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Cover photo: Long-horned bee (*Melissodes*). Photo by J. Gibbs.

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NEW RECORDS OF THE CHEWING LOUSE, *EUTRICHOPHILUS SETOSUS* (PHTHIRAPTERA: TRICHODECTIDAE), INFESTING NORTH AMERICAN PORCUPINE, *ERETHIZON DORSATUM* (RODENTIA: ERETHIZONTIDAE), IN MANITOBA, CANADA

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Chewing lice in the family Trichodectidae are all permanent parasites of terrestrial or semi-aquatic mammals. All 19 species of the trichodectid genus *Eutrichophilus* infest New World porcupines (Erethizontidae) (Timm & Price 1993, 1999; Price *et al*. 2003; note host classification by Voss *et al*. 2013). *Eutrichophilus setosus* (Giebel) is a host-specific parasite of the North American porcupine, *Erethizon dorsatum* (Linnaeus), distributed throughout its host range from Alaska to northern Mexico (Timm & Price 1993). In Canada, it has been recorded in British Columbia (Hopkins 1960), Alberta (Hopkins 1960), Ontario (Judd 1954), and Nova Scotia (Thompson 1934; Wright 1979). There is one record of two specimens deposited in the Canadian National Collection of Insects, Arachnids and Nematodes (Ottawa), collected in Dollard, Saskatchewan, 21 Jan. 1935, by C.F. Holmes. I believe the records below to be the first for Manitoba.

MATERIALS AND METHODS

Four porcupines were salvaged from the Wildlife Haven rehabilitation hospital at Île des Chênes, Manitoba. Case number (*e.g*., POR/35/CEN/99 indicates the mammal host, the numerical sequence of submission, the source of the host, and the year admitted). These animals succumbed at the hospital to injuries sustained in the wild, or in one case (POR/1692/CEN/10) died in care of unknown causes and were immediately frozen at -20 ˚C before being transported to the lab and subsequently examined for ectoparasites. Once removed from the freezer and allowed time to thaw to the point of flexibility in the limbs, each animal was weighed, and then vigorously washed twice in warm soapy water and once in clean warm water, as described by Galloway (2020), with some modifications. Because of the prickly nature of porcupines, special caution had to be used during the washing process. Animals were held only by the paws, where there are no quills, and the person washing the porcupine wore heavy duty leather lineman gloves. Because quills cover most of the body, only the face and belly were rubbed to assist in dislodging ectoparasites. Each wash was passed through a 90 µ sieve, and the residue was

preserved in 95% ethanol. An interesting problem arose using this technique where dislodged quills became embedded in the screen of the sieve. Quills were removed carefully to minimize damage to the screen. Samples were sorted using a stereomicroscope, and all ectoparasites were preserved in 95% ethanol. Infestation parameters were calculated using Quantitative Parasitology, QWeb (Version 1.9.15, 2020) (Reiczigel *et al*. 2019).

One road-killed porcupine from St. Francois Xavier (15 Jun. 2003) was examined superficially at the roadside. Because of its physical condition, it was not returned to the lab to be washed.

Representative samples of chewing lice were mounted onto glass microscope slides using the method described by Richards (1964). All specimens were deposited in the J.B. Wallis/R.E. Roughley Museum of Entomology, Department of Entomology, University of Manitoba, Winnipeg, Manitoba.

RESULTS

The four porcupines received from Wildlife Haven are as follows: Camp Assiniboia (3720 g), 3 Feb. 1999 (POR/35/CEN/99); Balmoral (3402 g), 21 Feb. 2001 (POR/33/CEN/01); Birds Hill Park (2495 g), 9 Feb. 2011 (POR/1692/CEN/10); Zhoda, juvenile (1670 g), 29 Dec. 2014 (POR/no case number/CEN/14). All animals were infested (prevalence = 100%) with the following number of specimens of *E. setosus*, respectively: 39♂, 29♀, 25 nymphs; 19♂, 50♀, 183 nymphs; 1♂, 6♀, 2 nymphs; 56♂, 27♀, 67 nymphs. The total number of lice collected was 504. Mean intensity of infestation was 126 (Bootstrap BCa, 95% confidence limits, 2000 bootstrap replications = 32.5 to 201). The variance/mean ratio was 79.5, and Poulin's discrepancy index (DI) was 0.302 (95% CI, bootstrap BCa with 1000 replications: 0.101 to 0.523). The sample size was too small to fit the negative binomial exponent value *k* (1.135) with confidence. There was no statistical difference in the overall number of males (n=115) versus that of females (n=112) ($\chi^2 = 0.04$; $df = 1$) The ratio of total males to females is 1.03. The ratio of total nymphs to females was 2.47.

No lice were found on the road-killed porcupine from St. Francois Xavier, perhaps because of the restrictive nature of circumstances under which the animal was examined. This animal was infested with 13♂ and 5♀ specimens of American dog tick, *Dermacentor variabilis* (Say).

DISCUSSION

New World porcupines (Caviomorpha: Erethizontidae) are distributed throughout the Americas, from Alaska to northern South America, and are infested by 19 species of the chewing louse genus, *Eutrichophilus* (Price *et al*. 2003). They are not very closely related to Old World porcupines (Hystricomorpha: Hystricidae) (see Huchon & Douzery 2001), none of which are known as hosts for chewing lice (Price *et al*. 2003). *Erethizon dorsatum* is the only species of porcupine in North America north of Mexico, ranging from northern Alaska, across Canada

(with the exception of Newfoundland) and the United States into northern Mexico (Woods 1973). The American porcupine does not hibernate anywhere in its range, and during colder months at higher latitudes, the soft underfur grows longer (Woods 1973). It should be noted that all four porcupines washed in the current study were obtained during winter months (December and February). It is not known whether there are seasonal patterns of infestation by *E. setosus*.

Although the efficiency of washing porcupines to collect lice was not determined, this is the first attempt to quantify total chewing louse populations on this host. There are references in the literature to porcupines being "heavily infested" with *E. setosus* (Jellison 1953; Roze 2009), or lice being "numerous", with males and females, but no nymphs being reported by Judd (1954). Most often, authors simply note the occurrence of lice on a host (*e.g.*, Kilham 1932; Thompson 1934; Canaris 1960). Jellison (1933) noted 79 specimens being collected from two museum skins by C.E. Johnson in 1931. Hopkins (1960) reported numbers of one, 11, 42, 44, and 46 in five different collections in Alberta and British Columbia by J. McT. Cowan and G.J. Spencer. It is not known if each of these collections was made from only one animal or more, or how the lice were collected from these porcupines. Apparently, Cowan and Spencer collected no nymphs, or at least none were reported. The objectives of many of these studies were to note the occurrence of lice in a particular geographic location. Consequently, there were seldom specified attempts to quantify the total infrapopulations of lice on their host porcupines. Nymphs were generally considered of lesser taxonomic importance, and their numbers were not always collected, or even their presence reported.

There is no question that sex ratios in mammal lice, and parasitic lice in general, require additional study (Clayton *et al*. 2016). Hopkins (1949) found that the sex ratios of mammal lice varied considerably from one host to another of the same species, but in general, females outnumbered males, or there were no significant differences in the proportions of males versus females (see also Marshall 1981). The sample size ($n = 4$) in the present study is too small to draw valid conclusions about the sex ratio in *E. setosus*, but observations here are consistent with those of Hopkins (1949). There was no significant difference in the total numbers of males versus females, though males outnumbered females on two animals, and females outnumbered males on the other two.

The results presented here add support to the importance of the role of wildlife rehabilitation hospitals in the study of diversity and ecology of arthropod ectoparasites (Galloway 2023).

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database on Phthiraptera. The continued support of the Department of Entomology and the Faculty of Agricultural and Food Sciences is greatly appreciated.

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NEW RECORDS OF COLEOPTERA (CARABIDAE, CERAMBYCIDAE, CICINDELIDAE) FOR MANITOBA AND NORTHWESTERN ONTARIO

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ABSTRACT

New records for three genera and ten species are added to the provincial list of Manitoba Coleoptera. Nine are Carabidae: *Clivina fossor* (Linnaeus 1758); *Bembidion occultator* Notman 1920*; B. planatum* (LeConte 1847); *B. rusticum* Casey 1918*; Pterostichus castor* Goulet & Bousquet 1983*; Oodes fluvialis* LeConte 1863; *Xestonotus lugubris* (Dejean 1829); *Harpalus affinis* (Schrank 1781); and *Platynus tenuicollis* (LeConte 1846). One is Cerambycidae: *Parelaphidion aspersum* (Haldeman 1847). Four range extensions for Cicindelidae are presented for Manitoba: *Cicindela duodecimguttata* Dejean 1825*; Cicindela formosa generosa* Dejean 1831; *Cicindela hirticollis shelfordi* Graves 1988 and *Cicindela scutellaris lecontei* Haldeman 1853. Two records for a rare species, Carabidae: *Platypatrobus lacustris* Darlington 1938 are presented for Manitoba. One range extension for Cicindelidae: *Cicindela scutellaris lecontei* and one range extension for Carabidae: *Oodes fluvialis* are presented for northwestern Ontario. One record for a rare species, Carabidae: *Pterostichus corrusculus* LeConte 1873 is presented for northwestern Ontario.

INTRODUCTION

The Coleoptera documented for Canada and Alaska were presented as a checklist by Bousquet *et al.* (2013). This included 376 species of Carabidae (including Cicindelidae) and 113 species of Cerambycidae for Manitoba. Lindroth (1961–1969) presented carabid collection records for Manitoba, including the far north. Holliday *et al*. (2014) reviewed the Carabidae of the Prairie grasslands of Canada. Woodcock *et al.* (2013) and Holliday (1982) documented carabid species records for the Churchill, Manitoba area. Bousquet *et al*. (2017) include a Canadian range map for *Parelaphidion* (Cerambycidae).

New provincial records for Manitoba are presented for the carabid genera *Clivina*, *Bembidion, Pterostichus, Oodes, Xestonotus, Harpalus*, and *Platynus* and for the cerambycid genus *Parelaphidion*. Range extensions and records of rare species of Carabidae and Cicindelidae are reported for both Manitoba and Northwestern Ontario.

METHODS

Specimens were collected using various methods. Plastic drinking cups with plastic rain covers were used as pitfall traps; a mixture of propylene glycol* and water was used as a bait/preservative and a small amount of denatonium benzoate was added as a bittering agent to deter vertebrate scavengers. Pitfalls traps with full-strength, red-wine vinegar were also used. Specimens were sifted from vegetative and beach debris with a two-part sifting litter box for cats. Specimens were hand-collected under stones or debris on the ground. Gravel on riverbanks was splashed with water and specimens were collected using an aspirator. Riverbanks and emergent shoreline vegetation were treaded to expose specimens. Fermentation traps were made from 2-litre soft drink bottles with windows cut out; dark brown sugar, molasses and yeast were mixed in water and allowed to ferment before being added to the traps.

* Propylene glycol was obtained from different sources depending on availability. Prestone® LowTox car antifreeze, Chem Fax®, Chem-Frost® 100% heat transfer fluid and Nemco® 100% propylene glycol were all used; all these products contained rust inhibitors.

Specimen Preparation and Determination

Specimens were pinned and determined to species by the author using Lindroth (1961, 1963, 1966, 1968, 1969a, 1969b), Bousquet (2010), Lingafelter (2000), and Pearson *et al.* (2015) with reference to the author's personal collection of Carabidae, Cicindelidae and Cerambycidae. Serge Laplante (Agriculture and Agri-Food Canada, Ottawa, ON) confirmed a Manitoba specimen was *Parelaphidion aspersum* (Haldeman 1847). Henri Goulet (retired, Agriculture and Agri-Food Canada, Ottawa, ON) confirmed the author's determinations for the Carabidae. The author did not identify *Bembidion occultator* Notman 1920 and *B. rusticum* Casey 1918 to species; identifications were done by Henri Goulet. The identifications for *Cicindela* were confirmed by Barry Knisley (Randolph-Macon College, Ashland, Virginia). The sex was not determined for specimens of *Clivina fossor* (Linnaeus 1758) as this can be confirmed only by internal structure.

Distribution

Canadian distributions for Carabidae and Cicindelidae are described using current abbreviations for provinces and territories (Bousquet 2012).

AB	Alberta
BC	British Columbia
MB	Manitoba
NB	New Brunswick
NL	Newfoundland and Labrador

NS	Nova Scotia
NT	Northwest Territories
NU	Nunavut
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan
YT	Yukon Territory

Only the US Border States which are geographically close to Manitoba are referenced for Carabidae and Cicindelidae. US state abbreviations follow those of the US Postal Service (Bousquet 2012).

MN	Minnesota
MT	Montana
ND	North Dakota
WI	Wisconsin

Distribution for Cerambycidae follow Bousquet *et al.* (2017).

Terms: References to "beavers" are to the American beaver, *Castor canadensis* Kuhl 1820. Species such as *Pterostichus castor* Goulet & Bousquet 1983 and *Platypatrobus lacustris* Darlington 1938 are defined as "obligate-associates of beavers" (Goulet 1965; Goulet & Bousquet 1983; Brunke *et al.* 2017), meaning they are found in association with beavers and their lodges. "Active" beaver lodges show signs of recent beaver activity such as new mud layers and logs. "Vacant" beaver lodges have no signs of recent beaver activity and often have weedy plant growth. "Teneral" refers to specimens where the imago has moulted and is soft and immature in colour. Specimens retained in the author's collection listed as: TLC. All scientific names for Coleoptera follow Bousquet (2012).

RESULTS

New Provincial Records for Manitoba

Family Carabidae Latreille 1802
Subfamily Scaritinae Bonelli 1810

Clivina fossor (Linnaeus 1758)

This Palaearctic species is adventive in North America, first found in eastern Canada in 1915 (Lindroth 1961). This species has been reported from AB, BC, NB, NL, NS, ON, PE, QC and SK in Canada, and from WI and MN in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 2; Pinawa, headwater of Pinawa channel; 50.159, -95.8685; 12 May 2012; T. Lawton leg.; sifted from beach debris on a thin, sandy beach backed by boulders; location of specimens: TLC • 1; Beaconia Beach; 50.443, -96.5761; 26/27 Jun 2022; T. Lawton leg.; sifted from vegetative debris at the edge of a *Typha* wetland; location of specimen: TLC • 1; Hwy 304, S of Manigotagan; 50.6992, -96.1023; 1/17 Jun 2022; T. Lawton leg.; pitfall trap on dry roadside at edge of a *Typha* wetland; location of specimen: TLC • 1; Winnipeg, Kings Park; 49.8002, -97.1262; 17 May 2023; T. Lawton leg; sifted from leaf debris in mature deciduous forest at edge of Red River during spring flooding; location of specimen: TLC; • 2; Hwy 15, at Brokenhead River; 49.8848, -96.3674; 31 May 2024; T. Lawton leg; treading vegetation at edge of the river; location of specimens: TLC.

Subfamily Trechinae Bonelli 1810

Bembidion occultator Notman 1920
This species has been reported from AB, NB, NL, NS, ON, QC and SK in Canada and from MN in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 1 ♂, 4 ♀, all teneral; SE of Wanipigow, Rice River Road; 51.1661, -96.1991; 11/26 Jul 2023; T. Lawton leg.; pitfall traps on or around a vacant beaver lodge on the dry flats of a drained beaver pond; location of specimens: TLC • 1 ♀; NE of Manigotagan; 51.1266, -96.222; 3/28 Aug 2023; T. Lawton leg.; pitfall trap set near pond in dry, previously flooded, grassy meadow; location of specimen: TLC • 2 ♂, teneral; NE of Gillam; 56.6872, -93.7995; 23 Aug 2022; T. Lawton leg.; pitfalls with red-wine vinegar on open flats with *Salix* and *Alnus* on the banks of the Nelson River; location of specimens: TLC.

Bembidion planatum (LeConte 1847)
This is the largest North American species of *Bembidion;* it has been reported from AB, BC, NB, NL, NS, NT, ON, QC and YT in Canada; it is also known from MT in the northwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 3 ♂, 1 ♀; NE of Gillam; 56.6872, -93.7995; 23 Aug 2022; T. Lawton leg.; collected by splashing water on gravel on a riverbank; location of specimens: TLC • 2 ♂, Kettle Dam, Stephens Lake; 56.3809, -94.6222; 13/15 Jun 2024; T. Lawton leg.; collected by splashing water on gravel on a lake shore; location of specimens: TLC.

Bembidion rusticum Casey 1918

Bembidion r. rusticum has been reported from NB, NL, NS, ON, and QC in Canada, *B. r. lenensoides* (Lindroth 1963) has been reported from AB, BC, and YT in Canada and from MT in the northwestern US (Bousquet 2012). The Manitoba specimens have a greenish luster on the forebody and pale rufous legs, consistent with *B. r. rusticum*.

Material examined. CANADA – Manitoba • 1 ♂, 4 ♀; NE of Gillam, gravel boat launch on the Nelson River; 56.6871, -93.7995; 23/24 Aug 2022; T. Lawton leg.; collected by splashing water on gravel on a riverbank; location of specimens: TLC.

