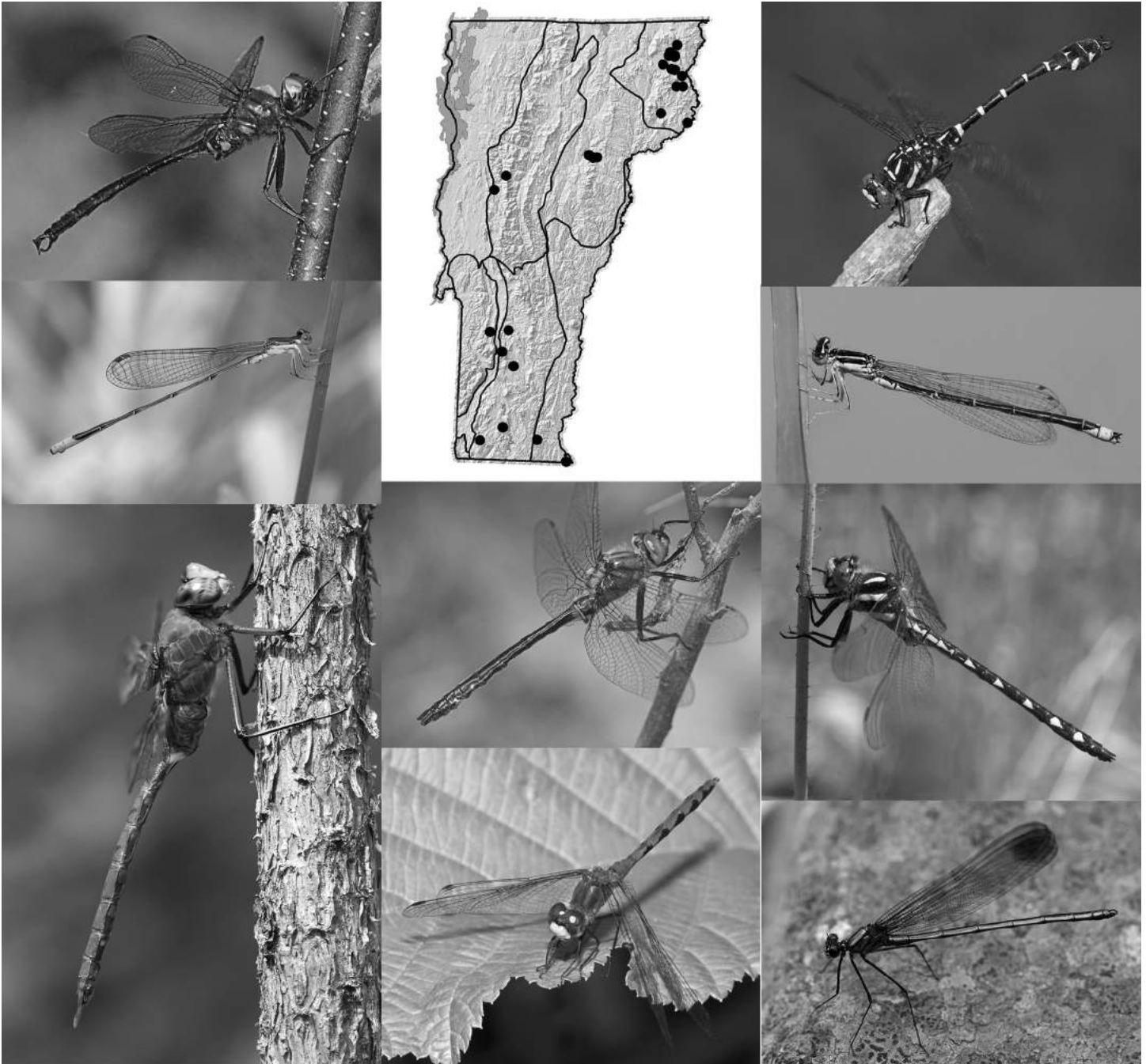


BULLETIN OF AMERICAN ODONATOLOGY



Blust, M. and B. Pfeiffer

69–119 The Odonata of Vermont

Front cover: Counter-clockwise from the upper left, *Somatochlora tenebrosa*, *Nehalennia gracilis*, *Anax longipes*, *Cordulia shurtleffi* (beneath the distribution map for *Somatochlora elongata*), *Sympetrum obtrusum*, *Calopteryx amata*, *Cordulegaster diastatops*, *Enallagma antennatum* and *Stylurus scudderi*. Photos by Bryan Pfeiffer and Mike Blust.

The Odonata of Vermont

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Key words: Odonata, United States, Vermont, records, dragonflies, damselflies

Abstract

Here we present the status and distribution of 142 species of Odonata from Vermont, compiled from historical records and a recent surge of field work. This marks the first such compilation for the state. We include descriptions of Vermont's biophysical regions, a history of odonatology in the state and species accounts that feature distribution, conservation rankings and flight periods. In 13 of Vermont's 14 counties we have documented a minimum of 76 odonate species.

Introduction

For decades Vermont was considered an Odonata black hole. Although the state, during the past century, attracted some of the continent's most eminent odonatologists, its fauna was poorly understood and its records sparse and fragmented. A new wave of field work, beginning in the late 1990s, quickly relieved Vermont of its reputation as the most mysterious among New England states for odonates. This publication presents the evidence. It documents the distribution and status of 142 Odonata species across the state—99 Anisoptera species and 43 Zygoptera species (Tables 1A, 1B). The foundation for this work is a century of field investigation beginning in 1891, as well as an abundance of field work and discovery during the past 15 years. The average number of species recorded at the county level has increased from roughly 30 in the year 2000 to its current average of 92. Thirty-two species have been added to the state list during the same time period, many of which have distributions that generally extend southerly in range. It may be tempting to suggest that global climate change may be partly responsible for the recent discovery of these “southern” species. Yet a lack of solid baseline data makes it difficult to conclude the previous absence of these species in the state. This publication will help make it easier to document future changes in Vermont's odonate fauna.

History

Albert Pitts Morse, better known as A.P. Morse, was a naturalist associated with Wellesley College in Massachusetts (Dow, 1937). On 16 July 1891, he collected the first odonate in Vermont, at least the first one with a proper date attached to it. It was a *Cordulegaster diastatops* (Delta-spotted Spiketail) from the northern town of Jay. That specimen is currently in the Museum of Comparative Zoology (MCZ)

at Harvard. Two days later, Morse collected an *Amphiagrion saucium* (Eastern Red Damsel) from Montgomery in Franklin County and five days after that a *Boyeria vinosa* (Fawn Darner) from Wolcott in Lamoille County. Many of A.P. Morse's specimens are housed in the MCZ and the Peabody Museum at Yale. His collecting was concentrated in the Woodstock area and 20 species are represented from there. Zygopterans account for 90 of his 106 Vermont records. A few of these records may well be duplicates, as it is difficult to correlate physical specimens with published information. Unfortunately, many of the museum specimens do not include dates.

The first published records of Vermont Odonata were recorded by Philip Calvert (1905). His Odonata section of the Fauna of New England, a four-page table of species from the six New England states, shows a mostly empty column for Vermont, already the least surveyed of the New England states. Of the six Vermont records that Calvert included, four came from Mrs. Annie Trumbull Slossan of Newport. Mrs. Slossan, most noted for her literary works, was no casual naturalist. In 1925 she donated her insect collection to the American Museum of Natural History (AMNH) in New York—a mere 35,000 specimens. She was also named an honorary member of the Brooklyn Entomological Society (Ifkovic, 2004). Her Vermont specimens, representing seven species, include seven in the AMNH collection, two at the Philadelphia Academy of Natural Science, and one listed for the National Museum of Natural History in Washington.

R. Heber Howe, headmaster of the Middlesex School and associated Thoreau Museum of Natural History in Concord, Massachusetts, wrote a series of works on New England Odonata (Howe, 1917–1927). Howe never collected in Vermont himself; several other collectors sent him specimens or records. One of the few Vermont residents who contributed

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Table 1A: Damselfly species presence and documentation levels by county. V = vouchered with specimen; P = photo; C = catch/release; S = sight; U = unknown (these are usually records from the literature or other sources where details are not provided); ? = Questionable evidence, insufficient for inclusion on state list. See text for details. Anisoptera totals (from Table 1B) and Odonata totals are included here.

	Bennington	Windham	Rutland	Windsor	Addison	Washington	Orange	Chittenden	Lamoille	Caledonia	Grand Isle	Franklin	Orleans	Essex	Total Counties
<i>Calopteryx aequabilis</i>	U	U	V		V	P		V	S	V		V	V	V	11
<i>Calopteryx amata</i>	V	U	V	V		S		V	V	U				V	10
<i>Calopteryx maculata</i>	V	C	V	V	V	V	CP	V	S	V	V	V	V	V	14
<i>Hetaerina americana</i>		V			V			S			V				4
<i>Archilestes grandis</i>										?					0
<i>Lestes congener</i>	V	V	V	V	V	V	V	V	V	V	P	V	V	V	14
<i>Lestes disjunctus</i>	V	V	V	V	V	V	V	V	V	V		V	V	V	13
<i>Lestes dryas</i>	V	V	V	V	V	V	V	V		C	V	U	P	V	13
<i>Lestes eurinus</i>	U	U	V	V	V	V	P	V	S			C	V	V	12
<i>Lestes forcipatus</i>	V	U	V	V	V	V	V	V	V	V	V			V	12
<i>Lestes inaequalis</i>	V	P	V	V	V	V	V	V	V	V	V	V	V	V	13
<i>Lestes rectangularis</i>	V	V	V	V	V	V	V	V	C	V	V	V	V	V	14
<i>Lestes unguiculatus</i>	V		V		V		V	V			V	V		V	8
<i>Lestes vigilax</i>	V	V	V	V	V	V	V	V	V	V			P	C	13
<i>Amphiagrion saucium</i>	V	P	V		U	V	V	V	V	V	S	V	V	V	13
<i>Argia apicalis</i>	V	V	V					P							4
<i>Argia fumipennis</i>	V	V	V	V	V	V	V	V	V	V		V	V	V	13
<i>Argia moesta</i>	V	V	V	V	V		V	V	S		V	V	V	V	12
<i>Chromagrion conditum</i>	V	V	V	V	V	V	V	V	V	V		V	V	V	13
<i>Coenagrion interrogatum</i>			P											V	2
<i>Coenagrion resolutum</i>	U		V		V	V	V	V	V	V	V	V	V	V	12
<i>Enallagma anna</i>							V								1
<i>Enallagma annexum</i>	U	U	V	U	V	V		V			U		V	V	10
<i>Enallagma antennatum</i>			V	V	V	V		V				V			6
<i>Enallagma aspersum</i>	V	U	V	V	U	V	C	V	C			C		V	11
<i>Enallagma boreale</i>	V	C	V	V	V	C	V	V				V		V	10
<i>Enallagma carunculatum</i>	V	V	V	V	V	V	V	V			V	V	V	S	12
<i>Enallagma civile</i>	V	V	V		V	U		V		V	V	V	V	V	11
<i>Enallagma divagans</i>			?												0
<i>Enallagma durum</i>	V							P							2
<i>Enallagma ebrium</i>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	14
<i>Enallagma exsulans</i>	V	V	V	V	V	V	V	V				V	V	U	11
<i>Enallagma geminatum</i>	V	V	V	V	V	V	P	C		S		V	C	U	12
<i>Enallagma hageni</i>	V	U	V	V	V	V	V	V	V	V	V	V	V	V	14
<i>Enallagma laterale</i>		V													1
<i>Enallagma signatum</i>	V	V	V	V	V	S		V	V		V	V	V	V	12
<i>Enallagma traviatum</i>		V	V												2
<i>Enallagma vernale</i>		V	V	V	V			V	V	V	V	V	V	V	11
<i>Enallagma vesperum</i>	P	S	V	V		S	V	P	V	V		V	V	C	12
<i>Ischnura hastata</i>	V	V									V				3
<i>Ischnura kellicotti</i>		V	V	V											3
<i>Ischnura posita</i>	V	V	V	V	V	V	V	V	V	V	V	C	V	U	14
<i>Ischnura verticalis</i>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	14
<i>Nehalennia gracilis</i>	U	V	V			V	V		C	C				C	8
<i>Nehalennia irene</i>	V	U	V	V	V	V	V	V	V	V	V	V	V	V	14
															State Total
Zygoptera	35	37	38	29	32	31	29	36	25	24	22	30	27	33	43
Anisoptera (see Table 1B)	71	81	77	62	69	65	49	64	55	57	40	46	56	72	99
Odonata	106	118	115	91	101	96	78	100	80	81	62	76	83	105	142

to Odonata information was a bryologist and member of the Vermont Botanical and Bird Club, Mr. D. Lewis Dutton (Dutton, 1920; Burchsted). His observations, primarily from the town of Brandon, were all reported in Heber Howe's various works. Dutton gets credit for contributing the greatest number of species to the state list with 27 during the period from 1912 to 1920. His specimens may be housed at the National Museum, as there are accession records for at least some odonate specimens from Howe to the museum in 1917(8) (Ravenel, 1919).

Around the same time, Charles Willison Johnson made several forays into Vermont from Massachusetts. He was president of the Boston Society of Natural History from 1902 to 1913, and later served as its curator of insects and mollusks. (Johnson, 2004). Although only 16 records are attributed to C.W. Johnson, mostly reported by Howe, six were new species for the state.

From that point, with about 50 species recorded for Vermont, additional odonate observations were sporadic for approximately the next 38 years as various collectors contributed isolated records. Again, most data appears to have come from visitors to the state, rather than residents. The data for this period largely comes from the MCZ, the Peabody Museum and the Zadock Thompson Natural History collection at the University of Vermont (UVM). A few notes are warranted on some of the people involved. Arthur Loveridge was a herpetologist associated with the MCZ (Burchsted). Alexander Petrunkevitch emigrated from his native Russia and became a professor at Yale. His name is better known in arachnology for his describing more than 100 species (Peabody Museum, 2005). G.E. Pickford most likely refers to Grace Pickford, a zoologist at Yale and doctoral student of Petrunkevitch (Hiram). W.W. Bowen probably refers to W. Wedgewood Bowen, a medical entomologist and amateur ornithologist who became curator of the Natural History Museum for Sudan (Tigani) and, closer to Vermont, curator of the Natural History Museum at Dartmouth (Dartmouth Yearbook, 1965). In 1945, C.P. Alexander, the crane fly expert from the University of Massachusetts, Amherst, added a few Odonata records, including Vermont's first *Lanthus vernalis* (Southern Pygmy Clubtail).

It was in 1955 that James G. Needham and Minter J. Westfall, Jr. published the first edition of their North American dragonfly manual (Needham & Westfall, 1955). In the manual's species descriptions, 30 Anisopterans are indicated to have been recorded in Vermont at the time. Needham and Westfall included two species for which we have no records prior to 1955. Unfortunately, no sources were given and no information was found in Westfall's notes. One of these species, *Ladona exusta* (White Corporal), remains unsubstantiated in the state. For the other, *Epitheca princeps* (Prince

Baskettail), no confirmed records existed until 1995.

In 1958 Paul D. Harwood made a short but productive collecting trip to Vermont. Harwood was a helminthologist from Ohio, but also an avid odonatologist who published on the Odonata of Ohio and West Virginia (Stuckey, 1997). His collections were donated to the International Odonata Research Institute (IORI) at the University of Florida at Gainesville. In his two-day visit, Harwood added five species to the state list.

The University of Vermont insect collection contains a significant number of Odonata specimens, a few as old as 1920 but most collected from 1961 to 1999, thanks largely to Ross Bell and the many students who prepared collections for his classes. There are numerous county records and even a few first state records that the students were unaware of as they swung nets to fulfill their course requirements.

The seventies saw increased activity, again largely from out-of-state collectors or individuals living only temporarily in Vermont. Hal White, from Delaware, visited the state for two days in June of 1970 and again for two days in July of 1975. He and others of this time period were particularly intrigued by the boreal habitat of the Northeast Kingdom. White's interest in north woods Odonata led to publications on the Odonata of New Hampshire and another on Mt. Desert Island, Maine. He contributed 10 new species to Vermont's list (White & Morse, 1973; White, 1989; White, personal communication).

Another avid collector, Paul Miliotis, collected in Vermont from 1973 to 1976 and accompanied Hal White in July of 1975 in a trip to Northeastern Vermont. During this time, Miliotis expanded the knowledge of Odonata in Vermont by visiting a variety of sites previously uninvestigated for Odonata and by actively collecting throughout the flight season. His contributions, including five state records, are in the collection at UVM, the IORI collection, the Brackenridge collection in Texas and the Slater Museum of Natural History in Washington. A third party to the July 1975 trip to Vermont, the northeastern corner commonly known as the "Northeast Kingdom," was Frank Louis Carle. Carle's contributions to Vermont Odonatology are extensive, and began in 1969. Carle graduated from UVM in 1972 with a degree in forestry and wildlife. He then moved on to the University of Virginia for graduate work, but later returned to Vermont to conduct odonate work for the state (Carle, 1982).

Two other notable visitors to the state were Sidney Dunkle and Minter Westfall. Dunkle visited briefly in 1973, adding *Sympetrum costiferum* (Saffron-winged Meadowhawk) to the state list, and then spent five days in July of 1982 collecting in the Northeast Kingdom, finding the state's first

Table 1B. Dragonfly species presence and documentation levels by county. V = vouchered with specimen; P = photo; C = catch/release; S = sight; U = unknown (these are usually records from the literature or other sources where details are not provided); ? = Questionable evidence, insufficient for inclusion on state list. See text for details.

	Bennington	Windham	Rutland	Windsor	Addison	Washington	Orange	Chittenden	Lamoille	Caledonia	Grand Isle	Franklin	Orleans	Essex	Total Counties
<i>Tachopteryx thoreyi</i>		?													0
<i>Aeshna canadensis</i>	V	V	V	V	V	V	V	V	V	V	C	V	V	V	14
<i>Aeshna clepsydra</i>		V	V		P										3
<i>Aeshna constricta</i>		V	V		V	S	P	V	S	C	V	V	V	V	12
<i>Aeshna eremita</i>	V	V	V	U	P	V	V	V	V	V			V	V	12
<i>Aeshna interrupta</i>	C	V	V	V	U	V		V	V	V			V	V	11
<i>Aeshna sitchensis</i>														P	1
<i>Aeshna subarctica</i>								U						V	2
<i>Aeshna tuberculifera</i>	V	V	V	V	V	V	V	V	V	U	V	V	V	V	14
<i>Aeshna umbrosa</i>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	14
<i>Aeshna verticalis</i>	V	U	V		V	U		V	V		V			V	9
<i>Anax junius</i>	V	V	V	V	V	S	S	V	C	S	V	V	V	V	14
<i>Anax longipes</i>				C				P							2
<i>Basiaeschna janata</i>	V	V	V	V	V	V	S	V	C	V	V	S	V	V	14
<i>Boyeria grafiana</i>	V	V	V	V	S	V	V	V			P	V	V	V	12
<i>Boyeria vinosa</i>	V	S	V	V	V	V	V	V	V	V	V	V	V	U	14
<i>Epiaeschna heros</i>		P	V					P			V				4
<i>Gomphaeschna furcillata</i>		V	V		P			P	V	V	V		V	U	9
<i>Nasiaeschna pentacantha</i>		V													1
<i>Rhionaeschna mutata</i>		V			P			P							3
<i>Arigomphus furcifer</i>	V	V	C	V	U	P		V	V			V	V	V	11
<i>Arigomphus villosipes</i>	V	U	V		V										4
<i>Dromogomphus spinosus</i>		V	V	S	V	C	S	P		U		V	P	U	11
<i>Gomphus abbreviatus</i>		V	V												2
<i>Gomphus adelphus</i>	V	V	V	V	V	V					P		V	V	9
<i>Gomphus borealis</i>	V	V	V	V	V	V		V	S	V		S	V	V	12
<i>Gomphus descriptus</i>	V	U	V	V	V	V		V	V	U		V	V	V	12
<i>Gomphus exilis</i>	V	U	V		V	V		V	V	V	V	V	V	V	12
<i>Gomphus fraternus</i>			V												1
<i>Gomphus lividus</i>	V		V		V							V			4
<i>Gomphus quadricolor</i>	V	V	V	V				V				V			6
<i>Gomphus spicatus</i>	V	V	V	U	V	V	V	V	V	V			V	V	12
<i>Gomphus vastus</i>		V													1
<i>Gomphus ventricosus</i>		U		U											2
<i>Hagenius brevistylus</i>	P	V			V	C			V	V			V	V	8
<i>Lanthus parvulus</i>	V	U	V	V	V	V	V	V	V	U			U	V	12
<i>Lanthus vernalis</i>	V	V	P	V	V	V	V		V	U		V	U	V	12
<i>Ophiogomphus aspersus</i>	V	V	V		V	V	V	V		V			V	V	10
<i>Ophiogomphus carolus</i>	V	P	V	V	V	V	V	V	V					V	9
<i>Ophiogomphus mainensis</i>	V	V		V	V	V	V			V			U	V	8
<i>Ophiogomphus rupinsulensis</i>	U	V		V					P						4
<i>Progomphus obscurus</i>				?											0
<i>Stylogomphus albistylus</i>	V	V	V	V	P	S		V	V	U		V	V	V	12
<i>Stylurus amnicola</i>		V													1
<i>Stylurus scudderii</i>	V		V	V	V	V	V	P	C	V		V	V	V	12
<i>Stylurus spiniceps</i>		V	V	V	V	V	P	V	V			V	P	V	10
<i>Cordulegaster diastatops</i>	V	V	V	V	V	V	V	C	S	V			V	V	12
<i>Cordulegaster maculata</i>	V	V	V	V	V	V	V	V	C	V		V	V	V	13
<i>Cordulegaster obliqua</i>			V		P										2
<i>Didymops transversa</i>	P	V	V	C	V	V		V	C	P	V	C	V	V	13

Continued next page...

Table 1B continued...

	Bennington	Windham	Rutland	Windsor	Addison	Washington	Orange	Chittenden	Lamoille	Caledonia	Grand Isle	Franklin	Orleans	Essex	Total Counties
<i>Macromia illinoiensis</i>		V	V	V		V			S	V		S	P	U	9
<i>Cordulia shurtleffii</i>	V	V	V	C	V	V	V	V	V	V			V	V	12
<i>Dorocordulia lepida</i>	V	V				C				S				U	5
<i>Dorocordulia libera</i>	V	V	V	V	V	S	V	C	C	C	V	V	V	V	14
<i>Epithea canis</i>	V	C	V	C	V	V	V	V	V	C	V	V	V	V	14
<i>Epithea cynosura</i>	V	V	V	C	S	C	V	V		V	V	V			11
<i>Epithea princeps</i>	S	S	V	U	V		V	V		V	V	V	V	S	12
<i>Epithea spinigera</i>	V		V	V	P	C	C	V		V	V	V	V	V	12
<i>Helocordulia uhleri</i>	V	U	U	V		V		P	C	V			V	V	10
<i>Neurocordulia yamaskanensis</i>		V	V	V	V							V	V		6
<i>Somatochlora albicincta</i>									V					U	2
<i>Somatochlora cingulata</i>		V								U				U	3
<i>Somatochlora elongata</i>	V	V	V		U	V		V		V				V	8
<i>Somatochlora forcipata</i>		U	U			V								V	4
<i>Somatochlora franklini</i>										V				V	2
<i>Somatochlora kennedyi</i>														V	1
<i>Somatochlora minor</i>	U													V	2
<i>Somatochlora tenebrosa</i>	V	V	V		V	V		V	V	V			P	V	10
<i>Somatochlora walsbii</i>	V	V	V	V	U	C	V	V	V	V			V	V	12
<i>Somatochlora williamsoni</i>	V	V	V		V	V	V		C	V			C	V	10
<i>Williamsonia fletcheri</i>	V					V	P			P				V	5
<i>Celithemis elisa</i>	V	V	V	V	V		V	S	P		V	C	P	V	12
<i>Celithemis eponina</i>	V	V	V	P	S		P	V			P	V			9
<i>Celithemis fasciata</i>		P													1
<i>Erythemis simplicicollis</i>	U	S	V	V	V	P		V	S		V	V			10
<i>Ladona exusta</i>			?												0
<i>Ladona julia</i>	V	V	V	V	V	V	V	V	S	V	C	V	V	V	14
<i>Leucorrhinia frigida</i>	V	V	V	U	V	V	V	V	C	C	C	V	V	V	14
<i>Leucorrhinia glacialis</i>	V	V	V	U	U	V	V		V	V				V	10
<i>Leucorrhinia hudsonica</i>	V	V	V	U	V	V	C		V	V				V	10
<i>Leucorrhinia intacta</i>	V	V	V	V	V	V	V	V	V	S	V	V	V	V	14
<i>Leucorrhinia proxima</i>	V	U	V		V	V	U	V	V	V	C	V	V	V	13
<i>Libellula cyanea</i>	V	V		V											3
<i>Libellula incesta</i>	V	V	V	P	V		V	V		U			S	V	10
<i>Libellula luctuosa</i>	V	S	V	V	V	U	V	V	S	V	V	V	S		13
<i>Libellula pulchella</i>	V	S	V	V	V	V	S	V	V	S	V	V	V	S	14
<i>Libellula quadrimaculata</i>	V	V	V	V	S	V	S	V	V	V	V	V	V	V	14
<i>Libellula semifasciata</i>	V	V	V	V							P				5
<i>Nannothemis bella</i>	S		P		V	U	V		C						6
<i>Pachydiplax longipennis</i>	V	V	V	V	V	U	V	V	S		V	S		S	12
<i>Pantala flavescens</i>	V		S	S	V	S	C	V	V		V	S		S	11
<i>Pantala hymenaea</i>	V	S	S	P	V			S			S			S	8
<i>Perithemis tenera</i>	S	V	V	P	V	V	S	V				V			9
<i>Plathemis lydia</i>	V	S	V	V	V	V	V	V	V	V	V	V	V	S	14
<i>Sympetrum costiferum</i>			P	U		V	C	V		V			P	V	8
<i>Sympetrum danae</i>						U					V			V	3
<i>Sympetrum internum/janae</i>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	14
<i>Sympetrum obtrusum</i>			V	U	V	V	V	V	V	C	V	V	V	V	11
<i>Sympetrum semicinctorum</i>	V	P	V		V	V		V	V	V	V	S	V	V	12
<i>Sympetrum vicinum</i>	V	V	V	V	V	U	V	V	V	S	V	V	V	V	14
<i>Tramea carolina</i>	V	P													2
<i>Tramea lacerata</i>	V	S	S		V	S		V			V		S		8
Anisoptera	71	81	77	62	69	65	49	64	55	57	40	46	56	72	

Somatochlora elongata (Ski-tipped Emerald). Westfall visited a friend on Lake St. Catherine in 1982 and 1986, during which he added five species to the state list, most notably *Aeshna clepsydra* (Mottled Darner). Also from 1982 are a few specimens attributed to the late George Bick, whose daughter lives in Vermont.

In 1987 the Vermont Department of Environmental Conservation (DEC) produced a report on the effects of acid rain (Fiske, 1987) using insect biomonitoring data. Oddly enough, this report became the first of a series of reports in which Odonata information for Vermont was finally beginning to be organized. Most of the odonate data from the DEC's biomonitoring program comes from Doug Burnham, who had the unenviable task of working exclusively with larvae, many of which were not in final instars. Although we have reviewed this data and some of the specimens for this publication, it remains likely that more discoveries are to be mined from this impressive collection of larval data.

