (Midland Clubtail / Le gomphe fraternel)
    Gomphurus fraternus fraternus (Say)
    Gomphurus fraternus manitobanus (Walker)
Gomphurus vastus (Walsh) (Cobra Clubtail / Le gomphe cobra)
Gomphurus ventricosus (Walsh) (Skillet Clubtail / Le gomphe ventru)

Hagenius brevistylus Sélys (Dragonhunter / L'hagénie)

Hylogomphus abbreviatus (Hagen *in* Sélys) (Spine-crowned Clubtail / Le gomphe courtaud)
Hylogomphus adelphus (Sélys) (Moustached Clubtail / Le gomphe jumeau)
Hylogomphus viridifrons (Hine) (Green-faced Clubtail / Le gomphe ictérin)

Lanthus parvulus (Sélys) (Northern Pygmy Clubtail / Le gomphule minuscule)
Lanthus vernalis Carle (Southern Pygmy Clubtail / Le gomphule printanier)

Octogomphus specularis (Hagen *in* Sélys) (Grappletail / L'octogomphe)

Ophiogomphus anomalus Harvey (Extra-striped Snaketail / L'ophiogomphe bariolé)
Ophiogomphus aspersus Morse (Brook Snaketail / L'ophiogomphe émaillé)
Ophiogomphus carolus Needham (Riffle Snaketail / L'ophiogomphe impérial)
Ophiogomphus colubrinus Sélys (Boreal Snaketail / L'ophiogomphe boréal)
Ophiogomphus howei Bromley (Pygmy Snaketail / L'ophiogomphe pygmée)
Ophiogomphus mainensis Packard *mainensis* Packard (Maine Snaketail / L'ophiogomphe canin)

Ophiogomphus occidentis Hagen (Sinuous Snaketail / L'ophiogomphe sinueux)
Ophiogomphus rupinsulensis (Walsh) (Rusty Snaketail / L'ophiogomphe roussâtre)
Ophiogomphus severus Hagen (Pale Snaketail / L'ophiogomphe déteint)
    Ophiogomphus severus severus Hagen
    Ophiogomphus severus montanus (Sélys)

Phanogomphus borealis (Needham) (Beaverpond Clubtail / Le gomphe boréal)
Phanogomphus descriptus (Banks) (Harpoon Clubtail / Le gomphe descriptif)
Phanogomphus exilis (Sélys) (Lancet Clubtail / Le gomphe menu)
Phanogomphus graslinellus (Walsh) (Pronghorn Clubtail / Le gomphe élégant)
Phanogomphus lividus (Sélys) (Ashy Clubtail / Le gomphe livide)
Phanogomphus quadricolor (Walsh) (Rapids Clubtail / Le gomphe des fosses)
Phanogomphus spicatus (Hagen *in* Sélys) (Dusky Clubtail / Le gomphe pointu)

Progomphus obscurus (Rambur) (Common Sanddragon / Le sablotin obscur)

Stylogomphus albistylus (Hagen *in* Sélys) (Eastern Least Clubtail / Le gomphule albistyle)

Stylurus amnicola (Walsh) (Riverine Clubtail / Le gomphe riverain)
Stylurus intricatus (Hagen *in* Sélys) (Brimstone Clubtail / Le gomphe soufré)
Stylurus laurae (Williamson) (Laura's Clubtail / Le gomphe de Laura)
Stylurus notatus (Rambur) (Elusive Clubtail / Le gomphe marqué)
Stylurus olivaceus (Sélys) (Olive Clubtail / Le gomphe olivâtre)
Stylurus plagiatus (Sélys) (Russet-tipped Clubtail / Le gomphe enflammé).
Stylurus scudderi (Sélys) (Zebra Clubtail / Le gomphe tigré)
Stylurus spiniceps (Walsh) (Arrow Clubtail / Le gomphe fléché)

Family CORDULEGASTRIDAE (Spiketails / Les cordulégastrides). 5 species

Cordulegaster dorsalis Hagen *in* Sélys (Pacific Spiketail / Le cordulégastre écaillé)
Cordulegaster erronea Hagen *in* Sélys (Tiger Spiketail / Le cordulégastre tigré)
Cordulegaster maculata Sélys (Twin-spotted Spiketail / Le cordulégastre maculé)
Cordulegaster obliqua (Say) (Arrowhead Spiketail / Le cordulégastre fléché)

Zoraena diastatops (Sélys) (Delta-spotted Spiketail / Le cordulégastre chevronné)

Family MACROMIIDAE (Cruisers / Les macromides). 4 species

Didymops transversa (Say) (Stream Cruiser / La macromie brune)

Macromia illinoiensis Walsh *illinoiensis* Walsh (Swift River Cruiser / La macromie noire)
Macromia magnifica McLachlan *in* Sélys (Western River Cruiser / La macromie magnifique)
    Macromia magnifica magnifica McLachlan in Sélys
    Macromia magnifica rickeri Walker
Macromia taeniolata Rambur (Royal River Cruiser / La macromie royale)

Family CORDULIIDAE (Emeralds / Les cordulides). 35 species

Cordulia shurtleffii Scudder (American Emerald / La cordulie d'Amérique)

Dorocordulia lepida (Hagen *in* Sélys) (Petite Emerald / La cordulie charmante)
Dorocordulia libera (Sélys) (Racket-tailed Emerald / La cordulie indépendante)