Subfamily Harpalinae Bonelli 1810

Pterostichus castor Goulet & Bousquet 1983
This large species with distinctive parallel-sided, iridescent elytra is a relatively recent discovery. *Pterostichus castor* was described by Goulet & Bousquet (1983) from specimens collected in eastern North America. It is considered an obligate associate of beavers (Goulet & Bousquet 1983; Brunke *et al* 2017). This species has been reported from NB, ON and QC in Canada and from WI in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 1 ♂, 1 ♀; Hwy 6, SW of Thompson; 55.3389, -98.355; 2/6 Jul 2022; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 1 ♂, teneral; N of Powerview on Hwy 304; 50.7207, -96.1279; 3/10 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♀; N of Powerview on Hwy 304; 50.7207, -96.1279; 10/16 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♂; N of Powerview on Hwy 304; 50.7207, -96.1279; 12/22 Jun 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♂, teneral; N of Powerview on Hwy 304; 50.7207, -96.1279; 7/19 Sep 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♂, teneral, N of Powerview on Hwy 304; 50.7927, -96.2210; 17/31 Aug 2022; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 3 ♂; N of Powerview on Hwy 304; 50.7927, -96.2210; 10/16 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 3 ♂; N of Powerview on Hwy 304; 50.7927, -96.2210; 16/23 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 3 ♀; N of Powerview on Hwy 304; 50.7927, -96.2210; 23/31 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 2 ♀; N of Powerview on Hwy 304; 50.7927, -96.2210; 12/22 June 2023; T. Lawton leg.; pitfall traps on a active beaver lodge; location of specimens: TLC • 1 ♀; N of Powerview on Hwy 304; 50.7927, -96.2210; 11/26 Jul 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♂; N of Powerview on Hwy 304; 50.9888, -96.2269; 23/31 May 2023; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimen: TLC • 4 ♂, 1 ♀; N of Powerview on Hwy 304; 50.9888, -96.2269; 24 Apr/8 May 2024; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimens: TLC • 1 ♀; N of Powerview on Hwy 304; 50.9888, -96.2269; 8/13 May

2024; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimen: TLC • 2 ♀; N of Powerview on Hwy 304; 50.9888, -96.2269; 13/19 May 2024; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimens: TLC • 1 ♂; N of Powerview on Hwy 304; 50.9888, -96.2269; 19/28 May 2024; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimen: TLC • 1 ♂; SE of Wanipigow, Rice River Road; 51.1661, -96.1992; 3/10 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♂; SE of Wanipigow, Rice River Road; 51.1661, -96.1992; 16/23 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 5 ♂; SE of Wanipigow, Rice River Road; 51.1661, -96.1992; 16 April/28 May 2024; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC.

Oodes fluvialis LeConte 1863
This species has been reported from ON and QC in Canada and from WI and MN in the northern midwestern USA (Bousquet 2012). Henri Goulet (Agriculture and Agri-Food Canada) (personal communication) stated this species is known from southernmost Ontario to Ottawa and Montreal, in Quebec. The Manitoba specimens, and those from northwestern Ontario, (see Range Extensions for northwestern Ontario below), represent a major extension in distribution.

Material examined. CANADA – Manitoba • 1 ♀; Beaconia Beach; 50.4443, -96.5761; 22 Jun 2022; T. Lawton leg.; sifted from vegetative debris at the edge of a *Typha* wetland; location of specimen: TLC • 1 ♂; Beaconia Beach; 50.4443, -96.5761; 26/27 Jun 2022; T. Lawton leg.; sifted from vegetative debris at the edge of a *Typha* wetland; location of specimen: TLC • 1 ♂; SE of Wanipigow, Rice River Road; 51.1661, -96.1991; 1/17 Jun 2022; T. Lawton leg.; pitfall trap at the edge of a *Typha* wetland; location of specimen: TLC • 1 ♀; NE of Manigotagan on Hwy 304; 51.1266, -96.2220; 7/26 Aug 2021; T. Lawton leg.; pitfall trap in wet grassy meadow near a pond; location of specimen: TLC.

Xestonotus lugubris (Dejean 1829)
This species has been reported from NB, NS, ON, PE and QC in Canada and from WI, and MN in the northern midwestern USA Bousquet 2012. According to Bousquet 2010 this species occurs in deciduous forests, forest edges and clearings, adjacent fields and sand pits, usually in leaf litter or under stones; occasionally in beaver houses. All of the Manitoba specimens were associated with beaver lodges.

Material examined. CANADA – Manitoba • 1 ♀; N of Powerview on Hwy 304; 50.7927, -96.221; 11 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♀; N of Powerview on Hwy 304; 50.7927, -96.221; 16/23 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 2 ♂; N of Powerview on Hwy 304; 50.7927, -96.221; 23/31 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC • 1 ♀; N of Powerview on Hwy 304; 50.7927, -96.221; 22/30 Jun 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of

specimen: TLC • 1 ♀; N of Powerview on Hwy 304; 50.8107, -96.2373; 23/31 May 2023; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 1 ♀; SE of Wanipigow, Rice River Road; 51.1661, -96.1991; 16/23 May 2023 ; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 7 ♂, 3 ♀; SE of Wanipigow, Rice River Road; 51.1661, -96.1991; 16 Apr/28 May 2024 ; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimens: TLC.

Harpalus affinis (Schrank 1781)
This Palaearctic species is adventive in North America, introduced before 1798 (Bousquet 2012). This species has been reported from AB, BC, NB, NL, NS, ON, PE and QC in Canada and from WI and MN in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 2 ♂, 4 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 25 May 2022; T. Lawton leg.; hand-collected under stones; location of specimens: TLC • 6M, 6♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 1 Jun 2022; T. Lawton leg.; hand-collected under stones; location of specimens: TLC • 1 ♂, 2 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 1/17 Jun 2022; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimens: TLC • 1 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 17 June/9 Jul 2022; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimen: TLC • 1 ♂, 7 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 9 July/4 Aug; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimens: TLC • 9 ♂, 3 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 4/31 Aug 2022; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimens: TLC • 1 ♂, 2 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 3 May 2023; T. Lawton leg.; hand-collected under stones; location of specimens: TLC • 1 ♂, 5 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 3/23 May 2023; T. Lawton leg.; pitfall traps set in dry, weedy open; location of specimens: TLC • 1 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 31 May/6 Jun 2023; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimen: TLC • 1♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 11/26 Jul 2023; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimen: TLC • 1 ♂, 3 ♀; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 3/17 Aug 2023; T. Lawton leg.; pitfall traps set in dry, weedy open area; location of specimens: TLC • 1 ♂; E of Wanipigow on Rice River Road; 51.1744, -96.2116; 7/19 Sep 2023; T. Lawton leg.; pitfall traps set in dry, weedy open area and hand-collected under stones; location of specimen: TLC • 1 ♂; Winnipeg, Kings Park; 49.7960, -97.1225; 25 May 2022; T. Lawton leg.; hand collected at lights on restroom building at night, in an area of mature mixed forest and tended lawns; location of specimen: TLC • 2 ♂; Winnipeg, Kings Park; 49.7960, -97.1225; 13 Jun 2022; T. Lawton leg.; hand collected at lights on restroom building at night, in an area of mature mixed forest and tended lawns; location of specimens: TLC • 1 ♂, 4 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 14 Jun 2022; T. Lawton leg.; hand collected at lights on restroom building at night, in an area of

mature mixed forest and tended lawns; location of specimens: TLC • 1M; Winnipeg, Kings Park; 49.7960, -97.1225; 17 Jun 2022; T. Lawton leg.; hand collected at lights on restroom building at night, in an area of mature mixed forest and tended lawns; location of specimen: TLC • 1M; Winnipeg, Kings Park; 49.7960, -97.1225; 18 Jun 2022; T. Lawton leg.; hand collected at lights on restroom building at night, in an area of mature mixed forest and tended lawns; location of specimen: TLC • 3 ♂, 2 ♀; Minago River at Hwy 6; 54.1956, -99.1732; 22 Jul 2022; T. Lawton leg.; hand-collected under stones on roadside; location of specimens: TLC • 1 ♀; Hwy 317, W of Lac du Bonnet, Pit Road; 50.2458, -96.2365; 15 May 2022; T. Lawton leg.; abandoned gravel pit, hand-collected under stones; location of specimen: TLC; • 1 ♀; Hwy 317, W of Lac du Bonnet, Pit Road; 50.2458, -96.2365; 23 May 2022; T. Lawton leg.; abandoned gravel pit, hand-collected under stones; location of specimen: TLC; • 1 ♂; Hwy 317, W of Lac du Bonnet, Pit Road; 50.2458, -96.2365; 7/15 Jun 2022; T. Lawton leg.; abandoned gravel pit, pitfall traps; location of specimen: TLC; • 1 ♂; Gillam, Pumphouse Beach; 56.3617, -94.6963; 4 Jul 2022; T. Lawton leg.; hand-collected on beach at night; location of specimen: TLC; • 1 ♂, Gillam Marina; 56.3294, -94.9495; 14 Jun 2024; T. Lawton leg.; hand-collected under debris on ground; location of specimen: TLC.

Harpalus affinis seems to be well established in Manitoba; it was found at a number of widely separated locations including the far north at Gillam. It is possible that this species has been overlooked; it superficially resembles *H. amputatus* Say 1830. Both are green or green-copper in colour, have numerous accessory setae on abdominal sterna 4 and 5 and can be common in dry, disturbed habitat.

Platynus tenuicollis (LeConte 1846)
This species has been reported from NB, NS, ON, PE and QC in Canada and from WI, and MN in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 6 ♂; Pinawa, headwater of Pinawa channel; 50.159, -95.8685; 12 May 2012; T. Lawton leg.; sifted from beach debris; location of specimens: TLC • ; 1 ♀; Cedar Lake, Cross Bay; 53.2646, -99.4078; 14 Jun 2015; T. Lawton leg.; hand collected on a narrow beach; location of specimen: TLC.

Family Cerambycidae Latreille 1802
Subfamily Cerambycinae Latreille 1802

Parelaphidion aspersum (Haldeman 1847)
This species occurs in southern Ontario and southern Quebec in Canada, and south to east-central Nebraska, south to Texas, and northern Florida in the USA (Bousquet *et al.* 2017).

Material examined. CANADA – Manitoba • 1 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 20 Jul 2018; T. Lawton leg.; sugar fermentation bottle traps hung in mixed, mature forest; location of specimen: TLC • 1 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 18 Jul 2021; T. Lawton leg.; sugar fermentation bottle traps hung in mixed, mature forest; location of specimen: TLC • 1 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 3 Aug 2021; T. Lawton leg.; sugar fermentation bottle traps hung in mixed, mature forest; location of specimen: TLC • 1 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 4 Aug 2021; T. Lawton leg.; sugar fermentation bottle traps hung in mixed, mature forest; location of specimen: TLC • 1 ♀; Winnipeg, Kings Park; 49.7960, -97.1225; 17 Aug 2021; T. Lawton leg.; sugar fermentation bottle traps hung in mixed, mature forest; location of specimen: TLC.

Serge Laplante (Agriculture and Agri-Food Canada) confirmed a Manitoba specimen was *Parelaphidion aspersum* and noted it was an aberrant female with short antennae.

Range Extensions for Manitoba.

Family Cicindelidae Latreille 1802
Subfamily Cicindelinae Fischer 1821

Cicindela duodecimguttata Dejean 1825
This species has been reported from AB, MB, NB, NL, NS, NT, ON, PE, QC and SK in Canada and from MN, ND, WI and MT in the northern midwestern and northwestern USA (Bousquet 2012).

The previously known range of this species in northeastern Manitoba extended to 40 km NE of Gillam, 56.5162, -94.1224 (Lawton 2018). The following site extends the range by 36 km NE and is situated at the terminal point of Hwy 290; currently no roads extend beyond this point.

Material examined. CANADA – Manitoba • 1 ♂, 2 ♀; NE of Gillam, gravel boat launch on the Nelson River; 56.6862, -93.8015; 25 Jun 2020; T. Lawton leg.; caught with an aerial net on sand and clay at the edge of the river; location of specimens: TLC.

Cicindela formosa generosa Dejean 1831
This subspecies has been reported from MB, NS, ON, QC and SK in Canada and from MN, ND and WI in the northern midwestern and MT in the northwestern USA. The records from SK and MT need confirmation (Bousquet 2012).

The previously known range of this subspecies in northeastern Manitoba extended to 12.3 km N of Patricia Beach, 50.4901, -96.5376 (Lawton 2018). The author also found a cluster of sites near Stead, Manitoba and a more northerly site on the Traverse Bay Road.

Material examined. CANADA – Manitoba • 6 ♂, 5 ♀; Hwy 304, near Stead; 50.4377, -96.4414; 4/6 Jun 2020; T. Lawton leg.; caught with an aerial net on sandy patches along highway; location of specimens: TLC • 1 ♂; Hwy 304, near Stead; 50.4422, -96.4143; 18 May 2021; T. Lawton leg.; caught with an aerial net on sandy patches along highway; location of specimen: TLC • 3 ♂, 2 ♀; Hwy 304, near Stead; 50.4476, -96.4084; 18 May 2021; T. Lawton leg.; caught with an aerial net in a large area of open sand.; location of specimens: TLC • 2 ♀; Traverse Bay Road N, near Hwy 11; 50.6402, -96.4847; 31 May 2023; T. Lawton leg.; caught with an aerial net in a large area of open sand.; location of specimens: TLC.

The Traverse Bay Road site is a range extension of approximately 17 km NNE from a site north of Patricia Beach, the closest known location and previously the northern range extension for eastern Manitoba.

All specimens are typical for the "*manitoba*" Leng 1902 variation of *C. f. generosa*, with expanded maculations on the elytra.

Cicindela hirticollis shelfordi Graves 1988
This subspecies has been reported from AB, MB and SK in Canada and from MN and ND in the northern midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 13 ♂, 20 ♀; NW of Manigotagan, shore of Lake Winnipeg; 51.1436, -96.3689; 28 Jun 2020; T. Lawton leg.; caught with an aerial net on sandy patches along highway; location of specimens: TLC

In following years the number of observed adults was greatly reduced. There is heavy ATV use on the beach. This species is rare in Manitoba (Lawton 2018). This record is between known Manitoba locations Elk Island and Berens Island (Preston, unpublished).

Cicindela scutellaris lecontei Haldeman 1853
This subspecies has been reported from MB, ON and QC in Canada and from MN, ND and WI in the northern Midwestern USA (Bousquet 2012).

Material examined. CANADA – Manitoba • 1 ♀; Hwy 304, near Stead; 50.4422, -96.4143; 7/10 May 2021; T. Lawton leg.; caught in pitfalltrap, sandy patches along highway; location of specimen: TLC

This subspecies was previously known to extend north to Mars Hill, (between Libau and Dencross), in southeastern Manitoba (Preston, unpublished). This new record represents a range extension of approximately 18 km NNE.

The specimen shows elytral maculations which are within the range of variation for the "*criddlei*" Casey 1913 form of *C. s. lecontei*; it has a complete marginal band on the elytra.

Records for a rare species in Manitoba

Family Carabidae Latreille, 1802
Subfamily Trechinae Bonelli 1810

Platypatrobus lacustris Darlington 1938
This species has been reported from AB, MB, NB, NT, ON, QC, SK in Canada and from MN in the northern Midwestern USA (Bousquet 2012)

Material examined. CANADA – Manitoba • 1 ♀; Hwy 6, SW of Thompson; 55.3389, -98.355; 22/28 Jul 2022; T. Lawton leg.; pitfall traps on a vacant beaver lodge; location of specimen: TLC • 2 ♂, 1 ♀; N of Powerview on Hwy 304; 50.9888, -96.2269; 7/19 Sept 2023; T. Lawton leg.; pitfall traps on an active beaver lodge; location of specimens: TLC

Range Extensions for northwestern Ontario

Family Cicindelidae Latreille 1802
Subfamily Cicindelinae Fischer 1821

Cicindela scutellaris lecontei Haldeman 1853
For distribution information, see account under Range Extensions for Manitoba.

Material examined. CANADA – Ontario • 1 ♂; N of Dryden, Marion Road; 49.8761, -92.8082; 10 Jun 2022; T. Lawton leg.; caught with an aerial net in a large area of open sand with forested borders; location of specimen: TLC

This represents a range extension of approximately 110 km NE of a location near Sioux Narrows, Ontario by Lawton 2008. Brust 2007 reported this species north of Nestor Falls, Ontario.

The specimen shows elytral maculations which are within the range of variation for the "*criddlei*" form of *C. s. lecontei*; it has an almost complete marginal band on the elytra.

Family Carabidae Latreille, 1802
Subfamily Harpalinae Bonelli 1810

Oodes fluvialis LeConte 1863

For distribution information for this species, refer to *Oodes fluvialis,* above in Provincial Records for Manitoba.

Material examined. CANADA – Ontario • 6 ♂, 3 ♀; Calliper Lake, S of Nestor Falls; 4 Jun 2022; T. Lawton leg.; sifted from beach debris; location of specimens: TLC

Record for a rare species in northwestern Ontario

Family Carabidae Latreille, 1802
Subfamily Harpalinae Bonelli 1810

Pterostichus corrusculus LeConte 1873
This rare species has been reported from NB, ON and QC in Canada and from WI in the northern Midwestern USA (Bousquet 2012).

Material examined. CANADA – Ontario • 6 ♂, 4 ♀; N of Caliper Lake, Lake View Road; 49.1931, -93.9411; 10 Jun 2022; T. Lawton leg.; sifted from vegetative debris at the edge of a *Typha* wetland; location of specimens: TLC

Henri Goulet (retired, Agriculture and Agri-Food Canada) (personal communication) stated that this is an "amazing record", and that largest Canadian series of this species came from Fredericton, NB.

DISCUSSION

Three new genera are added to the list of Coleoptera in Manitoba: Carabidae: *Oodes* and *Xestonotus* and one Cerambycidae: *Parelaphidion.*

In three instances, two new records of species to the province were captured at the same site at the same time. These associations are: *Clivina fossor* with *Playtnus tenuicollis*, *Oodes fluvialis* with *C. fossor and Pterostichus castor* with *Xestonotus lugubris.* Three new records of species to the province were captured at the same site but during different periods: *P. castor* (May 2023)*, X. lugubris* (June 2023) and *B. occultator* (July 2023). Three new records of species to the province were captured at the same site and at the same time: *Bembidion occultator, B. planatum* and *B. rusticum.* In this case *B. planatum* and *B. rusticum* were caught on the banks of the Nelson River and *B. occultator* was found approximately four meters up the bank under *Salix and Alnus.*

Eight of the ten new provincial records were found at more than one site. *Harpalus affinis* was found at several widely separated locations, supporting the view that it is a well-established adventive species in Manitoba.

On two occasions specimens of *Platypatrobus lacustris* were captured on lodges where *Pterostichus castor* had also been captured. *Platypatrobus lacustris* is an old relic species (Lindroth 1961) and was considered a great rarity until its habitat requirements were discovered (Bousquet 2010: Goulet 1965).