In 1988, Dr. Philip Nothnagle produced a report for Vermont's Non-game and Natural Heritage Program that marked the first modern attempted list of Odonata species for the state (Nothnagle, 1988). Nothnagle, a Vermonter with a doctorate in forest ecology from Dartmouth, was frequently called upon throughout New England to do contract work for various state agencies. In his Vermont report, he used data from the DEC, range notations from Needham and Westfall's 1955 manual and information from Dunkle (1983) to compile a list that confirmed 64 species of Odonata for the state. Given that the DEC's data rarely identified Zygoptera to species, and that Zygoptera were not included in Needham and Westfall, 61 of the 64 species confirmed were Anisopterans. The list also carried forward some questionable species likely resulting from larval misidentifications. Using information from neighboring states, Nothnagle also created a list of 29 species (including Zygoptera) likely to occur in Vermont and 33 species considered as possible. It should be noted that as of this particular publication, all 29 of the likely species and 25 of the 33 possible species have since been recorded in the state, while an additional two have been reported but not verified.

In 1994, Frank Carle, by now with a Ph.D. in entomology from Virginia Polytechnic Institute and State University, compiled a state list for Vermont. Carle used his own data plus data from White and Dunkle. He combined this with information from Nothnagle's report and with specimens from the University of Vermont, the University of Massachusetts at Amherst and the National Museum. In this report, Carle assigned tentative state rankings along with indications of the number of known localities for each species. At that time he indicated 103 species recorded in the state and 62 additional possibilities. Of those possibilities,

38 have since been found. One additional species, *Enallagma durum* (Big Bluet), has been found that was not included in Carle's list. Carle also began a multi-year project surveying Odonata of the southern Green Mountain National Forest (1994, 1995 and 1997). During this survey, he added 10 species to the state list (Carle, 1997).

In late June of 1997, the Dragonfly Society of the Americas had a gathering in western Rutland County (Novak, 1998), and notes from Blair Nikula, Richard Orr and others at the meeting documented the addition of *Gomphus quadricolor* (Rapids Clubtail) and *Neurocordulia yamaskanensis* (Stygian Shadowdragon). During the next few years several researchers were at work. Chris Fichtel, who had helped Frank Carle on some of his surveys, was doing some odonate work for The Nature Conservancy. Don Miller, an active entomologist in Vermont, did survey work for the state in the Northeast Kingdom and in the Colby Hill area (Miller, 1999–2003). Jim MacDougall visited the Northeast Kingdom several times between 1997 and 2000, sometimes joining Miller on his outings. In addition, Mark McPeck, a professor at Dartmouth, had been working on damselfly evolution and ecology in the region.

It was in 2001 that the authors of this paper began independently focusing on Odonata of Vermont and quickly teamed up to coordinate efforts. Mike Blust had worked with odonates for his master's thesis, and had continued an interest in aquatic insects. With the updated volume of Needham and Westfall and the first comprehensive field guide for odonates written by Dunkle, it was an open invitation to erase Vermont's reputation as the Northeastern state mostly poorly surveyed. Paul Brunelle was instrumental in this phase with two visits to the state, in 2000 and 2001, sponsored by the Vermont Entomological Society and Bryan Pfeiffer. Brunelle also compiled Vermont data from various locations and passed it on to the authors of this report. In the ensuing eight years, 16 species were added to the state list and the average county list climbed to 89 species from about 30. In 2005 the Vermont Wildlife Action Plan (Kart et al., 2005) included Odonata as a priority insect order among its invertebrate analyses. The plan listed 42 odonates (32 Anisoptera and 10 Zygoptera) as Species of Greatest Conservation Need (SGCN). From 2007–2009, Pfeiffer, working under contract for the Vermont Department of Fish and Wildlife, conducted extensive surveys for SGCN Odonata in peatlands and rivers (Pfeiffer, 2009).

Several other individuals have more recently contributed to the knowledge of odonate distribution in the state. Kevin Hemeon, a New Yorker from over the line near Bennington County, has made numerous contributions, including adding *Enallagma durum* (Big Bluet). Meanwhile, David Hoag's work in Grand Isle included finding the state's first *Epiaschna*

Table 2. State Conservation ranks. Species conservation status arranged by rank and by taxonomic order within the ranks.

Species	Rank	Species	Rank	Species	Rank
<i>Enallagma darum</i> , Big Bluet	S1	<i>Somatochlora williamsoni</i> , Williamson's Emerald	S3S4	<i>Enallagma bogeni</i> , Hagen's Bluet	S5
<i>Enallagma laterale</i> , New England Bluet	S1	<i>Pantala flavescens</i> , Wandering Glider	S3S4	<i>Enallagma signatum</i> , Orange Bluet	S5
<i>Aeshna subarctica</i> , Subarctic Darner	S1	<i>Pantala hymenaea</i> , Spot-winged Glider	S3S4	<i>Ischnura verticalis</i> , Springtime Bluet	S5
<i>Naisiaeschna pentacantha</i> , Cyrano Darner	S1	<i>Calopteryx amata</i> , Superb Jewelwing	S4	<i>Ischnura verticalis</i> , Eastern Forktail	S5
<i>Rhionaeschna mutata</i> , Spatterdock Darner	S1	<i>Lestes eurtinus</i> , Amber-winged Spreadwing	S4	<i>Nehalennia irene</i> , Sedge Sprite	S5
<i>Gomphus vastus</i> , Cobra Clubtail	S1	<i>Enallagma aspersum</i> , Azure Bluet	S4	<i>Aeshna canadensis</i> , Canada Darner	S5
<i>Gomphus ventricosus</i> , Skillet Clubtail	S1	<i>Enallagma vesperum</i> , Vesper Bluet	S4	<i>Aeshna constricta</i> , Lance-tipped Darner	S5
<i>Somatochlora albicincta</i> , Ringed Emerald	S1	<i>Aeshna tuberculifera</i> , Black-tipped Darner	S4	<i>Aeshna interrupta</i> , Variable Darner	S5
<i>Sylvaris annicola</i> , Riverine Clubtail	S1	<i>Boyeria graffiana</i> , Ocellated Darner	S4	<i>Aeshna umbrosa</i> , Shadow Darner	S5
<i>Enallagma traviatum</i> , Slender Bluet	S1S2	<i>Gomphus borealis</i> , Beaverpond Clubtail	S4	<i>Anax junius</i> , Common Green Darner	S5
<i>Ischnura kellicottii</i> , Lilypad Forktail	S1S2	<i>Lanthus parvulus</i> , Northern Pygmy Clubtail	S4	<i>Basiaeschna janatta</i> , Springtime Darner	S5
<i>Gomphus abbreviatus</i> , Spine-crowned Clubtail	S1S2	<i>Ophiogomphus aspersus</i> , Brook Snaketail	S4	<i>Boyeria vinosa</i> , Fawn Darner	S5
<i>Cordulegaster obliqua</i> , Arrowhead Spiketail	S1S2	<i>Spylogomphus albistylus</i> , Least Clubtail	S4	<i>Gomphus spicatus</i> , Dusky elubrail	S5
<i>Somatochlora cingulata</i> , Lake Emerald	S1S2	<i>Macromia illinoensis</i> , Swift River Cruiser	S4	<i>Cordulegaster diastatops</i> , Delta-spotted Spiketail	S5
<i>Somatochlora franklini</i> , Delicate Emerald	S1S2	<i>Epithea spinigera</i> , Spiny Baskettail	S4	<i>Cordulegaster maculata</i> , Twin-spotted Spiketail	S5
<i>Somatochlora kennedyi</i> , Kennedy's Emerald	S1S2	<i>Somatochlora walshii</i> , Brush-tipped Emerald	S4	<i>Diachnops transversa</i> , Stream Cruiser	S5
<i>Williamsonia fletcheri</i> , Ebony Boghaunter	S1S2	<i>Celithemis eponina</i> , Halloween Pennant	S4	<i>Cordulia shurtleffi</i> , American Emerald	S5
<i>Sympetrum danae</i> , Black Meadowhawk	S1S2	<i>Leucorhinia glacialis</i> , Crimson-ringed Whiteface	S4	<i>Dorocordulia libera</i> , Racket-tailed Emerald	S5
<i>Gomphus quadricolor</i> , Rapids Clubtail	S2	<i>Tramea lacerata</i> , Black Saddlebags	S4	<i>Epithea canis</i> , Beaverpond Baskettail	S5
<i>Somatochlora minor</i> , Ocellated Emerald	S2	<i>Lestes forcipatus</i> , Sweetflag Spreadwing	S4S5	<i>Epithea cynosura</i> , Common Baskettail	S5
<i>Libellula cyanea</i> , Spangled Skimmer	S2	<i>Lestes inaequalis</i> , Elegant Spreadwing	S4S5	<i>Epithea princeps</i> , Prince Baskettail	S5
<i>Hetaerina americana</i> , American Rubyspot	S2S3	<i>Coenagrion resolutum</i> , Taiga Bluet	S4S5	<i>Celithemis elisa</i> , Calico Pennant	S5
<i>Enallagma antennatum</i> , Rainbow Bluet	S2S3	<i>Enallagma boreale</i> , Boreal Bluet	S4S5	<i>Erythemis simplicicollis</i> , Eastern Pondhawk	S5
<i>Aeshna clepsydra</i> , Mortled Darner	S2S3	<i>Enallagma civile</i> , Familiar Bluet	S4S5	<i>Ladona julia</i> , Chalk-fronted Corporal	S5
<i>Gomphaeschna fuscillata</i> , Harlequin Darner	S2S3	<i>Ischnura posita</i> , Fragile Forktail	S4S5	<i>Leucorhinia intacta</i> , Dot-tailed Whiteface	S5
<i>Gomphus lividus</i> , Ashy Clubtail	S2S3	<i>Aeshna eremita</i> , Lake Darner	S4S5	<i>Libellula incesa</i> , Slaty Skimmer	S5
<i>Somatochlora forcipata</i> , Forcipate Emerald	S2S3	<i>Dromogomphus spinosus</i> , Black-shouldered Spinyleg	S4S5	<i>Libellula luctuosa</i> , Widow Skimmer	S5
<i>Argia apicalis</i> , Blue-fronted Dancer	S3	<i>Gomphus exilis</i> , Lancet Clubtail	S4S5	<i>Libellula pulchella</i> , Twelve-spotted Skimmer	S5
<i>Nehalennia gracilis</i> , Sphagnum Sprite	S3	<i>Ophiogomphus carolus</i> , Rifle Snaketail	S4S5	<i>Libellula quadrimaculata</i> , Four-spotted Skimmer	S5
<i>Argemomphus villosipes</i> , Unicorn Clubtail	S3	<i>Leucorhinia frigida</i> , Frosted Whiteface	S4S5	<i>Pachydiplax longipennis</i> , Blue Dasher	S5
<i>Gomphus adalphus</i> , Mustached Clubtail	S3	<i>Leucorhinia hudsonica</i> , Hudsonian Whiteface	S4S5	<i>Plathemis lydia</i> , Common Whitetail	S5
<i>Gomphus descriptus</i> , Harpoon Clubtail	S3	<i>Leucorhinia proxima</i> , Belted Whiteface	S4S5	<i>Sympetrum internum/janeae</i> , Cherry-faced/Jane's Meadowhawk	S5
<i>Lanthus vernalis</i> , Southern Pygmy Clubtail	S3	<i>Perithemis tenera</i> , Eastern Amberwing	S4S5	<i>Sympetrum obrustum</i> , White-faced Meadowhawk	S5
<i>Ophiogomphus mainensis</i> , Maine Snaketail	S3	<i>Sympetrum semicinctum</i> , Band-winged Meadowhawk	S4S5	<i>Sympetrum vicinum</i> , Autumn Meadowhawk	S5
<i>Dorocordulia lepida</i> , Petite Emerald	S3	<i>Calopteryx aquabilis</i> , River Jewelwing	S5	<i>Ischnura hastata</i> , Citrine Forktail	SA
<i>Neurocordulia yamaskanensis</i> , Stygian Shadowdragon	S3	<i>Calopteryx maculata</i> , Ebony Jewelwing	S5	<i>Coenagrion interrotatum</i> , Subarctic Bluet	SH
<i>Somatochlora elongata</i> , Ski-tailed Emerald	S3	<i>Lestes congener</i> , Spotted Spreadwing	S5	<i>Archilestes grandis</i> , Great Spreadwing	SNA
<i>Nannothemis bella</i> , Elfin Skimmer	S3	<i>Lestes disjunctus</i> , Northern Spreadwing	S5	<i>Enallagma divagans</i> , Turquoise Bluet	SNA
<i>Sympetrum costiferum</i> , Saffron-winged Meadowhawk	S3	<i>Lestes dryas</i> , Emerald Spreadwing	S5	<i>Tachopteryx thoreyi</i> , Grey Petaltail	SR
<i>Ophiogomphus rupinulensis</i> , Rusty Snaketail	S3?	<i>Lestes rectangularis</i> , Slender Spreadwing	S5	<i>Ladona exusta</i> , White Corporal	SR
<i>Lestes unguiculatus</i> , Lyre-tipped Spreadwing	S3S4	<i>Lestes vigilax</i> , Swamp Spreadwing	S5	<i>Aeshna stichensis</i> , Zig-zag Darner	SU
<i>Enallagma annexum</i> , Northern Bluet, (<i>cyathigerum</i>)	S3S4	<i>Amphiurion saucium</i> , Eastern Red Damselfly	S5	<i>Anax longipes</i> , Comet Darner	SU
<i>Aeshna verticalis</i> , Green-striped Darner	S3S4	<i>Argia fumipennis</i> , Variable Dancer	S5	<i>Epiaeschna heros</i> , Swamp Darner	SU
<i>Argemomphus furcifer</i> , Lilypad Clubtail	S3S4	<i>Argia moesta</i> , Powdered Dancer	S5	<i>Libellula semifasciata</i> , Painted Skimmer	SU
<i>Hagenius brevisyllus</i> , Dragonhunter	S3S4	<i>Chironagrion conditum</i> , Aurora Damselfly	S5	<i>Enallagma anna</i> , River Bluet	unranked
<i>Sylvaris scudderii</i> , Zebra Clubtail	S3S4	<i>Enallagma carunculatum</i> , Tule Bluet	S5	<i>Gomphus fraternus</i> , Midland Clubtail	unranked
<i>Sylvaris spiniceps</i> , Arrow Clubtail	S3S4	<i>Enallagma ebrium</i> , Marsh Bluet	S5	<i>Celithemis fasciata</i> , Banded Pennant	unranked
<i>Helocordulia uhleri</i> , Uhler's Sundragon	S3S4	<i>Enallagma exulans</i> , Stream Bluet	S5	<i>Tramea carolina</i> , Carolina Saddlebags	unranked

heros (Swamp Darner). In addition, a corps of entomologists and naturalists from Massachusetts, particularly Fred Morrison and Lynn Harper, have added vital records from the southeastern corner of the Vermont. More recently, Wally Jenkins is adding to the Addison and Chittenden county lists. Josh Lincoln has filled in records in central Vermont, and Laura Gaudette has provided much-needed coverage in the southeastern portion of the state, including the addition of new state records.

Other notable collectors to visit the state and add to its collection of data include Dennis Paulson from Washington, Ginger Brown from Rhode Island and George and Phoebe Harp from Arkansas. In addition, numerous other individuals not mentioned here have contacted us with specimens or photos that have helped in the production of this publication. We appreciate their help as well.

Several collectors mentioned above have, for a variety of reasons, not yet shared their private collection data with us. We hope that their information will someday be added to the data for Vermont. There is also much data yet to be discovered in biomonitoring collections and perhaps other museum collections. However, since there has never been a publication on Vermont Odonata, and given the progress made in recent years, it is time to put the current knowledge in print.

As part of the process of preparing this publication, in 2008, the authors, working with Mark Ferguson of the Vermont Non-game and Natural Heritage Program, used data presented here to assign S-ranks for the Vermont Odonata species. The rankings are included in the individual species accounts and are listed in order of rarity in Table 2.

Vermont Landscape and Biophysical Regions

With a land area of 9,250 square miles (2.4 million hectares), Vermont has been a work in progress for more than 1 billion years. The result is a landscape of mountains (with limited alpine zones), river valleys and lowlands. The Grenville Orogeny, roughly 1.3 billion years ago, is evident in few bedrock formations of the state. Instead the ocean sediments of the Taconic Orogeny 450 million years ago were monumental in the building of present-day Vermont (with the Acadian Orogeny 360 million years ago as a sort of final act).

A defining “moment” for the Vermont landscape, at least to many biologists, was the last glacial advance and retreat. The most recent march of ice, to as far south as Long Island about 24,000 years ago, began the work for much of what is present day Vermont. As the glaciers retreated northward, clearing the northern border roughly 10,000 years ago, they left behind not only mountains and surficial deposits across

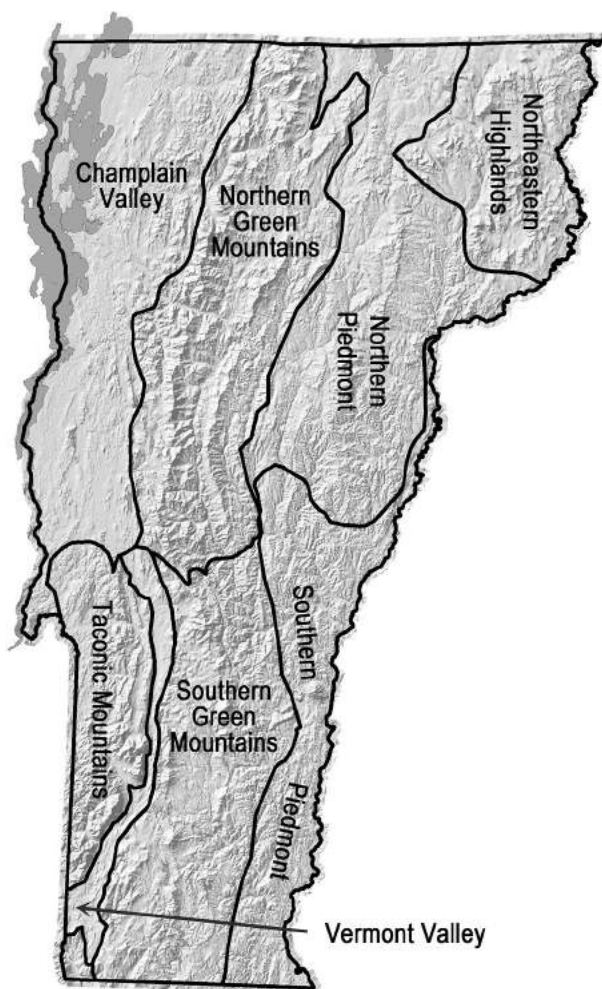


Figure 1. Biophysical regions of Vermont. Species accounts refer to the biophysical regions of Vermont based on Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont (Thompson, 2000).

a varied landscape, but also lakes, rivers and wetlands that have contributed to the state’s odonate diversity.

Vermont claims approximately 80 natural community types across eight biophysical regions, each with fairly distinctive geology, climate, topography and soils (Thompson, 2000) (Figure 1). The regions are generally recognized as the following:

Champlain Valley – With the lowest elevation in the state, the Champlain Valley is comparatively dry and warm. Its dominant features are Lake Champlain, lowland agriculture and wetlands (sedge, *Typhus* sp. and swamps), some of which are manipulated in state Wildlife Management Areas. Numerous species found primarily south and or west of Vermont are limited to the Champlain Valley and or the Taconic Mountains in Vermont. Grand Isle County, located entirely within Lake Champlain, lacks good lotic habitat and is thus missing a suite of species normally found elsewhere in the state.

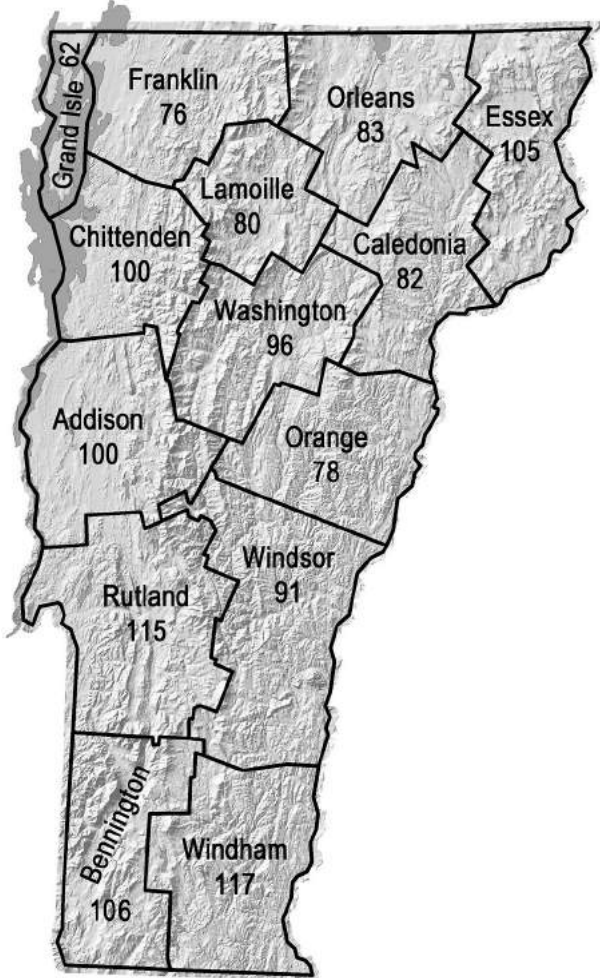


Figure 2. Species richness by county. Species richness is generally influenced by habitat diversity, area, and sampling effort. Grand Isle County, small, with little elevation, and poor in lotic habitats, has the lowest number of species recorded, but the greatest number of species per unit area.

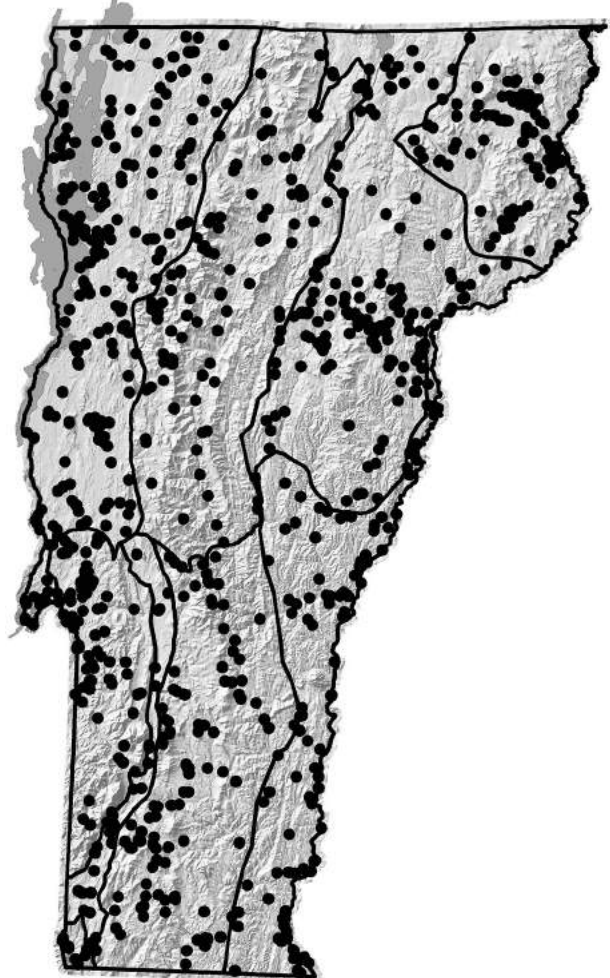


Figure 3: Sampling Sites: Distribution of all sampling sites in Vermont used for the data in this publication. These include sampling sites for larvae as well as adults.

Taconic Mountains – This mountain range in Vermont’s southwestern corner varies from high-elevation spruce and fir woodlands to oak and hickory forests (atypical for Vermont) at lower altitudes. It remains somewhat unexplored for odonates.

Vermont Valley – The narrow valley between the Taconic Mountains to the west and the Green Mountains to the east is a compact mixture of wetlands, rivers and agricultural lands. Originating in the valley’s mid-section is Vermont’s longest river, Otter Creek, which flows north to Lake Champlain. That river, however, is of low gradient and not yet particularly well-studied for odonates.

Southern Green Mountains – Running the length of the state, the Green Mountains, a section of the Appalachian chain, are characterized by dense forest cover, high-gradient rivers, peatlands and ponds. They are dissected into two distinct biophysical regions. The Southern Green Mountains,

sometimes called the Green Mountain Plateau, offer greater wetland diversity than the Northern Green Mountains. Despite presence of some peatlands, this portion of the Green Mountains is not particularly known for an abundance of boreal odonates.

Northern Green Mountains – This region includes Vermont’s tallest and most recognizable peaks. Its wetland diversity is notably lower than the Southern Green Mountains. Peatlands and ponds are scattered and less common than in the Southern Green Mountains. Noteworthy Vermont odonates are scarce at this region’s elevations, which generally run from roughly 2000 to 3000 feet above sea level, occasionally higher, with *Somatochlora albicincta* (Ringed Emerald) being among a few exceptions. High-gradient streams in this region do not offer wide odonate diversity. But the region is horizontally dissected by two major river valleys, the Winooski and the Lamoille. The two rivers, somewhat oddly, fall short in hosting the rare odonates found on the Connecticut River.

Southern Piedmont – In Vermont, piedmont comprises the eastern slopes of the Green Mountains and certain lower elevations. This region is for the most part hilly deciduous woods dissected by rivers and streams and dotted with lakes and ponds and very few peatlands. The warmest, lowest portion of this region, at its eastern edge, is the Connecticut River Valley. Through the quirks of political boundaries, the Connecticut River is considered New Hampshire. Thus, odonates seen flying over the river or emerging on bridge abutments mid-river are not technically in Vermont. Several large river odonate species are found along the river only where it marks the southeast edge of Vermont. This region also includes the White River; its fairly high *Ophiogomphus* diversity and abundance suggests promise for additional species with more investigation.

Northern Piedmont – A larger land area than its southern counterpart, this region offers greater wetland and river diversity yet contains only a small portion of the Connecticut River Valley. The abundance of lotic and lentic sites makes this region accessible, reliable and diverse for many Vermont odonate species and those with a generally northern continental distribution.

Northeastern Highlands – With lower temperatures, huge basins with granitic bedrock and comparatively northern latitude, this corner of the state lies at the southern extension of the boreal forest zone. Accordingly, it is rich in boreal odonate species and has a history of vigorous exploration by odonatists. The region is also known in Vermont as the Northeast Kingdom. Much of Vermont's *Somatochlora* diversity is concentrated in this region.

