

**NOTE*****Scudderia fasciata* and *Scudderia septentrionalis* (Orthoptera: Tettigoniidae) from the Maritime Provinces of Canada, with additional notes on the Tettigoniidae of New Brunswick****Jake H. Lewis and Donald F. McAlpine**

Scudder and Vickery (2010) provided an updated checklist to the Orthoptera of the Atlantic Maritime Ecozone (New Brunswick [NB], Nova Scotia [NS], Prince Edward Island [PE], the Gaspé and Eastern Townships of Quebec). Since then a number of new Orthoptera species have been confirmed in NB, NS, and PE (Catling 2013; McAlpine et al. 2015 and papers cited therein). However, many of these species have been reported from only a single or very limited number of localities, with the result that geographic range and abundance remains poorly known for many Orthoptera in the region. Here, we present the first reports for Atlantic Canada of the Bush Katydid, *Scudderia fasciata* Beutenmüller, 1894 and *Scudderia septentrionalis* (Serville, 1839). The former is associated with conifers, the latter is a deciduous tree specialist (Bland 2003). We also present new distributional records from NB for seven additional species of Tettigoniidae that were previously recorded for the province from a limited number of sites. Specimen records reported here are based on material deposited in the New Brunswick Museum (NBM).

***Conocephalus brevipennis* (Scudder, 1863)**

NEW BRUNSWICK: Charlotte Co.: Bonaview Road, near Canty Lake (45.200954°, -67.10324°), 22 September 2017, J.H. Lewis, from roadside vegetation (1 male, NBM-054773); **Sunbury Co.:** near Noonan, Grand Lake Protected Natural Area (45.98310°, -66.40211°), 15 August 2014, J.H. Lewis, old field habitat (2 males, NBM-054761); **Queens Co.:** Adjacent to Nerepis River, 4.6 km northeast of Welsford (45.469446°, -66.322665°), 21 September 2015, D.F. McAlpine, damp old field habitat (2 males, NBM-054820); **York Co.:** 6.5 km southwest of McAdam (45.551688°, -67.383805°), 23 September 2015, D.F. McAlpine, old field along Hwy 630 (1 female, NBM-054821); Nackawic (46.005339°, -67.235029°), 10 September 2016, D.F. McAlpine, old field (1 male, NBM-054817); Ayers Lake (45.201208°, -67.274120°), 11 September 2016, D.F. McAlpine, damp verge of woods road (8 males, 8 females, NBM-054818); Pirate Lake, Spednic Lake Protected Natural Area (45.722202° -67.66416°), 19 August 2017, D.F. McAlpine, floating bog (5 males, 1 female, NBM-054825); Diggity Stream, Spednic Lake Protected Natural Area (45.621°, -67.435°), 11 August, 21 August 2017, D.F. McAlpine, R.W. Webster (3 males, 1 female, NBM-054826, NBM-054824); 0.5 km east of McAllister Cove, Spednic Lake, Spednic Lake Protected Natural Area (45.65025°, -67.66172°), 17 August 2017, M. Empey, bog margin (2 males, NBM-054834); Silas Cove, upstream towards Bolton Lake, Spednic Lake Protected Natural Area (45.662034°, -67.516809°), 18 August 2017, J.H. Lewis, bog along stream (1 male, NBM-054819).

This species was previously reported in NB from two sites in Queens County and a single site in York County (McAlpine and Ogden 2012; Catling et al. 2013). The number of records now available for *Conocephalus brevipennis* suggests widespread distribution in at least southwestern NB. Although *Conocephalus brevipennis* is not as widespread in NB as *Conocephalus fasciatus* (De Geer, 1773) (Vickery and Kevan 1985), the species is clearly not uncommon. Vickery and Kevan (1985) note that *Conocephalus brevipennis* occupies wetter habitats than *Conocephalus fasciatus*. In NB, *Conocephalus brevipennis* certainly seems to be most prevalent in wet meadows, damp grassy verges, and along wetland margins.