This work demonstrates that *Pterostichus castor* can be effectively captured with pitfall traps on active and vacant beaver lodges. The most productive lodges for *P. castor* had been vacant for one to two years after either commercial trappers or provincial highway crews removed beavers. Pitfall traps set on the very top of the lodges were often the most likely to capture *P. castor*. Beaver lodges in Manitoba should be further investigated to determine if other new species to the province occur in this unique and specialized habitat and what their species associations are.

Brunke *et al.* (2017) points out that beaver and muskrat lodges represent a stable and predictable microhabitat that is maintained year-round, and therefore are host to a diverse assemblage of obligate and, even more numerous, facultative associates among the beetles. They further stated that based on nest-associated beetles and their closest living relatives, beaver and muskrat lodges may extend distributions northward by moderating winters, promote sympatric speciation and act as refugia against extinction of lineages on a broader time-scale.

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79TH ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF MANITOBA

ABSTRACTS

MEASURING BIODIVERSITY FROM INTERACTIONS TO LANDSCAPES

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The accelerating loss of biodiversity is threatening the functioning of ecosystems on a global scale. Estimates suggest a 69% decline in wild populations since 1970. International agreements ask countries to quantify their biodiversity and monitor shifts in community composition to try and gauge species decline and the effect of interventions to mitigate loss. However, despite emerging trends of large scale drops in insect biodiversity and quantifiable risks all habitats, quantifying biodiversity anywhere is a challenge and monitoring continual change is impossible at almost any scale. Going beyond basic counts to understanding how an individual organism interacts with other species in the environment can be painfully challenging. In this presentation I will describe three case studies which look at how my research group is addressing these challenges from the smallest interactions in an ecosystem to the the larges scales of biomonitoring. In part one I will talk about “symbiomes” and how genetic tools are making it possible measure the finest scale interactions using native Canadian pollinators as or developing model. In part 2 I will talk about the use of eDNA as a species at risk indicator in bee hives, bat roosts and bird boxes. Finally in part 3 we scale up with a risky plan to measure all terrestrial life on earth. All three example fall under the BIOSCAN project. A Canadian led national and international project to try to understand life on earth.

Submitted Papers

PLANT NUTRITION DO NOT EFFECT OVIPOSITION OF ORANGE WHEAT BLOSSOM MIDGE, *SITODIPLOSIS MOSELLANA* (GÉHIN) (DIPTERA: CECIDOMYIIDAE)

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The wheat midge, *Sitodiplosis mosellana* (Géhin) (Diptera: Cecidomyiidae), causes damage to wheat crops estimated at millions of dollars per year in Canada. Host plant nutrition has directly influenced insect oviposition or indirectly by attracting natural enemies due to their higher quality of food. Therefore, we tested the effect of a range of fertilizer rates (0.5, 1.5, 2.5 g/pot) on wheat midge oviposition and plant growth parameters in susceptible wheat cv. Roblin. Fertilizer treatments did not influence oviposition preference and performances in wheat midge. The highest plant biomass and spike numbers were observed in moderate and high fertilizers-treated plants compared to low. Highly fertilized plants, however, had similar plant growth to moderately fertilized plants. Future experiments focus on analyzing VOC profiles from fertilized plants to test whether fertilizer applications could alter VOC emissions.

FIRST RECORD OF DION SKIPPER (LEPIDOPTERA: HESPERIIDAE) IN MANITOBA, CANADA

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The Dion skipper, *Euphyes dion* W.H. Edwards, 1879 (Lepidoptera: Hesperiidae) is associated with sedge meadows and bog fen habitats. They use *Carex lacustris* (Cyperaceae) and other sedges as larval host plants and have also been associated with the exotic *Carex acutiformis* (Cyperaceae). The butterfly's known range extends north to northwestern Ontario, northern Minnesota, and southeastern North Dakota, but they have never been reported from Manitoba. I describe the first occurrence of *Euphyes dion* in Manitoba from observations made 70 km northeast of Winnipeg.

A PRICKLY PROBLEM: ASSESSING CHEWING LOUSE (PSOCODEA: ISCHNOCERA: TRICHODECTIDAE: *EUTRICHOPHILUS SETOSUS*) POPULATIONS ON AMERICAN PORCUPINE (RODENTIA: ERETHIZONTIDAE: *ERETHIZON DORSATUM*) IN MANITOBA, CANADA

T.D. Galloway

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Porcupines (*Erethizon dorsatum*) are particularly difficult to examine for ectoparasites, especially for the host specific chewing louse (*Eutrichophilus setosus*). Four porcupines were salvaged from wildlife rehabilitation hospitals in Manitoba for this study. Each animal was washed twice in warm, soapy water and once in clean water to remove ectoparasites. Wash water was passed through a 90µ screen and the residue preserved in 95% ethanol. Samples were sorted under a dissecting microscope and lice were enumerated, sexed, and aged (nymphs versus adults). *Eutrichophilus setosus* was the only species of chewing louse collected. Each animal was infested (prevalence = 100%) with the following number of specimens, respectively: 39♂, 29♀, 25 nymphs; 19♂, 50♀, 183 nymphs; 1♂, 6♀, 2 nymphs; 56♂, 27♀, 67 nymphs. The total number of lice collected was 504. Mean intensity of infestation was 126 (Bootstrap BCa, 95% confidence limits, 2000 bootstrap replications = 32.5 to 201). Although there are numerous records of this species of louse in North America, this is the first attempt to assess total louse populations. Specific challenges in assessing louse populations infesting porcupines will be discussed.

Student Competition – Oral Presentations

INVESTIGATING THE HISTORICAL IMPACT OF WEATHER AND THE POTENTIAL IMPACTS OF CLIMATE CHANGE ON THREE ENDANGERED HESPERIIDAE SPECIES IN MANITOBA, CANADA

A. Thorkelson, K. Dearborn, and R. Westwood

Department of Environmental Studies and Sciences, University of Winnipeg, R3B 2E9, Winnipeg, Manitoba, Canada

Poweshiek skipperling (*Oarisma poweshiek*), Dakota skipper (*Hesperia dacotae*), and Mottled duskywing (*Erynnis martialis*) are three federally listed critically endangered butterflies found within the province of Manitoba. In recent decades each species has experienced substantial declines in both abundance and range, and there exists considerable uncertainty as to why, presenting a challenge for conservation efforts. The rapidly changing climate could be contributing to these declines, but relationships between climate and population dynamics in Manitoba have not been formally investigated. My research aims to 1) determine the relationship, or lack of relationship, between past weather and species abundance and emergence date, and 2) investigate whether future climate change will inhibit the ability of the species to survive in their current geographic ranges. I will address objective 1 by relating yearly species population estimates to monthly temperature and precipitation averages and extremes experienced over the complete life cycle of one generation. Objective 2 will be achieved through the creation of correlative climate envelope models (CEMs) for the three species, which use species occurrence locations to derive the suitable climatic range of the species and then map the change in this distribution under a changing climate through the incorporation of climate change model projections. The CEMs will yield an estimation as to whether the current restricted ranges of the species will become climatically unsuitable, and identify potentially climatically suitable areas that can aid in reintroduction and habitat management or restoration planning in the future.

EARLY DETECTION OF DUTCH ELM DISEASE INFECTIONS IN URBAN FORESTS IN WINNIPEG, MANITOBA USING AERIAL DRONE TECHNOLOGY.

J. Ehn, K. Dearborn, and R. Westwood

Department of Environmental Studies and Sciences, University of Winnipeg, R3B 1E9, Winnipeg, Manitoba, Canada

Dutch elm disease (DED) is an ongoing threat to Winnipeg's urban forest. Research advancements and development of new strategies to manage DED are necessary to protect the city's elm population and prevent mass tree mortality. My research focuses on using drone technology to assess tree health and determine if non-visible symptoms of DED can be detected at earlier stages to reduce the time of diagnosis in diseased trees. Combining early detection and rapid removal of diseased trees to decrease the presence of elm bark beetle disease vectors may significantly decrease the spread of disease. My research involves flying aerial drones equipped with multi-spectral sensors over selected study neighbourhoods in Winnipeg and using imagery to examine DED development throughout the summer. I will also be comparing the imagery to comprehensive ground surveys to analyze the accuracy of disease detection using drones. The aim of my work is to increase the efficacy of rapid diseased tree removal, thereby reducing elm bark beetle populations in Winnipeg.

FLORAL ENHANCEMENTS ADJACENT TO MANITOBA CROP FIELDS INCREASE BENEFICIAL INSECT ABUNDANCE

M. Killewald[1], A. Costamagna[1], R. Gulden[2], Y. Lawley[2], and J. Gibbs[1]

[1]Department of Entomology, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada; [2]Department of Plant Science, University of Manitoba

Beneficial insects such as bees, syrphid flies, and ground beetles provide valuable ecosystem services to agriculture including pollination and biological control of pests. However, in areas with intense agriculture, populations of these beneficial insects are in decline. Floral strips have proven effective at increasing populations of beneficial insects in other areas of the world. Although, this practice has not been adequately studied in areas with rotational crops, such as Manitoba. In the summer of 2019, we installed fifteen floral strips at multiple farms across Manitoba and used multiple collection techniques to monitor abundances of beneficial insects at strip, control, and natural sites for subsequent years. We found significantly more beetles and bees in strips than the control treatment. Syrphids collected with nets were more abundant in strip sites than control sites, but syrphids collected with bluevane traps were similar between treatments. We found no interaction between treatment and year for bees and syrphids, but beetles did show a significant interaction. Beetle abundances were highest in 2020 strip sites, but abundances in 2021 strip sites were significantly lower. Increases in bee and beetle abundance at strip sites should provide more pollination and pest control services to agriculture- which may increase the yield of adjacent crops. These results support the use of floral strips in rotationally managed agricultural systems to increase abundances of beneficial insects.

COMBINED EFFECTS OF PLANT DENSITY AND CHEMICAL MANAGEMENT STRATEGIES ON FLEA BEETLE ABUNDANCES, PLANT DEFOLIATION AND YIELD OF CANOLA ACROSS CANADIAN PRAIRIES

S. Woodland[1], M. Damien[1], H. Cárcamo[2], J. Otani[2], T. Wist[2], R. Duncan[1], J. Gavloski[3], A.C. Costamagna[1]

[1]University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada; [2]Agriculture and Agri-food Canada/Agriculture et Agroalimentaire Canada; [3] Agriculture and Resource Development, Government of Manitoba

Crucifer flea beetles, *Phyllotreta cruciferae* (Goeze) (Coleoptera: Chrysomelidae), and striped flea beetles, *Phyllotreta striolata* (Fabricius) (Coleoptera: Chrysomelidae), are devastating pests in Canadian canola. Currently, flea beetles are managed by prophylactic application of insecticides on seeds and foliar sprays. We investigated the effect of increasing canola density as an alternative method to reduce defoliation and insecticide use in canola. We conducted field trials in four regions of the Canadian prairies testing the effects of three planting densities combined with two management treatments (seed treatment and foliar spray) and two controls (flea beetle-free treatment and untreated) from 2018-2021. We found that flea beetles increase aggregation as plant density increased, but their numbers per plant and defoliation levels decreased. Yield increased with increased plant density regardless of the management treatment or region. We conclude that increasing plant density as an alternative or complementary strategy to chemical control is effective to protect canola yield.

TWO NEW SPECIES OF *LASIOGLOSSUM* (*HEMIHALICTUS*) AND THE STATUS OF THE BIZARRE, MACROCEPHALIC *L. ABSURDICEPS* (HYMENOPTERA: HALICTIDAE)

T. Hettiarachchi and J. Gibbs

Department of Entomology, University of Manitoba, 12 Dafoe Road, R3T 2N2, Winnipeg, Manitoba, Canada

The bee genus *Lasioglossum* is renowned for its taxonomic complexities. The unusually macrocephalic male *L. absurdiceps* was known only from the holotype. While considering this unusual specimen we determined a close association with the beautiful, desert bee *L. arizonense.* Ultimately, two new species in this complex were discovered from the Colorado River lower basin to the Coachella Valley, California, and another from Washington County, Utah. These two species are described based on morphometric analysis and geographical distribution patterns.

Left: A new species named in honour of the indigenous Cocopah tribe

Below: Macrocephalic male *L. absurdiceps,* holotype

CONTRIBUTIONS OF DISTURBANCE-BASED PRAIRIE MANAGEMENT ACTIVITIES SUCCESS TOWARDS POPULATION RECOVERY OF TWO ENDANGERED SKIPPER BUTTERFLIES IN MANITOBA

J.M. Sánchez-Jasso[1], N. Koper[2], and R. Westwood[3]

[1]Natural Resources Institute, University of Manitoba, R3T 2M6, Winnipeg, Manitoba, Canada; [2]Faculty of Environment, University of Northern British Columbia, V2N 4Z9, Prince George, British Columbia, Canada; [3]Department of Biology, University of Winnipeg, R3B 1E9, Winnipeg, Manitoba, Canada

The tall-grass prairies in North America stand as one of the most depleted and least protected ecosystems. Only 1% of the original tall-grass prairies persist in Canada, with the majority found in Manitoba. The loss of these prairies has resulted in numerous prairie species becoming at risk of extinction, such as Dakota skipper (*Hesperia dacotae* Skinner 1911) and Poweshiek skipperling (*Oarisma poweshiek* Parker 1870). The research focuses on studying how specific management practices, applied to maintain and recover prairie habitat for both skippers, have shaped grass-prairie structure, composition, and function. It will specifically assess the effectiveness of management practices in various scenarios through three main specific objectives: comparing habitat structure and composition between occupied and formerly occupied; analyze the cumulative effects of past disturbance and disturbance-based prairie management activities; and quantify the short-term effects of disturbance-based prairie management activities on the skippers abundance, as well as plant community suitability. The study will be conducted at various sites within the tall-grass prairie in Manitoba, where the remaining populations of the Poweshiek skipperling and Dakota skipper exist in Canada. Surveys will be conducted in both occupied and formerly occupied sites, encompassing various management regimes, such as idle, prescribed burns, grazing, haying, and mowing, at different temporal scales. Historical data of past management and natural disturbances will be compiled. Spatial landscape analyses and statistical modeling will be conducted. The research will contribute to identifying potential improvements or alternatives to current management practices to preserve prairie habitats for these two endangered butterfly species.

PWSK, Sánchez-Jasso, 2022

DAKS, Sánchez-Jasso, 2022

EVALUATION OF THE ATTRACTION OF DIFFERENT FLOWER MIXTURES TO NATURAL ENEMIES AND POLLINATORS

C. Montemayor[1], A.C. Costamagna[1], Y. Lawley[2], and J. Gibbs[1]

[1]Department of Entomology, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada; [2]Department of Plant Science, University of Manitoba

Strips with flowering plant mixtures can be important refuges and floral resources for beneficial arthropods beside crops. Establishment of flowering plants in field borders can be challenging and little is known on how different plant mixtures function to establish a community that attracts beneficial insects. In this study, pollinators and natural enemies were evaluated in three flowering plant mixtures treatments: domesticated annuals mix, native perennials mix, and tame perennials/annuals mix in replicated experimental plots. Each treatment was evaluated with and without oats as a nurse crop. Rye perennial grass was established as the control plot treatment. Blue vane and bee bowls were used to capture pollinators. Sweep nets, D-vac, clear sticky traps, and pitfall traps were used to capture predators. Samples were collected four times every two weeks starting from the blooming period. First year preliminary results of bee bowls and pitfall traps are presented.

BIOGEOGRAPHY AND GENETIC VARIATION IN A HIGH-ALTITUDE BUTTERFLY FROM THE ANDES MOUNTAINS: *JUNONIA VESTINA* (LEPIDOPTERA: NYMPHALIDAE)

N. Kopchak and J.M. Marcus

Department of Biological Sciences, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada

Nymphalid butterflies in the genus *Junonia* are known for their nearly worldwide distribution, including thriving on remote oceanic islands, highlighting their exceptional ability to disperse and diversify. The New World *Junonia* carry three common major mitochondrial haplotype groups, shared between species and polymorphic within species, suggesting a possible history of hybridization and mitochondrial introgression. Haplotype group A subgroups A1 and A2 are most common across all *Junonia* species in South America (>80%), with haplotype group B occurring at much lower frequency (15%). *Junonia vestina* is found in the Andes (1900m-3500m) with documented populations in Peru, Ecuador, and Bolivia. Prior studies of few

specimens indicate that Peruvian populations of *J. vestina* are the sole known source of the rare mitochondrial haplotype group C, while conspecifics from other regions exhibited different haplotype groups (mostly A1). Mitochondrial haplotype group C is closely related to haplotypes found in *J. villida* from the Indo-Pacific region, hinting at potential long-distance gene flow across the Pacific Ocean. South American *J. vestina* butterfly specimens from museums and personal collections were examined. DNA from 64 samples was isolated, quantified, and PCR amplified, before being genotyped by restriction digests at haplotype group-specific diagnostic cut sites in COX1, COX3, and ND5. Based on data from this and previous studies, we have provisionally assigned 41 *J. vestina* specimens (from populations ranging from Colombia to Argentina and Chile) to haplotypes A1 (49%), A2 (20%), B (17%), and C (15%). Haplotype C remains restricted to populations from Peru.

ASSESSING THE ABUNDANCE OF AMERICAN DOG TICKS, *DERMACENTOR VARIABILIS* (SAY), ON CATTLE PASTURES AND CATTLE IN SOUTHERN MANITOBA, CANADA: ENVIRONMENTAL FACTORS AND IMPLICATIONS FOR TICK-BORNE DISEASE

D. Wood[1], C. Madden[1], N. Chilton[2], D. Walker[3], and K. Rochon[1]

[1]Department of Entomology, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada; [2]Department of Biology, University of Saskatchewan, S7N 5A2, Saskatoon, Saskatchewan, Canada; [3]Department of Environment and Geography, University of Manitoba

In recent decades, American dog ticks, *Dermacentor variabilis* (Say), have been spreading north and west within the Canadian Prairies. This range expansion poses potential risks to both beef cattle and production workers in these regions. The increased presence of ticks may lead to more interactions between ticks and cattle in pastures, which raises concerns about the transmission of tick-borne diseases like bovine anaplasmosis caused by the *Anaplasma marginale* bacteria. We selected four cow-calf operations in Southern Manitoba and assessed tick abundance and biting pressure by sampling pastures and cattle. Tick abundance was estimated by using tick drags and habitat variables were recorded. The cattle grazing the pastures were checked for ticks during tick activity periods, and GPS collars were fitted on individual cows from each herd to monitor their movements. Ticks are more abundant in cooler and more humid microhabitats. As areas with these features within pastures are typically also attractive to cattle, landscape features can influence tick encounters. Understanding what pasture features increase the risk for tick interactions can help producers better understand what they can do to protect their livestock and themselves from tick bites. Although no ticks collected tested positive for *Anaplasma marginale* through Polymerase Chain Reaction (PCR) assays, it's important for producers to recognize the

potential risks associated with the presence and high numbers of ticks in their regions for the well-being of their animals.