Data coverage

Vermont has not had an organized dragonfly survey. Thus, the range of sampling in Vermont, both spatially and seasonally, is far from satisfactory. In spite of this, the efforts of relatively few individuals have resulted in sufficient data to warrant publication at this time. With the exception of Grand Isle County (at 62 species), we have documented at least 76 species in each of Vermont's other 13 counties (Figure 2). It is particularly important to document species distributions that may be changing as a result of climate change. For example, of the 31 species added to the state list since the year 2000, Vermont lies on the southern edge of five, none of which is common or shows signs of expansion. However, Vermont lies at the northern edge of 16 of these new species, and 10 show signs of expansion, many becoming quite common. It is hoped that this publication will serve as a means of focusing future efforts and perhaps be the impetus for a statewide survey in the future. Figure 3 shows the distribution of sampling sites throughout the history of dragonfly records for the state. While this distribution is impressive for

a state with no organized survey, some of these sites represent one-time sampling events and thus miss the potential for species found at other times of the season. In addition, some sites represent sampling done for larvae at times when adults were not flying. As is typical, greater sampling efforts have occurred near some populated areas, near the home regions of odonate aficionados and in regions of biological interest (such as peatlands of the Northeast Kingdom). The Southern Piedmont region is particularly under-surveyed. In addition, early and late flight season records may be sparse as a result of field seasons typical of academics.

In most cases where a river serves as the border between two states, the center of the river is the official boundary. Not so with Vermont and New Hampshire. New Hampshire lays political claim to essentially the entire Connecticut River. Officially, only odonate larvae emerging on the Vermont shore or adults flying over land on the Vermont side are "found in Vermont." Of course the biological reality would include these river species as being part of the Vermont fauna. We have chosen to include records from the Connecticut River between the states on our distribution maps and discussions of species distributions, but not to include these records on the official Vermont list or on county lists. Given current political trends, we are considering a redistricting bill to help improve our numbers.

Species Accounts

Each account begins with a short description of the species' distribution and preferred habitat, based on published data and in large part the authors' own field investigations. Many accounts include some additional detail on the particular species—a suggested reliable site, for example, or a behavioral characteristic—that might aid an observer in the field. Finally, each account includes the species' global, national and state-level conservation status as well as a flight period for Vermont based on the earliest and latest recorded flight dates. We also use presence of exuviae as an indicator of flight season for some species. In a few cases, flight season data is limited to a single date or is indicated as "no information" if only larval records exist or if the record lacks a collection date.

Appendix 1 is a summary of flight season data. The table in Appendix 2 presents altitudinal distribution of each species. Finally, in Appendix 3, distribution maps, which outline biophysical region boundaries, show locations where each species has been reliably reported. Each dot essentially represents one site where the species was encountered. The maps are based on our own aggregated dataset of nearly 7,000 records spanning the period from 1891 to 2015. A searchable database designed with Microsoft Access 2003 was interfaced with ArcGIS 9.2 to organize the data and produce the

maps. Our nomenclature generally follows A Checklist of North American Odonata (Paulson & Dunkle, 2011) and the NatureServe data source (NatureServe, 2011).

Suborder Zygoptera (Damselflies)

Family Calopterygidae (Jewelwings)

Calopteryx aequabilis Say 1839 — River Jewelwing

Relatively widely distributed in low- to mid-elevation streams and rivers around the state. Usually found in slower reaches where substrate is sandy to mucky and shoreline plants offer perching spots. Can be fairly common on some rivers, particularly where they empty into Lake Champlain or the Connecticut River. The lower Poultney River is one of the best sites in the state to find this insect.

Status: G5 N5 S5

Vermont Flight Season: 28 May – 18 August

Calopteryx amata Hagen 1889 — Superb Jewelwing

An impressive damselfly of mid-level streams. Primarily associated with the Green Mountains, the Taconic Mountains and the Northeastern Highlands. Among the *Calopteryx*, this species is a bit harder to find due to its more selective habitat and lower numbers where it does occur. Look for flashes of green and amber along the shore of cool streams near riffles or on strategic perches not far upstream or downstream of such sites.

Status: G4 N4 S4

Vermont Flight Season: 5 June – 10 August

Calopteryx maculata (Beauvois 1805) — Ebony Jewelwing

Widely distributed across the state, from small, high elevation streams to larger, slower flowing river mouths. Found at a wide variety of elevations and flow rates, this damselfly is probably one of the best known among casual naturalists due to its distinctive, eye-catching appearance and common occurrence near sites where people frequent. Males often perch in good numbers on streamside vegetation and exhibit flashy courtship displays. This has the longest recorded flight season of any of our Calopterygidae.

Status: G5 N5 S5

Vermont Flight Season: 25 May – 19 September

Hetaerina americana (Fabricius 1798) — American Rubyspot

Known only from Lewis Creek, the lower LaPlatte river, and Little Otter Creek on Lake Champlain side of Vermont, and the West River flowing on the Eastern side. Two anomalous specimens in the University of Vermont collection are

labeled from Grand Isle, but a lack of suitable habitat there raises questions about the legitimacy of the labels. Prefers low-elevation rivers with emerged rocks and a richly vegetated shoreline, both for perching sites. In New England, this species is one of our latest emerging damselflies and is possibly more widespread yet undiscovered owing to its late flight season. The known population on Lewis Creek inhabits a portion of the river treated with lampricide.

Status: G5 N5 S2S3

Vermont Flight Season: 23 August – 5 October

Family Lestidae (Spreadwings)

Archilestes grandis (Rambur 1842) — Great Spreadwing

Known from a single anomalous record from Peacham by Frank Carle. No date is associated with the record (although Carle has a record of another species from the same site dated 22 Jun 1983, which may or may not correspond to the *A. grandis* site visit). The specimen was unavailable for this publication. This appears to have been a vagrant associated with other eastern records of *Archilestes* that same year.

Status: G5 N5 SNA

Vermont Flight Season: Insufficient data

Lestes congener Hagen 1861 — Spotted Spreadwing

Widely distributed at lower to mid-elevations. Particularly common in marshes, ponds, and lake edges with reeds. This is a late-season species most abundant in August and September and is often the last *Lestes* flying in the year.

Status: G5 N5 S5

Vermont Flight Season: 12 July – 2 November

Lestes disjunctus Selys 1862 — Northern Spreadwing

The most widespread and common *Lestes* species in Vermont. Found in a variety of lake, pond and wetland habitats and elevations. Though the flight season is only slightly earlier than *Lestes congener*, the peak abundance is significantly earlier, primarily in July and August.

Status: G5 N5 S5

Vermont Flight Season: 29 June – 5 October

Lestes dryas Kirby 1890 — Emerald Spreadwing

Widely distributed in Vermont, but not quite as common as *L. congener* or *L. disjunctus*. Found in the same low to mid-elevation range as *L. congener*, but at the opposite end of the season with peak abundance in late June and early July. Habitats include a variety of wetlands, but it is more apt to be found in nearby fields and other openings, even along woodland trails or roads, than some of the other *Lestes*.

Stokes and McPeck (2006) note that this species is typical of vernal ponds where it encounters neither dragonfly larvae or fish as predators.

Status: G5 N5 S5

Vermont Flight Season: 11 June – 23 August

Lestes eurinus Say 1839 — Amber-winged Spreadwing

Widely distributed in Vermont but more scarce in occurrence than most of our spreadwings. Appears to be primarily, though not exclusively, associated with bog and other acidic wetlands as well as ponds with a boggy shoreline. Stokes and McPeck (2006) note this species as the only *Lestes* adapted to fishless, permanent water habitats. On average, found at higher elevations sites than other *Lestes*. Our earliest-appearing spreadwing, though its flight abundance roughly corresponds to that of *L. inaequalis*.

Status: G4 N4 S4

Vermont Flight Season: 29 May – 12 August

Lestes forcipatus Rambur 1842 — Sweetflag Spreadwing

Relatively widely distributed in Vermont, but not as predictable in occurrence as *L. disjunctus*. Found in a variety of wetland, pond and lake habitats; flight season similar to that of *L. disjunctus*. It should be noted that difficulties in separating *L. disjunctus* and *L. forcipatus* may have resulted in confusion in the data, particularly from older records.

Status: G5 N5 S4S5

Vermont Flight Season: 24 June – 27 September

Lestes inaequalis Walsh 1862 — Elegant Spreadwing

Widely scattered in Vermont. Most likely found associated with ponds and lake edges, though marshes with some open water are also possible sites. Unlike most *Lestes*, this species is found in association with fish (Stokes & McPeck, 2006). It is one of our early-season *Lestes* species with abundance peaking in late June and early July. It is possible that a focus on collecting in river habitats during June has limited our records of this pond- and lake-dwelling spreadwing.

Status: G5 N5 S4S5

Vermont Flight Season: 4 June – 10 August

Lestes rectangularis Say 1839 — Slender Spreadwing

Widely distributed but more likely to be found at low to mid-elevations. Has one of the longest flight seasons of our *Lestes* and is reasonably easy to find throughout the season. Sometimes found in less open, shaded locations near water.

Status: G5 N5 S5

Vermont Flight Season: 16 June – 29 September

Lestes unguiculatus Hagen 1861 — Lyre-tipped Spreadwing

Widely scattered, especially across the western part of the state but does not usually occur in large numbers at any given site. Preferred habitat seems to be small, marshy areas, often along or near rivers within the Champlain Valley and the Vermont Valley. A healthy presence on Grand Isle indicates association with non-riparian wetlands. Though only two records exist for the Connecticut River Valley, it is likely to be more common in that region than the data indicate. A low-elevation species, rarely found above 1,000 ft. Adults may be found in grassy fields away from water.

Status: G5 N5 S3S4

Vermont Flight Season: 11 June – 22 September

Lestes vigilax Hagen in Selys 1862 — Swamp Spreadwing

Widespread in Vermont. Encountered on larger ponds and lakes in association with fish (Stokes & McPeck, 2006). While there is significant overlap with the flight season of *L. inaequalis*, *L. vigilax* tends to become more common in July while the numbers of *L. inaequalis* are declining. It is not uncommon to see *L. vigilax* feeding on smaller damselflies.

Status: G5 N5 S5

Vermont Flight Season: 20 June – 12 September

Family Coenagrionidae (Pond Damsels)

Amphiagrion saucium (Burmeister 1839) — Eastern Red Damsel

Widely scattered over much of Vermont in grassy, open or semi-open sites, usually in association with seeps or fens. Uncommon in the Champlain Valley. Within its habitat, it can be overlooked as it does not readily fly above the level of the graminoid plants.

Status: G5 N5 S5

Vermont Flight Season: 22 May – 27 July

Argia apicalis (Say 1839) — Blue-fronted Dancer

A species more common south of Vermont, it was first recorded in the state in 2002. Early records are from near southern borders, with a more recent record showing presence farther north along the shores of Lake Champlain near Burlington. National distribution maps (OdonataCentral) show Vermont at the northern edge of the species range. All sites are in low-elevation, slow-flowing, silty rivers.

Status: G5 N5 S3

Vermont Flight Season: 8 July – 19 August

Argia fumipennis (Burmeister 1839) — Variable Dancer

All records of this species in Vermont are *A. f. violacea*, the Violet Dancer. Found at mid to low elevations in much

of Vermont where it is often, but not exclusively, in association with flowing water. Occasionally found at ponds. Mountainous areas with higher gradient streams or rivers lack this species. The scarcity of records in the Champlain Valley seems somewhat anomalous and may result from a lack of appropriate survey effort or relatively few streams of the right substrate and gradient.

Status: G5 N5 S5

Vermont Flight Season: 9 June – 2 October

Argia moesta (Hagen 1861) — Powdered Dancer

Common in the Champlain Valley and scattered in the rest of Vermont. Based on New Hampshire data, it is more common along the Connecticut River than records would indicate. As with *A. fumipennis*, often, but not exclusively associated with flowing water and usually found where there are rocks to perch on within the water. All three of our *Argia* species can be found at our lowest elevations. *A. moesta* will be found farther upstream than *A. apicalis*, but not as far as *A. fumipennis*.

Status: G5 N5 S5

Vermont Flight Season: 30 May – 20 September

Chromagrion conditum (Selys 1876) — Aurora Damsel

Found in most of Vermont with the exception of the Champlain Valley. While it does occur at lower elevations in the right habitat, the average elevation of sites in Vermont is about 1250 feet. Mostly associated with boggy, seepy areas and can be more common back in the undergrowth rather than at water's edge. Also found at lakes or ponds, generally with clear, cool water. *C. conditum* is one of our earlier species with all records of tenerals being found in May.

Status: G5 N5 S5

Vermont Flight Season: 6 May – 8 August

Coenagrion interrogatum (Hagen in Selys 1876) — Subarctic Bluet

Vermont's first evidence of this species came from a single specimen taken in the vicinity of Dennis Pond by Hal White on 6 July 1975. Additional recent investigations at the Dennis Pond site, and a nearby bog, produced no evidence of the species. On 25 June 2006, while conducting a survey for the Vermont Breeding Bird Atlas, an observer encountered and photographed one male *C. interrogatum* at Lost Pond Bog on Mt. Tabor. One subsequent visit to Lost Pond Bog in 2007 (Pfeiffer and Blust) produced no evidence of the species. At the southern edge of its range, this damselfly almost certainly warrants further investigation in Vermont.

Status: G5 N5 SH

Vermont Flight Season: 25 June – 6 July

Coenagrion resolutum (Hagen in Selys 1876) — Taiga Bluet

Concentrated in the northern two-thirds of the state. Equally likely to be found at most elevations, but prefers open boggy, grassy or marshy habitats. Also found at ponds, especially those with grassy edges. The fairly concentrated spring flight season generally ends in mid-July, though a couple of mid-August records exist.

Status: G5 N5 S4S5

Vermont Flight Season: 19 May – 8 August

Enallagma anna (Williamson 1900) — River Bluet

Our most recent addition to the state list. One individual found in suitable habitat in August 2014 documents the continued eastward expansion of this species by providing the first record for New England. It is not yet known whether this was a lone individual or part of an established population.

Status: G5 N5 SU

Vermont Flight Season: Insufficient data (11 August)

Enallagma annexum (Hagen 1861) — Northern Bluet

Recently separated from its European counterpart *E. cyathigerum*. Prior to that, *E. vernale* was described in 1945, but gradation between *E. annexum* and *E. vernale* make separating these two species difficult in the field. Efforts have been taken to separate records of these two species in the state, but historic records without vouchers are problematic. Some of these records were not used in generating our data. Stoks and McPeck (2006) note that *E. annexum* is associated with fishless waters while *E. vernale* is found where fish predation exists. This may correlate with elevational data that tends to favor *E. annexum* at higher elevations and *E. vernale* at lower elevations. More careful observation and data on these two species is warranted.

Status: G5 N5 S3S4

Vermont Flight Season: 24 May – 17 July

Enallagma antennatum (Say 1839) — Rainbow Bluet

At the eastern edge of its US range, this species is sparsely scattered in Vermont, occurring at eight sites, including lakes, ponds or slow-moving rivers. All sites are in relatively low-elevation valleys. A new site for *E. antennatum* within the city of Montpelier (2008) suggests that this species may be more common than currently known. According to national distribution maps (OdonataCentral), the Connecticut River is the easternmost range for the species in the US (although it is found slightly farther east in Canada).

Status: G5 N5 S2S3

Vermont Flight Season: 31 May – 14 August

Enallagma aspersum (Hagen 1861) — Azure Bluet

Another species associated with fishless bodies of water. As with *E. annexum*, this seems to limit its occurrence in the Champlain Valley. It is, however, widely distributed elsewhere in Vermont where bogs, quarry ponds, and other commonly fishless habitats occur. Found up to 2,700 ft in elevation, and seems to be a mid-season damselfly.

Status: G5 N5 S4

Vermont Flight Season: 29 May – 8 September

Enallagma boreale Selys 1875 — Boreal Bluet

A springtime species found through much of the state, though less common in low open land. Ponds and bogs are the preferred habitat, and it can be fairly numerous where it does occur. Due to its adaptations to fishless ponds, its distribution in the state somewhat follows that of *E. annexum*.

Status: G5 N5 S4S5

Vermont Flight Season: 11 May – 17 July

Enallagma carunculatum Morse 1895 — Tule Bluet

True to its name, associated with reedy lake margins and marshes. In season, probably the most common *Enallagma* along much of Lake Champlain. Scattered records occur in the rest of the state, including some presence along the Connecticut River. Not found much above 1,500 ft. Although some individuals appear in June, this is primarily a mid- to late season species in terms of overall abundance.

Status: G5 N5 S5

Vermont Flight Season: 18 June – 6 October

Enallagma civile (Hagen 1861) — Familiar Bluet

Another species that does well in the Champlain Valley, particularly close to the lake itself. Surprisingly, this bluet was not found in Vermont until 1993, perhaps owing to a lack of investigators. Or perhaps this species may be showing recent movement into the state from the west or southwest. Fall semester entomology classes in Burlington (on Lake Champlain) are responsible for all records from 1993 to 2000 after which it started being found elsewhere in the state. This species can occur in significant numbers in marshy ponds.

Status: G5 N5 S4S5

Vermont Flight Season: 25 June – 11 October

Enallagma divagans Selys 1876 — Turquoise Bluet

Status in Vermont is unclear. Two larvae collected in the Poultney River were identified as this species, but adults have never been found at the site. It is included in this publication to increase awareness of the possibility and therefore improve the odds of finding more conclusive evidence of its presence in the state.

Status: G5 N5 SU?

Vermont Flight Season: No adult records

Enallagma durum (Hagen 1861) — Big Bluet

A recent addition to the Vermont Zygoptera species list, from an encounter on 14 July 2007. On 4 September 2014, a second location was found farther north along Lake Champlain at the mouth of the LaPlatte River. It is also expected to occur on the Connecticut River due to records in nearby Massachusetts and New Hampshire. Preferring brackish or slow-moving fresh water, *E. durum* appears to be expanding its range north and should be looked for in slow rivers, lakes or ponds in the Champlain Valley and Connecticut River Valleys.

Status: G5 N5 S1

Vermont Flight Season: 14 July – 4 September

Enallagma ebrium (Hagen 1861) — Marsh Bluet

One of the widest and most evenly distributed *Enallagma* in Vermont. Occurs in a variety of marshy, pond and slow river habitats. Easily confused in the field with *E. hageni*, with which it shares similar habitats. However, *E. ebrium* is more common in the Champlain Valley and close to the Connecticut River than *E. hageni*. McPeck (1989) found *E. ebrium* more likely to inhabit water bodies subject to winter fish kills than *E. hageni*.

Status: G5 N5 S5

Vermont Flight Season: 29 May – 27 August

Enallagma exsulans (Hagen 1861) — Stream Bluet

Limited primarily to rivers and some ponds near the east and west borders of Vermont. Can be found along Lake Champlain, in the Champlain Valley, rivers leading into the lake and occasional ponds, especially those formed from dammed rivers. Likewise, found along the eastern edge of the state in the Connecticut River and its tributaries. Often plentiful and obvious. Though a few hardy individuals hang on late into the season, it peaks primarily from the last half of June through July.

Status: G5 N5 S5

Vermont Flight Season: 9 June – 7 September

Enallagma geminatum Kellicott 1895 — Skimming Bluet

Another species found primarily in ponds at lower elevations across much of the state. However, it does occur at higher elevations in some lakes or ponds, particularly at several sites in the Northern and Southern Piedmont regions and only one known site in the flat areas of the Southern Green Mountains. It is also occasionally found on backwaters of large, slow rivers.

Status: G5 N5 S5

Vermont Flight Season: 16 June – 15 September

Enallagma hageni (Walsh 1863) — Hagen's Bluet

Widespread and common, the exception being the low flat areas of the Champlain Valley where its occurrence is sporadic. Also appears to have a diminished presence in the southern piedmont, though this area is less heavily surveyed. May be found at the same locations as its look-alike, *E. ebrium*, but in many cases one or the other either dominates the site or has an exclusive presence. McPeck (1989) has found that *E. hageni* is more likely in fish-inhabited lakes not subject to winter fish kills.

Status: G5 N5 S5

Vermont Flight Season: 4 June – 14 August

Enallagma laterale Morse 1895 — New England Bluet

A coastal plain species found at only one site, Lily Pond, in extreme southeastern Vermont. Appears to have a stable population, but has not been found in large numbers. Observed in two different years at the site, but both were on 21 June, hence our limited knowledge of its flight season in Vermont.

Status: G3G4 N3N4 S1

Vermont Flight Season: Insufficient data (21 June)

Enallagma signatum (Hagen 1861) — Orange Bluet

Best location is Lake Champlain. Can also be found at reservoirs, backwaters of the Connecticut River and medium- and large-sized ponds, particularly at lower elevations. Seems to have an extended emergence with teneral being found easily throughout much of its flight season.

Status: G5 N5 S5

Vermont Flight Season: 9 June – 2 September

Enallagma traviatum Selys 1876 — Slender Bluet

First found in Vermont in 2001 along the lower Poultney River where it begins to broaden into Lake Champlain. Since then has been found in the southeastern corner of the state along the Connecticut River and at Half Moon Pond in Hubbardton. This is another southern species that may be expanding into our region, as the Poultney River and Half Moon sites are among the most northern in New England for this species.

Status: G5 N5 S1S2

Vermont Flight Season: 9 July – 31 August

Enallagma vernale Gloyd 1943 — Vernal Bluet

See *E. annexum* for a discussion of this species.

Status: G5 N4 S5

Vermont Flight Season: 16 May – 17 July

Enallagma vesperum Calvert 1919 — Vesper Bluet

Widely scattered in lakes and ponds with lilies across Vermont. While it has been found in nearly every biophysical region, including along the Connecticut River, it is less common at higher elevations. The scattered nature of the records may well reflect the relative inactivity of this species during the part of the day when odonatists are most active.

Status: G4 N5 S4

Vermont Flight Season: 16 June – 17 September

Ischnura hastata (Say 1839) — Citrine Forktail

Has an odd history in the state with no convincing records until 2004, when a single individual was found along the edge of a small pond in southeastern Vermont. Within a week, the species was found at a location in southwestern Vermont and in the Champlain Islands, but has not been found since. This probably indicates a species that may be dispersed into Vermont under certain weather conditions but does not breed here. It is possible that dispersing individuals may establish residential populations in the future.

Status: G5 N5 SNA

Vermont Flight Season: 5–11 August

Ischnura kellicotti Williamson 1898 — Lilypad Forktail

First found in Vermont in 2002 at Lake St. Catherine. It has since been found at two sites in the southern piedmont and additional sites within 15 miles of Lake St. Catherine. Status at Lake St. Catherine seems secure as it has been found in the shallower subsections at both ends of the lake and is reliable in the proper season. All known sites have lilypads.

Status: G5 N5 S1S2

Vermont Flight Season: 12 June – 1 August

Ischnura posita (Hagen 1861) — Fragile Forktail

Widespread and common in Vermont, but less frequently encountered than *I. verticalis*. May be somewhat underreported due to its tendency to stay low within the vegetation. Found in a wide range of habitats, often vegetated pond edges and river edges. Somewhat more likely at lower elevations, but can be found in mountainous areas as well.

Status: G5 N5 S4S5

Vermont Flight Season: 15 May – 16 September

Ischnura verticalis (Say 1839) — Eastern Forktail

The most ubiquitous species of Odonata in Vermont. Found in almost every habitat and throughout the flight season, though a few species do outlast it into late fall. Individuals at river sites probably disperse from nearby lentic waters or come from backwater areas of tributaries. Young females can be found almost any time of the year, indicating a lack of

distinct generations within a season or an overlap of multiple generations. Occasional andromorphic females are encountered as well as males with broken thoracic stripes resembling *I. posita*.

Status: G5 N5 S5

Vermont Flight Season: 29 April – 20 October

Nehalennia gracilis Morse 1895 — Sphagnum Sprite

True to its common name, it is limited primarily to classic bog habitats, though it is not reliably found at all bogs. Due to the distribution of its preferred habitat, it is most likely to be found in the Green Mountains, Northeastern Highlands or Northern Piedmont.

Status: G5 N5 S3

Vermont Flight Season: 30 May – 13 August

Nehalennia irene (Hagen 1861) — Sedge Sprite

Fairly widespread and often common to abundant where it occurs. Found primarily in marshes, ponds, fens and bogs. It was the only damselfly encountered during the two known site visits (in late June and early July) to Lake of the Clouds below the summit of Mt. Mansfield, the highest elevation body of water in the state at 3930 ft.

Status: G5 N5 S5

Vermont Flight Season: 27 May – 27 August

Suborder Anisoptera (Dragonflies)

Family Petaluridae (Petal tails)

Tachopteryx thoreyi (Hagen in Selys 1857) — Gray Petaltail

Often an obvious dragonfly at its woodland seep breeding sites, evidence in Vermont comes from a single sight record by a credible odonatologist, Frank Carle, in suitable habitat at Grout Pond in the state's Southern Green Mountains on 15 July 1995. One other report from Groton State Forest during the 1970s lacks substantiation. Vermont would be at the northern edge of this species' range. Lacking incontrovertible evidence, the status of the East's only Petaluridae remains unknown in Vermont.

Status: G4 N4 SU

Vermont Flight Season: Insufficient data (15 July)

Family Aeshnidae (Darners)

Aeshna canadensis Walker 1908 — Canada Darner

One of Vermont's most widely distributed *Aeshna* species, with the Southern Piedmont having the fewest records (per-

haps owing to relatively little survey work in that region and a shortage of habitat). Common to fairly common at ponds, marshes, bogs and fens. One reliable way to net this species is to wait at water's edge for a male to pass by on one of its routine shoreline patrols for females.

Status: G5 N5 S5

Vermont Flight Season: 5 June – 20 October

Aeshna clepsydra Say 1839 — Mottled Darner

Among the state's rarest *Aeshna* species. Known from four sites: Lily Pond and Sadawga Lake in Windham County, Wells in Rutland County (probably Lake St. Catharine) and Winona Lake in Addison County. Like most other *Aeshna*, prefers marshes and ponds with emergent vegetation. Pond Lily is typical at its sites. Shows some affinity for lakes with fringing bogs. Our only *Aeshna* species with a "mottled" — rather than striped — thoracic pattern.

Status: G4 N4 S2S3

Vermont Flight Season: 22 July – 25 September

Aeshna constricta Say 1839 — Lance-tipped Darner

Can be a locally abundant in the Champlain Valley. Found in a mix of habitats: marshes, bogs, ponds and occasionally slow rivers with emergent vegetation. Seems to be the dominant member of its genus in the Champlain Valley, with sizeable swarms found near Lake Champlain. Appears to forage more often than its congeners in overgrown fields (sometimes falling prey to spiders in the genus *Argiope*).

Status: G5 N5 S5

Vermont Flight Season: 8 July – 3 October

Aeshna eremita Scudder 1866 — Lake Darner

Scattered at mid- and upper elevation lakes and ponds. Most records from the Green Mountains and Northern Piedmont. The mean elevation is approximately 1840 feet, with no specimens collected below 400 feet. Yet to be found in the Champlain Valley or Connecticut Valley. Walker (1912) notes *A. eremita* as abundant in northern Canada, becoming more local in the transition zones to the south. Vermont is at the southern edge of its range. Abundance at a given site can vary widely. Huge numbers of exuviae and adults observed at Lewis Pond in Northeastern Highlands, but also found in low numbers at sites among other *Aeshna* species.

Status: G5 N5 S5

Vermont Flight Season: 3 July – 20 September

Aeshna interrupta Walker 1908 — Variable Darner

Although its distribution is somewhat difficult to interpret, this darner's stronghold seems to be the Northeastern Highlands, the Green Mountains and the Northern Piedmont, where bog habitats are most common in Vermont. Oddly

well represented in the southwestern portion of the state and characteristically absent from the Champlain Valley. Tends to be uncommon at its preferred bog and occasional pond sites.