Epitheca canis (McLachlan) (Beaverpond Baskettail / L'épithèque canine)
Epitheca costalis (Selys) (Slender Baskettail / L'épithèque cintrée)
Epitheca cynosura (Say) (Common Baskettail / L'épithèque cynosure)
Epitheca princeps (Hagen) (Prince Baskettail / L'épithèque princière)
Epitheca semiaquea (Burmeister) (Mantled Baskettail / L'épithèque mantelée)
Epitheca spinigera (Sélys) (Spiny Baskettail / L'épithèque épineuse)

Helocordulia uhleri (Sélys) (Uhler's Sundragon / L'épithèque safranée)

Neurocordulia michaeli Brunelle (Broad-tailed Shadowdragon / L'épithèque de Brunelle)
Neurocordulia yamaskanensis (Provancher) (Stygian Shadowdragon / L'épithèque de Provancher)

Somatochlora albicincta (Burmeister) (Ringed Emerald / La cordulie annelée)
Somatochlora brevicincta Robert (Québec Emerald / La cordulie de Robert)
Somatochlora cingulata Sélys (Lake Emerald / La cordulie ceinturée)
Somatochlora elongata (Scudder) (Ski-tailed Emerald / La cordulie allongée)
Somatochlora ensigera Martin (Plains Emerald / La cordulie porte-épée)
Somatochlora filosa (Hagen) (Fine-lined Emerald / La cordulie tricoteuse)
Somatochlora forcipata (Scudder) (Forcipate Emerald / La cordulie fourchue)
Somatochlora franklini (Sélys) (Delicate Emerald / La cordulie délicate)
Somatochlora hineana Williamson (Hine's Emerald / La cordulie du Midwest)
Somatochlora hudsonica (Hagen *in* Sélys) (Hudsonian Emerald / La cordulie hudsonienne)
Somatochlora incurvata Walker (Incurvate Emerald / La cordulie incurvée)
Somatochlora kennedyi Walker (Kennedy's Emerald / La cordulie entaillée)
Somatochlora linearis (Hagen) (Mocha Emerald / La cordulie linéaire)
Somatochlora minor Calvert (Ocellated Emerald / La cordulie mineure)
Somatochlora sahlbergi Trybom (Treeline Emerald / La cordulie holarctique)
Somatochlora semicircularis (Sélys) (Mountain Emerald / La cordulie des Rocheuses)
Somatochlora septentrionalis (Hagen) (Muskeg Emerald / La cordulie septentrionale)
Somatochlora tenebrosa (Say) (Clamp-tipped Emerald / La cordulie ténébreuse)
Somatochlora walshii (Scudder) (Brush-tipped Emerald / La cordulie coiffée)
Somatochlora whitehousei Walker (Whitehouse's Emerald / La cordulie sinueuse)
Somatochlora williamsoni Walker (Williamson's Emerald / La cordulie velue)

Williamsonia fletcheri Williamson (Ebony Boghaunter / La corduliette bistrée)
Williamsonia lintneri Hagen *in* Sélys (Ringed Boghaunter / La corduliette tigrée)

Family LIBELLULIDAE (Skimmers / Les libellulides). 48 species

Celithemis elisa (Hagen) (Calico Pennant / La célithème indienne)
Celithemis eponina (Drury) (Halloween Pennant / La célithème géante)
Celithemis fasciata Kirby (Banded Pennant / La célithème fasciée)
Celithemis martha Williamson (Martha's Pennant / La célithème de Mattie)

Erythemis collocata (Hagen) (Western Pondhawk / L'érythème jumelle)
Erythemis simplicicollis (Say) (Eastern Pondhawk / L'érythème des étangs)
Erythemis vesiculosa (Fabricius) (Great Pondhawk / L'érythème émeraude)
Erythrodiplax berenice (Drury) (Seaside Dragonlet / L'érythrodiplax côtier)
Erythrodiplax umbrata (Linnaeus) (Band-winged Dragonlet / L'érythrodiplax ombré)

Ladona exusta (Say) (White Corporal / L'embrasée)
Ladona julia (Uhler) (Chalk-fronted Corporal / La julienne)

Leucorrhinia borealis Hagen (Boreal Whiteface / La leucorrhine géante)
Leucorrhinia frigida Hagen (Frosted Whiteface / La leucorrhine frigide)
Leucorrhinia glacialis Hagen (Crimson-ringed Whiteface / La leucorrhine glaciale)
Leucorrhinia hudsonica (Sélys) (Hudsonian Whiteface / La leucorrhine hudsonienne)
Leucorrhinia intacta (Hagen) (Dot-tailed Whiteface / La leucorrhine mouchetée)
Leucorrhinia patricia Walker (Canada Whiteface / La leucorrhine nordique)
Leucorrhinia proxima Calvert (Belted Whiteface / La leucorrhine apprivoisée)

Libellula forensis Hagen (Eight-spotted Skimmer / L'élégante)
Libellula incesta Hagen (Slaty Skimmer / La voluptueuse)
Libellula luctuosa Burmeister (Widow Skimmer / La mélancolique)
Libellula pulchella Drury (Twelve-spotted Skimmer / La gracieuse)
Libellula quadrimaculata Linnaeus (Four-spotted Skimmer / La quadrimaculée)
Libellula semifasciata Burmeister (Painted Skimmer / La chaleureuse)
Libellula vibrans Fabricius (Great Blue Skimmer / La vibrante)

Nannothemis bella (Uhler) (Elfin Skimmer / L'elfe)

Pachydiplax longipennis (Burmeister) (Blue Dasher / Le pachydiplax)

Pantala flavescens (Fabricius) (Wandering Glider / La pantale flavescente)
Pantala hymenaea (Say) (Spot-winged Glider / La pantale bimaculée)

Perithemis tenera (Say) (Eastern Amberwing / La périthème délicate)