ASSOCIATION BETWEEN INFESTATION PARAMETERS OF NASAL MITES (ACARI: RHINONYSSIDAE: *TINAMINYSSUS* SPP.) AND HOST BODY CONDITION IN ROCK PIGEONS (AVES: COLUMBIDAE: *COLUMBA LIVIA*) IN MANITOBA

M. Dupuis, T.D. Galloway, and K. Rochon

Department of Entomology, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada

Rock pigeons (*Columba livia* Gmelin) are host to a variety of parasites including nasal mites (Rhinonyssidae: *Tinaminyssus* spp.). While distribution and host association have been studied through surveys in Canada, little is known about the ecology of these parasites. We salvaged pigeons to determine nasal mite prevalence and mean intensity as well as to examine the relationship between host body condition and infestation parameters. Seventy-five pigeons salvaged from Manitoba Wildlife Haven (2016-2022) were given a body condition score (BCS) of 1-5, with 1 being emaciated and 5 being obese. Their respiratory turbinates were flushed using a curved 12 ml Monojet ™ 412 syringe with soapy water so that it ran out of the mouth onto a 90 µm sieve. The sample was preserved in 95% ethanol until the mites were counted and identified. Data were analyzed using Quantitative Parasitology (QPWeb). Pigeons were infested with nasal mites, *Tinaminyssus melloi* (Castro) and *T. columbae* (Crossley). Prevalence and mean intensity were 52.4% and 14.9 mites per bird, respectively (n=615). There was an association between host condition and increased prevalence, with the hosts in the BCS 1-2.5 category being more

likely to be infested than the hosts in the BCS 3 and BCS 3.5-4.5 categories. There were no differences in intensity based on host body condition

Posters

WILLOW POLLEN COLLECTION BY A BLUEBERRY SPECIALIST

J.B. Watson, K.G. Bartel, J. Gibbs

Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada

Andrena (*Conandrena*) *bradleyi* Viereck (Hymenoptera: Andrenidae) is widely regarded as a Ericaceae specialist bee due to its elongate head, plant records, and common collection in commercial blueberry fields. We provide evidence of *A. bradleyi* collecting pollen from willow (*Salix* L., Salicaceae) in southeastern Manitoba. This indicates the bee is not obligately specialized on Ericaceae pollens and that early blooming plants may contribute to its early nutritional requirements.

BLACKLEGGED TICKS, *IXODES SCAPULARIS* SAY, ABUNDANCE AND DISTRIBUTION ON PASTURES IN MANITOBA, CANADA.

C. Madden[1], D. Wood[1], D. Walker[2], and K. Rochon[1]
[1]Department of Entomology, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada;
[2]Department of Environment and Geography, University of Manitoba

Blacklegged ticks (BLT) (*Ixodes scapularis* Say, Acari: Ixodidae) are hard ticks known for transmitting tick-borne pathogens, including *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, and *Babesia microti*, which can affect humans and other animals. Over the last two decades, BLTs have expanded their distribution into the Canadian Prairies. Little is known about the habitat suitability of pastures for BLTs in Manitoba, and cattle producers were concerned about the risk BLTs could pose for their cattle, their horses, and themselves. In this two-year study conducted at seven sites in southern Manitoba, we established the abundance of BLTs on pastures; the biting pressure of BLTs on cattle and horses; the interaction between tick-environment-cattle; and the presence of pathogens in collected BLTs. We collected a total of 70 BLTs from pastures, cattle, and horses that grazed those pastures. To analyze relationships between tick-cattle-environment, we gathered data on cattle movement in the pastures using GPS

collars and mapped-out tick presence using GPS units during drag sampling. Pathogens were detected in 28 BLTs using PCR. Overall, the abundance of BLTs on cattle pastures was low. Weather conditions in both years delayed the start of the grazing season, which may have led to a mismatch between animal grazing and peak tick activity in the pastures.

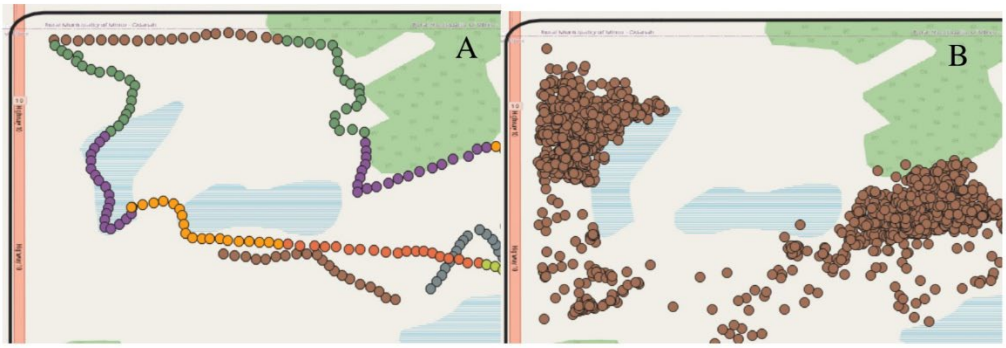


Figure 1: Point location data collected from GPS units (A) and GPS collars (B) at one site in 2021. A) Each point represents a 10-m quadrat within a 200 m transect along which ticks were collected using the tick drag technique. B) Each point represents the location of the same cow every 10 minutes for a 7-day period in 2021.

Symposium

USING UAS IN BIOLOGICAL CONTROL FOR THE RELEASE OF EGG PARASITOIDS: A CASE STUDY IN FORESTRY

V. Martel[1] and F. Jean[2]

[1]Natural Resources Canada, Canadian Forest Service, G1V 4C7, Québec, Canada; [2]Canopée Dronautique Inc., H2V 3H6, Montréal, Québec

The use of Uninhabited Aerial Systems (UAS) has recently increased, for hobbies as well as for professional uses. Entomology is no exception. It is used for image acquisition for detection and for pest management, opening new possibilities for precise management. In spite of their obvious benefits, there are also some challenges and barriers to their use (financial cost, federal restrictions, authorizations, etc.) and all these factors must be taken into account when deciding which technique to use. In this talk, I will present the different uses, current or potential, of UAS in entomology. I will also present a case study of biological control using UAS: the release of the egg parasitoid *Trichogramma minutum* against the spruce budworm, *Choristoneura fumiferana*.

During that study, two release methods were compared (UAS and trichocards) and their efficacy will be discussed. Benefits and challenges will be discussed in light of my own experience.

REMOTE FIELD MONITORING OF INSECT PRESSURE SAVES TIME AND OPTIMIZES USE OF RESOURCES – USING iSCOUT AND iSCOUT MOBILE (COMBINING iSCOUT® TRAPS WITH COMMONLY USED MANUAL TRAP DEVICES)

G. Ash

Vice President Metos North America, Training and Key Accounts Manager, METOS North America/Canada

The use of in-field IoT devices for digital agriculture continues to provide additional solutions that have the potential to save time, optimize resources and reduce environmental impact. Two such solutions are iSCOUT and iSCOUT Mobile for insect monitoring within fields. iSCOUT is a digital insect trap (pheromone, food, flying or color trap) with a high-resolution camera, modem, battery, and solar panel that captures pictures of insects on a sticky plate that are sent to software via LTE, where the insects are visualized (rectangle squares), counted, and graphed by date/time. Sophisticated software using AI aids in the insect identification process. The user can go back in time and view all images and graphs of insect dynamics. iSCOUT Mobile combines iSCOUT hardware devices with commonly used manual trap devices (delta traps, sticky traps etc.). The user can create digitalized images associated with the manual traps. Pictures are taken with your phone, and the identified insects are automatically counted and identified in the app. Both solutions can view on desktop software. A look at how these automated and digitalized manual traps can be used for field crop insect identification to save time, optimize resources, and reduce environmental impact will be discussed.

THE ATK SUBCOMMITTEE OF COSEWIC: OUR PROCESSES, LIMITATIONS AND OPPORTUNITIES

D. Benoit

COSEWIC Aboriginal Traditional Knowledge Subcommittee

RNA-BASED BIOTECHNOLOGIES TO CONTROL PEST INSECTS

S. Whyard, A. Singh, A. Tayler, M. Wood, E. Jonson, and N. Amanat

Department of Biological Sciences, University of Manitoba, R3T 2N2, Winnipeg, Manitoba, Canada.

Controlling pest insects is still largely achieved using broad-spectrum insecticides, but these chemicals can adversely harm many non-target species. Double-stranded RNA (dsRNA)-based pesticides are now being regarded as a new generation of pesticides, as they have the potential to act in a species-limited manner. To control crop pest insects, we have been developing different methods of dsRNA delivery to plants, including transgenic technologies, whereby the plants produce protective dsRNAs, and non-GM technologies such as foliar sprays, root treatments, and topical insecticides. In most applications, the dsRNA must be ingested by the insect to be effective, and given that the gut is a hostile environment for dsRNA molecules, we have also been developing modified dsRNAs that are both more robust than conventional dsRNAs. Here, I will report on our progress to develop RNA-based insecticides, highlighting both the benefits and the potential challenges that lie ahead, as we strive to provide effective methods of pest insect control without adversely harming non-target or beneficial species.

ACKNOWLEDGEMENTS

The Entomological Society of Manitoba Wishes to Thank the Following Sponsors for Their Generous Support of the 79th Annual Meeting

Canadian Centre for Mosquito Management

Cano Pest Control

City of Winnipeg

Taz Pest Control

Valkyrie Pest Solutions

Meeting Minutes

79th Annual General Meeting

Saturday, 28 October 2023, 1:30 PM

Attendance:
J. Henault
K. Rochon
D. Wade
N. Holliday
R. Currie
J. Tanner
D. Vanderwal
J. Gibbs
R. Lamb
P. MacKay
R. Wrigley
K. Eckhardt
L. Capar
K. Cano
P. Fields
J. Bannerman
L. Ganesan
E. Martineau
V. Hervet
J. Gavloski
P. Nakagawa
R. Westwood
T. Galloway

Regrets:
J. Marcus
A. Civetta

1. **Acceptance of Agenda** at 1:30 pm

J. Tanner shared that two amendments were made to the agenda, including removal of the Orkin award review as a New Business item and the addition of the Report of the Chair of the Ad hoc Committee Guidelines / By-laws Committee to committee reports.

Motion: J. Bannerman motioned to accept the revised agenda, 2nd N. Holliday… Carried.

2.**Acceptance of the Minute**

s of the last Annual Meeting (29 October 2022)

Motion: T. Galloway motioned to accept the 2022 minutes, 2nd R. Currie… Carried.

3. **Business Arising from the Minutes**

a. Fundraising expansion

K. Rochon shared we had discussed going to additional sources for fundraising. This year we have successfully added new sponsors this year thanks to K. Cano. We continue to expand on this further. Further noting that any suggestions for donors are welcome. R. Currie suggested any of the companies that presented today.

b. Membership and meeting cost review

K. Rochon provided we reviewed other society rates and reviewed the costs of membership and the meeting separately. We concluded our membership cost was adequate but decided it was appropriate to increase our meeting costs which was reflected this year.

c. Digital archiving – next steps

K. Rochon noted that this will be addressed by our web archivist in his report.

d. Awards amounts

a. Review proposal for increasing prize pool for awards and disbursement K. Rochon shared that Justis has put forth this proposal and reviewed the details on the proposal (see included).

J. Henault clarified the prize pools current amount and regulation and referenced what is awarded for the same kind of competition in Ontario and Saskatchewan.

R. Currie provided that having the flexibility was beneficial for the judges.

N. Holliday asked where these awarding guidelines reside.

J. Henault shared that they are included in the committee guidelines.

K. Rochon noted that the guidelines are in the process if being cleaned up and will include the amendment if passed.

J. Bannerman noted that those guidelines are in a separate PDF from roles and by-laws.

N. Holliday pointed out that the proposal should have it noted to be added to guidelines.

J. Bannerman inquired if the judging guidelines remain the same, and if should we post them to the web page.

J. Henault said we are putting it together and we can do that once finalized.

Motion: J. Henault has motioned to increase the prize pool as directed in his proposal with the amendment of inclusion into the committee guidelines, 2nd P. Mackay… Carried.

4. **Reports of the Executive**

Motion: J. Gibbs motions to receive the reports, 2nd R. Currie… Carried

President – Alberto Civetta, delivered by Kateryn Rochon

Treasurer – Kathy Cano

K. Eckhardt noted that we still need to apply for youth outreach ESC award.

ACTION ITEM: Executive will follow-up to ensure the ESC youth outreach fund award application is submitted.

Regional Director(s) to the ESC – Jason Gibbs

Editor of the Proceedings – Jason Gibbs

J. Gibbs has noted that Kelsey has stepped down as editor.

Membership – Jade Tanner

5. **Reports of the Committees**

Endowment Fund – Richard Westwood/Kathy Cano

Scientific Program – Justis Henault

K. Rochon identified ways to streamline hybrid events including designated devices.

R. Currie suggested a dedicated AV person for meetings.

P. Fields expressed that hybrid events are more complicated and maybe not worth the extra work and potential technical difficulties.

J. Henault noted the outreach outside province potential benefit and accessibility.

Newsletter – Justis Henault

Youth Encouragement/Public Education – Kristyn Eckhardt

Social – Lavanya Ganesan

Scholarship and Awards – Desiree Vanderwel

Fundraising – Kathy Cano

Archives and Web Page – Jordan Bannerman

T. Galloway inquired if we should include our archive on our website.

R. Currie noted the university has an archive system that we could use to house digital archive.

J. Henault highlighted we should be omitting any personal information if archive was to become public.

Motion: T. Galloway motions for ESM to formally recognise the students responsible for digitizing ESM archives, 2nd N. Holliday… Carried.

Motion: D. Vanderwel motions to provide a formal ad hoc title to be recorded for the students, 2nd P. Mackay… Carried.

ACTION ITEM: Executive to decide on title, have it recorded on webpage, and provide students with official award letters.

Common Names – Jason Gibbs

Ad hoc Committee Guidelines / By-laws Committee – Jason Gibbs

N. Holliday pointed out during discussion surrounding J. Gibbs suggested motion 4 that bank signing authorities and process should be reviewed.

Motion: N. Holliday motions to approve J. Gibbs suggested motions (see report) 1,2,3, and 5 as amended (see below), 2nd R. Currie… Carried.

ARTICLE XXIII.5

"Unless approved by a two-thirds majority of the Active Members present at the Annual Meeting, they shall from that time cease to have force and effect."

Becomes

"Unless rejected by a two-thirds majority of the Active Members present at the Annual Meeting, rules and regulations prescribed by the Executive shall remain in force and effect."

ACTION ITEM: J. Tanner to update by-law document to reflect these changes and submit to our webmaster to be updated on our website.

ACTION ITEM: K. Cano and L. Capar to inquire with the bank on current process for updating signatories.

6. **Results from the election: new executive and committee members**

Motion: T. Galloway motions to destroy ballots, 2nd J. Henault… Carried.

ACTION ITEM: J. Tanner to destroy e-ballots.

7. **New Business**

8. **Adjournment** at 3:14 pm

Motion: N. Holliday motions to adjourn, 2nd J. Henault… Carried.

Addendum: Proposed increase to student competition prize pool

Justis Henault

I propose to increase the prize pool for the student competition (oral and poster presentations during the Annual General Meetings) to $400, as outlined below:

To judge student papers. The judging criteria are to be distributed to all competitors upon entering the competition. The decisions of the judges are final.

Awarding guidelines:

1) At least one winner each for oral and poster presentations (including in the event of only 1 entrant to the respective competitions).

2) A total of $400 is available to be disbursed.

a) Additional winners may be selected (such as second-places, or ties) and the $400 distributed amongst all winners at the discretion of the Student Paper Award committee. Higher ranks must be awarded no less money than lower ranks (second place cannot receive more money than first place). Equality between oral and poster arrays is encouraged.

APPENDIX A: Agenda of the Entomological Society of Manitoba

79th Annual General Meeting

Saturday, 28 October 2023, 1:30 PM

Department of Entomology Rm 219

1. Acceptance of Agenda
2. Acceptance of the Minutes of the last Annual Meeting (29 October 2022)
3. Business Arising from the Minutes
    a. Fundraising expansion
    b. Membership and meeting cost review
    c. Digital archiving – next steps
    d. Awards amounts
        a. Review proposal for increasing prize pool for awards and disbursement
4. Reports of the Executive

    President – Alberto Civetta, delivered by Kateryn Rochon

    Treasurer – Kathy Cano

    Regional Director(s) to the ESC – Jason Gibbs

    Editor of the Proceedings – Kelsey Jones/Jason Gibbs

    Membership – Jade Tanner
5. Reports of the Committees

    Endowment Fund – Richard Westwood/Kathy Cano

    Scientific Program – Justis Henault

    Newsletter – Kelsey Jones/Justis Henault

    Youth Encouragement/Public Education – Kristyn Eckhardt

    Social – Lavanya Ganeson

    Scholarship and Awards – Desiree Vanderwel

    Fundraising – Kathy Cano

    Archives and Web Page – Jordan Bannerman

Common Names – Jason Gibbs

Report of the Chair of the Ad hoc Committee Guidelines / By-laws Committee – Jason Gibbs

6. Results from the election: New executive/committee members
7. New Business
8. Other Business
9. Adjournment

APPENDIX B: Entomological Society of Manitoba
Annual Business Meeting – President's Report to the Membership
28 October 2023

There were four meetings of the Executive Committee of the Entomological Society of Manitoba between December 2022 and September 2023:

First Executive Meeting – December 1, 2022

- We discussed previous business regarding seeking avenues for increase of revenues, but it was noted that fundraising had improved relative to previous years. A possible venue will be, other than outside donors, to bring back ESM new member social for fundraising. We had an action to have a review of funds available.