Status: G5 N5 S5

Vermont Flight Season: 9 July – 1 October

Aeshna sitchensis Hagen 1861 — Zigzag Darner

Known in Vermont from a lone specimen collected in the year 2000 (date unavailable) by a respected biologist, Don Miller, at a bog-fen complex in the town of Ferdinand in the Northeastern Highlands. As a result, it is unknown whether this species has a breeding population in Vermont.

Status: G5 N3 SU

Vermont Flight Season: Insufficient data

Aeshna subarctica Walker 1908 — Subarctic Darner

Near the southern end of its range in Vermont. Known from only two records: one at a spruce bog in the Northeast Highlands (2003) and the other from a grassy opening at 2700 feet in elevation at the top of a ski lift in the Green Mountains (2004). No peatland associated with this latter record has been identified. Additional investigation may yet reveal more sites for *A. subarctica* in Vermont. True to the nature of this species (T. Donnelly, pers. comm.), individuals encountered at the bog site seemed to prefer areas with saturated *Sphagnum* moss.

Status: G5 N2 S1

Vermont Flight Season: 10–27 September

Aeshna tuberculifera Walker 1908 — Black-tipped Darner

Scattered is the best way to describe its distribution. Seems to prefer bogs, swamps and ponds and is occasionally the most abundant species among *Aeshna* swarms. True to its common name, it does indeed have an all-black tenth abdominal segment; yet its scientific name refers to the ventral tubercle on each of the male's cerci.

Status: G4 N4 S4

Vermont Flight Season: 3 July – 9 October

Aeshna umbrosa Walker 1908 — Shadow Darner

A fairly wide distribution, found at bogs, ponds and in nearby openings. Can be abundant at certain sites and does indeed fly in shadows more than its congeners, sometimes in sizeable swarms. With its long flight period, an *Aeshna* netted in late fall is most likely to be this species. Among the *Aeshna* this seems the most likely to find its way indoors.

Status: G5 N5 S5

Vermont Flight Season: 11 June – 27 October

Aeshna verticalis Hagen 1861 — Green-striped Darner

A bit of a state odonate mystery. Sporadic and uncommon in Vermont yet fairly common elsewhere across its range. Normally prefers peatlands, ponds and wet meadows. But the paucity of Vermont records makes it difficult to draw conclusions about its distribution and abundance in the state. Numbers seem quite variable from year to year.

Status: G5 N5 S3S4

Vermont Flight Season: 15 July – 18 September

Anax junius (Drury 1770) — Common Green Darner

Vermont's most widespread Aeshnidae species inhabits lakes and ponds at all elevations, perhaps less frequently at upper elevations. Owing to its itinerant and migratory nature, this large darner can appear in other habitats as well. Despite its widespread distribution, it can be uncommon at many breeding sites. Adults appearing in April, when many ponds and wetlands remain frozen in Vermont, are almost certainly northbound migrants. In the fall, southbound migrants are seen at hawkwatch sites and occasionally snatched and consumed by migrating American Kestrels (*Falco sparverius*).

Status: G5 N5 S5

Vermont Flight Season: 19 April – 3 November

Anax longipes Hagen 1861 — Comet Darner

Vermont would appear out of the range of this swift and impressive dragonfly. Yet a single larva was collected from a farm pond near Norwich, Vermont, on 5 September 1999 and reared to adult by a skilled and credible biologist, Mark McPeck. The specimen was not preserved. Our only adult record is from a female that was photographed in Burlington in August of 2015. It remains unknown whether a viable population exists in Vermont. Known to establish temporary populations at the periphery of its range.

Status: G5 N5 SU

Vermont Flight Season: 4 August

Basiaeschna janata (Say 1839) — Springtime Darner

Scattered distribution at lake and slow stream sites across the state and somewhat less likely to be found in the Champlain Valley and upper elevations of the Green Mountains. Rarely appears at any site in high numbers and is sometimes found patrolling roads or other openings away from natal sites. Owing to its early flight period, *B. janata* is the most likely candidate when a small, bluish aeshnid drifts by in May or early June.

Status: G5 N5 S5

Vermont Flight Season: 11 May – 17 July

Boyeria grafiana Williamson 1907 — Ocellated Darner

Fairly well distributed on rivers across the state. Typically prefers swift currents and rocky streams through forests. Less common than its congener in Vermont, it nevertheless flies in most biophysical regions. Lack of records from the Northern Green Mountains may be due to sampling bias. The best way to find and catch this species is to stand at stream edges and wait for an inquisitive, darting, brownish darner which may be a female considering your leg as an ovipositioning site.

Status: G4 N4 S4

Vermont Flight Season: 12 July – 24 September

Boyeria vinosa Say 1839 — Fawn Darner

More common than its congener, well distributed on rivers with more moderate flow and perhaps on certain lakes as well. Flies in most biophysical regions. Though no Vermont records exist along the Connecticut River in southern Vermont, low numbers of exuviae have been found along much of the New Hampshire side of the river (Hunt et al., 2010). Like its congener, the best way to find and catch this species is to stand at stream edges and wait for one to fly by.

Status: G5 N5 S5

Vermont Flight Season: 4 July – 11 October

Epiaeschna heros (Fabricius 1798) — Swamp Darner

Vermont's largest dragonfly has among the most limited range in the state of any member of its family. Its "range" is difficult to determine because it is known from only a handful of confirmed records. Grand Isle has a few encounters, but until recently, the only other record in the state consisted of two individuals patrolling in the front yard of one of this paper's authors. With peatlands and rivers attracting much attention among odonatists in Vermont, this species may turn up at swamp or other wetland sites with additional investigation.

Status: G5 N5 SU

Vermont Flight Season: 7 June – 17 August

Gomphaeschna furcillata (Say 1839) — Harlequin Darner

Appears scattered in primarily peatland sites across the state. Encounters are often only one or two individuals per site. Most occurrences are in the Nulhegan Basin in Vermont's Northeastern Highlands, with a pocket of reports from Rutland County. Although encounters away from bogs are few, Vermont data suggests it may occur in hardwood swamps and fens as well.

Status: G5 N5 S2S3

Vermont Flight Season: 23 May – 5 July

Nasiaeschna pentacantha (Rambler 1842) — Cyrano Darner

One site from southwestern Vermont, Lily Pond, constitutes the only known occurrence in the state, including a female ovipositing on 21 June 2005. Prefers lakes, ponds and slow streams. Warrants further investigation in southern Vermont.

Status: G5 N5 SU

Vermont Flight Season: Insufficient data (21 June)

Rhionaeschna mutata (Hagen 1861) — Spatterdock Darner

First found in Vermont in June of 2005, it is now known from four sites in the state. These records, which include one confirmed breeding from southeastern Vermont, are at the northeastern edge of the species' range. All records are from June. *Nuphar variegatum* (Yellow Water Lily) is typically associated with this species. Other Vermont ponds with *N. variegatum* warrant investigation.

Status: G4 N4 S1

Vermont Flight Season: 4 – 25 June

Family Gomphidae (Clubtails)***Arigomphus furcifer*** (Hagen in Selys 1878) — Lilypad Clubtail

Widely scattered in Vermont with most records coming from the Taconic Mountains and the Piedmont region. Since rarely found in quantity, is possibly overlooked when present. Also appears to have a fairly compact flight season. Unlike many other gomphids, usually found on ponds and lakes rather than in association with rivers.

Status: G5 N5 S3S4

Vermont Flight Season: 29 May – 17 July

Arigomphus villosipes (Selys 1854) — Unicorn Clubtail

Limited to the southwestern portion of Vermont: the Taconic Mountains, Vermont Valley and nearby Green Mountains. Vermont lies toward the northern end of its range. Recorded flight season and habitat almost identical to that of its Vermont congener. Appears more likely to be found in association with slow-flowing portions of rivers than *A. furcifer*.

Status: G5 N5 S3

Vermont Flight Season: 8 June – 15 July

Dromogomphus spinosus Selys 1854 — Black-shouldered Spinyleg

Large, fairly obvious and among the more cosmopolitan Gomphidae species in Vermont. Fairly broad distribution probably correlates to ability to breed in varied habitat—mostly larger streams and slow rivers as well as lakes with rocky shorelines. The Connecticut River (Hunt et al.) and

Poultney River basin seems to be strongholds for this species, our only member of this sparse genus in Vermont. Can be found perched on lakeside vegetation and riverside boulders or tenaciously patrolling a small section of territory along a river.

Status: G5 N5 S4S5

Vermont Flight Season: 13 June – 16 September

Gomphus abbreviatus Hagen in Selys 1878 — Spine-crowned Clubtail

Small and stocky, known from only a few sites in western Rutland County (Poultney and Hubbardton rivers) and one site on the Connecticut River below Vernon Dam. With limited data, and variability in each known site, habitat preferences in Vermont would be difficult without additional encounters. Can be locally common, with collection of exuviae during early stages (late May) of its flight period the most reliable survey method. One speculation: although egg-laying appears to be in riffle areas, larvae may drift downstream into silty areas for emergence.

Status: G3G4 N3N4 S1S2

Vermont Flight Season: 21 May – 4 July

Gomphus adelphus Selys 1858 — Mustached Clubtail

One of Vermont's two members in the subgenus *Hylogomphus*. Far less common and widespread than most members of the genus, it has a scattered and somewhat unpredictable distribution on rivers of varying sizes. Nevertheless, new sites for this species seem to be gradually turning up, so gaps in its distribution may begin to close. Sites range from rocky, swiftly flowing rivers to small pond outlets. May also breed along rocky shores of Lake Champlain.

Status: G4 N4 S3

Vermont Flight Season: 27 May – 15 July

Gomphus borealis Needham 1901 — Beaverpond Clubtail

Uncommon to our south, widely distributed across most biophysical regions in Vermont, but with few records from the Champlain Valley. Can be abundant at marshy wetlands and ponds, including beaver ponds. Among the first gomphids on the wing in Vermont and among the few members of its genus favoring lentic habitats. Females are often found sitting in shrubby or grassy vegetation away from natal wetlands.

Status: G4 N4 S4

Vermont Flight Season: 22 May – 22 July

Gomphus descriptus Banks 1896 — Harpoon Clubtail

Sparse occurrences in an odd pattern, generally the north-eastern and southwestern portions of the state. Inhabits river sites, perhaps favoring sand-bottomed substrates. Rarely

found in numbers approaching those of *G. borealis* or its other more common congeners. Sporadic in the Champlain Valley. *G. descriptus* may yet prove to have a wider distribution than is currently known. Nevertheless, this species is vulnerable or imperiled across some of its range. Endangered in Massachusetts, it may warrant watching for population or distributional declines in Vermont.

Status: G4 N4 S3

Vermont Flight Season: 24 May – 15 July

Gomphus exilis Selys 1854 — Lancet Clubtail

Perhaps owing to its cosmopolitan habitat preferences, this small clubtail is well-distributed across Vermont, but with scarce records from the Connecticut River Valley. Males in particular can be found resting on rocks near ponds, rivers and streams. In all likelihood the most common member of the subgenus *Phanogomphus* to be found in the Champlain Valley. Its small size and blue eyes make this a distinctive member of that somewhat homogenous group.

Status: G5 N5 S4S5

Vermont Flight Season: 25 May – 13 August

Gomphus fraternus (Say 1839) — Midland Clubtail

A recent addition to the state, it has been found only where the Poultney River merges into Lake Champlain. First discovered on 4 June 2009, as adults on a sandy shore, a larva was taken from the river nearby and reared the following year. In addition, adults have been found in nearby fields. This species should be looked for in the northwest corner of the state and perhaps along the Connecticut River in south-east Vermont.

Status: G5 N5

Vermont Flight Season: 21 May – 4 June

Gomphus lividus Selys 1854 — Ashy Clubtail

Found only in the western portion of the state, primarily in the Taconic Mountains and Vermont Valley. With the exception of the one northerly record, the distribution looks very similar to that of *Arigomphus villosipes*. Within its range, it has been found primarily along rivers, but also has a couple records from lake/pond situations. First recorded in Vermont in 2003, with approximately six sites with adult records to date. Has a relatively short recorded flight season.

Status: G5 N5 S2S3

Vermont Flight Season: 17 May – 16 June

Gomphus quadricolor Walsh 1863 — Rapids Clubtail

Does not quite live up to its common name in Vermont. Sites range from lower sections of the Poultney and Hubbardton rivers to larger slower rivers of northwestern Vermont. None of these sites can be considered “rapids,” but

rather slower, flatter sections of the rivers, as is the case in New Hampshire as well (Pam Hunt, pers. comm.). Larval sampling has revealed a wider distribution than originally thought. As with *G. abbreviatus*, adults may oviposit farther upstream from where most mature larvae and exuviae are found.

Status: G3G4 N3N4 S2

Vermont Flight Season: 21 May – 2 July

Gomphus spicatus Hagen in Selys 1854 — Dusky Clubtail

A drab clubtail with a range across the northeastern quarter of the continent, it is common and well-distributed across much of Vermont—a pattern similar to its closely related still-water clubtail, *G. borealis*. Seemingly not found in the Champlain Valley, perhaps avoiding the siltier nature of water bodies in this region. Besides ponds, probably more apt to be found at slow or moderate stream sites than *G. borealis*. A relatively early-flying gomphid, it can be fairly abundant at certain sites. May be less common at higher-elevation areas of the Green Mountains than *G. borealis*.

Status: G5 N5 S5

Vermont Flight Season: 7 May – 8 August

Gomphus vastus Walsh 1862 — Cobra Clubtail

Yet another rare Vermont clubtail, initially known only from an exuvia along the Connecticut River below Vernon Dam. But an adult was finally documented in 2014 in Putney, significantly upriver of the dam. (Another exuvia has also been found farther north in New Hampshire across from the Wells River). Although other sites may yet be discovered along the Connecticut River, it should be pointed out that this species is abundant (huge hauls of exuviae) at sites on the Connecticut River in Massachusetts. Typical habitat is large to medium mud- or silt-bottomed rivers. Adults can be found perching on vegetation near rivers, but investigation for exuviae or larvae remains the most effective survey method for this and other large-river species.

Status: G5 N5 S1

Vermont Flight Season: 10 June – 10 July

Gomphus ventricosus Walsh 1863 — Skillet Clubtail

Globally vulnerable, this species is known in Vermont only from exuviae at three sites on the Connecticut River, two of which technically may not be in Vermont: two bridges over the Connecticut River from Windham County. The third record is from Windsor County. Dates for all of these records are presently unavailable; however an adult was reported from the Connecticut River in New Hampshire, just north of Massachusetts, on 4 July 1939 (Kormandy, 1960). Apparently sensitive to habitat and water quality degradation, this species appears to be in decline elsewhere within its range. It warrants further investigation in Vermont.

Status: G3 N3 S1

Vermont Flight Season: Insufficient data (4 July)

Hagenius brevistylus Selys 1854 — Dragonhunter

Vermont's largest gomphid and, to many, among the most charismatic of dragonflies. Has a scattered distribution on rivers, streams, lakes and ponds, primarily in the northern part of the state. Sites range from the Connecticut River to small pond outlets where females lay eggs in still water that presumably drift downstream. While many encounters are of few individuals, it has been seen in higher numbers (as many as six individuals patrolling close to one another) on certain lakes. Trailside encounters away from water are not uncommon. Despite its somewhat formidable appearance, this is among our most unwary and easy-to-catch clubtails.

Status: G5 N5 S3S4

Vermont Flight Season: 9 June – 31 August

Lanthus parvulus (Selys 1854) — Northern Pygmy Clubtail

A species of lower order streams and rivers, common in the Taconic Mountains and throughout the spine of the Green Mountains. Also found in streams of the Northern Piedmont and Northeast Highlands. As adults, small and easily overlooked. As larvae, relatively easy to find but almost impossible to tell from *L. vernalis*. As a result, it is difficult to pinpoint differences in the habitats of these two species. Flight seasons for both species are compact and almost identical.

Status: G4 N3N4 S4

Vermont Flight Season: 1 June – 17 July

Lanthus vernalis Carle 1980 — Southern Pygmy Clubtail

Less common than its congener. Yet to be confirmed in the Taconic Mountains, but found scattered within the Green Mountains, Northern Piedmont and Northeast Highlands. See comments under *L. parvulus*.

Status: G4 N4 S3

Vermont Flight Season: 2 June – 27 July

Ophiogomphus aspersus Morse 1895 — Brook Snaketail

Fairly well distributed in streams and rivers, mostly with sandy or fine gravel substrates. Seems to show a preference to the Northeastern Highlands (sampling bias may be a factor) but also scattered in a few sites fringing the Champlain Valley. Also seems to prefer siltier reaches than *O. carolus*, with which it can occur, but is also more likely than *O. carolus* to co-occur with *O. mainensis*. Does not appear to be abundant at most of its sites. This species may be more secure than once believed in Vermont, making it a potential candidate for removal from the Vermont list of Species of Greatest Conservation Need (SGCN). Like other members of its genus, it can sometimes be found resting on vegetation

along riverbanks or, more often, on the emerged portion of rocks in a river or stream.

Status: G4 N4 S4

Vermont Flight Season: 30 May – 18 August

Ophiogomphus carolus Needham 1897 — Riffle Snaketail

The most common member of its genus in Vermont. Reasonably well distributed in streams and swift rivers (or portions thereof) with sandy or rocky substrate (perhaps explaining its absence from the Champlain Valley). Can be locally abundant at certain sites. Apparently secure in Vermont, it is a likely candidate for removal from the list of SGCN. Though all members of this genus in Vermont have fairly similar flight seasons, *O. carolus* is among our first to emerge and first to disappear for the year. One method for netting this species (and its congeners) on a river is to hold an insect net low and horizontal over the flowing water so that individuals investigate it as a potential resting spot.

Status: G5 N5 S4S5

Vermont Flight Season: 25 May – 13 July

Ophiogomphus mainensis Packard in Walsh 1863 — Maine Snaketail

This “ophio” tends to be found at higher altitude, colder water sites than its congeners in the state. It is more likely to be found in sites with *O. aspersus* than with *O. carolus*, but all three may at times co-occur. Sites are scattered in brooks and streams (occasionally rivers) with noticeable current over coarse cobble. Has the highest average elevation among its Vermont congeners, having been found in scattered sites along the spine of the Green Mountains. Most reliably found in the Northeast Highlands. May be a candidate for elevation to a rank of S4. Like other members of its genus, it prefers to rest on exposed tops of cobble in rivers.

Status: G4 N4 S3

Vermont Flight Season: 18 June – 16 July

Ophiogomphus rupinsulensis (Walsh 1862) — Rusty Snaketail

The least common member of its genus in Vermont, scattered at fewer than 10 known sites across the state. Seemingly more tolerant of silt than its relatives, it is known from slower streams and rivers and is our lowest elevation member of its genus. Hunt et al. reports this species from several sites along the Connecticut River corresponding especially to Windsor and Windham county sections. Owing to the relative lack of data on this species in Vermont (hence the provisional state rank), its status warrants additional investigation.

Status: G5 N5 S3?

Vermont Flight Season: June 4 – August 24

Progomphus obscurus (Rambur, 1842) — Common Sanddragon

Our only record of this species is an adult female that was technically taken in New Hampshire (Hunt et al., 2010) since NH claims the entire Connecticut river separating the two states. However, anyone looking at a map would call this a Vermont record. Indeed, its occurrence may represent a population from Vermont streams emptying into the Connecticut River near this point. Certainly the location makes an investigation of the surroundings in both states a priority for the future.

Status: G5 N1 S? (not ranked)

Vermont Flight Season: Insufficient data (13 August)

Stylogomphus albistylus (Hagen in Selys 1878) — Eastern Least Clubtail

A small gomphid of small to medium, relatively shallow, rocky streams. Distribution deviates somewhat from patterns of other rocky river gomphids with which it often associates, such as the *Ophiogomphus* and *Lanthus*. Less likely to be found in higher elevations, and therefore more likely to be found in the Champlain Valley. Previous work (Blust 1980) suggested this species was most associated with woodland streams that had been warmed, such as outflows from ponds or streams that flowed through meadows then entered forests. This pattern seems to apply to most of the sites where it is found in Vermont. Flight season relatively late for a stream gomphid, approximating that of *O. mainensis*.

Status: G5 N5 S4

Vermont Flight Season: 29 May – 8 August

Stylurus amnicola (Walsh 1862) — Riverine Clubtail

Vulnerable or imperiled across much of its range and known only from exuviae collected at two sites, the Connecticut River below Vernon Dam and the mouth of the West River. Studies in New Hampshire have found evidence of this species farther up the Connecticut River almost to the region of the Northeast Highlands. Preferred habitat appears to be clear rivers with moderate current and gravel or sandy (perhaps silty) substrate. Well-known elusiveness of adults suggests it may be found at other sites in Vermont, with searches for larvae or exuviae the most reliable survey method. Members of this genus, commonly known as the “hanging club-tails,” spend portions of the day resting on vegetation high in the tree canopy.

Status: G4 N4 S1

Vermont Flight Season: Insufficient data (4 July)

Stylurus scudderi (Selys 1873) — Zebra Clubtail

More common in Vermont than once believed. Scattered distribution includes rivers or streams with sandy substrates

(occasionally silty substrates) at all but high elevations. Hunt et al. found this species in the Connecticut River, but declining in abundance from north to south. Adults seen flying at two sites where a stream had flooded or been diverted to flow along a nearby sandy road. May be more nutrient tolerant than other members of its genus. Adults can be obvious at certain sites, but the most effective method of detection is searching for larvae or exuviae on streamside vegetation and rocks. This species may be a potential candidate for removal from the list of SGCN.

Status: G4 N3N4 S3S4

Vermont Flight Season: 5 July – 1 September

Stylurus spiniceps (Walsh 1862) — Arrow Clubtail

Another sand and silt river species likely to be found on or near the lower elevation fringes of Vermont. Encountered along the Connecticut River, the Poultney River and the Winooski and Missisquoi Rivers within the Champlain Valley. *S. spiniceps* and *S. scudderi* have been found together at only a few sites. Hunt et al. reported a pattern in the Connecticut River that, unlike *S. scudderi*, increased in abundance from north to south. Records from larvae and exuviae are more common than adult records.

Status: G5 N4 S3S4

Vermont Flight Season: 24 June – 22 September

Family Cordulegastridae (Spiketails)

Cordulegaster diastatops (Selys 1854) — Delta-spotted Spiketail

Found regularly in the Northeast Highlands and Northern Piedmont as well as the Taconic Mountains and Southern Green Mountains. Unlike *C. maculata*, has not been found in the Champlain Valley. On average, occurs at slightly higher elevations (1600 ft) than *C. maculata* (1200 ft), yet it has not been found in the Northern Green Mountains. Larval records of *C. diastatops* are unusual, whereas a significant number of *C. maculata* records are larvae. The small, spring-fed streams preferred by *C. diastatops* are probably under-sampled. The Museum of Comparative Zoology at Harvard (MCZ) holds a specimen that is the oldest dragonfly from Vermont for which a full date is known: 16 July 1891 by Prof. A.P. Morse of Wellesley, Massachusetts.

Status: G5 N4 S5

Vermont Flight Season: 25 May – 26 July

Cordulegaster maculata Selys 1854 — Twin-spotted Spiketail

One of the most common and predictable odonates in streams and rivers of Vermont. Found in all physiographic regions, though less so in the Champlain Valley. Larvae seem

to be almost a “given” in most small to medium streams. Present, but less common in larger, slow-flowing rivers. Less frequently observed as adults, but when found they are usually patrolling the edges of streams in a fairly regular pattern.

Status: G5 N5 S5

Vermont Flight Season: 9 May – 31 July

Cordulegaster obliqua (Say 1839) — Arrowhead Spiketail

Only known from Vermont since 2006, but its occurrence was expected based on distribution records in nearby states. Initially predicted to occur in seep streams in the “thumb” of Vermont formed by the Poultney River. The first visit to such a site in that region at the right time of year yielded the new addition to the state list. Since then, a larva was found in another stream a few miles away, and an adult was found about 30 miles away in Middlebury. Owing to its under-sampled habitat, this species may be more widespread than records indicate and its flight season is likely to be longer than our limited records indicate.

Status: G5 N4 S1S2

Vermont Flight Season: 28 May – 6 July

Family Macromiidae (Cruisers)

Didymops transversa (Say 1839) — Stream Cruiser

Found throughout most of the state with the exception of steeper sloped regions. Appears to be more closely associated with lakes and ponds than *M. illinoensis*. Also, unlike *M. illinoensis*, not as limited to lower elevations. Adults seem more likely to be found flying away from water than *M. illinoensis*. When at water, they are often found cruising the shoreline well into dusk. Though the flight season is shifted about two weeks earlier than that of *M. illinoensis*, both species seem to peak in the later half of June and early July.

Status: G5 N5 S5

Vermont Flight Season: 15 May – 9 August

Macromia illinoensis Walsh 1862 — Swift River Cruiser

More spotty than *D. transversa* in its distribution, associated primarily with larger rivers, which more than likely accounts for its lower altitudinal distribution. In the Champlain Valley, found only on the Poultney, Missisquoi and Lamoille rivers, but likely occurs on other rivers throughout the biophysical region. Larval records indicate it may be more widely distributed in the Northern and Southern Piedmont regions than formerly thought. Though normally seen cruising low, up and down the middle of rivers, it will occasionally be found flying low over roads as well.

Status: G5 N5 S4

Vermont Flight Season: 2 June – 31 August

Family Corduliidae (Emeralds)***Cordulia shurtleffii*** Scudder 1866 — American Emerald

Common in much of Vermont, with the exception of the Champlain Valley. Also appears less common in the Southern Piedmont, but that could be in part due to lack of sampling. Mostly associated with ponds, fens and bogs, and has been found at every elevation in Vermont up to ponds near the summit of Mount Mansfield. Flight season appears to end rather abruptly in mid to late July.

Status: G5 N5 S5

Vermont Flight Season: 12 May – 22 July

Dorocordulia lepida (Hagen in Selys 1871) — Petite Emerald

Found at a few locations in the eastern part of the state, which fits its overall distribution as a coastal plain species, though a few records do exist west of Vermont. A bog and fen specialist. The boggy Northeast Highlands includes the majority of sites for this species, though Lily Pond, a coastal plain pond in extreme southeastern Vermont seems to have a reliable population. In addition, it has been recently found at a bog in southwestern Vermont. Flight season is likely longer than our limited records indicate.

Status: G5 N5 S3

Vermont Flight Season: 21 June – 5 August

Dorocordulia libera (Selys 1871) — Racket-tailed Emerald

Common and widespread, preferring swamps, bogs, and other types of wooded wetlands. Less likely in wide-open agricultural parts of the state. Frequently encountered along forest roads and trails, especially during mid-June to mid-July. Males often patrol a small territory at pond and field edges.

Status: G5 N5 S5

Vermont Flight Season: 29 May – 22 August

Epitheca canis (McLachlan 1886) — Beaverpond Baskettail

Our most widely distributed *Epitheca* is well represented in all regions of the state, with the exception of the Connecticut River Valley and perhaps high elevations. The most likely baskettail to be found at ponds and peatlands with open water where it can be quite common. Among our earliest flying Anisoptera, often encountered working a small, zig-zag patrol area near natal waters.