Plathemis lydia (Drury) (Common Whitetail / La lydienne)

Sympetrum ambiguum (Rambur) (Blue-faced Meadowhawk / Le sympétrum cyanosé)
Sympetrum corruptum) (Hagen (Variegated Meadowhawk / Le sympétrum bagarreur)
Sympetrum costiferum (Hagen) (Saffron-winged Meadowhawk / Le sympétrum rubigineux)
Sympetrum danae (Sulzer) (Black Meadowhawk / Le sympétrum noir)
Sympetrum illotum (Hagen) (Cardinal Meadowhawk / Le sympétrum cardinal)
Sympetrum internum Montgomery (Cherry-faced Meadowhawk / Le sympétrum intime)
Sympetrum janeae Carle (Jane's Meadowhawk / Le sympétrum de Jane)
Sympetrum madidum (Hagen) (Red-veined Meadowhawk / Le sympétrum ivre)
Sympetrum obtrusum (Hagen) (White-faced Meadowhawk / Le sympétrum éclaireur)
Sympetrum pallipes (Hagen) (Striped Meadowhawk / Le sympétrum rayé)
Sympetrum rubicundulum (Say) (Ruby Meadowhawk / Le sympétrum rouquin)
Sympetrum semicinctum (Say) (Band-winged Meadowhawk / Le sympétrum semi-ambré)
    Sympetrum semicinctum semicinctum (Say)
    Sympetrum semicinctum occidentale Bartenev
Sympetrum vicinum (Hagen) (Autumn Meadowhawk / Le sympétrum tardif)

Tramea carolina (Linnaeus) (Carolina Saddlebags / La traméa de la Caroline)
Tramea darwini Kirby (Striped Saddlebags / La traméa rayée)
Tramea lacerata Hagen (Black Saddlebags / La traméa lacérée)
Tramea onusta Hagen (Red-mantled Saddlebags / La traméa mantelée)

Hybrids

Hybrids reported from Canada:

Enallagma anna x *civile* (Donnelly 2000)
Enallagma carunculatum x *civile* (Catling, pers. obs.; see also Donnelly 2008)
Enallagma ebrium x *hageni* (Catling 2001)
Somatochlora albicincta x *sahlbergi* (Cannings & Cannings 1997, 2014; Cannings *et al.* 2010). *Somatochlora hudsonica* x *sahlbergi* (Cannings & Cannings 1997, 2014; Cannings *et al.* 2010).

In the Canadian Maritime Provinces, the closely related *Sympetrum internum* and *S. obtrusum* apparently hybridize freely, given the abundance of specimens with intermediate morphological characteristics (P. Brunelle, pers. obs.). See also *Sympetrum janeae* in "Species new to the Canadian list". In addition, even less closely related *Sympetrum* species have been collected in tandem (*S. s. semicinctum* with *S. vicinum*; *S. obtrusum* with *S. s. semicinctum*).

In the northern Yukon, there is morphological evidence of hybridization between *Somatochlora hudsonica* and *S. sahlbergi*, and between *S. albicincta* and *S. sahlbergi* (Cannings & Cannings 1997, 2014), and further genetic evidence from mitochondrial DNA confirms this introgression (Cannings *et al*. 2010). Unexpectedly, the same analysis revealed genetic introgression between *S. hudsonica* and *S. albicincta* on the north coast of British Columbia. There also appears to be historical introgression in mitochondrial DNA in other groups within *Somatochlora*.

Additional hybrid combinations have been reported from the United States for species that also occur in Canada, including *Enallagma anna* x *carunculatum* (possibly equivalent to *E. opimolocus* (Miller & Ivie 1996, Westfall & May 2006)), *Enallagma boreale* x *carunculatum* (D.R. Paulson, pers. comm.; suspected miscommunication), *Phanogomphus graslinellus* x *lividus* (as *sordidus*) (Williamson 1903), *Ophiogomphus rupinsulensis* x *carolus* (T.W. Donnelly, pers. comm.) and *Sympetrum internum* x *obtrusum* (e.g., Donnelly 2004b).

Conservation and Protection

General status ranks are coordinated with those of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (https://tinyurl.com/y3a4mwqn), which provides a scientifically sound ranking of wildlife species potentially at risk. COSEWIC, under the Species at Risk Act (SARA), serves as an independent body of experts responsible for identifying and assessing species at risk. Thus, its work has strongly encouraged surveys and analyses of the status of Odonata species. COSEWIC produces comprehensive status reports of species and results are reported to the Canadian government and the public; if the Minister of Environment and Climate Change designates the species under Schedule 1 of the Act, the species may then qualify for legal protection and recovery under SARA. Assessments of Odonata began in 2004. Using the SARA Public Registry Species Search (Species search - Species at risk registry (canada.ca)) we have prepared a list of species for which COSEWIC status reports exist (Table 2).

As of 2023, nine Odonata species have been assessed by COSEWIC (Table 2). Four species have been designated as Endangered: *Phanogomphus quadricolor* (Ontario), *Somatochlora hineana* (Ontario), *Stylurus laurae* (Ontario), and *Stylurus olivaceus* (British Columbia). *Gomphurus ventricosus* was originally assessed as Endangered (2010); it was only known from New Brunswick at the time. COSEWIC reassesses species approximately every 10 years and, in 2022, G. *ventricosus* was re-assessed as Special Concern largely due to an increase in the number of known populations (Ontario, Québec, New Brunswick). *Octogomphus specularis* (British Columbia), *Ophiogomphus howei* (Ontario, New Brunswick), and *Argia vivida* (British Columbia, Alberta) are designated Special Concern. *Stylurus amnicola* was assessed in 2012 as three separate designatable units, with the Prairie (Manitoba) and Boreal (Québec) populations designated Data Deficient, and the Great Lakes Plains population (Ontario) designated Endangered. When *S. amnicola* was reassessed in 2023, additional data and changes in guidelines to defining designatable units led to the species being reassessed as a single Canadian population, which was designated Special Concern. Most relevant information is available in Table 2, but the registry (https://tinyurl.com/y3qak3c7) contains additional information (e.g., COSEWIC 2011a, 2011b). No other Odonata are currently listed as priority candidates on the candiate lists of species for consideration by COSEWIC (Cosewic / Cosepac - Candidate wildlife species).