Received 2 February 2018. Accepted for publication 10 April 2018. Published on the Acadian Entomological Society website at www.acadianes.ca/journal.php on 23 April 2018.

Jake H. Lewis and Donald F. McAlpine: New Brunswick Museum, 277 Douglas Avenue, Saint John, New Brunswick, Canada, E2K 1E5

Corresponding author (email jlewis3@unb.ca)

***Neoconocephalus ensiger* (Harris, 1841)**

NEW BRUNSWICK: Saint John Co.: Saint John, near Drury Cove and Brookville (45.330212°, -66.030783°), 9 September 2016, J.H. Lewis, calling in roadside old field habitat (10 males, NBM-054758); Saint John, near Fairville Plateau (45.247462°, -66.101215°), 10 September 2016, J.H. Lewis, calling along grassy road margin (1 male, NBM-054769); Saint John, University of New Brunswick Saint John Campus (45.305835°, -66.082611°), 11 September 2016, J.H. Lewis, calling along grassy road margin (1 male, NBM-054770); Saint John, University of New Brunswick Saint John Campus (45.308852°, -66.084890°), 5 October 2016, J.H. Lewis, calling in small overgrown field (1 male, NBM-054771); Saint John, near Drury Cove and Brookville (45.33033°, -66.030666°), 17 September 2017, J.H. Lewis, calling with several other males in roadside old field habitat (1 male, NBM-054772).

Vickery and Kevan (1985) reported *Neoconocephalus ensiger* from two sites in the Canadian Maritime Provinces; from southwestern NS and in western NB near the Canada-US border. More recently, a single male specimen was collected in Kings County, NB (McAlpine et al. 2015). The records presented here suggest this species can be quite abundant in old field and grassy road margin habitats in Saint John County. Future survey efforts will likely reveal the presence of this species in other areas of the province.

***Orchelimum gladiator* Bruner, 1891**

NEW BRUNSWICK: Sunbury Co.: near Noonan, Grand Lake Protected Natural Area (45.9831°, -66.40211°), 15 August 2014, J.H. Lewis, old field habitat (1 male, NBM-054761); **York Co.:** Bolton Brook, Silas Cove, Spednic Lake Protected Natural Area (45.66°, -67.52°), 10 August 2017, 18 August 2017, D.F. McAlpine, J.H. Lewis, tall grasses in ericaceous bog (1 female, 1 male, NBM-054831, NBM-054828); Georgia Pacific Road, 4 km N of Pirate Lake, Spednic Lake Protected Natural Area (45.72239°, -67.65942°), 15 August 2017, J.H. Lewis, dried marsh (2 males, NBM-054835); Dead Brook, Route 630, Spednic Lake Protected Natural Area (45.655°, -67.449°), 10 August 2017, 11 August 2017, J.H. Lewis, marshy vegetation (2 males, NBM-054829, NBM-054830); Pirate Lake, Spednic Lake Protected Natural Area (45.716886°, -67.658008°), 20 August 2017, J.H. Lewis, floating bog (1 male, NBM-054827).

McAlpine and Ogden (2012) reported *Orchelimum gladiator* from the Maritimes for the first time, from Prince Edward Island. Later, Catling et al. (2013) documented

the species from Kouchibouguac National Park, NB (Kent County) and York County, NB. The records presented here suggest a somewhat wider distribution in NB.

***Roeseliana roeselii* (Hagenbach, 1822)**

NEW BRUNSWICK: Northumberland Co.: Nepisiguit River, Nepisiguit Protected Natural Area, approximately 13 km upstream from Popple Depot (47.354416°, -66.677613°), 16 August 2016, J.H. Lewis, on riverside vegetation (1 male, NBM-054760); **Sunbury Co.:** Gilbert Island (45.8870°, -66.3209°), 18 July 2012, C. Hughes, pasture land (1 male, 1 female, NBM-044496).