Status: G5 N5 S5

Vermont Flight Season: 5 May – 19 August

Epitheca cynosura Say 1839 — Common Baskettail

May be Vermont's least cosmopolitan baskettail, with a distribution favoring large river valleys and other low-elevation sites. Essentially absent from piedmont and mountain bio-

physical regions, where *E. canis* and *E. spinigera* are more common. The taxonomic difficulties of this species are not encountered in Vermont since *E. semiaquea* and *E. costalis* have not been found in Vermont (yet). Both clear- and mark-winged males are netted in Vermont, and smoky-winged females are regularly encountered. Rutland County is a stronghold for the species, which is also found in the Champlain Valley and at locations not far from the Connecticut River.

Status: G5 N5 S5

Vermont Flight Season: 15 May – 21 September

Epitheca princeps Hagen 1861 — Prince Baskettail

Our “river” *Epitheca* is distributed somewhat reliably on major rivers, particularly the Connecticut River, and most reliably along Lake Champlain. Can be relatively common at some sites, but also appearing singly away from its lowland habitats in “inland” locations in the state. Although it can be found along forest edges, roads and fields (Nikula, 2003), this seems to be less the case in Vermont, where *E. princeps* is often found near or above water (and often out of reach). Most individuals in Vermont show moderate wing markings. One method of netting a patrolling “*princeps*” is to elevate your net ring high and hold it still until an unsuspecting individual comes too close for its own good.

Status: G5 N5 S5

Vermont Flight Season: 13 June – 31 August

Epitheca spinigera (Selys 1871) — Spiny Baskettail

This baskettail's habitat preferences in Vermont are somewhat difficult to distinguish from that of *E. canis* which shares a somewhat similar distribution. It is, however, usually encountered in low numbers, occasionally at or near peatlands and marshes. That said, a mass emergence was observed near Fair Haven in May of 2015. In northeastern US, Vermont tends to be near the southern edge of *E. spinigera*'s range, with many states to the south reporting its status as vulnerable or imperiled.

Status: G5 N5 S4

Vermont Flight Season: 2 May – 13 July

Helocordulia uhleri (Selys 1871) — Uhler's Sundragon

Sparsely distributed and infrequently encountered in Vermont, with most occurrences in the Northeastern Highlands and Green Mountains. Prefers relatively clean streams and perhaps pond or pond outlets. Distribution may be greater in Vermont than currently known. Among our early-season flyers. Sampling for this species may be more productive when adults move away from natal waters to mature. Later in the season flies low over streams and rivers somewhat like an *Ophiogomphus* and is therefore difficult to catch and document.

Status: G5 N5 S3S4

Vermont Flight Season: 18 May – 16 July

Neurocordulia yamaskanensis (Provancher 1875) — Stygian Shadowdragon

A crepuscular species difficult to locate as an adult and with scattered distribution on river sites and a few lake sites across the state. New populations were located by finding exuviae on the Lamoille River, Otter Creek and Poultney River within recent years. Bridge abutments and hydroelectric power stations tend to be good search locations for exuviae. Hunt et al. found numerous locations along the Connecticut River, especially in the southern section. Likely to turn up in other locations with appropriate search efforts. Likewise, two of its northeastern congeners, *N. michaeli* and *N. obsoleta*, may yet be discovered in Vermont. Confirmation by exuviae requires careful inspection.

Status: G5 N5 S3

Vermont Flight Season: 31 May – 21 June

Somatochlora albicincta (Burmeister 1839) — Ringed Emerald

At the southern end of its range in the eastern United States and known only from two ponds near the summit of Mt. Mansfield and from Lewis Pond in Lewis. Prefers boreal ponds or slow-running waters. Other high-elevation ponds are candidates for this species, including Sterling Pond in the Northern Green Mountains and Skyline Pond in the Bread-loaf Wilderness. Warrants further investigation in Vermont.

Status: G5 N4 S1

Vermont Flight Season: 11 June – 3 July

Somatochlora cingulata (Selys 1871) — Lake Emerald

Among Vermont's rarest members of this genus, is known from six sites mostly in the Northeastern Highlands. Preferred habitat includes lakes, bog ponds, and rivers, but the Vermont sites are all lakes. Can be abundant at latitudes north of Vermont. May yet turn up at more Vermont sites with additional investigation (particularly in the Green Mountains), but is nonetheless considered imperiled or vulnerable in adjoining states (and stable in Quebec). A site in southern Vermont, a rather acidic lake, may represent the most southerly breeding population in eastern North America.

Status: G5 N4 S1S2

Vermont Flight Season: 28 June – 29 July

Somatochlora elongata (Scudder 1866) — Ski-tipped Emerald

Associated with fens and related slow-moving outlets and streams, with fairly broad representation in the Northeast-

ern Highlands and scattered sites elsewhere in Vermont (excluding the Champlain Valley). Like other members of the genus, can be found feeding away from water or its natal peatland, including patrolling roads. Additional data may be required on this species before being considered for a ranking adjustment or removal from status as a Vermont SGCN.

Status: G5 N5 S3

Vermont Flight Season: 6 June – 1 September

Somatochlora forcipata (Scudder 1866) — Forcipate Emerald

The vast and varied peatlands of the Yellow Bogs area of the Nulhegan Basin in Vermont's Northeastern Highlands (Silvio O. Conte National Wildlife Refuge) appear to be its stronghold in Vermont. Even so, recorded from a half dozen or so other peatland sites around the state including a surprise find at a marginal fen in Washington County. Considered vulnerable or imperiled in the northeastern United States. Most encounters in Vermont have been in forest openings away from preferred habitat of peatlands and forested streams. Often patrols forest roads roughly one to four meters above ground level.

Status: G5 N4 S2S3

Vermont Flight Season: 6 June – 30 July

Somatochlora franklini (Selys 1878) — Delicate Emerald

The only reliable encounters with this vulnerable species were among the peatlands of the Yellow Bogs area of the Nulhegan Basin in Vermont's Northeastern Highlands (Silvio O. Conte National Wildlife Refuge) with one additional encounter at Peacham Bog in Caledonia County. Although sphagnum bogs are the presumed breeding habitat, most encounters are along dirt roads or woodland openings near peatlands. Among our earliest flying *Somatochlora* species, Vermont is near the southern edge of its range. Like *S. forcipata*, often patrols roughly one to four meters above ground level.

Status: G5 N3N4 S1S2

Vermont Flight Season: 31 May – 29 July

Somatochlora kennedyi Walker 1918 — Kennedy's Emerald

Similar to *S. franklini* in its known distribution, the only sites are in Northeastern Highlands, notably in the peatlands of the Yellow Bogs area of the Nulhegan Basin (Silvio O. Conte National Wildlife Refuge). May indeed be more rare and more vulnerable than *S. franklini*. Bog ponds or other standing or flowing water may be included among its habitat preferences, but this has not been confirmed in Vermont. Like its congeners, most encounters are along dirt roads or woodland openings near peatlands. Vermont is toward the southern edge of its range.

Status: G5 N3N4 S1S2

Vermont Flight Season: 6 June – 5 July

Somatochlora minor (Calvert in Harvey, 1898) — Ocellated Emerald

All but one record is from the Northeastern Highlands and are associated with fens having noticeable flow. Toward the southern edge of its range on the continent, this species may warrant further investigation, especially in the Green Mountains. Listed as secure in Quebec but either vulnerable, at higher risk or unranked across much of its range.

Status: G5 N4 S2

Vermont Flight Season: 11 June – 26 July

Somatochlora tenebrosa (Say 1839) — Clamp-tipped Emerald

Although it can be the most abundant *Somatochlora* flying at any given site, it has a sparse distribution across Vermont. Like many congeners, seems to have a strong presence in the Northeastern Highlands with limited distribution elsewhere. Peatlands and forested streams are preferred breeding habitat, but most often encountered patrolling other openings, including woods, roads, open fields or power line rights of way. Distribution may yet turn out to be broader as more observers spend time in the field searching for *Somatochlora*. Often seems to prefer flying at a height just out of net range.

Status: G5 N5 S3S4

Vermont Flight Season: 9 July – 17 August

Somatochlora walshii (Scudder 1866) — Brush-tipped Emerald

The most widely distributed *Somatochlora* in Vermont, with records from every biophysical region of the state, it is somewhat predictable but never abundant at any given site. Prefers slow, clear streams through bogs, fens and marshes. Seems to be more predictable at its preferred habitat than Vermont's two other common *Somatochlora* species. Often flying lower than other members of the same genus and may also be the *Somatochlora* easiest to catch in the state. This may account for some of its apparently greater distribution, particularly compared to *S. williamsoni*.

Status: G5 N4 S4

Vermont Flight Season: 6 June – 29 August

Somatochlora williamsoni Walker 1907 — Williamson's Emerald

Similar in distribution and abundance to *S. walshii*, tends to fit the "*Somatochlora* pattern" for Vermont, i.e. mostly found in the Northeastern Highlands, Northern Piedmont and Green Mountains. Its ability to breed away from peatlands most likely accounts for occurrences in the Champlain

Valley and elsewhere in the state. Although forest clearings are most reliable, it has also been located at small farm ponds and beaver wetlands.

Status: G5 N5 S3S4

Vermont Flight Season: 28 June – 7 September

Williamsonia fletcheri Williamson 1923 — Ebony Boghaunter

Known from five sites in Vermont, all fens under conservation protections. Conditions at each site vary slightly, with one, a gramminoid fen, having a bog pond and another with little in the way of open water. Additional sites for this species may yet be discovered. One strategy for finding *W. fletcheri* is to look for adults in sunny woodland openings near the peatland. Moderate effort has been devoted to locating its congener, *W. lintneri*, in Vermont without success.

Status: G4 N4 S1S2

Vermont Flight Season: 9 May – 18 June

Family Libellulidae (Skimmers)

Celithemis elisa (Hagen 1861) — Calico Pennant

Though more widespread in the state than the *C. eponina*, this species is most common in the western part of Vermont where it can be found in association with a variety of marshes, ponds and bogs. Though records date as far back as 1951, they are few in number and limited to southern counties until 1997.

Status: G5 N5 S5

Vermont Flight Season: 31 May – 6 September

Celithemis eponina (Drury, 1773) — Halloween Pennant

Scattered through the lower elevations of western Vermont and along the southern border. Not recorded from Vermont until 24 June 2002, when it was simultaneously recorded from two different locations by separate observers. Emergence has been observed on blooming waterlilies, reinforcing a preference for vegetated waters. Seems to travel some distance from water and is often found in relatively dry, weedy fields.

Status: G5 N5 S4

Vermont Flight Season: 14 June – 31 August

Celithemis fasciata (Kirby, 1889) — Banded Pennant

Another recent addition to the state list from south of us. Known only from a sighting of a single male on a lake with a central boggy island in southern Vermont. Its appearance in Vermont was predicted and more sightings are expected.

Status: G5 N5 SU

Vermont Flight Season: Insufficient data (1 August)

Erythemis simplicicollis (Say, 1839) — Eastern Pondhawk

Although cosmopolitan in its habitat preferences, it is not as widespread in Vermont as might be expected. Common and easily located in the lowlands of the Champlain Valley, its unmistakable stronghold in the state, and to a lesser extent in the Connecticut River Valley, but more sparsely distributed in the higher elevation regions. Vermont does lie toward the eastern end of this species' range in the Northeast. Listed as vulnerable (S3) in Maine and imperiled (S2) in Quebec. Breeds in lakes, ponds, marshes, streams and ditches—all usually with emergent vegetation. Often seen feeding on other dragonflies.

Status: G5 N5 S5

Vermont Flight Season: 31 May – 23 August

Ladona julia (Uhler, 1857) — Chalk-fronted Corporal

Can be extremely abundant at its favored sites throughout the state. Vermont is loaded with bog and acidic ponds, where *L. julia* thrives, making it arguably the most widespread and abundant spring Anisoptera species in the state. Among the few regions where it is not widespread and abundant is Windham County in southeastern Vermont and portions of the Champlain Valley, perhaps owing to a relative scarcity of acidic ponds in those regions.

Status: G5 N5 S5

Vermont Flight Season: 16 May – 12 August

Ladona exusta (Say, 1839) — White Corporal

Reported from Vermont in Needham and Westfall (1955), but lacking details or a source. Also reported from a single record in the Southern Green Mountains on 12 July 1995, by Frank Carle, but with no specimen available as evidence. Prefers coastal plain ponds, a community all but absent in Vermont. Pending additional evidence of this species, a state ranking is not applicable.

Status: G4 N4 SNA

Vermont Flight Season: Insufficient data (12 July)

Leucorrhinia frigida Hagen, 1890 — Frosted Whiteface

Vermont's abundance of lake and ponds with a shoreline of emergent plants contributes to a fairly widespread distribution of this species, which also shows up at bogs with open ponds. Most reliable biophysical regions are those with elevation, with Champlain Valley and the Connecticut River Valley offering fewest sites. At some sites, this small whiteface can almost mirror *L. julia* in abundance, offering large and small versions of dragonflies with the same pruinosity to the base of their abdomens. *L. frigida* is often accompanied by at least one other member of its genus at many sites.

Status: G5 N5 S4S5

Vermont Flight Season: 31 May – 10 August

Leucorrhinia glacialis Hagen, 1890 — Crimson-ringed Whiteface

With similar habitat preferences to *L. frigida*, this whiteface has a similar, yet somewhat more limited distribution in Vermont. The principal difference is its absence from the Taconic Mountains and the odonate-rich portions of western Rutland County. Can be encountered in low numbers or exceedingly abundant, such as at one pond in the Northeastern Highlands with a shoreline ringed with emergent Leatherleaf (*Chamaedaphne calyculata*), or a similar high-elevation, acidic pond in the Southern Green Mountains. This is Vermont's largest *Leucorrhinia*.

Status: G5 N5 S4

Vermont Flight Season: 17 May – 9 August

Leucorrhinia hudsonica (Selys, 1850) — Hudsonian Whiteface

The quintessential peatland whiteface. Fairly reliable at bogs and fens and, to a lesser extent, ponds. Like *L. proxima*, its tendency to be more common in northern Vermont probably reflects its northern distribution across the continent. Often the first *Leucorrhinia* taking flight at bogs and fens, as early as April in some cases, making it a distraction for those few hearty souls out in frigid peatlands searching for *Williamsonia lintneri* at the start of the season.

Status: G5 N5 S4S5

Vermont Flight Season: 29 April – 22 July

Leucorrhinia intacta (Hagen, 1861) — Dot-tailed Whiteface

One of the continent's most widespread *Leucorrhinia* is also one of Vermont's most cosmopolitan. Its distribution includes every biophysical region in the state, and it makes a fairly strong showing in the Champlain Islands, which cannot be said of many dragonflies in Vermont. Although ponds and lakes constitute its preferred habitat, this whiteface seems to move around, showing up some distance from natal waters, including along woodland roads. It also occurs in low numbers at bogs. Its habit of perching in obvious places for relatively long periods of time may account for some survey bias, but this dragonfly is indeed widespread across the state.

Status: G5 N5 S5

Vermont Flight Season: 6 May – 12 September

Leucorrhinia proxima Calvert, 1890 — Belted Whiteface

With a general northern distribution across the continent, *L. proxima* is more widely distributed across northern Vermont than anywhere else in the state. Its preference for bogs, fens and acidic ponds probably accounts for this distribution. Abundance at many sites tends to be lower than its

congeners. But at one gramminoid fen with an open pool in Washington County, *L. proxima* is fairly common. Nick Donnelly has raised questions regarding yellow forms of *L. proxima*, which seem to dwell farther from the water's edge than red forms. This raises questions about the taxonomy of these "forms." Noted from New York State west to Wisconsin, so observers in Vermont should watch for these as well.

Status: G5 N5 S4S5

Vermont Flight Season: 26 May – 12 September

Libellula cyanea Fabricius, 1775 — Spangled Skimmer

Once considered a species with only sporadic occurrences in the state. Frequency of sightings has increased and breeding was documented in June of 2013. Records are currently limited to a few southern counties. With Vermont toward the northern end of its range in New England, this species warrants more investigation in the state.

Status: G5 N5 S2

Vermont Flight Season: 15 June – 10 August

Libellula incesta Hagen, 1861 — Slaty Skimmer

Can be common and hard to miss at ponds and lakes, particularly in the southern half of the state. Although not often found in the mountains of northern Vermont, it does occur in the higher-elevation ponds and wetlands of southern Vermont, as well as ponds and lakes of the Taconic Mountains and Piedmont regions. Curiously, the first record of this species is a museum specimen labeled as Burlington, Vermont, from 1975. Since then, the species has only recently been recorded from that part of the state, though it appears to be expanding northward and is expected to become more common in the Champlain Valley.

Status: G5 N5 S5

Vermont Flight Season: 14 June – 11 October

Libellula luctuosa Burmeister, 1839 — Widow Skimmer

Abundant across much of its range on the continent, this species is more common in the western half of Vermont than anywhere else in the state. The Champlain Valley represents the core of its range, with occurrence dropping in the Green Mountains and increasing somewhat through the lowlands of eastern Vermont. Vermont does lie toward the eastern end of the range for this otherwise widespread libellulid. Lakes and ponds, farm ponds, ditches and slow-moving water, all with emergent vegetation, are preferred habitats. Abundance at given sites can vary.

Status: G5 N5 S5

Vermont Flight Season: 29 May – 6 September

Libellula pulchella Drury, 1773 — Twelve-spotted Skimmer

Large and obvious with a similar distribution in Vermont as

that of *L. luctuosa*, yet with more sites in the eastern half of the state, including the Northern and Southern piedmont regions. This mirrors its broader distribution in the eastern portion of North America compared to *L. luctuosa*. Lakes and ponds, including constructed farm ponds with emergent vegetation often host this hearty species. Despite its propensity to patrol a regular beat with frequent stops to perch at the apex of emergent or pondside vegetation, *L. pulchella* can be deft in its ability to avoid capture.

Status: G5 N5 S5

Vermont Flight Season: 29 May – 9 September

Libellula quadrimaculata Linnaeus, 1758 — Four-spotted Skimmer

Tending to be more northern in its continental distribution, this species is more evenly distributed in Vermont than its congeners. A tolerance for acidic habitat most likely explains this wider pattern of occurrence. The "Quad," as it's commonly dubbed in the field, is well represented in lakes, ponds, marshes and bogs across the state, including at high elevations in the Green Mountains. It is less likely than its congeners to be found in high numbers at the state's numerous "libellulid factories"—small, nutrient-rich ponds with emergent plants. This is the earliest flying member of its genus in Vermont.

Status: G5 N5 S5

Vermont Flight Season: May 9 – September 12

Libellula semifasciata Burmeister, 1839 — Painted Skimmer

Another southern species with a few erratic records from Vermont. Interestingly, five of the eight records are from the Southern Green Mountains at relatively high elevations. This species is known for migratory movements, which leaves uncertainty as to whether there are breeding populations somewhere in the southern mountains of Vermont or whether these are all migrants.

Status: G5 N5 SU

Vermont Flight Season: 3 June – 16 July

Nannothemis bella Uhler, 1857 — Elfin Skimmer

The continent's smallest dragonfly is known from only seven sites in Vermont, mostly gramminoid fens in various biophysical regions. The absence of reports from the northeastern highlands is a bit surprising. It can be abundant at one site and yet rare at another. Although there is some evidence this species may tolerate non-pristine habitats, this does not appear to be the case in Vermont, where undisturbed fens seem to be its preference. At least four of its sites are protected conservation lands. This species has among the shortest known flight periods of any regularly occurring Vermont Anisoptera species.

Status: G4 N4 S3

Vermont Flight Season: 26 May – 13 July

Pachydiplax longipennis (Burmeister, 1839) — Blue Dasher

One of North America's most widespread and abundant species, but doesn't quite fit its national reputation in Vermont. The Champlain Valley represents the core of its distribution, with only scattered sites across the rest of the state. Prefers lakes, ponds and slow-moving waters, all with floating vegetation. Abundance at any given site can be high in the Champlain Valley, but that is rarely the case at sites in other biophysical regions.

Status: G5 N5 S5

Vermont Flight Season: 31 May – 6 September

Pantala flavescens (Fabricius, 1798) — Wandering Glider

A wide-ranging and unpredictable migrant and breeder. The earliest seasonal date in Vermont is 21 July, giving the impression that the records are primarily individuals that wander into Vermont after emerging elsewhere. Half of the records for this species are from the Champlain Valley, while the others are scattered from the Northern and Southern Piedmont regions, Northeast Highlands and other mountainous regions of the state. At least two breeding sites are known from Vermont. Large flights have been observed in mid-August in recent years. This species is often seen patrolling in parking lots where reflectance from cars seems to mirror breeding sites.

Status: G5 N5 S3S4

Vermont Flight Season: 12 July – 4 October

Pantala hymenaea (Say, 1839) — Spot-winged Glider

Found primarily in the Champlain Valley and the Vermont Valley. A couple of records also exist from the Northeast Highlands and Southern Piedmont regions. The flight season of this species in Vermont is significantly earlier than *P. flavescens*. In addition, it is known to breed in at least one location near Shaftsbury, Vermont.

Status: G5 N5 S3S4

Vermont Flight Season: 6 June – 6 September

Perithemis tenera (Say, 1839) — Eastern Amberwing

This dainty and colorful dragonfly is scattered primarily in low elevation areas of Vermont such as the Champlain Valley, Vermont Valley and near the Connecticut River. It has yet to be found in five of Vermont's northern counties. Prefers vegetated ponds and sheltered inlets of large lakes and rivers. Though small, its brightly colored wings and habit of perching on vegetation in the open water make it easy to spot where it does occur.

Status: G5 N5 S4S5

Vermont Flight Season: 9 June – 31 August

Plathemis lydia (Drury, 1773) — Common Whitetail

Among Vermont's most ubiquitous dragonfly species, occurring in every biophysical region and a variety of habitats. Least likely to be found in the southeastern quarter of the state, perhaps owing to sampling bias and relatively fewer breeding sites. It prefers lakes, ponds (including constructed ponds) and slow-moving streams.

Status: G5 N5 S5

Vermont Flight Season: 8 May – 18 September

Sympetrum costiferum (Hagen, 1861) — Saffron-winged Meadowhawk

Somewhat rarely encountered, or rarely noticed. Seems to be primarily in the northwestern quarter of the state. One possible reason for the low number of records is its late flight season. When found, usually at ponds or wetlands with pools of standing water, it is a refreshing change from the more abundant species in this genus.

Status: G5 N5 S3

Vermont Flight Season: 22 July – 26 September

Sympetrum danae (Sulzer, 1776) — Black Meadowhawk

Seen only six times in Vermont, never in substantial numbers, and not regularly at any location. This species remains somewhat of a mystery in Vermont. Four records are from the Northeast Kingdom, one from the Northern Piedmont, and a seemingly odd record from Grand Isle. The unpredictability is very unlike other meadowhawks. It also has the latest apparent flight season of any meadowhawk in Vermont, not appearing until August.

Status: G5 N5 S1S2

Vermont Flight Season: 9 August – 20 September

Sympetrum internum Montgomery, 1943 — Cherry-faced Meadowhawk

Once mid-summer arrives, this species becomes one of the most ubiquitous odonates of the late-summer and fall. Breeds in a range of water bodies, from ditches to ponds. But adults occur in habitats relatively far from natal waters. Least likely to be found in the higher-elevation areas. Owing to the unsettled taxonomy of a species described as *S. janae* Carle, 1993, all Vermont records of *S. internum* and *S. janae* are here lumped as *S. internum*. Also, older literature records of *S. rubicundulum* are assumed to have been *S. internum*.

Status: G5 N5 S5

Vermont Flight Season: 14 June – 12 October

Sympetrum obtrusum (Hagen, 1867) — White-faced Meadowhawk

Found primarily in the northern part of Vermont. The more

southerly records are often associated with higher elevations. Compared to *S. internum*, more likely to be found associated with bogs and ponds than marshes and meadows. The bright white face on this species can be quite distinctive at times.

Status: G5 N5 S5

Vermont Flight Season: 5 June – 3 October

Sympetrum semicinctorum (Say, 1839) — Band-winged Meadowhawk

Not as hard to find as *S. danae*, but difficult to predict where it may occur. Not recorded in the Southern Green Mountains or the Southern Piedmont, but widely distributed in the Taconic Mountains and the Vermont Valley. Not widespread in the Champlain Valley, but has been recorded a number of times on the islands of Lake Champlain. Within the Northern Piedmont, it is concentrated in the region of boggy ponds and lakes.

Status: G5 N5 S4S5

Vermont Flight Season: 28 June – 15 October

Sympetrum vicinum (Hagen, 1861) — Autumn Meadowhawk

True to its common name, the last odonate to be found each season and sometimes even after Thanksgiving. Widespread throughout the state, though somewhat less common in the mountains. Its distribution is fairly similar to that of *S. internum*. Regularly seen drifting, sometimes pairs in tandem, at fall hawkwatch sites. It basks in what little sun is available in various open habitats late in the year.

Status: G5 N5 S5

Vermont Flight Season: 5 July – 26 November

Tramea carolina (Linnaeus, 1763) — Carolina Saddlebags

Most likely a vagrant, first encountered in Vermont on 6 August 2010 at two sites, a wetland with open water and a retention pond at a landfill in Bennington County. Similar reports surfaced across much of the Northeast during the same season. It remains unclear whether this species breeds in Vermont.

Status: G5 N5 SNA

Vermont Flight Season: 23 June – 6 August

Tramea lacerata Hagen, 1861 — Black Saddlebags

Generally found at pond sites and randomly in open habitats, primarily in the Champlain Valley, though also in the Vermont Valley and along the Connecticut River Valley. Two records come from the interior of the state, both of which are early in the flight season for the species in Vermont. What this may indicate in terms of breeding versus migrant status is unclear at this time. However, in 2012, a teneral was reported from along Lake Champlain which

supports the probability that the lake generates many of the Champlain Valley adults.

Status: G5 N5 S4

Vermont Flight Season: 11 June – 5 October

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Appendix 2: Species Distribution by Elevation. Elevation data (in feet) for each species showing minimum elevation, maximum elevation, mean elevation, sample size (number of sites) and standard deviation. Arranged in order of increasing average elevation. While low sampling sizes for some species makes the accuracy of some numbers questionable, the data is presented as an aspect of habitat characterization that could have utility.