Only some Canadian provinces and territories have something equivalent to an Endangered Species Act that protects listed species (Nixon *et al.* 2012). Although Saskatchewan has an act (Saskatchewan Wildlife Act), it has some serious limitations (Olive 2018) and, regardless, does not list any odonates. None, also, are listed under Manitoba's Endangered Ecosystems and Species Act (Agriculture and Resource Development | Province of Manitoba (gov.mb.ca)). Ontario's Act lists *Ophiogomphus howei* (Pygmy snaketail | Ontario.ca), *Phanogomphus quadricolor*) (Rapids clubtail | Ontario.ca), *Somatochlora hineana* (Hine's emerald | Ontario.ca), *Stylurus amnicola* (Riverine clubtail | Ontario.ca), and *Stylurus laurae* (Laura's clubtail | Ontario.ca). Ten odonates were listed among the insects at risk in the province of Québec (Domaine *et al*. 2010) but none are listed in that province's Endangered Species Act. New Brunswick's Act lists *Ophiogomphus howei* and *Gomphurus ventricosus* (as *Gomphus ventricosus* (https://tinyurl.com/4tkk2bt8). The endangered species acts of Newfoundland and Labrador, Nova Scotia, and the Northwest Territories do not list any Odonata. The latter territory has indicated that *Somatochlora sahlbergi* may be at risk (Catling 2016a).

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TABLE 1. Species Distribution by Province and Territory with Status Ranks

The thirteen provinces and territories are listed west to east (the three territories, which make up Canada north of 60°N, are listed after the provinces): BC–British Columbia; AB–Alberta; SK–Saskatchewan; MB–Manitoba; ON–Ontario; QC–Québec; NB–New Brunswick; NS–Nova Scotia; PE–Prince Edward Island; NF/LB–Newfoundland and Labrador (the two parts presented separately); YT–Yukon; NT–Northwest Territories; NU–Nunavut.

A value in the column indicates that the species has been reported from that jurisdiction. The codes represent the current NatureServe provincial and territorial conservation status ranks; these are largely the same but may differ from those recently published in the Wild Species 2020 report (https://www.wildspecies.ca/). The N and S prefices denote national and provincial/territorial ranks. The numeric codes are: 1–Critically Imperiled; 2–Imperiled; 3–Vulnerable; 4– Apparently Secure; 5–Secure; H-Possibly Extirpated; U–Unrankable (usually further information is being sought); NR–Not Ranked (i.e., not assessed); NA–Not Applicable (most species in this category are vagrants. A rank followed by a B indicates this is a conservation assessment of the breeding status; one followed by an M indicates migrant status; and one followed by an N indicates non-breeding status. An asterisk (*) indicates species with more than one subspecies in Canada; these subspecies are not ranked separately. See notes on subspecies preceding the list for additional information on these taxa.

Species totals for all jurisdictions are indicated in Figure 9.

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
CALOPTERYGIDAE														
Calopteryx aequabilis	N5	S3	S3S4	S4	S4	S5	S5	S5	S5	S4	S3/-		SU	
Calopteryx amata	N5						S4	S4	S5					
Calopteryx maculata	N5				SH	S5	S5	S4	S5	S4				
Hetaerina americana	N4N5					S4	S1	S4						
Hetaerina titia	N2					S2								
LESTIDAE														
Archilestes californicus	NNR	SNR												
Archilestes grandis	N1					S1								
Lestes australis	NU					SU								
Lestes congener	N5	S5	S5	S5	S3S4	S5	S5	S5	S5	S5	S2/S2	S1	S4S5	
Lestes disjunctus	N5	S5	S5	S5	S5	S5	S5	S5	S5	S5	S5/S2	S5	S4S5	
Lestes dryas	N5	S5	S5	S4S5	S3S4	S5	S5?	S5	S5	S5		S3	S4S5	
Lestes eurinus	N5					S4	S3S4	S4	S4	S1				
Lestes forcipatus	N5	S4		S3	S3	S4	S5	S4	S5	S4		S1S3	S4	
Lestes inaequalis	N5				S1	S4	S3	S4						
Lestes rectangularis	N5				S3	S5	S4	S4	S5	SU				
Lestes unguiculatus	N5	S5	S5	S5	S4	S5	S5	S4	S5	S5	SU/-			
Lestes vigilax	N5					S4	S2	S4	S5					