Roeseliana roeselii was first reported in the Maritimes by McAlpine (2009) from Saint John County, NB in 2008. However, Catling et al. (2013) later presented somewhat earlier records (2003–2006) from the province for this tettigoniid. The species is a European introduction that apparently entered North America prior to 1952 and since has become widespread in the northeast (Nickle 1984). In NB, *Roeseliana roeselii* has previously been reported from Albert, Charlotte, Kent, Queens, Victoria, and York counties (McAlpine and Ogden 2012; Catling et al. 2013; McAlpine et al. 2015). The species is clearly widespread in NB, and with additional sampling effort may also be discovered in NS and PE.

***Scudderia curvicauda* (De Geer, 1773)**

NEW BRUNSWICK: York Co.: large bog 2.5 kilometers northwest of Musquash Lake, Spednic Lake Protected Natural Area (45.69874°, -67.67813°), 14 August 2017, J.H. Lewis, mostly calling individuals from shrubs at edge of large, wet sphagnum bog, (4 males, 2 females, NBM-054763); **Charlotte Co.:** bog off Hwy. 1, near Cauty Lake and Haddock Lake (45.199751°, -67.105317°), 3 August 2016, J.H. Lewis, on shrubs surrounding edge of bog, (2 males, NBM-065027).

Scudder and Vickery (1985) show *Scudderia curvicauda* distributed throughout NS (including Cape Breton), and from one locality in NB (York County) and on PE (Kings County). The NB records reported here were collected from bog margins, although Vickery and Kevan (1985) report the species from a variety of open, wooded habitats. Males reported here were heard calling during the late evening from low shrubs and *Larix laricina* (Du Roi) K. Koch (Pinaceae). Further surveying effort will be required to determine the extent of this species' range in NB.

***Scudderia fasciata* Beutenmüller, 1894**

NEW BRUNSWICK: Northumberland Co.: Sevogle (47.0876°, -65.8613°), 17 September 2013 – 1 October 2013, Hughes, C., Webster, V., Van Rooyen, K., Morrison, A., Lindgren funnel trap in old *Pinus banksiana* Lamb. (Pinaceae) forest (1 female, NBM-044628); **Kings Co.:** Grand Bay-Westfield (45.33973°, -66.245166°), 15 September 2017, J.H. Lewis, calling individuals taken from lower branches of coniferous trees along trail through mixed forest and wet, disturbed habitat (2 males, NBM-054766).

Scudderia fasciata was previously reported to range from Tennessee and North Carolina north to Maine (Vickery and McKeven 1985), and is also known in Canada from southern Québec and Ontario (Bland 2003). The NB records presented here are in accordance with previous remarks on the association of *Scudderia fasciata* with coniferous trees (Kevan and Vickery 1985; Bland 2003).

***Scudderia furcata* Brunner, 1878**

NEW BRUNSWICK: Kings Co.: Grand Bay-Westfield (45.33973°, -66.245166°), 15 September 2017, J.H. Lewis, calling individuals taken from lower branches of deciduous trees along trail through mixed forest and wet, disturbed habitat (2 males, NBM-054767); **Charlotte Co.:** Bonaview Road., near Canty Lake (45.200954°, -67.10324°), 22 September 2017, J.H. Lewis, calling individuals taken from lower branches of deciduous trees along road (3 males, NBM-054768).

McAlpine et al. (2015) reported *Scudderia furcata* from NB for the first time, with records from York and Westmorland counties. Given that this species is also found throughout NS (Vickery and Kevan 1985) and is present on PE (Catling et al. 2013), the records presented here suggest *Scudderia furcata* is widespread throughout the Canadian Maritime provinces.