- We initiated looking into digital archiving of ESM files

- We started looking into issues arising from lack of clarity regarding membership and AGM attending costs.

- Actions were undertaken regarding seeking feedback from the 2022 ESM meeting Scientific Chairperson and Chair of Awards committee regarding awards amounts and disbursement of awards.

- We moved to initiate a review of the society's role responsibilities documentation (https://home.cc.umanitoba.ca/~fieldspg/ESM_committee_guidelines.pdf)

Second Executive Meeting – February 14, 2023

- We received and discussed our funds availability and funds fluidity as a way to plan ahead for costs incurred during the ESM annual meeting, specifically costs related to awards/scholarships. It was decided to have a follow up review that specifically focused on meeting costs.

- A follow up of the review committee guidelines initiated at the last meeting identified the need for clarity to reduce overlaps and avoid stretching beyond assigned roles. Moreover, a need to update gendering language was identified.

- We discussed whether we should come out with a selection of what society's documentation needed to be digitalized in ordered to be archived. It was agreed that there was a need to digitalized all material and we discussed different possibilities for archiving. Actions

were taken to scan paper versions of the secretary files and to initiate a search of University storage options.

- We got a volunteer for the role of Scientific Chairperson for the 2023 AGM and discuss requirements criteria for that role.

- We filled the position of Scientific Chair for the upcoming JAM to be hosted in Winnipeg and stressed the need to fill the position of Treasurer.

- An action was taken to draft a call for nomination for the positions of ESM fundraiser, Finance Committee Chair, and Treasurer plus other openings in the Executive and committees.

Third Executive Meeting – May 3, 2023

- We selected the Scientific Chairperson for the 2023 ESM meeting and arranged for a checklist of items to be considered during the organization to be passed along from the previous year Chair.

- An action was put forward to initiate a call to fill opening positions in the executive and society committees.

- We reviewed costs encountered during our previous year ESM meeting. Without the same pressure as in previous years from Covid, we secured volunteers for hosting the mixer, as done before Covid, to reduce cost.

- Digital archiving undergoing, but we faced the challenge of scanning paper documents. It was entertained that this task could be taking upon by a student.

- We discussed the need to fill positions for the JAM that will be hosted in Winnipeg. Specifically, Scientific Chairperson and Treasurer. Potential cost inquiry underway.

Fourth Executive Meeting – September 7, 2023

- We received updates from the AGM organizing committee and finalized different aspects relating to the organization of the AGM, including planning committee composition, theme and budget and expenditures.

- The Scientific Chair for JAM is in place and aware of milestones towards the 2026 meeting.

- We set up on appointment of scrutineer for upcoming elections and confirmed the positions that were up for election. We got a volunteer for the position of Treasurer.

On February 17, 2023, The President, President-Elect and Regional director of the ESM attended the Meeting of the Entomological Societies of Canada (MESC). The discussions revolved around the upcoming 2023 JAM and planning for future JAMS. We discussed the need to review the ESC strategic plan and to integrate regional societies and non-member entomologists. Representatives from different societies provided general reports on each of the ongoing societies activities.

We had, over the year, several requests from the public regarding insect identification and I would like to thank those who were available to help me address these requests. We also had requests from schools for visits which were canalized through our Youth Encouragement & Public Education committee. More recently, the Web Page & Archiving committee finalized re-hosting the ESM website (http://entsocmb.ca/)

It has been a learning experience to serve as President of the ESM and I still feel I have so much to learn. I want to thank you all for your vote of confidence on a relative newcomer to the ESM. Members of the executive committee have done a fantastic job at keeping things rolling and have been extremely supportive, and patient. The society will not function without the work done by those who spend time serving in different committees. Thank you!

APPENDIX C: Report of the Treasurer

FINANCIAL STATEMENTS YEAR ENDING AUGUST 31, 2023

NOTE: These Financial statements have not been audited. The accounts, bank statements and receipts were provided by the treasurer.

Treasurer: Kathy Cano Date: October 23, 2023

	2023	**2022**	**2021**
Current Assets			
Cash	5831.22	11,496	22,046.89
GIC's	50,000	50,000	40,000.00
TOTAL	55831.22	61,496	62,046.89
LIABILITIES			
Current	NIL	NIL	NIL
NET ASSETS			
Unrestricted net assets	5831.22	11,496	22,046.89
Internally restricted	50,000	50,000	40,000.00
	55,831.22	61,496	62,046.89

	2023	**2022**	**2021**
REVENUES			
Annual Meeting (Registration)	820.00	0	0
Donations	600.00	800	850.00
ESC	0	0	0
Interest income	838.72	777.50	920.23
Membership fees	1165	1500	1385
Miscellaneous	0	0	0
Youth encouragement & Pub Ed	500.00	0	0
Total	3923.72	3077.50	3255.23
EXPENDITURES			
Awards and Scholarships	6300	3250	5000
Donations	0	0	0
General	138.43	106.51	64.83
Meetings:			
ESC	0	0	0
ESM	3906.53	0	0
Social Committee	0	0	0
Youth Encouragement & Public Education	511.89	20.25	0
Bank Fees	114.20	85.50	61.02
TOTAL	10,829.73	3462.26	5125.85
EXCESS ((DEFICIENCY) OF REVENUES OVER EXPENDITURES	(6906.01)	(384.76)	(1870.62)

APPENDIX D: Report of the Regional Director

Prepared by Jason Gibbs, 23 October

I have attended Board of Directors Meetings virtually since the last AGM. Several pieces of news have been passed on to the ESM executive and/or membership through meetings, direct emails form the Secretary, or publication in the Newsletter. These have included positions available on the ESC board (currently a co-secretary position to replace Neil Holliday is available), student awards, notifications of the joint annual meeting and encouragement to participate in the national meeting, and changes to The Canadian Entomologist.

I have reported back to the ESC on ESM activities through formal reports submitted, notes published in the ESC Bulletin, and during meetings of the board of directors.

The ESC is currently undergoing a process to renew its strategic plan. A special meeting, led by facilitator, was conducted before the 2023 JAM. A strategic plan was not arranged during this meeting but the groundwork for determining priorities was laid.

Members of the ESM are encouraged to provide feedback to the Regional Director on matters related to the ESC. My term has ended as Regional Director and I’m pleased to be replaced by John Gavloski.

APPENDIX E: Report of the Proceedings Editors

Volume 78 (2022) of the Proceedings of the Entomological Society of Manitoba was produced exclusively in electronic format. It was sent to the Secretary (Jade Tanner) to be distributed to the membership and to the Webmaster (Jordan Bannerman) to be posted to the website. Volume 78 includes three scientific papers. Abstracts from the papers presented at the 2022 Annual Meeting of the Entomological Society of Manitoba are also included. Some of the abstracts are accompanied by amazing images of study specimens and field sites submitted by the presenters. Annual Meeting Minutes and Committee Reports from the 78th Annual Business Meeting can be found at the end of the volume. Thanks to Jade Tanner for providing committee reports, and to Sheila Wolfe for providing the abstracts for this issue.

Volume 78 was produced by co-editors Kelsey Jones and Jason Gibbs. All future Scientific Note and Scientific Paper submissions should be emailed to kelsey.jones@agr.gc.ca or jason.gibbs@umanitoba.ca. The Proceedings has come out with an official "Instructions for Authors" document to aid in the formatting and submission process. This document will be accessible on the Entomological Society of Manitoba website.

We encourage everyone to consider submitting Scientific Notes and full Scientific Papers. The Proceedings is a terrific place to publish new distribution records and faunal lists for insects and related arthropods in Manitoba, as well as the results of a wide variety of entomological study. We already have promises from several people to submit a number of very interesting papers, which we hope will appear in the 2023 Proceedings. All submitted manuscripts are peer-reviewed; all published papers are available as PDF reprints on the website. Issues of the Proceedings are fully accessible using on-line search engines. There are no page charges to authors for published manuscripts, and with our electronic format, colour images can be included in manuscripts. In theory, there are no practical limits to manuscript length. All issues of the Proceedings are freely available to entomologists around the world. If you have something of relevance to entomology in Manitoba, we encourage you to consider submitting it to the Proceedings.

Respectfully,

Kelsey Jones & Jason Gibbs

Proceedings Co-Editors

APPENDIX F: Report on Membership by the Secretary

The Entomological Society of Manitoba currently has 88 members (84 in 2022). Our membership is composed of 31 students, 52 regular members, three honorary members, and two lifetime members. At the time of the meeting, we do not have any members with overdue membership fees.

E-transfers continue to be an efficient and effective way to receive renewals and is now largely the main membership payment method. We encourage all members to use this tool for renewals in the future.

I would like to welcome our new members and thank them for joining our entomological fold. If you have not done so, please fill out our membership information forms to submit via email. Please continue to invite students and colleagues to join.

Members are encouraged to get in touch when they come across insect related (or adjacent) events / activities that would be of interest to our group. The Secretary can help by sending out calls for volunteers and notices for events.

I've had a great time working together with our members and our executive. This coming year will be my third year as the secretary, and I would like to pass the reins of this position over at the end of the year. If anyone might be interested in my position and has any questions, please reach out to me! I am looking forward to continuing to work with you all in 2023-2024!

Thank you,

Jade Tanner

APPENDIX G: Report of the Endowment Fund Board for 2022–2023

A summary of investments and projected interest income for the fiscal year is attached (Table 1). Interest generated by the Endowment Fund provides a basis for funding the Society activities. The Endowment Fund principal is $50,000.

Richard Westwood, Endowment Fund

Kathy Cano, Treasurer

Endowment Fund Guaranteed Investment Certificates

Table 1: Account information as of October 12, 2023.

Certificate No.	Principal $	Interest Rate (%)	Term	Maturity Date	Anticipated interest ($)
00920196133-0006	10000.00	2.00	5 yrs	November 19, 2024	1000.00
00920196133-0007	10000.00	2.25	5 yrs	December 13, 2024	1125.00
00920196133-0012	1000.00	4.90	3 yr	November 4, 2025	147.00
00920196133-0010	10000.00	2.18	5 yrs	November 30, 2026	1090.00
00920196133-0011	10000.00	2.18	5 yrs	December 2, 2026	1090.00
00920196133-0001	9000.00	5.75	5 yrs	November 10, 2027	2587.50
Total	**50000.00**				

APPENDIX H: Report of the Scientific Chair

Justis Henault (henaultjps@gmail.com)
Submitted to the Entomological Society of Manitoba President (Vincent Hervet) on 6 September 2024

The Entomological Society of Manitoba's 79th Annual Meeting went well. We tried out a new venue for the scientific portion of the meeting, listened to a fascinating plenary by Dr. Elizabeth Clare and returned to Bob and Pat's house to enjoy our mixer. Despite some technical difficulties with hosting a hybrid event, this meeting was a success.

J. Henault 2023

This report is divided into an Executive Summary followed by a more thorough discussion of the Entomological Society of Manitoba (ESM) meeting. Components of the meeting are discussed in separate sections; recommendations upcoming Scientific Program Committee and/or ESM Executive Committee are summarised in the Executive Summary. A series of documents has also been zipped and submitted with this text report:

- ESM AGM 2023_Announcement.jpg
- ESM AGM 2023_Call for Papers (.docx and .pdf)
- ESM AGM 2023_Organiser.xlsx
- ESM AGM 2023_Programme_computer view (.docx and .pdf)
- ESM AGM 2023_Programme_foldable (.docx and .pdf)
- ESM AGM 2023_Venues information.xlsx

- ESM AGM 2023_SmartPark Innovation Hub (folder)
- ESM AGM 2023_Sponsor poster and logos (folder)

The other members of the Scientific Program Committee (SPC) (Jade Tanner, Kathy Cano, Lavanya Ganesan, Sheila Wolfe, Terry Galloway), Lisa Capar (incoming Treasurer) and Kateryn Rochon (provided guidance throughout) reviewed the report; feedback was subsequently incorporated.

Executive Summary

Scientific Program Committee

Members	Responsibilities
Jade Tanner	Membership and registration
Kathy Cano	Fundraising and finances
Lavanya Ganesan and Sheila Wolfe	Refreshments and Mixer
Terry Galloway	Student Competition
Justis Henault	General meeting coordinator

The Scientific Program Committee (SPC) was formed in May of the year of the conference. Each committee member had core responsibilities, but also contributed generally where able to. This approach worked well.

An "Organiser" file was created to a) track tasks required to successfully host a meeting and b) log expenses and revenue. This file helped the SPC to ensure that all necessary steps required to host a meeting were planned for and completed.

An online registration form was also created. By collecting all of the information required to create the programme within this form, we were able to automate the creation of the programme, thus reducing transposition errors and workload.

A meeting logo that matched the theme of the Keynote speaker's research was created by re-styling the ESM logo. This logo added a personalised touch to the meeting.

Recommendations:

1) Continue to form the SPC as soon as possible after previous meeting to provide ample time to plan the upcoming meeting.
2) Use the "Organiser" in order to a) identify, plan and complete tasks and b) log expenses and revenue, revising the files as-needed.

3) Announce the upcoming ESM meeting in the body of an email, an attachment to the same email, in the ESM Newsletter and on the ESM website.
4) *Registration*
   a) Create the online registration form using an ESM Executive Member's Gmail account to ensure that the form is accessible to the upcoming SPC.
   b) Collect all information required to create the programme within the online registration form, in order to reduce the workload required to create the programme.
   c) Encourage ESM members to register online, but provide the option to register in-person in order to meet the preferences/capabilities of our membership.
5) Customise meeting materials to reflect the theme.

Meeting Date

After considering the dates of last year's ESM meeting, other scientific meetings and Winnipeg Blue Bomber home games, we decided to hold the meeting on 27 and 28 October 2023. Despite icy conditions, these dates work out okay.

Recommendations

6) When considering dates for an ESM meeting, keep in mind a) the dates of previous ESM meetings, b) the dates of meetings that ESM members might also participate in, c) relation to the start of the school year, d) likelihood of experiencing weather that may make travel difficult and/or dangerous and e) if adequate time has elapsed since the end of the field season.
7) Refer to the list of Scientific Meetings in this report, revising as necessary.

Scientific Program

With the theme "Innovations in Entomology" we heard from Dr. Elizabeth Clare, who delivered a Keynote address on eDNA research. We also welcomed Véronique Martel, Guy Ash, Dan Benoit and Steve Whyard as Symposium speakers. Fifteen additional papers were presented (thirteen orally using a slideshow and two via posters). Congratulations to Danie Wood, Shayla Woodland, Casandra Madden, James Watson and Keziah Bartel as winners of the Student Competition! Thanks to everyone who participated in the paper session at the 79th Annual Meeting of the ESM! Please refer to our scientific programme, appended, for a full list of speakers.

On our recommendation, Elizabeth Clare stayed at the Four Points Sheraton Hotel and gave a positive review. We took her out for dinner at Nicolino's. The Keynote and Symposium speakers were each presented with a gift of appreciation.

Recommendations

8) *Speakers and theme*

a) Begin the search for a Keynote and Symposium speakers as early as possible, aiming to finalise the speakers before the summer field season commences.
b) Although sticking to a theme might be convenient, adapting the theme to complement the research of the Keynote speaker can create a successful solution.
c) I encourage future organisers to continue to include speakers with various perspectives (such as Indigenous and Western), regardless of the meeting's theme.
d) Offer invited speakers complimentary meeting registration.
e) Express gratitude toward invited speakers. This may include a gift.

9) *Participation*
a) All ESM members are encouraged to present research at upcoming conferences, to ensure that we have a full schedule of speakers from a variety of positions in their career.
b) Students are encouraged to attend the entire meeting, especially in order to hear from all of the meeting's invited speakers.

10) *Student Competition*
a) Continued efforts to ensure fairness in the Student Competition is recommended (*e.g.*, randomly assign presentation order).
b) Review the monetary value of prizes, considering the value of equivalent prizes awarded in other jurisdictions, and revise when necessary.
c) Continue to provide judges flexibility when assigning award monetary values and the number of awards to be disbursed, while following the updated ESM protocols.

11) Recommend the Four Points Sheraton Hotel (2935 Pembina Hwy, Winnipeg, MB R3T 2H5) as accommodations for out-of-Winnipeg guests/registrants.

Scientific Program Venues

We hosted a hybrid event, the first in the ESM's history. The first day took place at the Smartpark Innovation Hub and the second at the Department of Entomology Building, both on the main University of Manitoba campus. Despite technical difficulties that disrupted the experience of attendees, the overall impression of the venues was positive.

Despite the difficulties, two significant benefits were obtained by trialing a hybrid-style event:

1) The hybrid format allowed an immunocompromised attendee to participate while reducing health risks to themselves. Providing an opportunity for all of our members to attend is important.
2) We were able to hear from a researcher who was beyond driving distance, without having to pay for their travel (*i.e.*, airfare, accommodations, etc.) as we would a Keynote. Extending our reach out to entomologists beyond Manitoba, whose research is still relevant to ESM members, can be valuable.

This meeting provided invaluable experience as a trial-run to host a hybrid meeting, but a hybrid event is likely not worthwhile in any given year. Considerations regarding hybrid events, and recommendations for how to successfully implement them, are discussed in the report.

Entomological and similar departments in neighbouring jurisdictions were sent invites to our meeting, but no-one outside Manitoba attended.