Species	Minimum	Maximum	Mean	Samples	Std. Dev.
<i>Gomphus fraternus</i>	96	170	121	3	42
<i>Hetaerina americana</i>	130	299	201	5	67
<i>Gomphus vastus</i>	210	210	210	1	–
<i>Stylurus amnicola</i>	210	216	213	2	4
<i>Argia apicalis</i>	98	481	225	6	138
<i>Gomphus abbreviatus</i>	110	380	230	5	97
<i>Gomphus ventricosus</i>	191	269	236	3	40
<i>Cordulegaster obliqua</i>	210	331	256	3	66
<i>Gomphus quadricolor</i>	102	494	258	11	156
<i>Enallagma divagans</i>	288	288	288	1	–
<i>Enallagma traviatum</i>	110	579	303	4	204
<i>Enallagma antennatum</i>	100	639	320	10	211
<i>Perithemis tenera</i>	94	1154	337	21	316
<i>Stylurus spiniceps</i>	95	1437	342	21	306
<i>Argia moesta</i>	98	1433	366	38	325
<i>Erythemis simplicicollis</i>	94	2247	373	44	407
<i>Tramea lacerata</i>	94	1240	376	20	345
<i>Neurocordulia yamaskanensis</i>	105	883	381	8	261
<i>Enallagma laterale</i>	384	384	384	1	–
<i>Nasiaeschna pentacantha</i>	384	384	384	1	–
<i>Enallagma exulans</i>	100	2269	394	30	431
<i>Pantala flavescens</i>	110	1001	402	19	296
<i>Enallagma carunculatum</i>	95	1529	405	37	404
<i>Enallagma civile</i>	97	1826	441	29	437
<i>Pantala hymenaea</i>	107	1240	462	10	426
<i>Macromia illinoiensis</i>	110	1168	464	21	312
<i>Ophiogomphus rupinsulensis</i>	210	656	467	7	161
<i>Libellula luctuosa</i>	94	1334	472	71	366
<i>Enallagma anna</i>	475	475	475	1	–
<i>Lestes unguiculatus</i>	105	1077	480	17	322
<i>Aeshna constricta</i>	95	1770	489	46	471
<i>Epiptera cynosura</i>	95	1529	496	54	366
<i>Epiptera heros</i>	122	2126	499	7	724
<i>Pachydiplax longipennis</i>	98	2665	510	46	488
<i>Enallagma signatum</i>	94	2247	522	38	468
<i>Anax longipes</i>	528	528	528	1	–
<i>Epiptera princeps</i>	98	2247	544	38	568
<i>Enallagma durum</i>	548	548	548	1	–
<i>Gomphus lividus</i>	110	1348	548	11	370
<i>Celithemis eponina</i>	94	1711	554	20	432
<i>Rhionaeschna mutata</i>	384	812	567	4	181
<i>Dromogomphus spinosus</i>	95	1647	593	34	507
<i>Argomphus villosipes</i>	110	2247	610	11	642
<i>Lestes rectangularis</i>	94	2269	616	80	538
<i>Enallagma geminatum</i>	94	2247	617	29	474
<i>Calopteryx aequabilis</i>	98	2000	621	50	442
<i>Enallagma vesperum</i>	100	2247	637	22	477
<i>Ophiogomphus carolus</i>	110	1334	656	24	309
<i>Lestes dryas</i>	100	1824	660	24	468
<i>Ischnura kellicotti</i>	394	1711	667	7	464
<i>Stylurus scudderi</i>	324	1460	690	29	323
<i>Libellula pulchella</i>	98	2990	706	103	586
<i>Boyeria vinosa</i>	110	2000	716	46	459

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Appendix 2 continued...

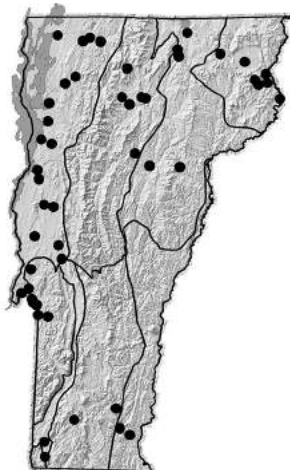
Species	Minimum	Maximum	Mean	Samples	Std. Dev.
<i>Aeshna clepsydra</i>	384	1711	716	5	558
<i>Leucorrhinia intacta</i>	98	3541	733	87	608
<i>Sympetrum semicinctum</i>	97	1697	757	42	498
<i>Lestes vigilax</i>	104	1437	759	34	375
<i>Aeshna verticalis</i>	94	2247	761	14	598
<i>Ophiogomphus aspersus</i>	110	1488	777	28	444
<i>Didymops transversa</i>	98	2247	785	33	589
<i>Sympetrum vicinum</i>	99	2269	787	70	490
<i>Ischnura posita</i>	99	2680	800	59	644
<i>Epitheca spinigera</i>	103	2681	811	39	699
<i>Arigomphus furcifer</i>	100	2680	812	26	680
<i>Argia fumipennis</i>	110	2247	813	55	458
<i>Stylogomphus albistylus</i>	130	2160	819	25	545
<i>Libellula cyanea</i>	235	2247	821	7	713
<i>Lestes inaequalis</i>	102	2291	822	27	572
<i>Basiaeschna janata</i>	105	2129	827	51	514
<i>Libellula incesta</i>	125	2247	831	31	472
<i>Ischnura verticalis</i>	95	3541	836	216	633
<i>Boyeria graefiana</i>	94	2000	837	29	545
<i>Anax junius</i>	95	2990	840	117	732
<i>Lestes congener</i>	100	2269	842	65	558
<i>Gomphus exilis</i>	105	2350	848	56	559
<i>Calopteryx maculata</i>	98	2247	853	100	565
<i>Enallagma vernale</i>	97	2990	854	30	735
<i>Sympetrum internum</i>	94	4000	857	136	735
<i>Celithemis elisa</i>	104	2680	858	40	670
<i>Coenagrion resolutum</i>	105	2681	883	40	655
<i>Gomphus descriptus</i>	110	2015	886	29	503
<i>Plathemis lydia</i>	94	2681	892	109	692
<i>Gomphaeschna furcillata</i>	130	2247	911	19	538
<i>Dorocordulia libera</i>	105	2633	935	62	666
<i>Tramea carolina</i>	688	1122	937	3	224
<i>Nannothemis bella</i>	545	1287	939	7	312
<i>Aeshna tuberculifera</i>	122	3207	949	47	653
<i>Enallagma ebrium</i>	97	2561	950	144	601
<i>Epitheca canis</i>	95	2350	976	61	590
<i>Ophiogomphus mainensis</i>	225	2000	977	24	427
<i>Gomphus adelphus</i>	100	2015	993	18	580
<i>Lestes forcipatus</i>	99	4000	1018	35	734
<i>Dorocordulia lepida</i>	384	1460	1024	8	340
<i>Ischnura hastata</i>	100	1473	1035	4	648
<i>Enallagma aspersum</i>	110	2680	1043	31	616
<i>Leucorrhinia proxima</i>	198	1824	1067	51	396
<i>Gomphus spicatus</i>	121	2350	1077	57	504
<i>Sympetrum obtrusum</i>	105	2043	1098	41	470
<i>Hagenius brevistylus</i>	210	1770	1111	14	399
<i>Calopteryx amata</i>	110	2160	1123	43	507
<i>Somatochlora williamsoni</i>	94	2215	1127	26	450
<i>Nehalennia irene</i>	100	3930	1149	113	731
<i>Libellula quadrimaculata</i>	100	2990	1149	96	727
<i>Sympetrum danae</i>	202	1697	1153	5	571
<i>Aeshna canadensis</i>	96	3541	1169	102	709
<i>Cordulegaster maculata</i>	210	2340	1178	62	532
<i>Amphiagrion saucium</i>	100	4000	1187	33	745

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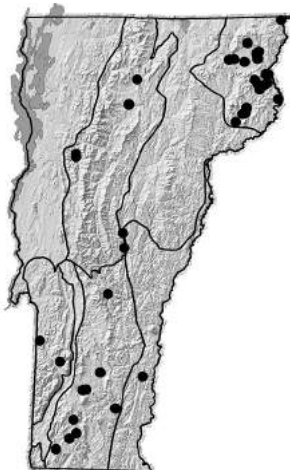
Appendix 2 continued...

Species	Minimum	Maximum	Mean	Samples	Std. Dev.
<i>Aeshna umbrosa</i>	125	3207	1189	69	704
<i>Lestes disjunctus</i>	97	4000	1200	91	762
<i>Lanthus parvulus</i>	161	2230	1200	46	456
<i>Lestes eurinus</i>	210	2680	1209	18	683
<i>Enallagma hageni</i>	103	2681	1211	108	598
<i>Lanthus vernalis</i>	464	2990	1213	17	587
<i>Somatochlora kennedyi</i>	975	1483	1224	7	152
<i>Somatochlora walshii</i>	391	2681	1232	34	496
<i>Sympetrum costiferum</i>	471	2316	1235	13	563
<i>Chromagrion conditum</i>	110	4000	1255	79	753
<i>Williamsonia fletcheri</i>	1123	1544	1259	5	168
<i>Ladona julia</i>	110	3930	1270	131	692
<i>Leucorrhinia frigida</i>	110	2990	1291	60	713
<i>Nehalennia gracilis</i>	110	2680	1293	12	710
<i>Somatochlora forcipata</i>	400	2230	1320	12	512
<i>Somatochlora tenebrosa</i>	380	2230	1321	14	517
<i>Archilestes grandis</i>	1332	1332	1332	1	–
<i>Aeshna interrupta</i>	207	3207	1354	45	660
<i>Helocordulia uhleri</i>	110	2378	1361	26	546
<i>Gomphus borealis</i>	95	2681	1371	62	591
<i>Enallagma boreale</i>	110	2681	1380	37	749
<i>Enallagma annexum</i>	122	2918	1381	24	690
<i>Somatochlora franklini</i>	1144	1544	1407	9	146
<i>Somatochlora elongata</i>	384	2584	1423	26	470
<i>Aeshna sitchensis</i>	1460	1460	1460	1	–
<i>Libellula semifasciata</i>	110	2990	1479	8	991
<i>Cordulegaster diastatops</i>	210	2918	1512	47	637
<i>Somatochlora minor</i>	1122	2681	1555	11	588
<i>Leucorrhinia hudsonica</i>	110	2990	1558	58	652
<i>Cordulia shurtleffii</i>	125	3930	1574	65	766
<i>Leucorrhinia glacialis</i>	781	3930	1618	29	720
<i>Celithemis fasciata</i>	1711	1711	1711	1	–
<i>Aeshna eremita</i>	400	4000	1822	34	1013
<i>Ladona exusta</i>	1853	1853	1853	1	–
<i>Coenagrion interrogatum</i>	1032	2680	1856	2	1165
<i>Somatochlora cingulata</i>	1462	2990	1955	6	595
<i>Tachopteryx thoreyi</i>	2220	2220	2220	1	–
<i>Aeshna subarctica</i>	1400	3077	2239	2	1186
<i>Somatochlora albicincta</i>	1824	3930	3098	3	1121

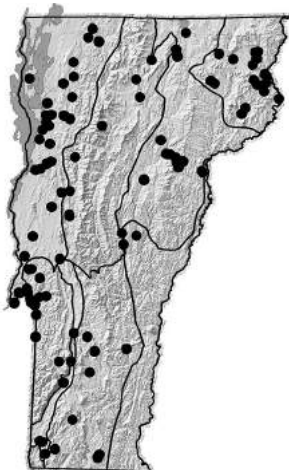
Appendix 3: Range Maps. Confirmed records, indicated by a dot, include adults, larvae and exuviae for which we have a photo or specimen. Unconfirmed records, lacking voucher evidence, are indicated with a question mark. Boundary lines indicate biophysical regions (p. 76).



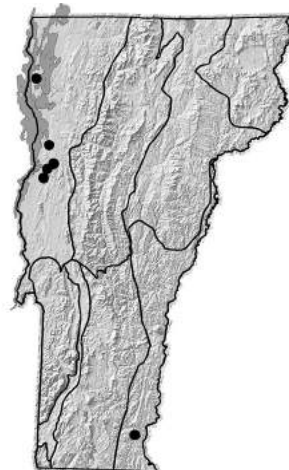
Calopteryx aequabilis
River Jewelwing



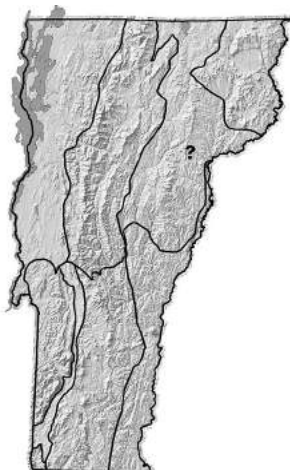
Calopteryx amata
Superb Jewelwing



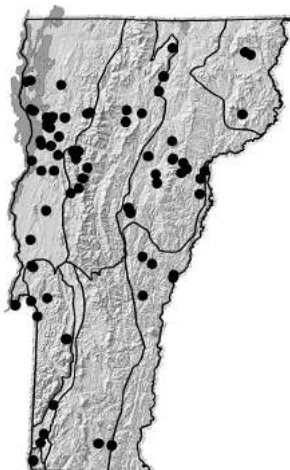
Calopteryx maculata
Ebony Jewelwing



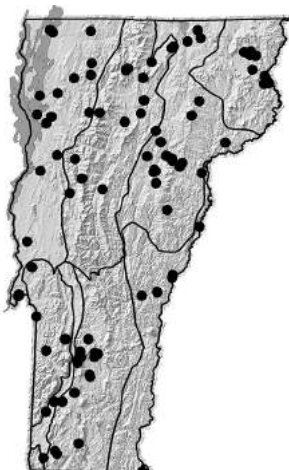
Hetaerina americana
American Rubyspot



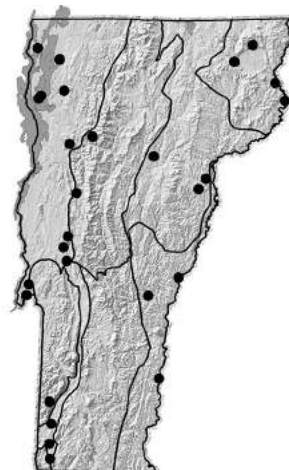
Archilestes grandis
Great Spreadwing



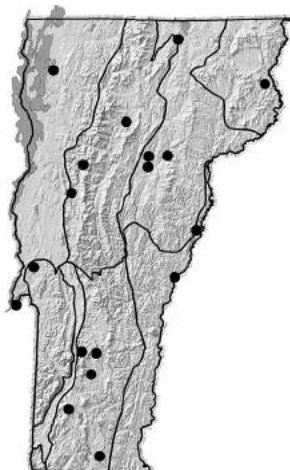
Lestes congener
Spotted Spreadwing



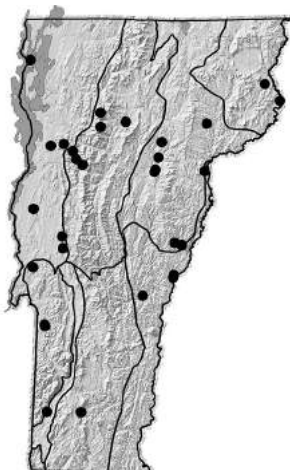
Lestes disjunctus
Northern Spreadwing



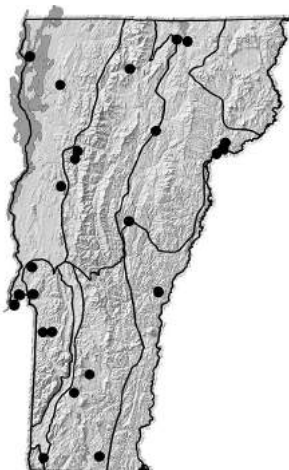
Lestes dryas
Emerald Spreadwing



Lestes eurinus
Amber-winged Spreadwing



Lestes forcipatus
Sweetflag Spreadwing

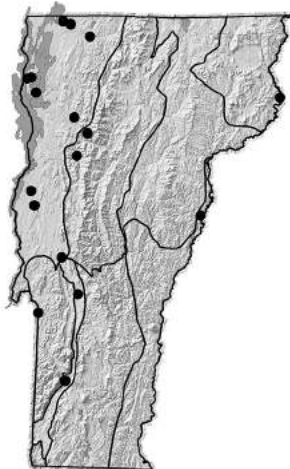


Lestes inaequalis
Elegant Spreadwing

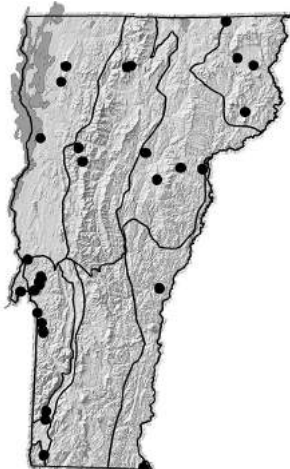


Lestes rectangularis
Slender Spreadwing

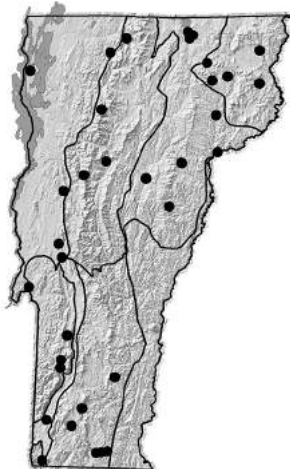
Appendix 3 continued...



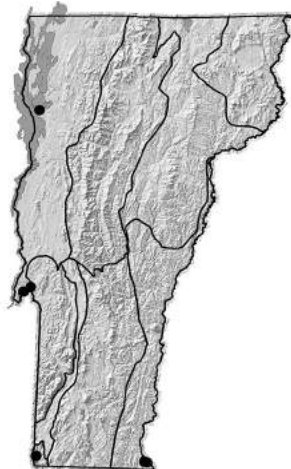
Lestes unguiculatus
Lyre-tipped Spreadwing



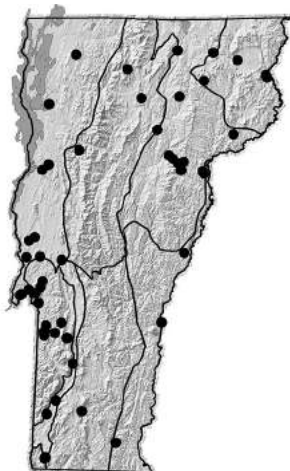
Lestes vigilax
Swamp Spreadwing



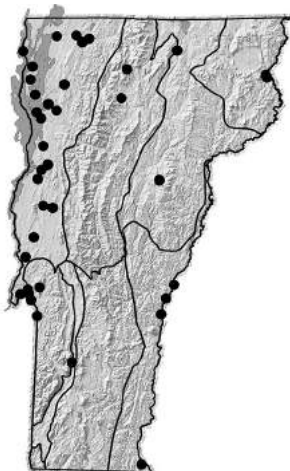
Amphiagrion saucium
Eastern Red Damsel



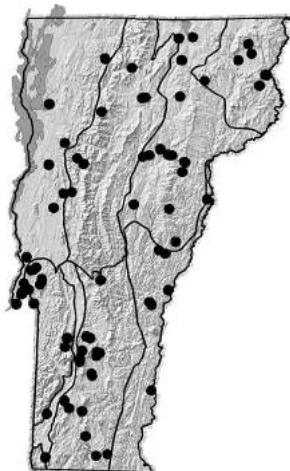
Argia apicalis
Blue-fronted Dancer



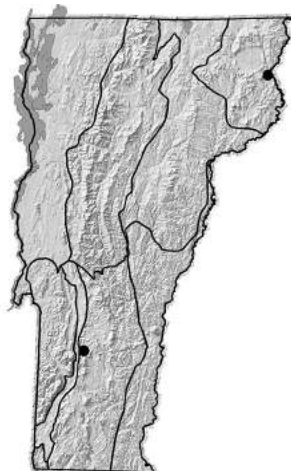
Argia fumipennis
Variable Dancer



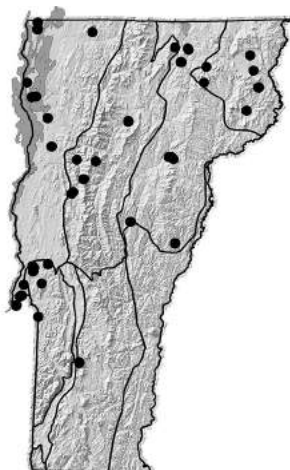
Argia moesta
Powdered Dancer



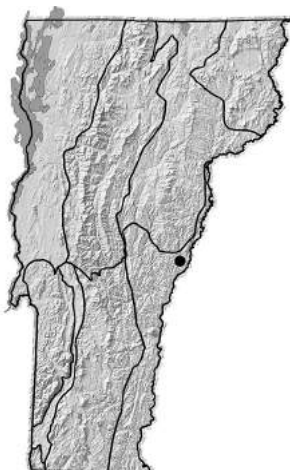
Chromagrion conditum
Aurora Damsel



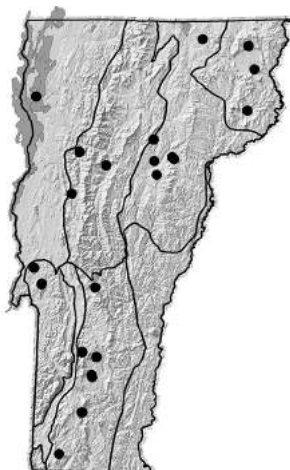
Coenagrion interrogatum
Subarctic Bluet



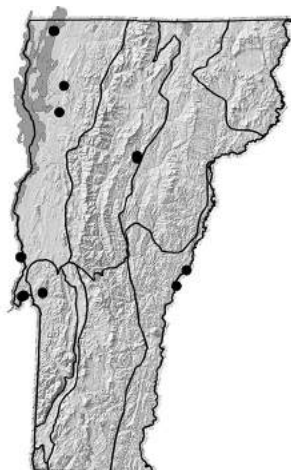
Coenagrion resolutum
Taiga Bluet



Enallagma anna
River Bluet

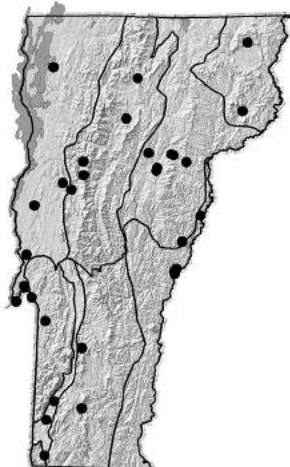


Enallagma annexum
Northern Bluet

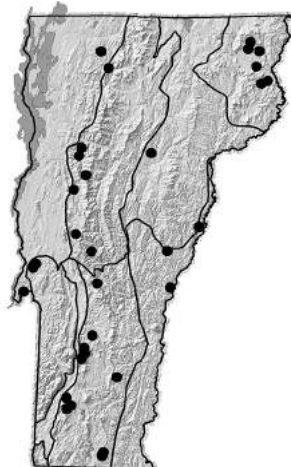


Enallagma antennatum
Rainbow Bluet

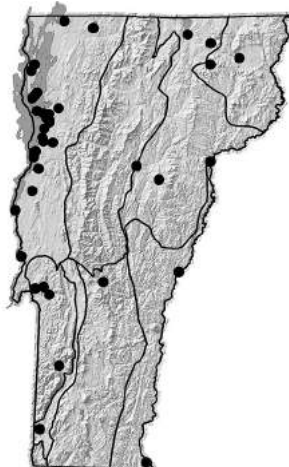
Appendix 3 continued...



Enallagma aspersum
Azure Bluet



Enallagma boreale
Boreal Bluet



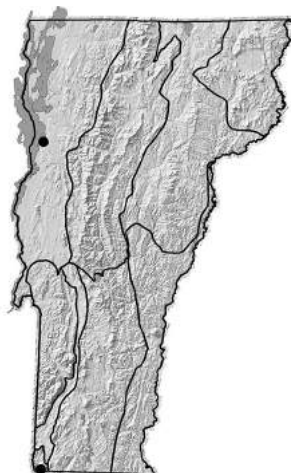
Enallagma carunculatum
Tule Bluet



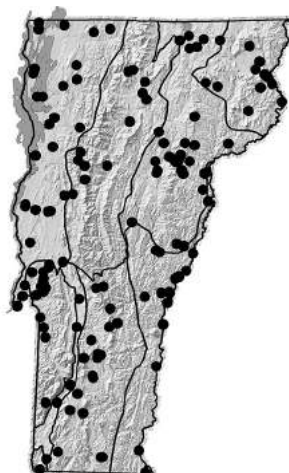
Enallagma civile
Familiar Bluet



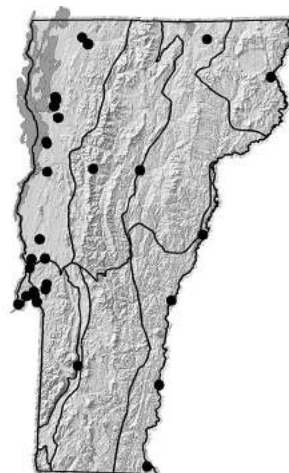
Enallagma divagans
Turquoise Bluet



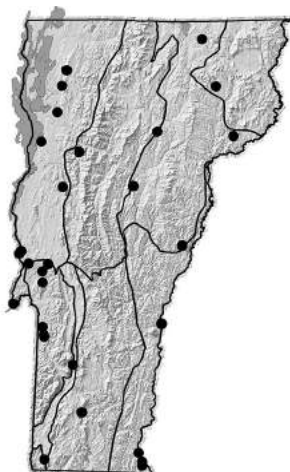
Enallagma durum
Big Bluet



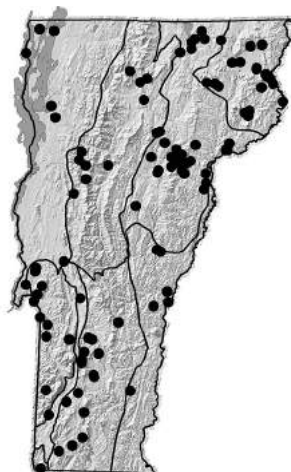
Enallagma ebrium
Marsh Bluet



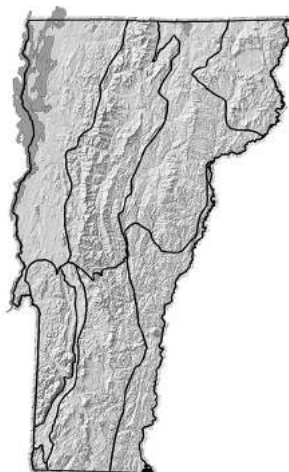
Enallagma exulans
River Bluet



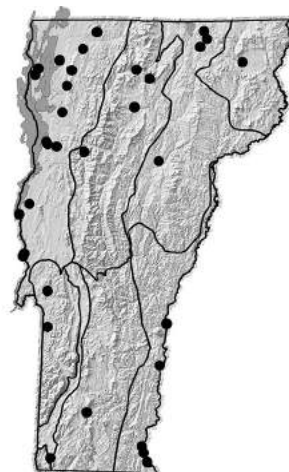
Enallagma geminatum
Skimming Bluet



Enallagma hageni
Hagen's Bluet

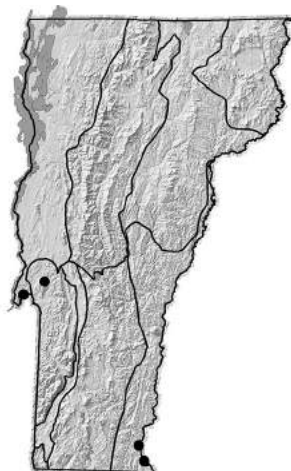


Enallagma laterale
New England Bluet

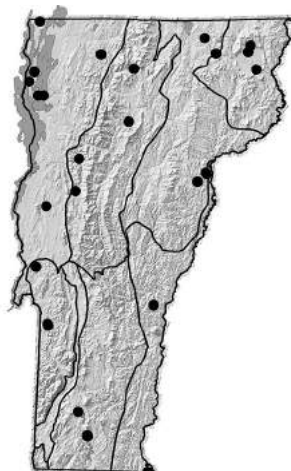


Enallagma signatum
Orange Bluet

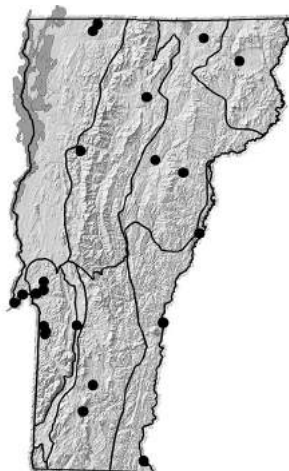
Appendix 3 continued...