***Scudderia pistillata* Brunner, 1878**

NEW BRUNSWICK: Albert Co.: 1.3 km east of McKinley Brook, Caledonia Gorge Protected Natural Area (45.77718°, -64.78658°), 12 September 2011, D.F. McAlpine (4 males, 1 female; NBM-044631); **Gloucester Co.:** Daly Point Nature Reserve, Bathurst (47.638012°, -65.615399°), 9 August 1993, R.P. Webster (1 female, NBM-023220); **Kent Co.:** Callanders Beach, Kouchibouguac National Park (46.80732°, -64.90716°), 14 July 2012, D. Doucet (1 female, NBM-065025); **Queens Co.:** Department National Defense Base Gagetown, Hampstead Road Junction (45.60941°, -66.18875°), 19 August 2009, D.F. McAlpine (1 female,

NBM-028220); **Restigouche Co.:** Belledune Pond, Jacquet River Gorge Protected Natural Area (47.82073°, -65.99543°), 12 August 2010, D.F. McAlpine (2 males, NBM-031205); **Saint John Co.:** Blueberry Hill Nature Reserve, Saint John (45.2981°, -66.1898°), 25 August 2009, D.F. McAlpine (1 male; NBM-028247); **York Co.:** Barkers Point (45.950558°, -66.610699°), 19 August 1994, T.J. Fletcher (1 male, NBM-023234); Pats Brook, Spednic Lake Protected Natural Area (45.62096°, -67.43415°), 15 August 2017, marsh vegetation, D.F. McAlpine, R.P. Webster (2 females, NBM-065026); **Sunbury Co.:** end of Grub Road, near Foshay Lake, Burpee (45.942549°, -66.299488°), 11 August 2014, J.H. Lewis, shrubs bordering lake (1 female, NBM-065028).

Data presented by Vickery and Kevan (1985) and Catling et al. (2013) show *Scudderia pistillata* to be widespread in NS and PE, respectively. Although there are only three previously published NB records for *Scudderia pistillata* (Vickery and Kevan 1985), the data presented here likewise demonstrates a wide distribution in NB for this species. In fact, *Scudderia pistillata* appears to be the most widespread member of the genus in the Canadian Maritime provinces. Vickery and Kevan (1985) also reported *Scudderia pistillata* in Canada from Alberta, Saskatchewan, Manitoba, Ontario and Québec.

***Scudderia septentrionalis* (Serville, 1839)**

NEW BRUNSWICK: York Co.: Wauklehegan Court, McAdam (45.59270°, -67.31593°), 12 August 2017, J.H. Lewis, singing individual collected at 2230 hrs from upper branches of *Alnus* sp. (Betulaceae) at forest edge along road through residential area (1 male, NBM-054764); North Lane, McAdam (45.59919°, -67.3261°), 14 August 2017, J.H. Lewis, singing individuals collected at 2130-2230 hrs from upper branches of *Alnus* sp. at forest edge along road through residential area (2 males, NBM-054762); **Charlotte Co.:** St. David (45.219586°, -67.232816°), 25 September 2017, J.H. Lewis, two individuals taken from top of low *Populus* sp. (Salicaceae) in roadside clear-cut (2 males, NBM-054765, Figure 1).

Scudderia septentrionalis is an arboreal species of eastern deciduous forests (Cantrall 1968; McCafferty 1976) previously known to range from Tennessee and South Carolina north to Minnesota and Maine, and from southern Ontario and Québec (Vickery and Kevan 1985). Period of seasonal activity has been reported as July 13 to September 28 (Cantrall 1968). The species has been described as uncommon (Bland 2003), very rare (Morse

Figure 1. *Scudderia septentrionalis* (NBM-054765) taken at St. David, Charlotte County, New Brunswick (45.219586°, -67.232816°) on 25 September 2017. (Photo credit: J.H. Lewis).



1919) to "...unquestionably one of the scarcest forms of North American Orthoptera having a distribution so extensive." (Rehn and Hebard 1914). Cantrall (1943), however, attributed the species apparent rarity to its tree-dwelling habits and capture difficulty. *Scudderia septentrionalis* is unique amongst Northeastern *Scudderia* in its distinctly petite size, male supra-anal plate lacking an elongate process, and complex two part song. Cantrall (1943) noted the absence of singing records of *Scudderia septentrionalis* during the day. In NB, singing was restricted to periods at or after sundown and males were found to be particularly responsive to playback of recorded songs. Even when temperature had dropped and individuals of *Scudderia septentrionalis* had not called for periods up to 20 minutes, song playback would often elicit a quick response in the form of a sequence of "tzick" calls, or a full-fledged two-part song.