.....*Continued on the next page*

TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
COENAGRIONIDAE														
Amphiagrion abbreviatum	N4?	S4	S3	S2S3										
Amphiagrion saucium	N4N5				SU	S4	S3	S4	S3S4	SU				
Argia apicalis	N4				SNR	S4	SU							
Argia emma	N3N4	S3S4	S1											
Argia fumipennis	N5			S2S3		S5	S4S5	S5	S5					
Argia moesta	N5					S5	S4S5	S5	S5					
Argia sedula	N2					S2								
Argia tibialis	N3					S3								
Argia translata	N2					S2								
Argia vivida	N3	S2S3	S2											
Chromagrion conditum	N5				SNA	S5	S4S5	S5	S5	S2				
Coenagrion angulatum	N5	S3S4	S5	S5	S3	SH							SU	
Coenagrion interrogatum	N5	S5	S4S5	S4	S3	S4	S5	S4	S1		S4/S3	S4S5	SU	
Coenagrion resolutum	N5	S5	S5	S5	S4	S5	S5	S5	S2	S5	S4/S3	S5	S4S5	
Enallagma anna	N5		S1S2	S2S3		S3	S5	SU						
Enallagma annexum	N5	S5	S5	S5	S4	S4	S5	S4	S5	S5	S4/S3	S5	S4S5	
Enallagma antennatum	N5			S2S3	SNR	S4	S3							
Enallagma aspersum	N5					S4	S3	S4	S5	S3				
Enallagma basidens	N3					S3								
Enallagma boreale	N5	S5	S5	S5	S4	S5	S5	S5	S5	S5	S4/S4	S5	S4S5	
Enallagma carunculatum	N5	S5	S3	S2S4	S3	S5	S4	SNR	SNR	SNR				
Enallagma civile	N5	SH		S3S4	S3	S5	S5	S5	S5	S5	S2/-			
Enallagma clausum	N4N5	S3	S3	S3	S3	S2	S1							
Enallagma durum	NNRB						SNRB							
Enallagma ebrium	N5	S5	S5	S5	S4	S5	S5	S5	S5	S5	S4/-	S1S2	S4S5	
Enallagma exsulans	N5				SNR	S5	S3S4	S4	S5					
Enallagma geminatum	N5					S4	S3	S4	S2S3					
Enallagma hageni	N5	S4	S5	S5	S3	S5	S5	S5	S5	S5		S1	SU	
Enallagma minusculum	N5?							S4	S4	S1				
Enallagma pictum	N3							S3						
Enallagma signatum	N5					S4	S4	S4	S4					
*Enallagma traviatum**	N2N3					S2S3	S1							
Enallagma vernale	N5					S4	S5		S3	SNR				

.....Continued on the next page

TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
Enallagma vesperum	N5					S4	S3	S4	S3S4					
Ischnura cervula	N5	S5	S2S3	S2S3										
Ischnura damula	N4N5	S1S3	S3	S4	S3							S1		
Ischnura erratica	N4	S4												
Ischnura hastata	NNA					SNA	SNRB	SNA	SNA					
Ischnura kellicotti	N3					S1		S3						
Ischnura perparva	N5	S5	S1S3	S2S3	SNA									
Ischnura posita	N5				SNA	S4	S4	S4	S5	SU	S2/-			
Ischnura verticalis	N5		S3	S2S4	S3	S5	S5	S5	S5	S5	S4/-			
Nehalennia gracilis	N5					S4	S3S4	S4	S4	S3				
Nehalennia irene	N5	S5	S5	S5	S4	S5	S5	S5	S5	S5	S4/-	S3	S4S5	
PETALURIDAE														
Tanypteryx hageni	N3	S3												
AESHNIDAE														
Aeshna canadensis	N5	S5	S4	S5	S5?	S5	S5	S5	S5	S5	S4/-	S1S3	SU	
Aeshna clepsydra	N5					S4	S1	S4	S3S4					
Aeshna constricta	N5	S2S3	S4	S1S3	S3	S5	S4S5	S4	S3S4	S4				
Aeshna eremita	N5	S5	S5	S5	S4	S5	S5	S5	S4	S3	S4/S3	S5	S4S5	SNA
*Aeshna interrupta**	N5	S5	S5	S5	S5?	S5	S5	S5	S5	S5	S4/-	S5	S4S5	
Aeshna juncea	N5	S5	S5	S5	S3	S4	S5	S2			S4/S4	S5	S4S5	SNA
Aeshna palmata	N5	S5	S5	S2S3								S4		
Aeshna septentrionalis	N5	S5?	S3S4	S2S3	S2	S2S3	S4				S2/S4	S5	S4S5	SU
Aeshna sitchensis	N5	S5	S5	S5	S4	S4	S5	S4	S4		S4/SNR	S5	S4S5	SU
Aeshna subarctica	N5	S5	S4	S4	SU	S4	S5	S4	S4	S1	S3/S2	S5	S4S5	
Aeshna tuberculifera	N5	S4	S2S4	S3S4	S2	S4	S5	S5	S5	S4				
*Aeshna umbrosa**	N5	S5	S5	S5	S3	S5	S5	S5	S5	S5	S4/-	S3	S4S5	
Aeshna verticalis	N5				SNA	S4	S2S3	S4	S4					
Anax junius	N5B, NNRN	S4B, SNRN, SNRM	S3B, SNRN, SNRM	S3S4B, SNRN, SNRM	S4B	S5B, SNRN, SNRM	SNRB	S5B, SNRN	S5B, SNRN	S5B, SNRN				
Anax longipes	NNA					SNA	SNRN	SNA						
Basiaeschna janata	N5			S2S3	S2S3	S5	S5	S5	S5	S1				
Boyeria grafiana	N5					S4	S5	S5	S3S4	S1				
Boyeria vinosa	N5				S2?	S5	S5	S4	S4	S1				