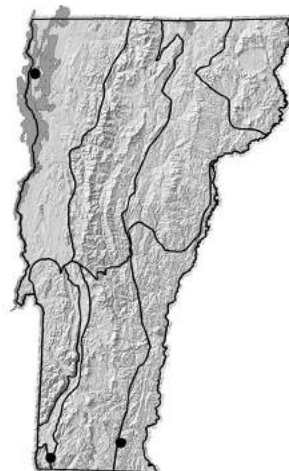
Enallagma traviatum
Slender Bluet



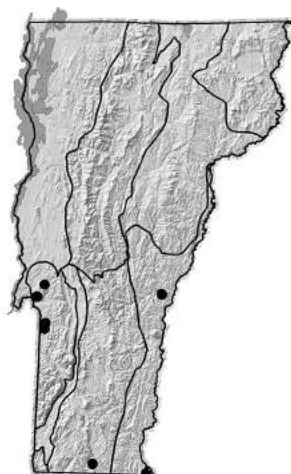
Enallagma vernale
Vernal Bluet



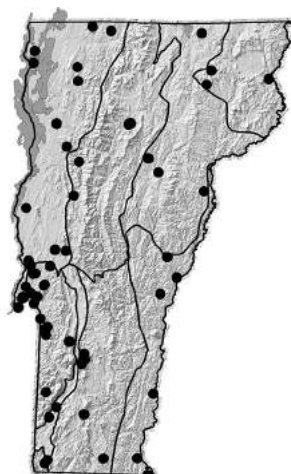
Enallagma vesperum
Vesper Bluet



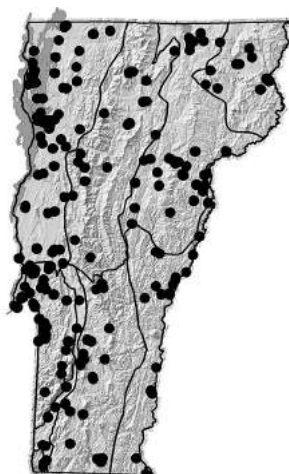
Ischnura hastata
Citrine Forktail



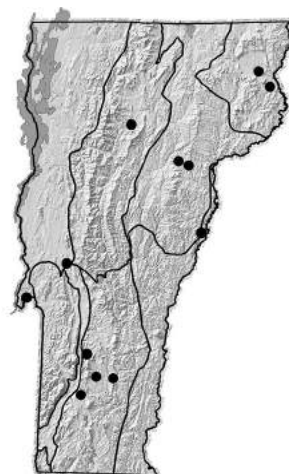
Ischnura kellicotti
Lilypad Forktail



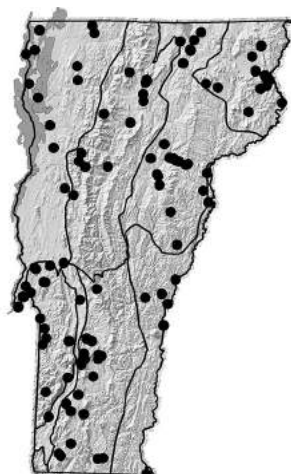
Ischnura posita
Fragile Forktail



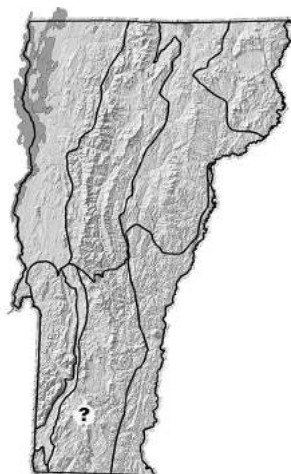
Ischnura verticalis
Eastern Forktail



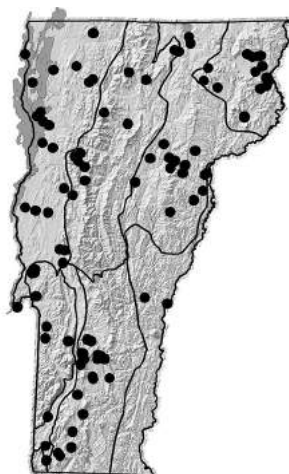
Nehalennia gracilis
Sphagnum Sprite



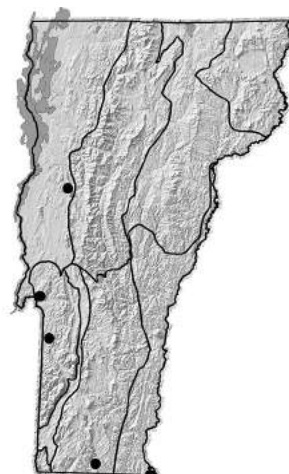
Nehalennia irene
Sedge Sprite



Tachopteryx thoreyi
Gray Petaltail

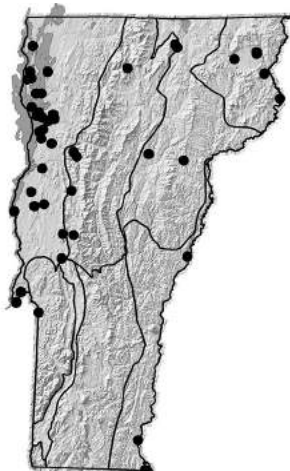


Aeshna canadensis
Canada Darner

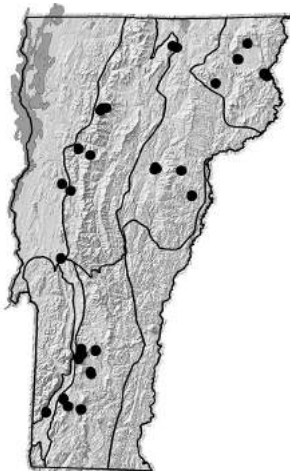


Aeshna clepsydra
Mottled Darner

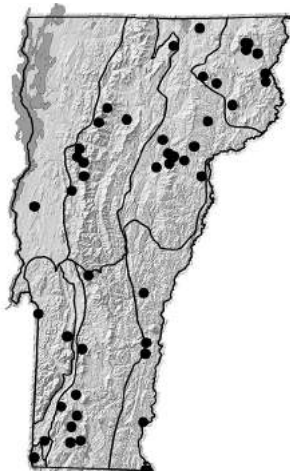
Appendix 3 continued...



Aeshna constricta
Lance-tipped Darner



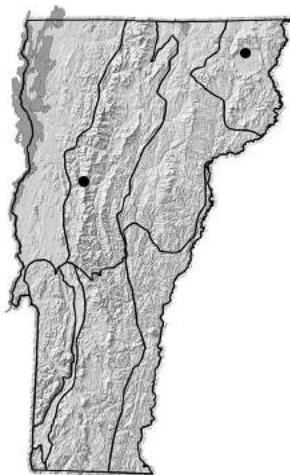
Aeshna eremita
Lake Darner



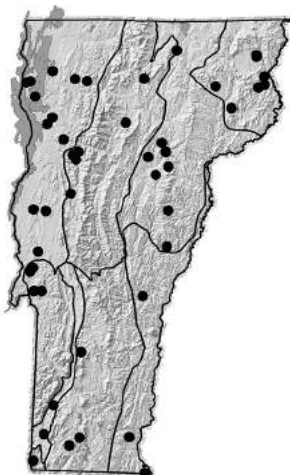
Aeshna interrupta
Variable Darner



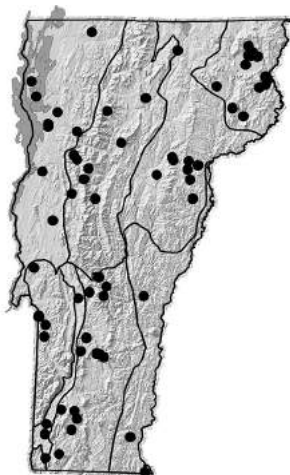
Aeshna sitchensis
Zigzag Darner



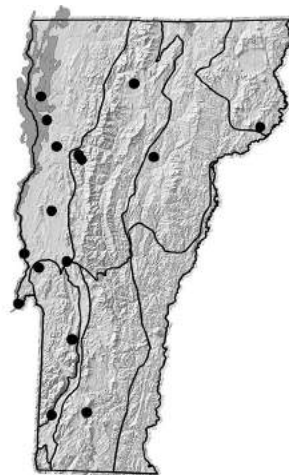
Aeshna subarctica
Subarctic Darner



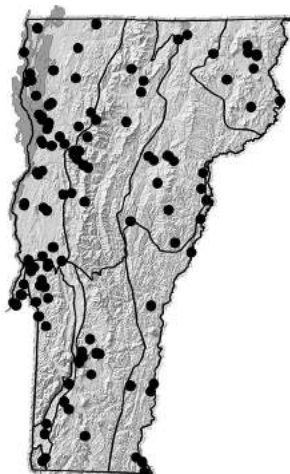
Aeshna tuberculifera
Black-tipped Darner



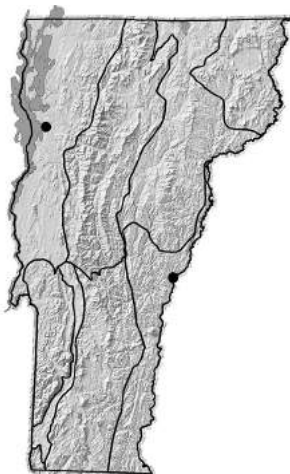
Aeshna umbrosa
Shadow Darner



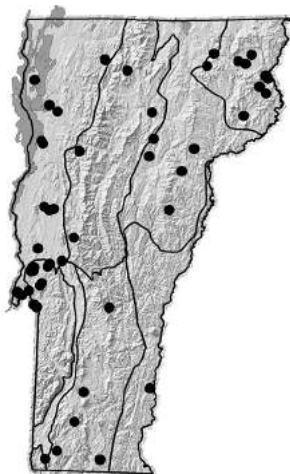
Aeshna verticalis
Green-striped Darner



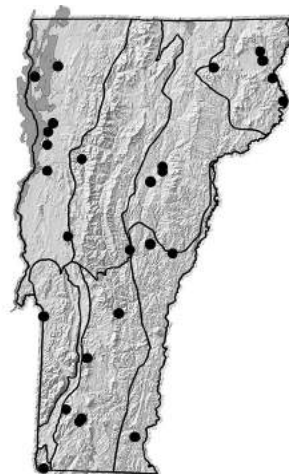
Anax junius
Common Green Darner



Anax longipes
Comet Darner

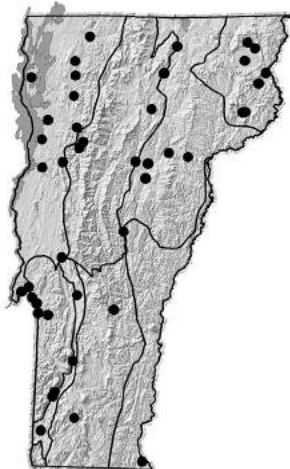


Basiaeschna janata
Springtime Darner

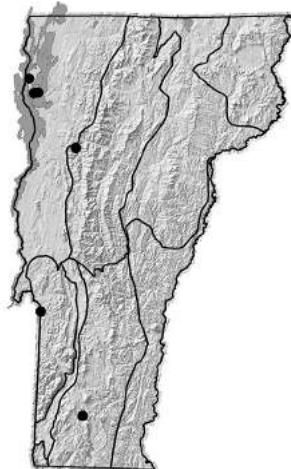


Boyeria grafiana
Ocellated Darner

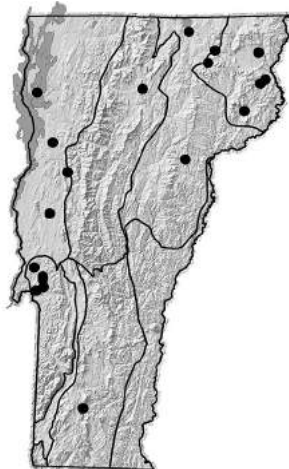
Appendix 3 continued...



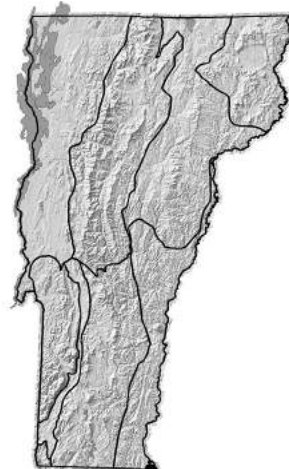
Boyeria vinosa
Fawn Darner



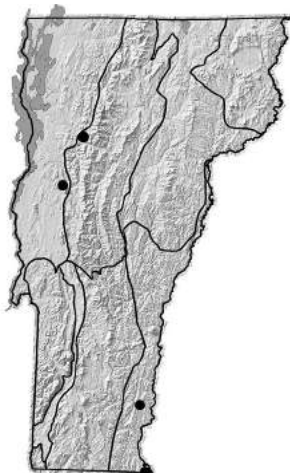
Epiaeschna heros
Swamp Darner



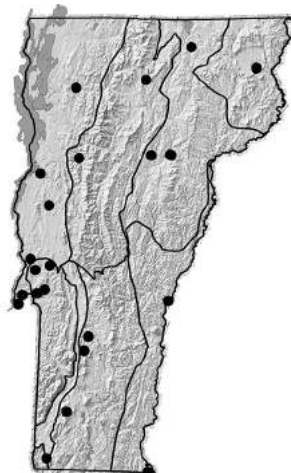
Gomphaeschna furcillata
Harlequin Darner



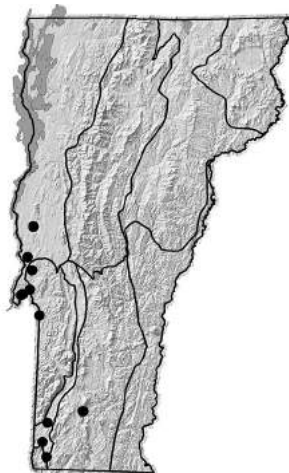
Nasiaeschna pentacantha
Cyrano Darner



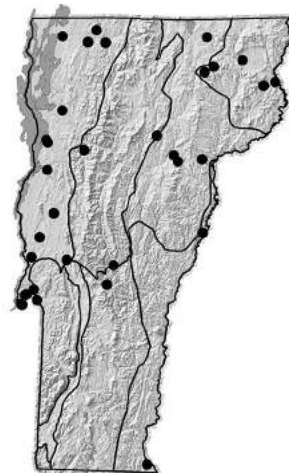
Rhionaeschna mutata
Spatterdock Darner



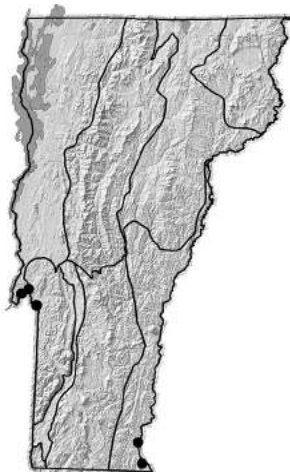
Arigomphus furcifer
Lilypad Clubtail



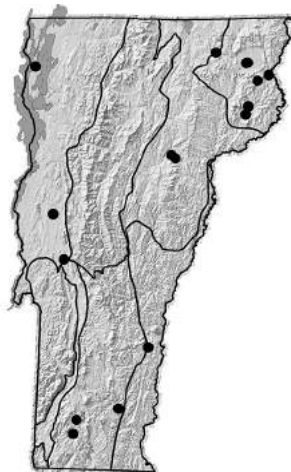
Arigomphus villosipes
Unicorn Clubtail



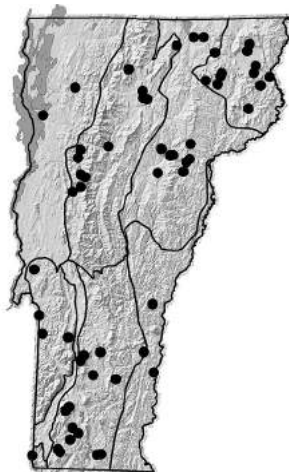
Dromogomphus spinosus
Black-shouldered Spinyleg



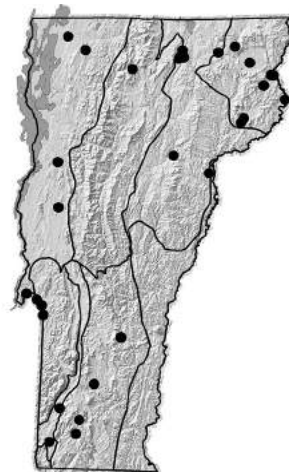
Gomphus abbreviatus
Spine-crowned Clubtail



Gomphus adelphus
Mustached Clubtail

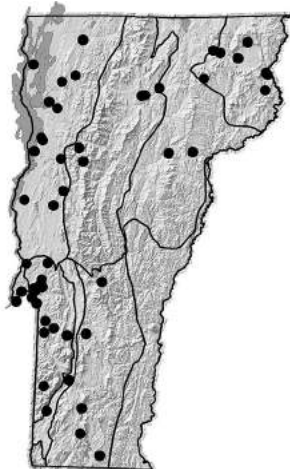


Gomphus borealis
Beaverpond Clubtail

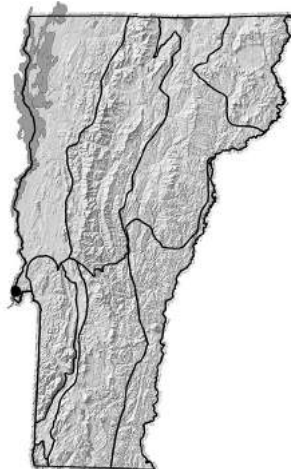


Gomphus descriptus
Harpoon Clubtail

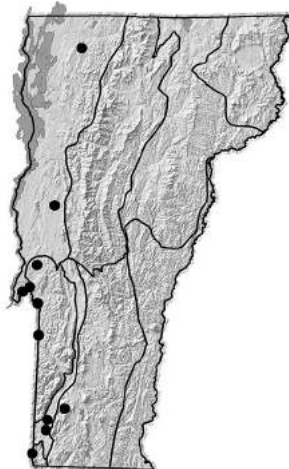
Appendix 3 continued...



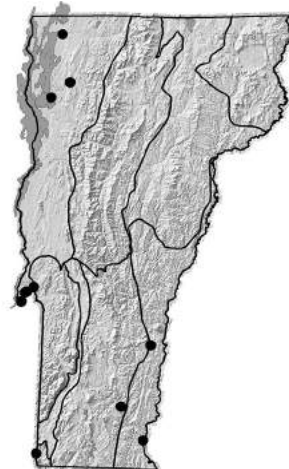
Gomphus exilis
Lancet Clubtail



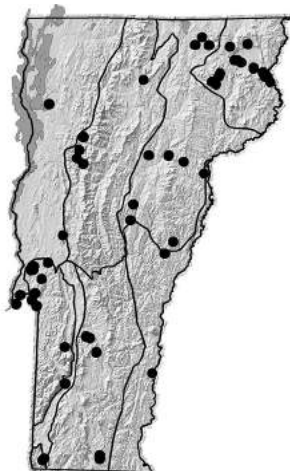
Gomphus fraternus
Midland Clubtail



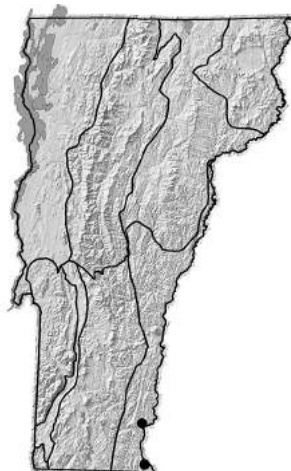
Gomphus lividus
Ashy Clubtail



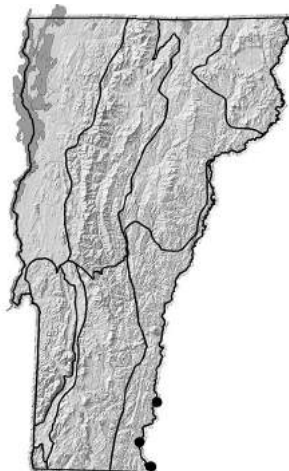
Gomphus quadricolor
Rapids Clubtail



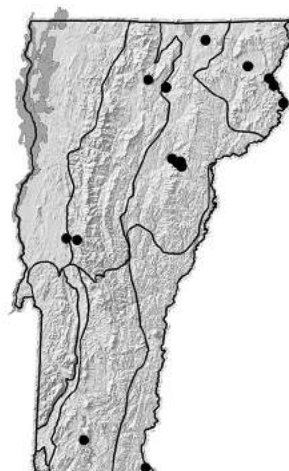
Gomphus spicatus
Dusky Clubtail



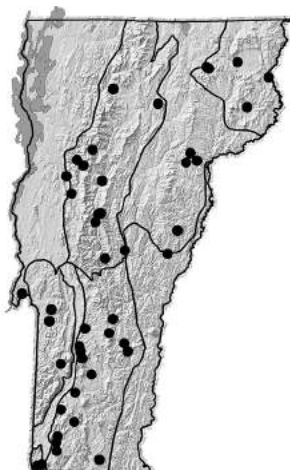
Gomphus vastus
Cobra Clubtail



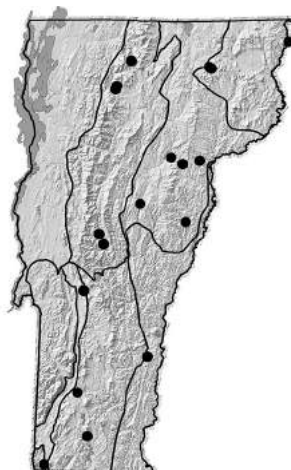
Gomphus ventricosus
Skillet Clubtail



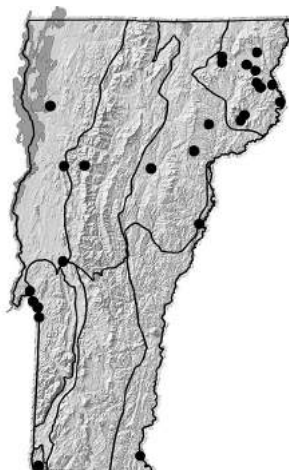
Hagenius brevistylus
Dragonhunter



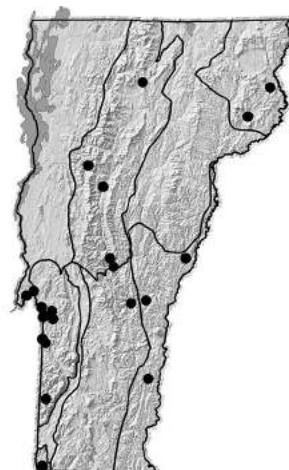
Lanthus parvulus
Northern Pygmy Clubtail



Lanthus vernalis
Southern Pygmy Clubtail

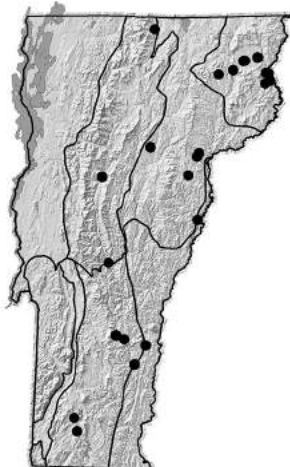


Ophiogomphus aspersus
Brook Snaketail

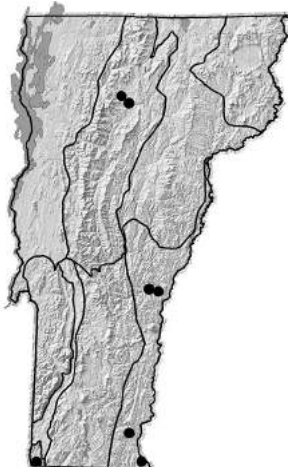


Ophiogomphus carolus
Riffle Clubtail

Appendix 3 continued...



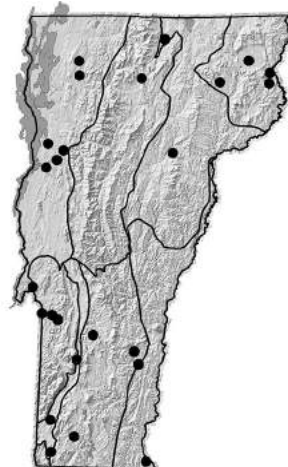
Ophiogomphus mainensis
Maine Snaketail



Ophiogomphus rupinsulensis
Rusty Snaketail



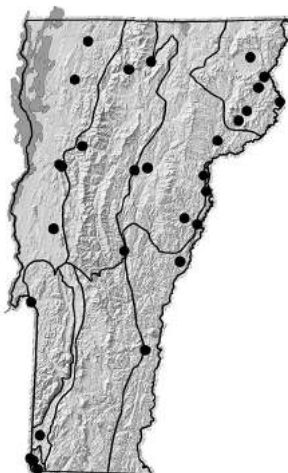
Progomphus obscurus
Eastern Sanddragon



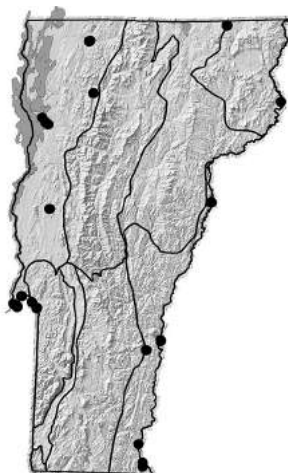
Stylogomphus albistylus
Eastern Least Clubtail



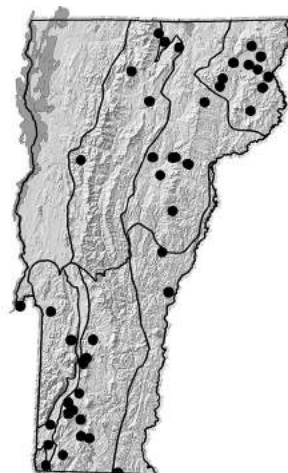
Stylurus amnicola
Riverine Clubtail



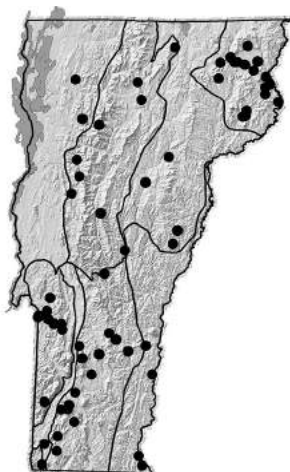
Stylurus scudderi
Zebra Clubtail



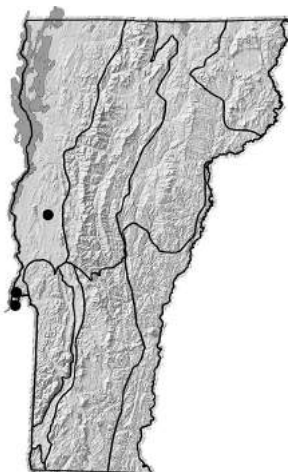
Stylurus spiniceps
Arrow Clubtail



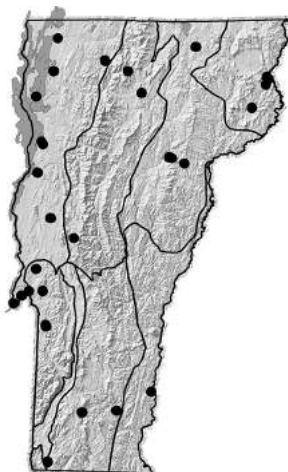
Cordulegaster diastatops
Delta-spotted Spiketail



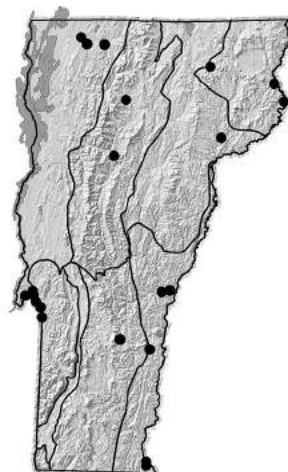
Cordulegaster maculata
Twin-spotted Spiketail



Cordulegaster obliqua
Arrowhead Spiketail

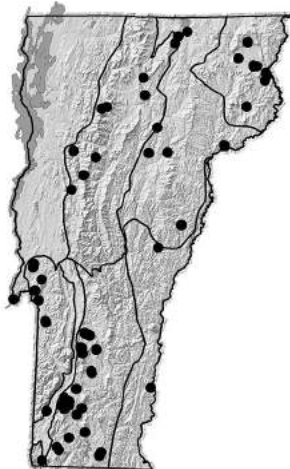


Didymops transversa
Stream Cruiser

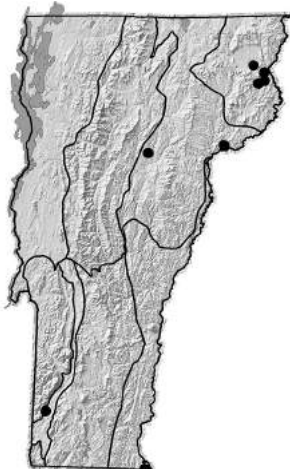


Macromia illinoiensis
Swift River Cruiser

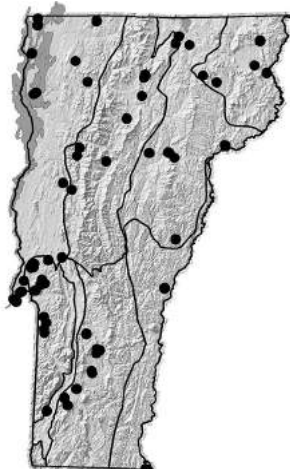
Appendix 3 continued...