ACKNOWLEDGMENTS

Funding for surveying during field programs in New Brunswick Protected Natural Areas (BiotaNB) was provided to the New Brunswick Museum Centre for Biodiversity Research by the New Brunswick Environmental Trust Fund, New Brunswick Wildlife Trust Fund, Salamander Foundation, Environment Canada, UNB Grand Lake Meadows Endowment Fund and the New Brunswick Department of Energy and Resource Development. We acknowledge with thanks the contributions of the various collectors cited who deposited material in the NBM collection. We also thank John Klymko and Paul Catling for their suggestions for improvements to the manuscript.

REFERENCES

- Bland, R.G. 2003. The Orthoptera of Michigan - Biology, Keys, and Descriptions of Grasshoppers, Katydid, and Crickets. 1st edition. Michigan State University Extension, East Lansing, Michigan. 220pp.
- Cantrall, I.J. 1943. The Ecology of the Orthoptera and Dermaptera of the George Reserve, Michigan. Miscellaneous Publications of the Museum of Zoology, University of Michigan **54**: 1-182.
- Cantrall, I.J. 1968. An Annotated List of the Dermaptera, Dictyoptera, Phasmatoptera, and Orthoptera of Michigan. The Great Lakes Entomologist **1**: 299-346.
- Catling, P, McAlpine, D.F., Adam, C.I.G., Belliveau, G., Doucet, D., Fairweather, A.D., Malloch, D., Sabine, S.L., and Thomas, A.W. 2013. New and noteworthy records of Orthoptera and allies in the Maritimes and the Îles-de-la-Madeleine, Quebec. Canadian Field-Naturalist **127**: 332-337.
- McAlpine, D.F. 2009. First occurrence of Roesel's Bush Cricket, *Metrioptera roeselii*, (Hagenbach), (Orthoptera: Tettigoniidae), in New Brunswick. Journal of the Acadian Entomological Society **5**: 1-2.
- McAlpine, D.F., and Ogden, J.B. 2012. New and noteworthy records of Orthoptera from Maritime Canada. Journal of the Acadian Entomological Society **8**: 43-47.
- McAlpine, D.F., Sabine, D.L., Lewis, J.H., and Webster, R.P. 2015. First report of *Scudderia f. furcata* (Tettigoniidae) and other noteworthy records of Orthoptera from New Brunswick. Journal of the Acadian Entomological Society **11**: 1-4.
- McCafferty, W.P. 1976. Indiana Ensifera (Orthoptera). The Great Lakes Entomologist **9**: 23-56.
- Morse, A.P. 1919. A list of the Orthoptera of New England. Psyche **26**: 21-39.
- Nickle, D.A. 1984. *Metrioptera roeseli*, a European katydid found for the first time in Pennsylvania, (Orthoptera: Tettigoniidae: Decticinae). Proceedings of the Entomological Society of Washington **86**: 744.
- Rehn, J.A.G., and Hebard, M. 1914. Studies in American Tettigoniidae (Orthoptera): I and II. Transactions of the American Entomological Society **40**: 271-344.
- Scudder, G.E., and Vickery, V.R. 2010. Grasshoppers (Orthoptera) and allied insects of the Atlantic Maritime Ecozone. In: Assessment of Species Diversity in the Atlantic Maritime Ecozone. Edited by D.F. McAlpine, and I.M. Smith. NRC Research Press, National Research Council Canada, Ottawa, Ontario. pp. 371-379.

Vickery, V.R., and Kevan, D.K.M. 1985. The insects and arachnids of Canada, part 14. The grasshoppers, crickets, and related insects of Canada and adjacent regions. Ulonata: Dermaptera, Cheleutoptera, Notoptera, Dictuoptera, Grylloptera, and Orthoptera. Agriculture Canada Research Branch Publication 1777. Ottawa, Ontario. 918 pp.