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TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
Epiaeschna heros	N3N4					S3S4	S1S2	SU						
Gomphaeschna furcillata	N5					S3S4	S2S3	S4	S3S4	S1				
Nasiaeschna pentacantha	N4					S4	S1	SU						
Rhionaeschna californica	N5?	S5?	SNR											
Rhionaeschna multicolor	N5	S5	S1	SNR										
Rhionaeschna mutata	N3					S3	S1		SNA					
GOMPHIDAE														
Arigomphus cornutus	N5				S3	S4	S2S3							
Arigomphus furcifer	N5					S4	S2S3	S3						
Arigomphus villosipes	N3					S3								
Dromogomphus spinosus	N5				S2	S5	S4S5	S5	S5					
Dromogomphus spoliatus	N1N2					S1S2								
Gomphurus externus	N3			SNR	S3									
*Gomphurus fraternus**	N4N5			SNR	S4	S4	S3							
Gomphurus vastus	N4				S3	S2	S3	S3						
Gomphurus ventricosus	N3					S1	S1	S2	SH					
Hagenius brevistylus	N5				S3S4	S5	S4S5	S5	S5					
Hylogomphus abbreviatus	N4							S4						
Hylogomphus adelphus	N5					S4	S5	S5	S5					
Hylogomphus viridifrons	N1					S1								
Lanthus parvulus	N5						S3S4	S4	S4					
Lanthus vernalis	N4							S3S4	S2S3					
Octogomphus specularis	N3	S2												
Ophiogomphus anomalus	N4					S3	S3	S4	S1					
Ophiogomphus aspersus	N4						S3S4	S4	S3					
Ophiogomphus carolus	N5					S3	S3S4	S5	S5					
Ophiogomphus colubrinus	N5	S4	S4	S4	S3	S4	S5	S2S3			S3/-	S2S3	S4S5	
Ophiogomphus howei	N2N3					S1		S2S3						
Ophiogomphus mainensis	N5					S1	S3S4	S5	S3					
Ophiogomphus occidentis	N3	S3												
Ophiogomphus rupinsulensis	N5			SU	S2?	S4	S3S4	S5	S3					
*Ophiogomphus severus**	N5	S5	S4	S4										
Phanogomphus borealis	N5					S3	S3	S4	S5					

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TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
Phanogomphus descriptus	N5					S3	S3	S4	S3					
Phanogomphus exilis	N5				S3	S5	S5	S5	S5					
Phanogomphus graslinellus	N5	S2S3	S1S2	S2	S3	S3								
Phanogomphus lividus	N5				SU	S4	S3							
Phanogomphus quadricolor	N2					S2	S1							
Phanogomphus spicatus	N5				S3	S5	S5	S5	S5	S2				
Progomphus obscurus	N2					S2	S1							
Stylogomphus albistylus	N5					S4	S3S4	S5	S5					
Stylurus amnicola	N4				S3	S2	S1							
Stylurus intricatus	N3N4		S2S3	S2S3										
Stylurus laurae	N1					S1								
Stylurus notatus	N4?		S1S3	S2	S3	S3	S3	SU					S3	
Stylurus olivaceus	N2N3	S2												
Stylurus plagiatus	NH					SH								
Stylurus scudderi	N5					S4	S4S5	S4	S2S3					
Stylurus spiniceps	N4					S3	S3							
CORDULEGASTRIDAE														
Cordulegaster dorsalis	N4	S4												
Cordulegaster erronea	N1					S1								
Cordulegaster maculata	N5				S1	S4	S5	S5	S5	S3				
Cordulegaster obliqua	N3					S3	S1							
Zoraena diastatops	N5					S4	S5	S5	S5		SNR/-			
MACROMIIDAE														
Didymops transversa	N5				S2	S4	S5	S4	S5					
Macromia illinoiensis	N5				S3	S4	S4	S4	S5					
*Macromia magnifica**	N3	S3												
Macromia taeniolata	N2					S2								
CORDULIIDAE														
Cordulia shurtleffii	N5	S5	S5	S5	S5	S5	S5	S5	S5	S5	S5/S4	S5	S4S5	
Dorocordulia lepida	N5							S4	S5	S1				

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TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
Dorocordulia libera	N5			SU	S3	S5	S5	S4	S4	S3				
Epitheca canis	N5	S4	S3S4	S4	S3	S5	S5	S5	S5	S4				
Epitheca costalis	N1					S1								
Epitheca cynosura	N5				S2	S5	S5	SNR	SNR					
Epitheca princeps	N5				SU	S5	S4	S4	S3					
Epitheca semiaquea	NNR							SNR	SNR					
Epitheca spinigera	N5	S4	S5	S4	S4S5	S5	S5	S4	S5	S3				
Helocordulia uhleri	N5					S3	S4	S5	S5					
Neurocordulia michaeli	N4N5					S2S3	S3	S4	S2					
Neurocordulia yamaskanensis	N4N5					S4	S4	S4						
Somatochlora albicincta	N5	S5	S5	S4	SU	S4?	S5	S4	S1S2		S2/S3	S5	S4S5	SNA
Somatochlora brevicincta	N5	S3				S2	S4S5	S2	S1S2		S2/-			
Somatochlora cingulata	N5	S4	S4	S4	SU	S4	S5	S4	S4	S1	S5/S4	SNR	SU	
Somatochlora elongata	N5					S3?	S4S5	S5	S4	S3				
Somatochlora ensigera	N4			S2S3	S2	S1								
Somatochlora filosa	N1						S1							
Somatochlora forcipata	N5	S3?	S2S4	S1S2	SU	S4	S5	S3S4	S3	S1	S3/S2		SU	
Somatochlora franklini	N5	S5	S4	S5	S4	S4	S5	S4	S3S4	S1	S2/S4	S4	SU	
Somatochlora hineana	N1					S1								
Somatochlora hudsonica	N5	S5	S5	S3	SU	S3?						S5	S4S5	
Somatochlora incurvata	N5					S3	S1	S4	S5	S2				
Somatochlora kennedyi	N5	S3S4	S3S4	S3	S2	S4	S5	S4	S2S3	S1	-/S2	S3	S4S5	
Somatochlora linearis	N2					S2	SX							
Somatochlora minor	N5	S5	S4S5	S5	S3	S4	S5	S4	S4	S1	S2/S2	S3S4	S2S3	
Somatochlora sahlbergi	N3N4											S3S4	S1	
Somatochlora semicircularis	N5	S5	S4S5									S3		
Somatochlora septentrionalis	N5	S4	S3S4		SU	S3?	S5	S1	S2		S3S4/ S4	S3	SU	
Somatochlora tenebrosa	N4N5					S3	S3	S3S4	S4	SU				
Somatochlora walshii	N5	S4	S3S4	S4	S3	S4	S5	S4	S5	S3	S3S4/-			
Somatochlora whitehousei	N5	S5	S3S4	S2S3	SU	S3	S4				-/S2	S4		
Somatochlora williamsoni	N5			S3	S2S3	S4	S5	S4	S2S3	S3				
Williamsonia fletcheri	N5				S2	S3	S2S3	S4	S2S3					
Williamsonia lintneri	N1					S1								