Recommendations

12) Keep in-mind that the Department of Fisheries and Oceans may not host our meetings in the near future.
13) Consider holding the conference on weekends to eliminate room fees by using rooms at the Department of Entomology.
14) Given the many benefits features of the Smartpark Innovation Hub and the professionalism displayed by our host, this venue is recommended as a strong candidate for future ESM meetings despite the charge for the room.
15) Continue to invite people from neighbouring jurisdictions, but do not plan for substantial attendance from these areas if at all.
16) *Considering whether to host a hybrid event*
    a) Components of a hybrid event, among other options, ought to be used as tools in order to maximise the experience of attendees while ensuring accessibility by all ESM members.
    b) Organisers could require all attendees to wear N95 masks, or equivalent, when they are not delivering a presentation. This would ensure the safety of immunocompromised individuals **without** requiring members to identify as such, while physically being in the same room as everyone else.
    c) Posters and presentations could be uploaded, in non-editable file formats, to an online cloud drive, which attendees who don't attend in-person could access. Additionally, presenters could be asked to record their presentation to pair with their poster/presentation for online attendees to hear/watch.
    d) Host one of the two days in the hybrid style, ensuring members who cannot attend in-person can at least attend part of the meeting. If used for the Invited Speakers Symposium, this style would eliminate monetary constraints and widen our pool of potential speakers.
    e) Have a regularly-occurring hybrid-style meeting. If a hybrid meeting is held every few years, then members will be able to benefit from its components regularly. However, any student requiring a hybrid format would only be able to participate once during their degree (within a 2-3 year Master of Science program or 4 year Doctoral program) or possibly not at all (1-year Honours thesis).
    f) If enough registrants would benefit from a hybrid format, then the SPC could host such an event. Registrations would have to be acquired very early - likely months in advance of the

meeting – which might be too early for many prospective registrants to know whether they will attend or not.

17) *If SPC decides to host a hybrid event*
   a) Dedicated audio-visual person.
   b) Host the online components using an account by someone affiliated with the University of Manitoba, and have a backup person and account.
   c) Enable co-host to admit attendees while presentation is ongoing without interruptions.
18) Continue to find innovative ways in which to host the ESM meetings when new technologies become readily usable (*e.g.*, hybrid meeting).

Registrant cards with names for insects in Indigenous languages

In an effort to go beyond a land acknowledgement, name cards with drawings of insects accompanied by a word used to describe them in an Indigenous language were used to still do something meaningful toward reconciliation.

Recommendation

19) Creatively and thoughtfully incorporate the land's history into the conference (*e.g.*, name cards).

Attendance

Fifty-five people registered: 26 Student registrants and 29 Regular. The maximum number of people in a room at one time was 50 plus up to 6 people on Zoom

Mixer

2024 was the first year back at Bob Lamb and Pat MacKay's home since the start of the COVID-19 pandemic. Members were excited to return! We socialised and announced the winners of the presentation awards and student achievement awards. It was likely the most well-attended event in recent memory, as evident by the number of shoes (37 pairs) and approximately 45 coats documented at different points during the evening (image and numbers courtesy of Pat and Bob). Thanks to Pat and Bob for hosting us!

Recommendations

20) Given the continued enjoyment by members here, Pat and Bob's home is recommended as the preferred candidate for upcoming mixers.
21) If the mixer occurs at a private residence, assess the viral health risk and rent air purifiers if necessary.

Cost

Itemised expenses/revenue lists for **all** items purchased for previous meetings was not available. We estimated our financial needs by anticipating inflation in the wake of the COVID-19

pandemic and amenities previously unavailable to members (parking, accessible washrooms and WiFi. To help cover the costs without unnecessarily burdening ESM members, we rose registration fees slightly, following approval from the ESM Executive.

Several sponsors donated to our event, and their logos were subsequently displayed at the front of the rooms during the meeting. Three regular sponsor organizations did not donate. Thanks to the following organisations for sponsoring our event:

Canadian Centre for Mosquito Management
Cano Pest Control
City of Winnipeg
Taz Pest Control
Valkyrie Pest Solutions

Overall, we posted a deficit of $239.31. Had our assumptions regarding the sponsors been correct then we would have posted a surplus. Whether past ESM meetings posted a surplus or instead a deficit is unclear, due to the lack of available documented itemized expense/revenue files. Going forward, SPCs are encouraged to prepare a budget. Perhaps, this budget could be approved by the Executive Committee, and its expenditure left to the discretion of the SPC. Having a budget would help everyone to stay on the same page and reduce the pressure on the Chair to ensure the budget is retained while enabling necessary delegated discretion to SPC members. Equipped with the detailed transactions sheet generated this year, the next SPC will be able to prepare a reasonable budget, prioritise needs and allocate funds accordingly.

Recommendations

22) Use the sheet in the "Organiser" file to itemize expenses/revenue to stay organised but also provide guidance to future SPCs.
23) Meeting fees are decided by the SPC based on expected expenses.
24) We recommended that no assumptions be made regarding if/when sponsors will donate, and the SPC strictly require donations to be submitted at least one week before the ESM AGM. This protocol will ensure the accuracy of the sponsor board and fairness when donating.
25) It is recommended that the ESM President send a thank-you message to the sponsors, to help build relationships. Including a .pdf of the sponsor board in this email would allow sponsors to see who else donated.
26) Regarding the Keynote speaker dinner, it is recommended that the Executive Committee discuss and generate a formal protocol for a) who pays for which meals and b) who should attend (*e.g.*, the Chair, ESM President and SPC). Obligated attendees have the option to send a designate in their place.
27) Prepare a budget, possibly approved by the ESM Executive Committee. Expenditure would be left to the discretion of the SPC.

28) Discuss the financial expectations of ESM meetings: a) recoup the costs of hosting the meeting, accepting the risk of falling short or b) provide a modest amount of revenue to the society, with the surplus tracked and invested into the next meeting.

Additional thoughts

Elizabeth Clare remarked about the friendliness of ESM members.

The hybrid component allowed access to our meeting by our membership and hear from an out-of-province speaker, but technical complications reduced the experience of in-person attendees. Based on our experience, solutions have been suggested to guide future SPCs exploring a hybrid event to host a successful meeting. I appreciate the gratitude expressed by several members about the efforts by the Organizing Committee and I, for putting together the meeting.

Report

Scientific Program Committee

During an ESM Executive Committee meeting, I volunteered to Chair the upcoming Annual Meeting. After being officially appointed, I contacted potential committee members and finalised the committee by 21 May 2023. Each committee member had core responsibilities, but also contributed generally where able to:

Jade Tanner – Membership and registration
Clarified ESM procedures for tasks.

Kathy Cano – Fundraising and finances
Approached past, and potential, funders for donations. The Scientific Program Committee ran cost estimates by Kathy before making purchases.

Lavanya Ganesan and Sheila Wolfe – Refreshments and Mixer
Planned and carried out refreshment breaks throughout, including the mixer (supplies; refreshments; set-up, take-down and transport).

Terry Galloway – Student Competition
Formed judging committee, chaired the student competition session and ensured that judging concluded early enough for the certificates to be printed (printed by Désirée Vanderwel).

Justis Henault
General meeting coordinator. Ensured the overall cohesion of meeting components.

The approach to delegating responsibilities worked well. It is recommended to continue to form the Scientific Program Committee as soon as possible after previous meeting to provide ample time to plan the upcoming meeting.

Organisational tools

I created a few tools to help me/us stay organised while planning. They may be of help to future Chairs and SPC, and as such, are appended as supplementary materials to this report:

1) Organiser – two components:

a) Task tracking spreadsheet – an itemised list of tasks with deadlines. I drew from efforts by previous Chairs – an itemised list created by Vincent Hervet, and report by Sheila Wolfe – before adding additional tasks and deadlines for each task. The sheet has been set-up to calculate the deadlines automatically based on completion dates for previous tasks. The deadlines that we imposed on ourselves, and the actual dates that we completed them, are shown in the column on the right-hand side, with the hopes that they may guide planning by the upcoming SPC. Tracking became less robust, and often neglected, planning became life-consuming closer to the meeting date. Progress status for each task is coded to change colour according to status (*i.e.*, "Not started", "In progress", "Completed", "Unknown").

b) Transactions spreadsheet – a spreadsheet to log expenses and revenue.

2) Online registration form – I revamped the form used last year, using Microsoft Forms.

- The form is essentially a duplicate of the .pdf file typically distributed before the meeting. However, embedding this information into the form ensures convenient access to this information by attendees as they register online. The form was structured to branch, with an additional section available to registrants who indicated that they would be submitting a paper (that is, an oral or poster presentation).

- We inserted anticipatory questions into the form, which reduced the workload required to process registrants, plan for refreshments and create the meeting programme.

  First, information about the registrants (*i.e.*, name, membership status, contact information) was exported as a spreadsheet, which was then subsequently used at the registration desk to more efficiently process attendees as they arrived at the meeting venue.

  Second, collecting information about dietary restrictions and accessibility requirements of online registrants, as well as whether a guest would be brought to the Mixer, allowed us to effectively ensure that the various needs of attendees were met.

  Finally, collecting information about papers in a consistent file format, enabled us to automate the creation of the abstract programme ("Mailings>Letters" function in Microsoft Word). This automation almost eliminated transposition errors by the Chair and the need to correct fonts, formats, etc. of submissions. The following information

was gathered: type of submission (poster or presentation), student competition (Y/N), title, author(s), affiliation(s), abstract, request to email media to Scientific Chair, time periods where the registrant could not present and questions. Timeslots when presenters were **not** available were identified within the form to avoid the numerous back-and-forth emails typically required to confirm availability.

- Going forward, having all attendees register online would increase the efficiency of registration and planning. However, many attendees prefer to register in-person, and the comfort levels of our membership ought to be supported. Therefore, it is recommended to a) announce the meeting in the body of an email, an attachment to the same email, in the ESM Newsletter and on the ESM website, and b) to encourage ESM members to register online, but provide the option to register in-person in order to meet the preferences/capabilities of our membership.

- Additionally, creating the online registration form using an ESM Executive Member's Gmail account (*e.g.*, Secretary, Treasurer) would ensure that the form could be accessed and updated by the next SPC. Transferring forms created in Google or Microsoft Office may not be possible.

Programme

Post-submission revisions from registrants (titles, names, etc.) were processed manually, and the ESM Secretary circulated the updated program the morning of the meeting.

I created a meeting logo by re-styling the ESM logo to match the focus of the keynote speaker's research – using shed eDNA of organisms to answer research questions. This added a personalised touch, while retaining a logo that could be recognized as that of the Entomological Society of Manitoba. Elizabeth Clare was pleased about the tailored logo when I pointed it out. Prior to this, I traced the ESM's picture format of the logo, into an .svg file in order to create a logo with crisper lines. This and updated logo files in image formats, have been provided to the Secretary for storage; members may alternatively contact me for the logo.

The programme was arranged into two, 3-fold versions:

1) easy to read while viewing online - information starts in the left-most column and continues to the right.

2) readable while viewing a printed version - title on the front, then chronological information appears as the document is unfolded and acknowledgements on the back. Setting up a document with columns can be frustrating, so I hope that the supplemental

editable file attached to this report will reduce the frustration experienced by the next Chair/SPC.

Only 15 programmes were printed in an effort to reduce paper consumption. An electronic version of the program was circulated to attendees prior to the meeting (for their printing if inclined), but did not capture any last-minute changes captured in the printed version.

Meeting date

We considered the date that the meeting was held last year (26 and 27 October 2022), other related meetings occurring during this time of year, and home game dates of the Winnipeg Blue Bombers (assuming that we would be at the University of Manitoba during at least part of the meeting). In the end, the meeting was held on 27 and 28 October 2023.

These dates worked out okay. Participants of this conference were also able to attend conferences during the weeks before and after. The first real snowfall of 2023 coincided with our meeting, causing sidewalks to be icy and travel to be difficult. However, the same approximate dates may be warm and sunny during other years. Advancing the date of the meeting may decrease the likelihood of snow, but ought to also be weighed against the chaos at the start of the school year in September and ensuring that potential speakers have had enough time to compile data from the summer/fall field season and present them.

The following is a list of other Scientific Meetings to consider:

Scientific Meeting	Website
Entomological Society of Canada Local student symposia	https://esc-sec.ca/annual-meetings/
Entomological Society of Saskatchewan	http://www.entsocsask.ca/events.html
Entomological Society of Ontario	https://www.entsocont.ca/events.html
Entomological Society of Alberta	https://entsocalberta.ca/news-and-events/annual-general-meeting/
Western Forum of Pest Management	https://www.westernforum.org/WCCPAnnualMeeting.html
Entomological Society of America	https://entsoc.org/events
International Congress of Entomology	https://ice2024.org/
Canadian Society for Ecology and Evolution	https://csee-scee.ca/

Scientific Program

The scientific program provided intriguing discussions about various research relevant to the ESM. Members indicated that Dr. Clare's talk was stimulating and set-up the rest of the conference well. We also welcomed Véronique Martel, Guy Ash, Dan Benoit and Steve Whyard as Symposium speakers. Thanks to everyone who participated in the paper session at the 79th Annual Meeting of the ESM! Please refer to our scientific programme, appended, for a full list of speakers.

Theme

Initially, the theme "Innovations: new technologies and re-emerging ancestral knowledge" was chosen - holding Western and Indigenous knowledges as equal, how may be incorporate these approaches into our research to answer our focal questions? People who could speak to Western, Indigenous approaches, and both, were approached over the summer prior to the meeting, with many unavailable or did not respond in-time/at all. Excitingly, Dr. Elizabeth Clare enthusiastically agreed to deliver the keynote address! Her research on eDNA matched the Western part of the theme well. We subsequently revised the theme to **Innovations in Entomology**. This theme allowed for a focused and helpful discussion of various approaches that researchers use to answer research questions. Discussions of Indigenous approaches were discussed during the main paper and symposium sessions of the meeting.

It is recommended to begin the search for a Keynote and Symposium speakers as early as possible. Although sticking to a theme might be convenient, adapting the theme to complement the research of the Keynote speaker can be a successful solution. I encourage future organisers to continue to include speakers with various perspectives (such as Indigenous and Western), regardless of the meeting's theme.

Invited Speakers

Finding available speakers whose research was relevant to our symposium was difficult. Emails sent during the summer received responses within hours to weeks. As soon as the first week of September arrived, response times improved considerably. This dynamic created a rush to finalise the programme in order to circulate meeting documents (including a Call for Papers) early enough to allow ESM members to consider how/if they wanted to participate. Thus, I recommend that the next SPC should aim to finalise the keynote and symposium speakers **before** summer in order to allow ample time during the fall.

Accommodations for Keynote Speaker

Following a positive review about the Four Points Sheraton Hotel (2935 Pembina Hwy, Winnipeg, MB R3T 2H5) from our 2022 Keynote speaker, we recommended this hotel for our 2023 speaker. Elizabeth Clare also gave a positive review. The hotel a) is close to the University

of Manitoba, b) recently renovated, providing the guest a modern room and c) has recently received positive reviews. As such, this location is recommended for future meetings.

We took the Keynote speaker out for dinner at Nicolino's (2077 Pembina Hwy; Winnipeg, MB; R3T 5J9), which she enjoyed.

Gift

Receiving honorariums for volunteering time at an event, is standard practice. As such, the Keynote and Symposium speakers were given a gift, as a gesture of the ESM's appreciation for their participation at our conference. Over the last year or so, honorariums that I have received were approximately $75, and the SPC decided that approximately $60 was to be spent for each person, with an emphasis on local gifts. Additionally, invited speakers were also offered complimentary meeting registration.

The speaker gift included:

- chocolate bar from Decadence Chocolates
- Smack-Dab Mustard or De Luca's risotto (risotto for Elizabeth Clare to ensure it could be placed in her carry-on luggage)
- Framed images of local insects by Thilina Hettiarachchi. He donated the images, emailing them to me, which I subsequently had developed at London Drugs, and placed into frames from Michaels before wrapping.
- a gift card to La Belle Baguette (for speakers living in Winnipeg) or to Mountain Equipment Company (for anyone outside of Winnipeg; all people who received these cards were often outside, so this outdoor gear company would likely be well-used).
- for a card, I printed out an image of the meeting's logo and attached it to folded cardstock. I also inserted a thank-you message in each card, which also briefly described the contents of the gift.

The gifts were presented to the speakers after their presentation (mailed to V. Martel). All of the speakers expressed appreciation for having received them.

Main session

Initially, we only had students (and 1 post-doc) submit papers. Although hearing from students is excellent, especially to provide an opportunity for them to develop their communication skills, having some seasoned professionals in the programme would allow students to hear from their mentors. Terry Galloway generously volunteered to add a presentation. I encourage all ESM members to present their research at upcoming conferences, to ensure that we have a full schedule of speakers from a variety of positions in their career. I additionally encourage students to attend the entire meeting, especially in order to hear from all of the meeting's invited speakers.

An example of the gift presented to each speaker (J. Henault 2023).

Student competition

We had 12 submitted papers, composed on 2 posters and 10 oral presentations. Presentations were stimulating, and the ESM membership enjoyed learning about students' research. For the first time in recent memory, two people wanted to present a poster together, given that they had jointly worked on the project. Since both students were on board, we approved it, and having both students present worked out well.

In an effort to ensure fairness with the order of papers, I first alphabetised student's names, before giving each a number in sequence. Then, I used a random number generator to create the order in which the speakers would present. I adjusted for time when presenters were unavailable and made sure that each session had at least 2 competitors so that they weren't speaking by themselves (morning, and both afternoon sessions had at least 2 competitors per session). Continued efforts to ensure fairness are recommended.

In order to increase the prize amounts awarded to recipients of the oral and poster presentations of the Student Competition, we moved to increase the prize pool from $200 to $400 prior to the meeting. This was approved by the ESM executive as follows:

> *To judge student papers. The judging criteria are to be distributed to all competitors upon entering the competition. The decisions of the judges are final.*

Awarding guidelines:
1) At least one winner each for oral and poster presentations (including in the event of only 1 entrant to the respective competitions).
2) A total of $400 is available to be disbursed.
a) Additional winners may be selected (such as second-places, or ties) and the $400 distributed amongst all winners at the discretion of the Student Paper Award committee. Higher ranks must be awarded no less money than lower ranks (second place cannot receive more money than first place). Equality between oral and poster arrays is encouraged.

Future SPC's are encouraged to review the monetary value of prizes, considering the value of equivalent prizes awarded in other jurisdictions, and revise when necessary.