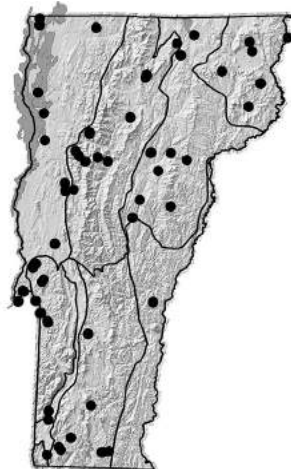
Cordulia shurtleffii
American Emerald



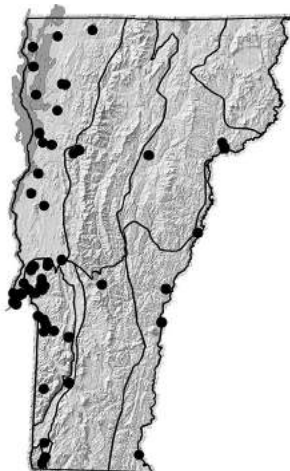
Dorocordulia lepida
Petite Emerald



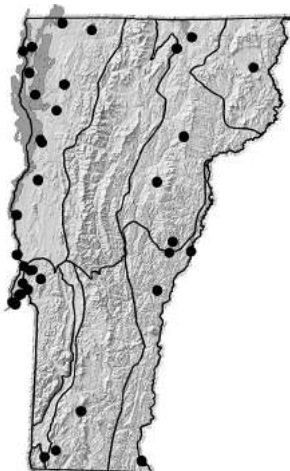
Dorocordulia libera
Racket-tailed Emerald



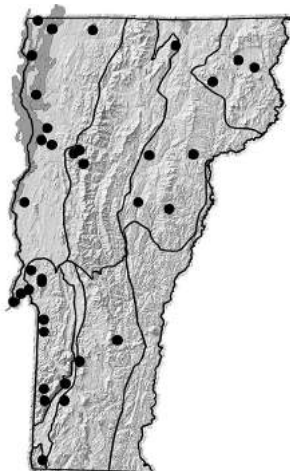
Epitheca canis
Beaverpond Baskettail



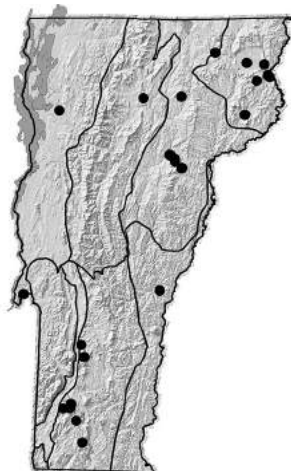
Epitheca cynosura
Common Baskettail



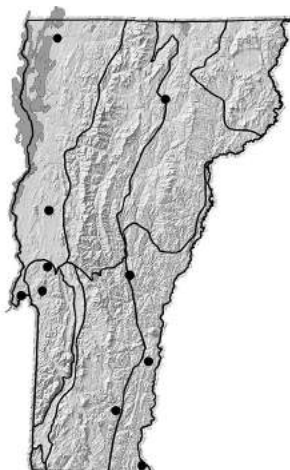
Epitheca princeps
Prince Baskettail



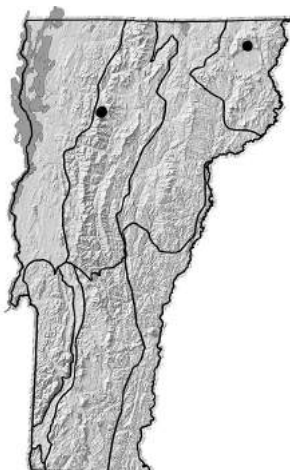
Epitheca spinigera
Spiny Baskettail



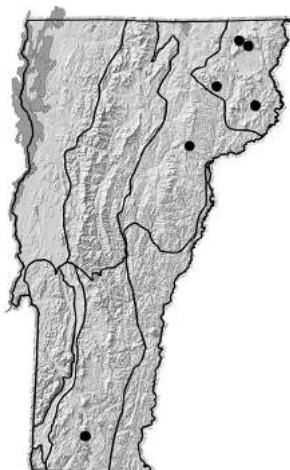
Helocordulia uhleri
Uhler's Sundragon



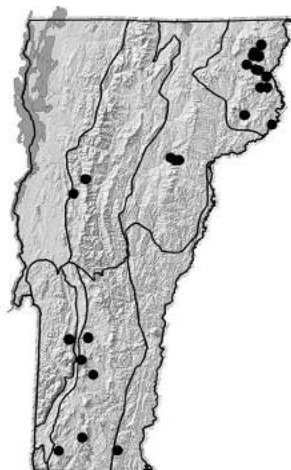
Neurocordulia yamaskanensis
Stygian Shadowdragon



Somatochlora albicincta
Ringed Emerald

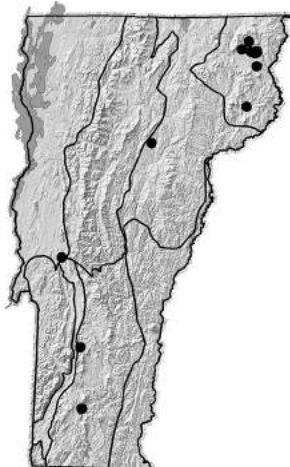


Somatochlora cingulata
Lake Emerald

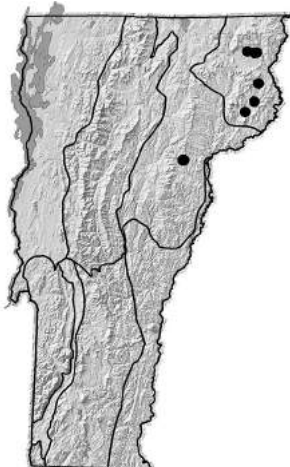


Somatochlora elongata
Ski-tipped Emerald

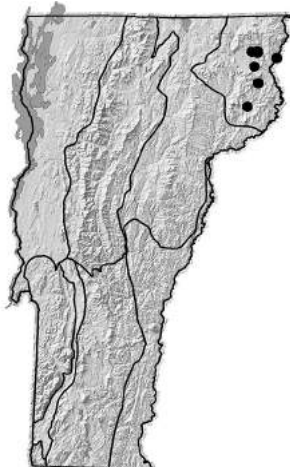
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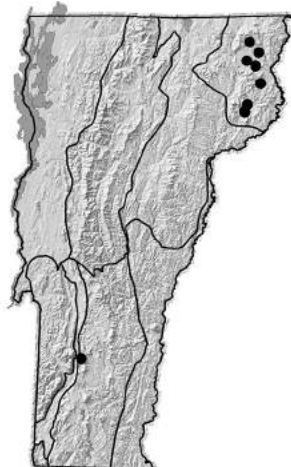
Somatochlora forcipata
Forcipate Emerald



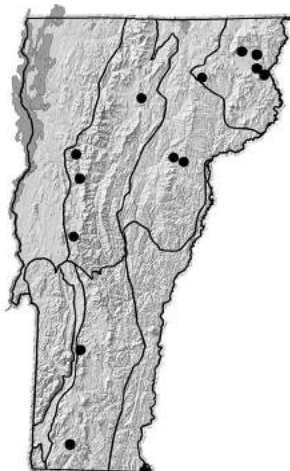
Somatochlora franklini
Delicate Emerald



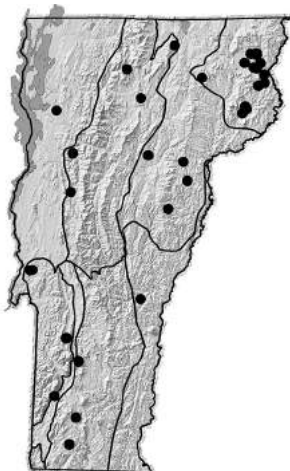
Somatochlora kennedyi
Kennedy's Emerald



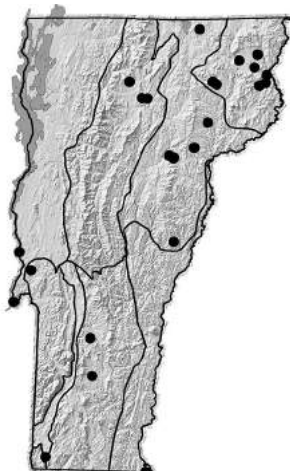
Somatochlora minor
Ocellated Emerald



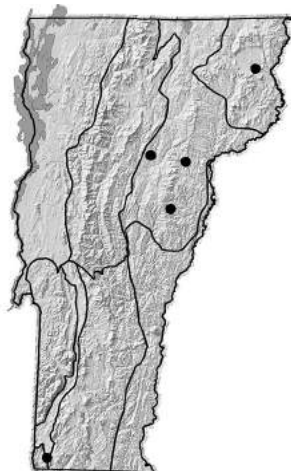
Somatochlora tenebrosa
Clamp-tipped Emerald



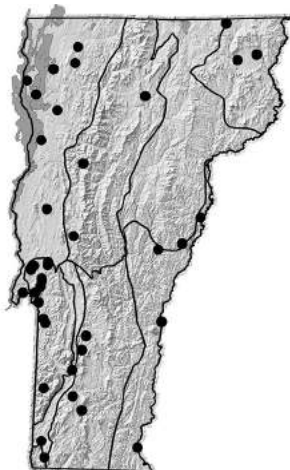
Somatochlora walshii
Brush-tipped Emerald



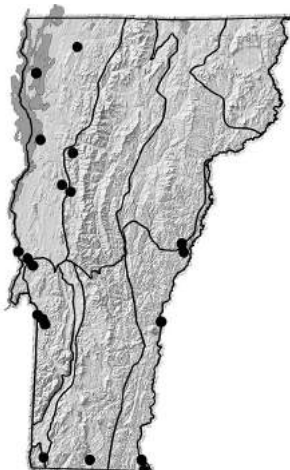
Somatochlora williamsoni
Williamson's Emerald



Williamsonia fletcheri
Ebony Boghaunter



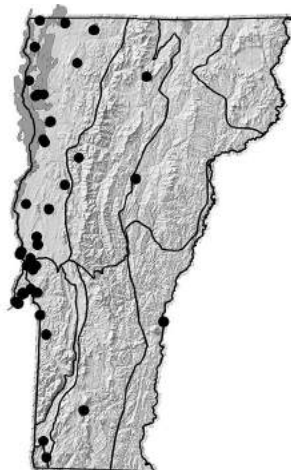
Celithemis elisa
Calico Pennant



Celithemis eponina
Halloween Pennant

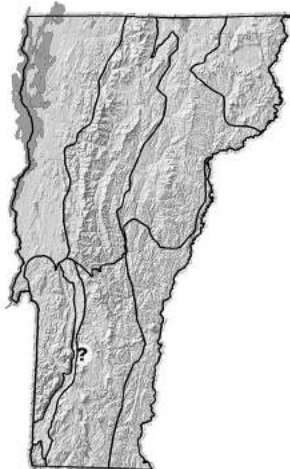


Celithemis fasciata
Banded Pennant

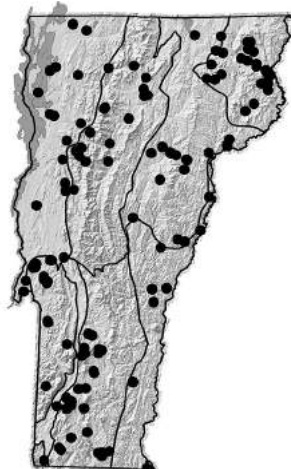


Erythemis simplicicollis
Eastern Pondhawk

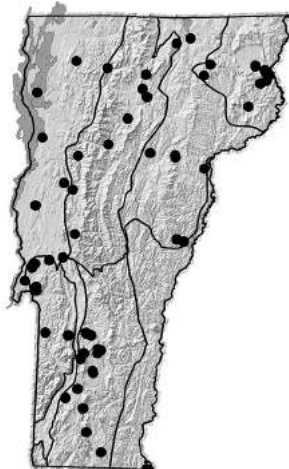
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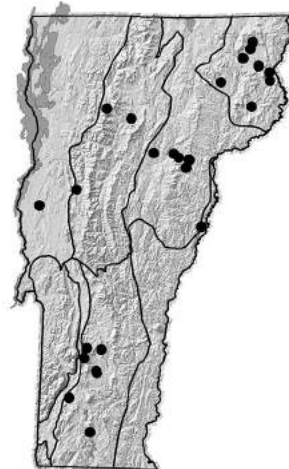
Ladona exusta
White Corporal



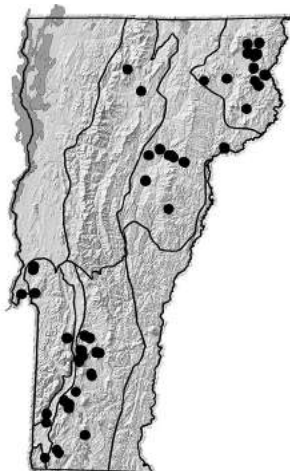
Ladona julia
Chalk-fronted Corporal



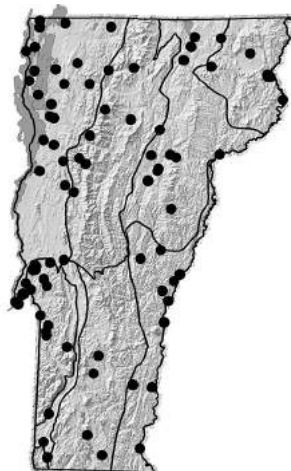
Leucorrhinia frigida
Frosted Whiteface



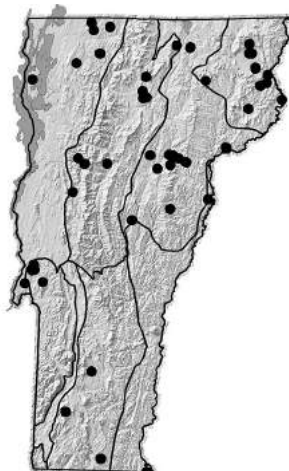
Leucorrhinia glacialis
Crimson-ringed Whiteface



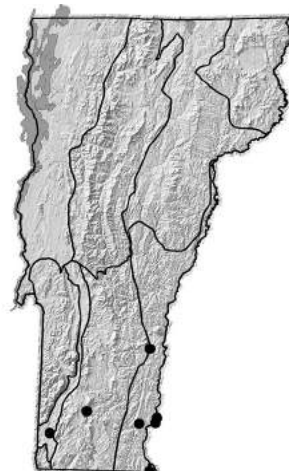
Leucorrhinia hudsonica
Hudsonian Whiteface



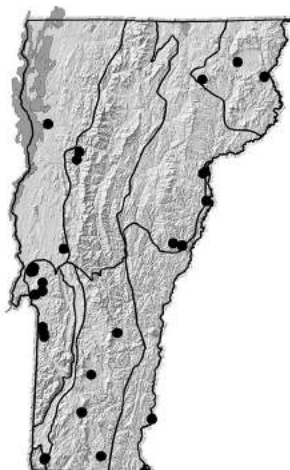
Leucorrhinia intacta
Dot-tailed Whiteface



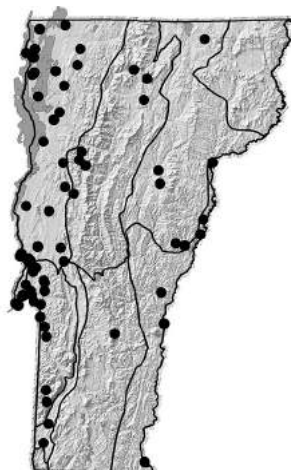
Leucorrhinia proxima
Belted Whiteface



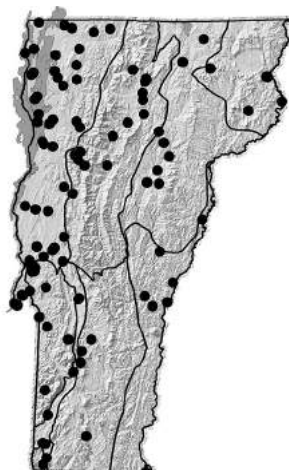
Libellula cyanea
Spangled Skimmer



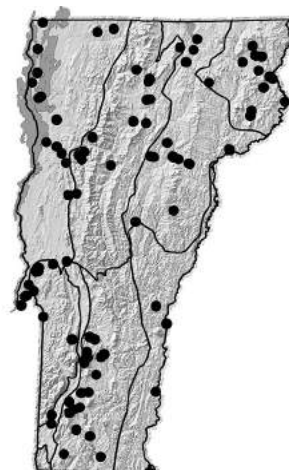
Libellula incesta
Slaty Skimmer



Libellula luctuosa
Widow Skimmer

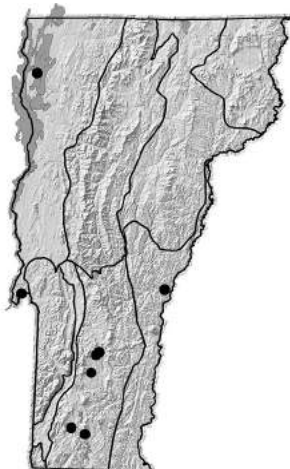


Libellula pulchella
Twelve-spotted Skimmer

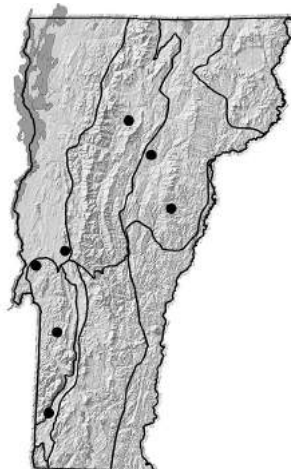


Libellula quadrimaculata
Four-spotted Skimmer

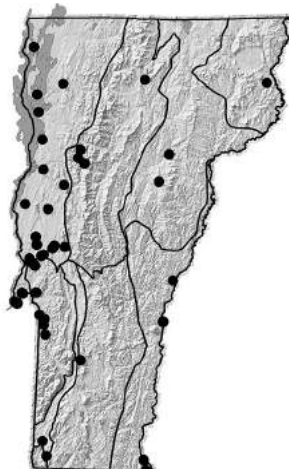
Appendix 3 continued...



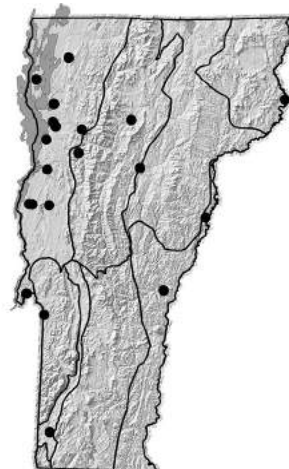
Libellula semifasciata
Painted Skimmer



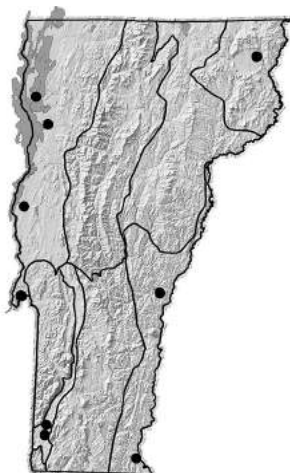
Nannothemis bella
Elfin Skimmer



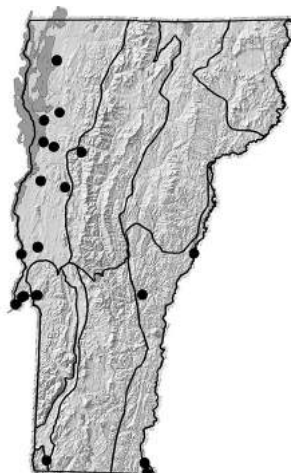
Pachydiplax longipennis
Blue Dasher



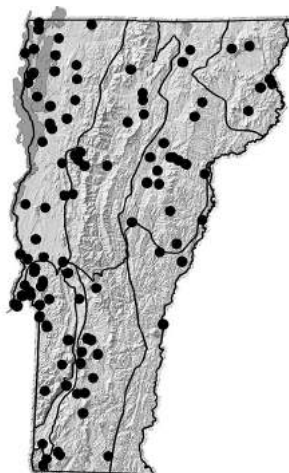
Pantala flavescens
Wandering Glider



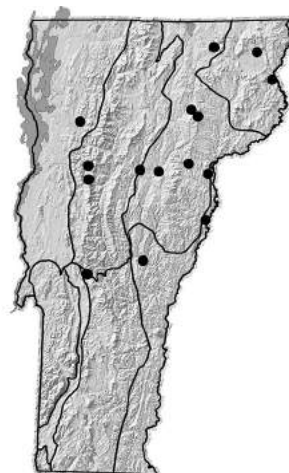
Pantala hymenaea
Spot-winged Glider



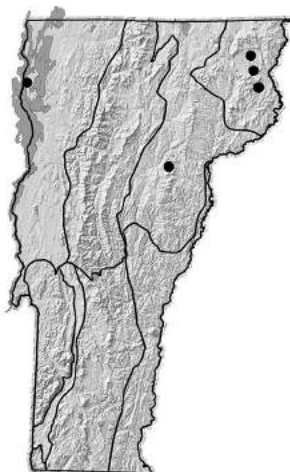
Perithemis tenera
Eastern Amberwing



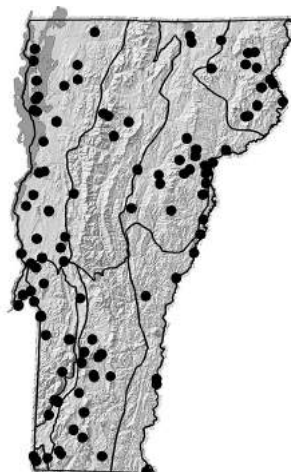
Plathemis lydia
Common Whitetail



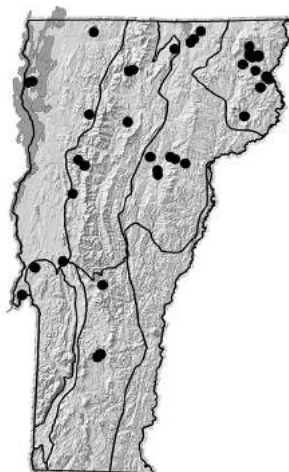
Sympetrum costiferum
Saffron-winged Meadowhawk



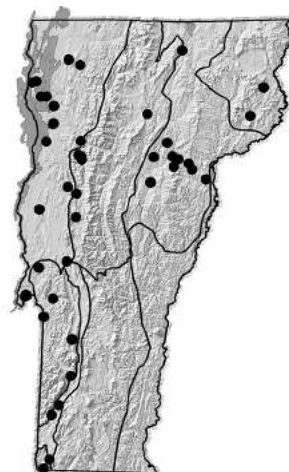
Sympetrum danae
Black Meadowhawk



Sympetrum internum
Cherry-faced Meadowhawk

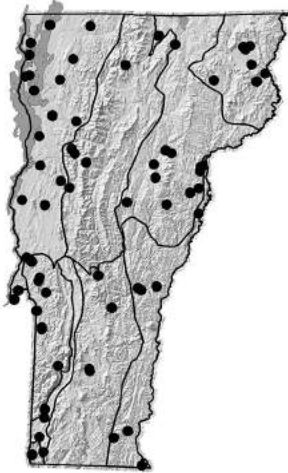


Sympetrum obtrusum
White-faced Meadowhawk

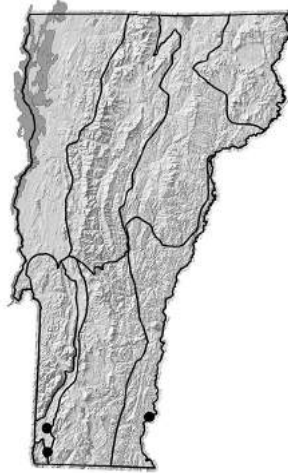


Sympetrum semicinctum
Band-winged Meadowhawk

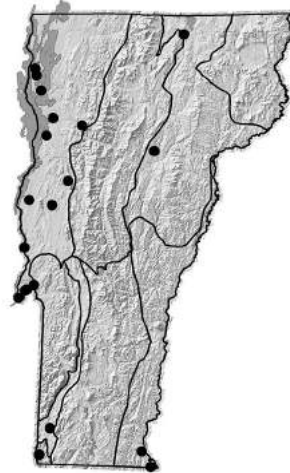
Appendix 3 continued...



Sympetrum vicinum
Autumn Meadowhawk



Tramea carolina
Carolina Saddlebags



Tramea lacerata
Black Saddlebags

The Dragonfly Society Of The Americas

Business address: Celeste Mazzacano, The Xerces Society for Invertebrate Conservation, 628 NE Broadway, Suite 200, Portland, Oregon, USA 76232

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Bulletin Of American Odonatology is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The BAO publishes taxonomic studies but will not consider the publication of new names at any taxonomic level.

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Membership in the DSA is open to any person in any country and includes a digital subscription to ARGIA. Dues for individuals in the US, Canada, or Latin America are \$15 us for regular memberships (including non-North Americans), institutions, or contributing memberships, payable annually on or before 1 March of membership year. The Bulletin Of American Odonatology is available by a separate subscription at \$20 us for North Americans and \$25 us for non-North Americans and institutions. Membership dues and BAO subscription fees should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, Florida, USA 32311. More information on joining DSA and subscribing to BAO may be found at <www.dragonflysocietyamericas.org/join>.

Mission of the Dragonfly Society of the Americas

The Dragonfly Society of the Americas advances the discovery, conservation and knowledge of Odonata through observation, collection, research, publication, and education.