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TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
LIBELLULIDAE														
Celithemis elisa	N5				SNR	S5	S3S4	S4	S5	S1				
Celithemis eponina	N5					S4	S5	SU	SU		SNR/-			
Celithemis fasciata	NNA					SNA								
Celithemis martha	N4							S3	S4					
Erythemis collocata	N3N4	S3S4												
Erythemis simplicicollis	N5					S5	S4	SU						
Erythemis vesiculosa	NNA					SNA								
Erythrodiplax berenice	N3N4						SH	SU	S3S4					
Erythrodiplax umbrata	NNA					SNA								
Ladona exusta	N5							S3	S5					
Ladona julia	N5	S5	S3S4	S4	S4	S5	S5	S5	S5	S5				
Leucorrhinia borealis	N5	S5	S5	S5	S3	S2S3						S5	S4S5	
Leucorrhinia frigida	N5				S3	S5	S4S5	S5	S5	S1				
Leucorrhinia glacialis	N5	S5	S3S4	S4	S3	S4	S5	S4	S5	S2	S3S4/S2	S1S3	SNR	
Leucorrhinia hudsonica	N5	S5	S5	S5	S5	S5	S5	S5	S5	S5	S5/S4	S5	S4S5	SU
Leucorrhinia intacta	N5	S5	S4	S5	S4	S5	S5	S5	S5	S4				
Leucorrhinia patricia	N5	S4		S4	SU	S3	S4S5	S1	S1			S4	S4S5	
Leucorrhinia proxima	N5	S5	S5	S5	S5	S5	S5	S5	S5	S5	S4/-	S4	S4S5	
Libellula forensis	N4	S4												
Libellula incesta	N5					S4	S4	S4	S4					
Libellula luctuosa	N5				SNA	S5	S4	SU	SNA					
Libellula pulchella	N5	S3	S1S2	S4	S3	S5	S5	S5	S5	S5				
Libellula quadrimaculata	N5	S5	S5	S5	S4	S5	S5	S5	S5	S5	S5/S3	S4	S4S5	
Libellula semifasciata	N3					S3	SNRN	SNA						
Libellula vibrans	N1					S1								
Nannothemis bella	N5					S4	S2S3	S4	S3S4					
Pachydiplax longipennis	N5	S3S4			SH	S5	S5	S1S2	S1					
Pantala flavescens	N5B		SNA		SNA	S4B, SNRM	SNRB	S4B	S5B	S2B	SNA/-			
Pantala hymenaea	N5B	SNA			SNA	S4B, SNRM	SNRB	S3B	S2?B					
Perithemis tenera	N5					S4	S5	SU	SU					
Plathemis lydia	N5	S4		SNR	S2	S5	S5	S5	S5	S5				
Sympetrum ambiguum	NNA					SNA								

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TABLE 1. (continued)

Species	Canada	BC	AB	SK	MB	ON	QC	NB	NS	PE	NF/LB	YT	NT	NU
Sympetrum corruptum	N5B, N5N, NNRM	S4S5	S5	S5	S3	S3	SNRB	SNA	SNA	SNA				
Sympetrum costiferum	N5	S5	S5	S5	S4	S4	S5	S5	S5	S5	S3/-		S4S5	
Sympetrum danae	N5	S5	S5	S5	S4	S4	S5	S4	S3S4	S1	S4/S2	S5	S4S5	
Sympetrum illotum	N4	S4												
Sympetrum internum	N5	S5	S5	S5	S5	S5	S5	SNR	S5	S5	S3/-	S4S5	S4S5	
Sympetrum janeae	NNR						S4							
Sympetrum madidum	N5	S4	S4	S5	S3	SU						S2	S4	
Sympetrum obtrusum	N5	S5	S5	S5	S4	S5	S5	S5	S5	S5		S1	S4S5	
Sympetrum pallipes	N5	S5	S3	S3										
Sympetrum rubicundulum	N5					S5	S1							
*Sympetrum semicinctum**	N5	S4S5	S4	S2S3	S3	S4	S4	S5	S5	S3				
Sympetrum vicinum	N5	S3S4			S3	S5	S5	S5	S5	S5				
Tramea carolina	NNA					SNA			SNA					
Tramea darwini	NNA					SNA			SNA					
Tramea lacerata	N4B	S2B, SNRM				S4B, SNRM	SNRB	SNA	SNA					
Tramea onusta	NNA					SNA								
Species totals	**220**	**88**	**73**	**80**	**103**	**179**	**153**	**142**	**128**	**72**	**41/24**	**43**	**44**	**6**