To avoid any confusion experienced by past judges, it was clarified that in 2023 it was up to the judges' discretion as to how the prize pool would be split-up amongst the recipients, with the Chair of the Student Competition providing guidance if needed, but with no need to gain approval from the Executive Committee. Judges appreciated the flexibility of these protocols.

Congratulations to the following award recipients:

Oral Presentation
1st place – **Danie Wood**
ASSESSING THE ABUNDANCE OF AMERICAN DOG TICKS, *DERMACENTOR VARIABILIS* (SAY), ON CATTLE PASTURES AND CATTLE IN SOUTHERN MANITOBA, CANADA: ENVIRONMENTAL FACTORS AND IMPLICATIONS FOR TICK-BORNE DISEASE.

2nd place – **Shayla Woodland**
COMBINED EFFECTS OF PLANT DENSITY AND CHEMICAL MANAGEMENT STRATEGIES ON FLEA BEETLE ABUNDANCES, PLANT DEFOLIATION AND YIELD OF CANOLA ACROSS CANADIAN PRAIRIES.

Poster Presentation

1st place – **Casandra Madden**
BLACKLEGGED TICKS, *IXODES SCAPULARIS* SAY, ABUNDANCE AND DISTRIBUTION ON PASTURES IN MANITOBA, CANADA

2nd place – **James Watson** and **Keziah Bartel**
WILLOW POLLEN COLLECTION BY A BLUEBERRY SPECIALIST

(Including contributions from ESM Scholarships and Awards Committee, Kathy Cano and pictures by Marcelo Cano.)

Scientific Program Venues

A major change during this year's meeting was to use a new venue for Day 1 of our scientific paper sessions.

Day 1 - Smartpark Innovation Hub, Room MPR 1

In the past, we had used the Freshwater Institute at the Fisheries and Oceans (DFO) building on the University of Manitoba Campus (501 University Cres, R3T 2N6, Winnipeg, MB). While this building worked well, two concerns prompted a search for a new space:

a) Wheelchair (etc.)-accessible washrooms were only available in the basement. To enter them, our contact at DFO had to be phoned to unlock the path as an escort. Understandably, avoiding this disruption to our contact's day would be beneficial.

b) The building had no internet signal accessible to patrons. I was informed that providing additional access to patrons would be difficult, if even possible, given the

strict security measures being a federal government building. This lack of internet was an inconvenience (*e.g.*, remote work), but also prevented a hybrid event to be held.

Several options were considered (a comparison file of various venues has been appended). I realised that the Smartpark Innovation Hub on the University of Manitoba campus may be a viable option (100 Innovation Drive, R3T 6A8, Winnipeg, MB). I contacted both Javier Uribe (javier.uribe@umanitoba.ca) and Larry Paskaruk (Larry.Paskaruk@umanitoba.ca) for information regarding room amenities, parking, pricing, etc. (information appended), before deciding with the SPC if we wanted to rent the event.

Features

- Accessible washrooms on first floor
- Free WiFi with booking of room
- At a location that had worked well for us in the past – located on the University of Manitoba Campus – approximately 1 km away from the Department of Entomology.
- Modern room, without feeling too extravagant. Amenities include: large presenter screen, a podium, whiteboard, a kitchenette, AV equipment (microphone, batteries, etc.), speakers in the ceiling, high-quality cameras at the front and back of the room, capability to host a hybrid meeting, coat rack, options to adjust lighting and cameras. The hosts set-up the room according to various floor plans. The features provided within the room made hosting a hybrid meeting possible (discussed below).
- Each room seats 50 people (tables, chairs and electrical outlets included), which was almost perfect. There is an option to extend to 100 people.
- Parking included with the room. Participants do not need to register their vehicles; towing in that lot is not enforced on the day of the conference. ~3 min walk away, with plenty of spaces.
- Upon the suggestion of Javier, we asked participants to pre-order their lunch during the first break. At lunch, all of the meals were ready to eat and attendees could begin eating right away – this worked out very well.
- Displayed our conference logo on a TV screen facing one set of the doors to the building

Several people expressed their delight with this year's venue, and the excitement on members' faces was evident as they entered the room. Additionally, our main contact, Javier, was friendly, professional, and easily accessible by email and phone. He was available during set-up and take-down, and immediately came to the room to help during the meeting when we experienced technical difficulties. I asked him directly if we could give him any thank-you gifts, but graciously declined as per company policy.

The following is his contact information, but please carbon copy the manager Larry Paskaruk (Larry.Paskaruk@umanitoba.ca) when doing so:

> **Javier Uribe**
> Operations Manager, Smartpark Research & Technology Park, 100 Innovation Drive, Suite 421, Winnipeg MB, R3T 6G2
> javier.uribe@umanitoba.ca

The DFO venue did not charge for use of the room, but did charge for parking. However, this lack of a room-charge was only possible because our contact– Cheryl Podemski (Cheryl.Podemski@dfo-mpo.gc.ca) – was entomologically inclined. She encouraged us to figure out a new plan soon, because she would be retiring in the near future. The room at Smartpark Innovation Hub cost $650 for the day (8 am – 4 pm booking). The Department of Entomology rooms are free-of-charge. However, these rooms are generally being used on the Friday, typically the first day of our conference (Day 1 = keynote and main paper session at DFO, Day 2 = symposium and ESM members meeting at Department of Entomology), and as such are unavailable as locations to hold the conference. If interested, the SPC could move both days of the conference to the weekend in order to use the Department of Entomology rooms and avoid booking fees. Given the many benefits features of the Smartpark Innovation Hub and the professionalism displayed by our host, this venue is recommended as a strong candidate for future ESM meetings despite the charge for the room.

Day 2 - Department of Entomology, Room 219

Use of the Department of Entomology room generally proceeded as usual. The room was large enough for our attendance, provided enough space for refreshments during the meeting and lunch at the ESM Members meeting and had accessible washrooms nearby. The room also facilitated a hybrid event.

Hybrid Event

Most conferences were being held as hybrid events, with attendees given the option of attending in-person or online. We decided to try out a hybrid event at this year's meeting – the first time this has been attempted by the ESM.

The functionality of both venues was tested before the meeting (Justis assisted by Javier Uribe at Smartpark and Kateryn Rochon at the Department of Entomology). We confirmed that the in-person and online audiences could hear the presenter and see the presentation, whether the presenter was in-person or online. Also, that I knew how to set-up the system(s) independently. During the days of the meeting, the same procedures used during testing were followed, but unfortunately the set-up did not work as planned. At various points, we had issues with audio feedback caused by unmuted microphone(s) on Zoom (obscured troubleshooting efforts), playing

videos without creating audio feedback, ensuring that both the in-person and online audiences could hear the videos and audio feedback in the room while presenters were speaking. Evidently, I didn't follow the correct procedures in at least some situations, but at some times, we experienced situations that Javier hadn't run into while hosting other conferences. As noted at the 2023 Annual Members' meeting, these disruptions reduced the quality of the experience for in-person attendees. There was a general feeling of understanding for having trialed this new hybrid type of event.

We sent invites to entomological and biological departments, and people, in neighbouring jurisdictions (*i.e.*, Québec, Ontario, Saskatchewan, Minnesota and North Dakota) in the hopes of drawing online attendees and/or presenters from outside of Manitoba. Unfortunately, nobody outside of Manitoba registered for the meeting. Six people joined over Zoom. It is recommended to continue to invite people from neighbouring jurisdictions, but to not expect substantial attendance from them.

Despite the difficulties, two significant benefits were obtained by trialing a hybrid-style event:

First, the hybrid format allowed an immunocompromised attendee to participate while reducing health risks to themselves. Providing an opportunity for all of our members to attend is important.

Second, we were able to hear from a researcher who was beyond driving distance, without having to pay for their travel (*i.e.*, airfare, accommodations, etc.) as we would a Keynote. Extending our reach out to entomologists beyond Manitoba, whose research is still relevant to ESM members, can be valuable.

At the Annual Member's Meeting, I was asked "Was it worth it?" This meeting provided invaluable experience as a trial-run to host a hybrid meeting. Now, at least we know what to expect from a hybrid event, and the benefits and detriments that may result. However, in any given year, the effort required to host a hybrid event, disruption caused by its complications, as well as the relatively small number of members who may participate online, a hybrid event is likely not worthwhile. This was a sentiment expressed by the ESM membership at the Annual Members' meeting. Instead, I recommend that components of a hybrid event, among other options, ought to be used as tools in order to maximise the experience of attendees while ensuring accessibility by all ESM members. Thoughtfulness and compassion are recommended throughout these decisions, to avoid ESM members feeling like a burden. The following may provide guidance to future chairs regarding the implementation of hybrid components:

a) Organisers could require all attendees to wear N95 masks, or equivalent, when they are not delivering a presentation. This would ensure the safety of immunocompromised individuals **without** requiring members to identify as such, while physically being in the same room as everyone else.

b) Posters and presentations could be uploaded, in non-editable file formats, to an online cloud drive, which attendees who don't attend in-person could access. Additionally, presenters could be asked to record their presentation to pair with their poster/presentation for online attendees to hear/watch.

c) Host one of the two days in the hybrid style, ensuring members who cannot attend in-person can at least attend part of the meeting. If used for the invited speakers session, this style would eliminate monetary constraints and widen our pool of potential speakers.

d) Have a regularly-occurring hybrid-style meeting. If a hybrid meeting is held every few years, then members will be able to benefit from its components regularly. However, any student requiring a hybrid format would only be able to participate once during their degree (within a 2-3 year Master of Science program or 4-year Doctoral program) or possibly not at all (1-year Honours thesis).

e) If enough registrants would benefit from a hybrid format, then the SPC could host such an event. Registrations would have to be acquired very early - likely months in advance of the meeting – which might be too early for many prospective registrants to know whether they will attend or not.

If the SPC decides to host a hybrid meeting, the following are recommended:

- Dedicated audio-visual person
  Initially, I had planned to have a dedicated person for the hybrid components, but by the time I returned to planning this component, it was late in the process and I didn't feel comfortable asking someone to commit so late in the process. I ended up a) chairing the 79th meeting, b) loading presentations for each speaker and c) troubleshooting the audio-visual components, simultaneously. This pulled me in too many directions at once. Having a dedicated person was also raised and supported by ESM members during our Annual Members' meeting.

- Host the online components using an account by someone affiliated with the University of Manitoba, and have a backup person and account.
  We upgraded my Zoom license to a one that was better suited to hosting conferences (only used for purposes of the meeting and upgraded subscription cancelled afterwards). However, we still had issues, including something about a "Connector Room Connector" license at the Department of Entomology which seemed to have required access to the technology infrastructure at the University of Manitoba (https://explore.zoom.us/en/products/zoom-rooms/room-connector/). Being ready with a

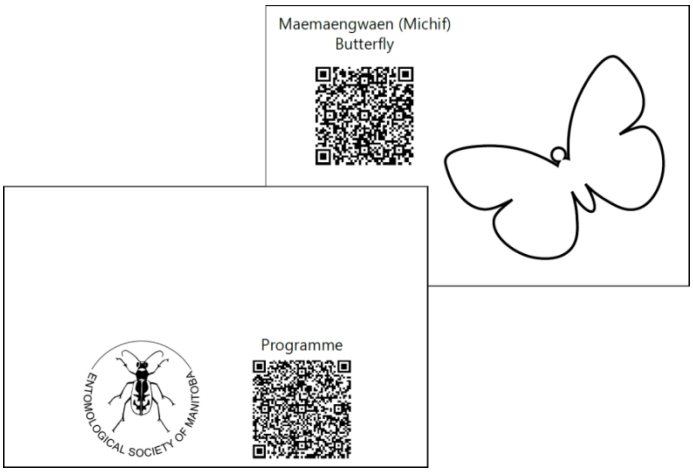
back-up account would also avoid any issues arising from extenuating circumstances regarding the owner of the first priority account during the meeting.

- Enable co-host to admit attendees while presentation is ongoing without interruptions
  The status of the virtual presenter was changed to "host" so that they could share their screen. At the same time, the people were stuck in the online waiting room. Since we didn't have access in the room, we couldn't admit anyone.

It is recommended that SPC's continue to find innovative ways in which to host the ESM meetings when new technologies become readily usable (*e.g.*, hybrid meeting).

Registrant cards with names for insects in Indigenous languages

For this meeting, I wanted to go beyond a land acknowledgement and additionally do something more meaningful. The SPC and I decided on creating name cards with drawings of insects accompanied by a word used to describe them in an Indigenous language. One side of the card, was the ESM logo with an empty area for the attendee to write their name. On the other side, was a line drawing of an insect (drawn in graphic editing software), the relevant word in an Indigenous language spoken in Manitoba and a QR code linking to a website where the pronunciation could be heard.



The cards were a thoughtful way to acknowledge the history of the place where we held the conference. I encourage upcoming organisers to incorporate the land's history creatively into the conference that they organise.

Attendance

Fifty-five people registered: 26 Student registrants and 29 Regular. The maximum number of people in a room at one time was 50 plus up to 6 people on Zoom. The number of registrants is typical for an ESM conference. Having a high proportion of our attendees as students is great. This engagement shows that our annual conference is an opportunity for students to practise public speaking and to participate in the exchange of knowledge as peers with others students but also with relatively established professionals.

Mixer

2024 was the first year back from at Bob Lamb and Pat MacKay's home since the start of the COVID-19 pandemic. Members were excited to return! After assessing the viral health risk, air purifiers were not rented. We socialised and announced the winners of the presentation awards and student achievement awards. It was likely the most well-attended event in recent memory, as evident by the number of shoes (37 pairs) and approximately 45 coats documented at different points during the evening (image and numbers courtesy of Pat and Bob). Thanks to Pat and Bob for hosting us!

Given the continued enjoyment by members here, Pat and Bob's home is recommended as the preferred candidate for upcoming mixers.

Shoes in the foyer at Pat and Bob's house. Image brightened 20% via MS Word (JHenault).

Cost

Itemised expenses/revenue lists for **all** items purchased for previous meetings was not available. As a result, we estimated what our expenses might be, knowing that we might over/underestimate them. The protocol adopted by the SPC and I was that all committee members would confer with Kathy Cano (ESM Treasurer) regarding an appropriate amount for their item before making a transaction. Bob and Pat were given leeway to purchase as they saw fit to host the Mixer as they had done successfully for decades; unused items were returned to stores after the Mixer to recoup expenses.

The degree to which inflation in the wake of COVID-19 increased our costs is unclear. During the planning stage, we anticipated that our costs would be at least somewhat affected. At this year's conference, we provided parking within the cost of registration, accessible washrooms and WiFi (both unavailable at our typical DFO locations). We also didn't want to unnecessarily burden ESM members, especially students. Membership fee amounts are outside the jurisdiction of the SPC, thus were left unchanged (Regular = $25, Student = $10). Considering all of this, we rose registration fees by approximately $5, ensuring that fees for membership + registration were lower than for registration alone (as an incentive to become a member). This increase was

approved by the ESM Executive. It was clarified in the Call for Papers, that both Annual Membership Dues and Conference Fees were required to be paid-for/addressed in order to attend the conference. Fees for online participants at the 79th AGM were the same as for in-person attendees. It is recommended that, going forward meeting fees are decided by the meeting organizers based on expected expenses.

Registration fees to attend the ESM AGM in 2022 and in 2023.

2022		**2023**	
Type	Cost	Type	Cost
Member - Regular	$25.00	Member - Regular	$30.00
Member - Student	$10.00	Member - Student	$10.00
Non-member - Regular	$45.00	Non-member - Regular	$60.00
Non-member – Student	$5.00	Non-member – Student	$25.00

We had planned for the sponsor board at the front of the room only to display logos of sponsors who had donated ahead of the meeting (confirmed via email receipt). Before the start of the meeting, three regular sponsor organizations had yet to donate and were assumed to send donations via cheques following the conclusion of the meeting, as had occurred in the past. However, the donations never came (Abell Pest Control, Bayer CropScience, Orkin). To avoid this situation going forward, we recommended that no assumptions be made and the SPC strictly require donations to be submitted at least one week before the ESM AGM. This protocol will ensure the accuracy of the sponsor board and fairness when donating. It is also recommended that the ESM President send a thank-you message to the sponsors, to help build relationships. Including a .pdf of the sponsor board in this email would allow sponsors to see who else donated.

Thanks to the following organisations for sponsoring our event:

Canadian Centre for Mosquito Management
Cano Pest Control
City of Winnipeg
Taz Pest Control
Valkyrie Pest Solutions

After discussions with the SPC and present and past ESM Executive Committee members, it was unclear if the meals of members of the Organizing Committee and/or ESM President would be/ought to be covered by the ESM at the Keynote's dinner. The Chair of the meeting and/or

ESM President are typically the people taking the speaker out for dinner, and as such are somewhat obligated to pay for a meal. They could of course defer to someone else, who is willing to pay for a restaurant meal, to accompany the keynote speaker to dinner instead. Due to the lack of a formal protocol, this matter was left up to my discretion - I chose to pay for my meal. It is recommended that the Executive Committee discuss this matter and generate a formal protocol for a) who pays for which meals and b) who should attend (*e.g.*, the Chair, ESM President and SPC). Obligated attendees have the option to send a designate in their place.

Overall, we posted a deficit of $239.31. Had our assumptions regarding the sponsors been correct then we would have posted a surplus. Whether past ESM meetings posted a surplus or instead a deficit is unclear, due to the lack of available documented itemized expense/revenue files. Going forward, SPCs are encouraged to prepare a budget. Perhaps, this budget could be approved by the Executive Committee, and its expenditure left to the discretion of the SPC. Having a budget would help everyone to stay on the same page and reduce the pressure on the Chair to ensure the budget is retained while enabling necessary delegated discretion to SPC members. Equipped with the detailed transactions sheet generated this year, the next SPC will be able to prepare a reasonable budget, prioritise needs and allocate funds accordingly.

It is recommended that the ESM Executive discuss the financial expectations of ESM meetings. Are the meetings expected to a) recoup the costs of hosting the meeting, accepting the risk of falling short or b) provide a modest amount of revenue to the society, with the surplus tracked and invested into the next meeting. Carrying forward past revenue would help to reduce the cost of meeting fees.