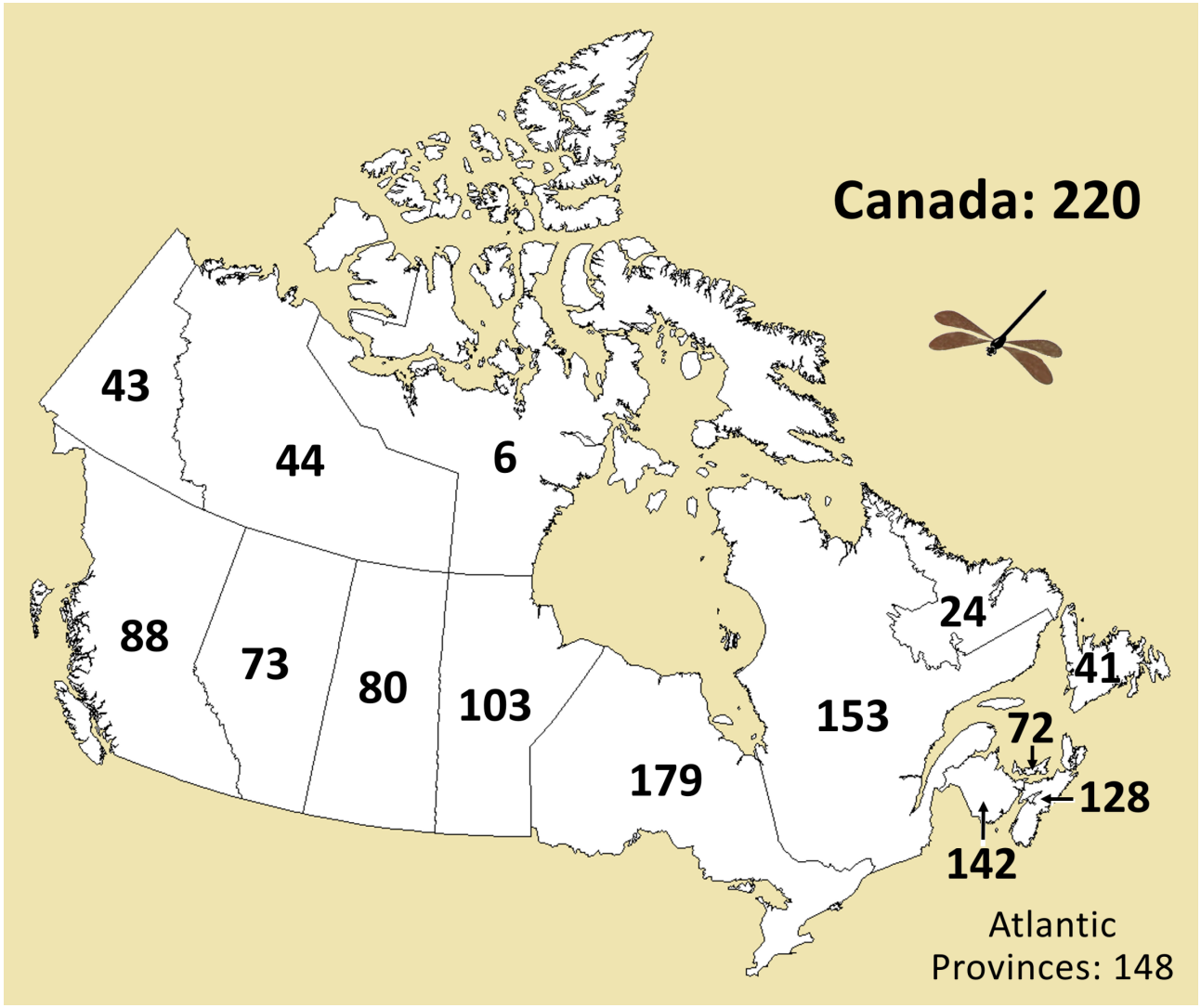

FIGURE 9. Map of Canada with Odonata species totals for provinces and territories. The totals for the two parts of the province of Newfoundland and Labrador are given separately.

TABLE 2. Odonata assessed by COSEWIC

Taxon	COSEWIC category (year(s) assessed)	SARA listing (year listed)
Argia vivida	Special Concern (2015)	Special Concern (2019)
Gomphurus ventricosus	Endangered (2010) but re-assessed as Special Concern in 2022	Endangered (2017)
Octogomphus specularis	Special Concern (2021)	---
Ophiogomphus howei	Special Concern (2009, 2018)	Special Concern (2011)
Phanogomphus quadricolor	Endangered (2008, 2019)	Endangered (2010)
Somatochlora hineana	Endangered (2011)	Endangered (2017)
*Stylurus amnicola**	Special Concern (2023)	---
Stylurus amnicola (Prairie population)	Data Deficient (2012)	---
Stylurus amnicola (Boreal population)	Data Deficient (2012)	---
Stylurus amnicola (Great Lakes Plains population)	Endangered (2012)	Endangered (2018)
Stylurus laurae	Endangered (2010)	---
Stylurus olivaceus	Endangered (2011)	Endangered (2017)

*Note that COSEWIC no longer recognizes the Prairie, Boreal, and Great Lakes Plains populations as separate designatable units of *Stylurus amnicola*. Presumably these designatable units will be dropped from the SARA listing in future.

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