Itemised expenses and revenue during ESM 79th Annual General Meeting. Editable excel file appended.

Date (date of receipt OR purchase)	Expense	Revenue	Description	Section
19-Oct-2023		$400.00	Valkyrie Pest Solutions	Sponsor
20-Oct-2023		$100.00	City of Winnipeg	Sponsor
21-Oct-2023		$300.00	Cano Pest Control	Sponsor
21-Oct-2023		$150.00	Taz Pest Control	Sponsor
21-Oct-2023	$24.06		Zoom upgrade to enable hybrid meeting	Scientific Venue
24-Oct-2023		$100.00	Canadian Centre for Mosquito Management	Sponsor
26-Oct-2023	$650.00		Room at Smartpark Innovation Hub	Scientific Venue
26-Oct-2023	$75.00		Gift Cards x 3 (MEC)	Speaker Gifts
26-Oct-2023	$56.71		Gift Cards x 2 (La Belle Baguette)	Speaker Gifts
26-Oct-2023	$11.15		Print pictures (London Drugs)	Speaker Gifts
26-Oct-2023	$75.57		Local chocolate bars, rice and mustard (Red River Co-op)	Speaker Gifts
26-Oct-2023	$66.92		Picture frames (Michaels; used a coupon)	Speaker Gifts
26-Oct-2023	$12.12		Gift bags and tissue paper (Dollarama)	Speaker Gifts
27-Oct-2023	$15.68		Lunch Day 1 (Smartpark Innovation Hub)	Keynote
27-Oct-2023	$52.89		Meal for Keynote speaker (Nicolinos)	Keynote
October 2023		$520.00	Registrations - students (26 registrations x [$10 member fee + $10 conference])	Member dues and Conference fees
October 2023		$1,595.00	Registrations - Regular (29 registrations x [$25 member fee + $30 conference])	Member dues and Conference fees
October 2023	$400.00		Post and Oral Presentation awards for Student Competition	Awards
October 2023	$229.40		Alcoholic beverages - net	Refreshments_Mixer
October 2023	$44.37		Groceries - Red River Co-op	Refreshments_Mixer
October 2023	$82.33		Groceries - Vic's market	Refreshments_Mixer
30-Oct-2023	$27.89		Shipping gift to VMartel	Speaker Gifts
31-Oct-2023	$504.61		Plane	Keynote
31-Oct-2023	$33.83		Uber	Keynote
31-Oct-2023	$34.96		Uber	Keynote
01-Nov-2023	$432.65		Hotel	Keynote
07-Nov-2023	$574.17		Refreshments, supplies, pizza lunch	Refreshments_Meeting

$1,074.62		Keynote
$574.17		Refreshments_Meeting
$356.10		Refreshments_Mixer
$674.06		Scientific Venue
$325.36		Speaker Gifts
$400.00		Awards
	$2,115.00	Member dues and Conference fees
	$1,050.00	Sponsor

Expenses	$3,404.31	
Revenue	$3,165.00	
Total	-$239.31	

Meeting materials

The following is where at least some of the meeting materials are currently located/held by the person:

Item	Location/Person
Sponsor foam board	Kateryn Rochon (Kateryn.Rochon@umanitoba.ca)
Sponsor poster file	In this report package. I included any logos that were sent directly to us by the companies.
Poster stand	Lisa Capar (lisa_capar@yahoo.ca) has at least 1 but maybe 2. If not, the second one is with Kathy Cano.
Name tag pouches and lanyards	Contact Lisa Capar first.
Certificates files for Student Competition	Désirée Vanderwel (d.vanderwel@uwinnipeg.ca)

Additional Thoughts

Elizabeth Clare remarked a few times about the friendliness of ESM members. In our final email, she said "Thanks for a lovely visit to your society. I was scientifically very interesting and the members were extremely welcoming." Dr. Clare enjoyed the mixer, but declined offers to tour around the city on Saturday. Sheila Wolfe drove her back to the airport.

The hybrid component allowed access to our meeting by our membership and hear from an out-of-province speaker, but technical complications reduced the experience of in-person attendees. Based on our experience, solutions have been suggested to guide future SPCs exploring a hybrid event to host a successful meeting. I appreciate the gratitude expressed by several members about the efforts by the Organizing Committee and I, for putting together the meeting.

I logged the time that I spent, accompanied by the respective activity, planning the meeting, conducting the conference and preparing the report. To give the next chair an idea of the time commitment, I spent at least 110.2 hours. This total does not include the time spent writing numerous brief emails nor pondering ideas/solutions during walks around my neighbourhood, appointments, etc.

If you have questions, comments or would like clarification please email me.

Acknowledgements

Thanks to the following people/groups:

- ESM Executive, for providing me with the opportunity to chair this meeting. I enjoyed it, especially working with numerous people who genuinely wanted to create the best meeting that we could.
- The Scientific Program Committee, for their willingness to join the group, timely responses to my communications and efforts to make the meeting a success.
- Désirée Vanderwel, for creating and printing award certificates for the Student Competition.
- Javier Uribe, for professional, friendly and accessible support at the Smartpark Innovation Hub.
- Kateryn Rochon for providing encouragement, guidance and logistical and technical support throughout; booking the room at the department of Entomology and donating a poster board.
- Kathy Cano, Robert Currie and Vincent Hervet, for Judging during the Student Competition
- Lisa Capar for operating the registration desk with Jade Tanner and for donating batteries for the slide advancer.
- Ryan Hébert for discussions about the Smartpark venue as an option.
- Thilina Hettiarachchi for donating pictures used as part of the speaker's gifts.

APPENDIX I: Report of the ESM Newsletter Committee

The Newsletter committee has currently published two issues of the 49th Volume of the Newsletter in 2023. A third issue will be released following the Scientific Meeting to recap the presentations and give recognition to the awards winners. This year, we gave the newsletter a new look – a photo title page, bold headers and more colour. The photo page hosts an image submitted by members. The Newsletter received submissions from a couple new authors and a few dedicated authors. We would like to thank John Gavloski, Robert Wrigley and Todd Lawton for their continuous contributions to the Newsletter. We rely on the contributions of members to be able to produce these fantastic issues of the Newsletter. We encourage all of the membership to contribute to the newsletter through articles, announcements and pictures. If anyone is interested in submitting an article to the newsletter, please do not hesitate to contact Kelsey Jones (kelsey.jones@agr.gc.ca) or Justis Henault (henaultjps@gmail.com).

Kelsey Jones & Justis Henault

Newsletter Co-Editors

APPENDIX J: Social Committee Report 2023

Last year, we were able to accommodate vegan, gluten-friendly and vegetarian options for people who had requested these options. During both days of the meeting Terry helped with the coffee machine and that was such a great relief. We bought vegan and gluten-friendly granola bars, muffins, and croissants for snacks with coffee and had sandwiches catered for lunch with special items labelled to help people isolate allergens if any were present. We also bough juice boxes which were not a big hit last year and this year we hope to reduce waste as much as possible by mostly buying those items which were loved by people last year.

For this year we are hoping to have everything available in time and have nothing short just like last year. We have approximately 34 people to account for this year and have 2 dietary requests (Thanks to Justis for the numbers) and we will do our best to accommodate every individual request and make this year's meeting a great one.

Thank you for your time.

Lavanya Ganesan

Social Committee Chair

Entomological Society of Manitoba

APPENDIX K: Report of the ESM Student Awards and ESM Scholarship Committee 2023

Applications were accepted for four scholarships and awards offered: Orkin Student Award; the ESM Student Achievement Award; the ESM Student Leadership and Service Award; and the ESM Graduate Student Scholarship. The committee was impressed by the high quality of the applicants/nominees: it certainly made our work difficult! The committee would like to thank the referees and nominees who participated in the process: your input was invaluable.

ESM Student Achievement Award: Awarded to a student who is in or recently completed a Bachelor's degree program. This award recognizes students who have shown exceptional interest in entomology as evidenced by their insect collections, insect photography, published articles of entomological interest, insect experiments and/or outstanding contributions during summer employment.

This year's winner of the ESM Student Achievement Award is Madeleine Dupuis (University of Manitoba). Madeleine is working towards a B.Sc. in Agroecology at the University of Manitoba, with a minor in Entomology, and has an exceptional record in Entomology courses. Madeleine was the recipient of two NSERC Undergraduate Student Research Awards (2022 and 2023) as well as the J. A. Garland Award (2023), to study ticks with Dr. Kateryn Rochon, and pigeon ectoparasites with Dr. Terry Galloway. Madeleine presented the results of her 2022 summer research project at the ESM meeting last year and tied for "best poster", and is writing up the results of her 2023 summer research project for submission to the Proceedings of the Entomological Society of Manitoba by the end of the year. Although it is unusual for students to be involved in the teaching activities of the department, Madeleine was a teaching assistant for two courses. In the words of her nominators, Madeleine is "the best kind of teaching assistant: passionate, organized and responsible". Madeleine also serves as the undergraduate student representative for both the Department of Entomology Graduate Student Association and the Entomology Department Council, and has worked hard to help to rebuild the student community in the post-COVID-19 world. From any perspective, Madeleine is an extremely deserving recipient of this award.

Orkin Student Award: This award is designed to foster and encourage student interest in general Entomology including natural methods of insect pest control and the proper use of insecticides. Candidates must have a demonstrated interest in entomology, superior scholastic ability, high research potential, originality and industriousness in their university courses and/or summer work.

This year's winner of the Orkin Award is James Watson. James is working towards a B.Sc. (Honours) in Biological Sciences at the University of Manitoba, with a minor in Entomology, and has an extremely strong academic record. In 2022 he worked as a summer student in Dr. Rob Currie's lab studying honey bee diseases, and last summer he was awarded an Undergraduate Research Award (NSERC USRA declined) to work with Dr. Jason Gibbs on the taxonomy of native bees. After graduation, James plans to pursue a Masters in Entomology. He is interested in continuing his work with honey bees and native pollinators, focussing on improving

pollination and managing diseases and pests, with the long-term goal of working in extension services and outreach.

ESM Student Leadership and Service Award: This award recognizes a student (at the graduate or undergraduate level) who has promoted the goals of the Entomological Society of Manitoba (i.e., to foster the exchange of information on entomology and to further the spread of entomological knowledge) through their volunteer activities.

This year's winner of the ESM Student Leadership and Service Award is Kirstyn Eckhardt (Department of Entomology, University of Manitoba), who is working towards an M.Sc. studying the endangered Poweshiek skipperling, supervised by Dr. Jason Gibbs (UofM). Kirstyn is the Chair of the ESM Youth Encouragement and Public Education Committee, and has conducted and organized many outreach events in this capacity. Kirstyn is also involved in many other outreach activities, including serving at the monarch festival at the Living Prairie Museum.

The ESM Graduate Scholarship: This scholarship is awarded to students in a M.Sc. or Ph.D. program related to entomology at the University of Manitoba, University of Winnipeg or University of Brandon. Students must be enrolled in their graduate program for at least 12 months prior to Oct 1 of the award year. This award recognizes superior scholastic ability, high research potential, and excellent communication skills.

This year's winner of the ESM Graduate Scholarship is Jessica Mariana Sánchez-Jasso (Natural Resources Institute, University of Manitoba), who is working towards her Ph.D. under the supervision of Dr. Nicola Koper and Dr. Richard Westwood. Her research aims to evaluate the effectiveness of disturbance-based management regimes to maintain and recover habitat for two endangered butterflies (Poweshiek skippering and Dakota skipper) in Manitoba. Jessica earned her M.Sc. in Agricultural Sciences and Natural Resources from Universidad Autónoma del Estado de México in 2011; a Diploma in Ecosystem's Restoration and Environmental Services in 2016; and a Diploma in "Automated Cartography, Remote Sensing and Geographic Information Systems" in 2017; amongst other qualifications. Jessica is an excellent student and has earned many prestigious awards to fund her studies including a Fellowship from the Weston Family Conservation Science Program and Nature Conservancy of Canada (2022-2026). Jessica is the author/co-author of 12 peer-reviewed publications, 1 book chapter, and 1 book, and has been very active in science outreach (presentations and articles). The committee was impressed with Jessica's efforts to include both western and Anishinaabe knowledge as she worked with her supervisor to create an identification book of birds of Pimachiowin Aki World Heritage Site.

Respectfully,

ESM Student Awards and ESM Scholarship Committee

Jeffrey Marcus
Taz Stuart
Désirée Vanderwel (Chair)
October 26, 2023

APPENDIX L: Youth Encouragement and Public Education Committee Report: 2023

This year we presented at a total of 29 events in the city and surrounding towns in southern Manitoba. Many of our events took place in elementary schools and daycares, with one notable exception at the Shaftsbury retirement home! We shared our knowledge and love of insects with more than 780 people of all ages. We also purchased insect supplies, including nets, mesh pop-ups, and carrying containers to be used for outreach events. These purchases were made possible thanks to the ESC Public Encouragement grant.

I want to thank everyone who generously volunteered their time to present with us – your expertise and enthusiasm was so appreciated. I especially want to thank graduate student Danie Wood for signing up to nearly every event in the city. I also want to thank John Gavloski and Abi Benson, who delivered 12 presentations at schools and public events outside of Winnipeg, all on their own. Thank you all so much!

Submitted by Kirstyn Eckhardt

APPENDIX M: Report of the Funding Raising Committee

The Entomological Society of Manitoba requested donations this past year from ten potential sponsors. The City of Winnipeg Insect Control, The Canadian Centre for Mosquito Management, Bayer CropScience, Abell Pest Control and Cano Pest Control provided donations totalling $600. Sponsors were recognized for their contributions at the meeting and their names and contact information were added to the ESM website.

Kathy Cano

Fundraising Committee

Editors' note: An updated list of sponsors appears in the Acknowledgements

APPENDIX N: ESM Website/Archivist Report – 2022-2023

In the past year I have managed the ESM website and updated it based on various requests from the Executive committee. In August 2023, I lost access to the website, due to an unknown issue/change with Paul Fields UofM account, preventing me from making further updates. The website was rehosted in October under a new url: https://entsocmb.ca/. This change means there will be an ongoing hosting cost for the website, so prior approval of the Executive was obtained. I have requested the URL be updated on the ESC and UofM websites, but if you are aware of other websites that currently link to our old website URL, please request that they update it.

In response to my suggestion at the 2022 annual business meeting, efforts were undertaken to digitize the physical materials stored in the basement of the Department of Entomology at the UofM. These efforts were led by Madeleine Dupuis, a summer student in Dr. Rochon's lab, and she received assistance from two other summer students, James Watson and Keziah Bartel. They successfully scanned and organized most archive materials that had not been previously digitized. All files are now stored on the UofM OneDrive cloud-based storage system. While this is not necessarily a permanent solution, it is a critically important first step. This was an enormous task, particularly for Madeleine, who completed most of the work. I feel that the Executive should formally thank Madeleine, James, and Keziah for their service to the ESM.

Jordan Bannerman

ESM Webmaster and Archivist

APPENDIX O: Report of the Common Names of Insects Committee

Prepared by Jason Gibbs, 23 October

1) Following a review of committee guidelines, which states that the chair of the common names of insects committee will represent the ESM on the national committee, I have formally joined the ESC common names committee. There was no requirement by the ESC to do so. The ESC committee is looking for a French-first language member preferably to serve as chair, but I have tentatively put my name forward in the absence of that option. A non-chair French speaker is still desired to serve on the national committee.

2) The ESC recently passed an amendment to the common names committee guidelines as follows to allow common names for species of concern that may not yet occur in Canada, but may be expected to be introduced.

Motion: That Standing Rule IX 2) (j) Insect Common Names Committee be amended by the following additions (underline):

The Committee shall maintain a list of English and French names of insects and related arthropods in Canada. Lists shall be restricted to taxa that have been identified as of high regulatory concern to Canada or taxa that occur in Canada for which there are clear benefits to having names that are accessible to the general public: examples are taxa for which there are monitoring programs at ports, economically relevant taxa, threatened species, and taxa, such as butterflies and dragonflies, that are easily distinguishable without specialized knowledge or equipment

3) Common names proposed in 2022

Diapheromera femorata (Say)

Phasmatodea: Heteronemiidae

Current English names: walkingstick

Suggested English name: northern walkingstick

Status. Change to ‘northern walkingstick’ approved by ESC committee, based on email from chair (2022-12-10), but it is not yet reflected on the ESC website (accessed 2023-10-23).

APPENDIX P: Report of the Chair of the Ad hoc Committee Guidelines / By-laws Committee

Prepared by Jason Gibbs

Following a loss of 'institutional' knowledge during the pandemic and some confusion over committee guidelines expressed at the last AGM, an ad hoc committee was struck to assess the current guidelines and by-laws. Several inconsistencies in committee guidelines or out-of-date text were found and flagged. The committee guidelines can be edited by the Secretary based on advice by the Executive (item 6 of the secretary's duties). A meeting to finalize recommendations to the Executive needs to be organized.

The By-laws have a few typographical errors and unnecessarily gendered terms ("chairman") or masculine pronouns ("he", "his", "him"). That could be easily replaced by non-gendered terms ("chair") and pronouns ("they", "their", "them").

Motion 1. Replace all references to 'chairman' in the By-laws with 'chair'.

Motion 2. Replace all masculine pronouns (he, him, his) in the By-laws with their non-gendered equivalents (they, them, their).

Motion 3. Delete Article XIII.2. "In these By-Laws the masculine shall include the feminine." And renumber the subsequent points accordingly (XIII.3 becomes XIII.2, etc.)

Motion 4. Article XXI should be rephrased to include an Oxford comma to remove ambiguity over who should be signing officers.

"The signing officers of the Society shall be the President, Past-President or the President-

Elect and the Treasurer or the Secretary."

Becomes:

"The signing officers of the Society shall be the President, Past-President or the President-

Elect, and the Treasurer or the Secretary."

If the intention is for the signing officers to be

1) President

2) Past-President or President-Elect

3) Treasure or Secretary

Motion 5. Correct the following typographical errors or ambiguities in the By-laws:

Article VIII.6

"The President-Elect shall be elected by annual paper or electronic ballot and shall fill the

office of the President when it become vacant."

Becomes:

The President-Elect shall be elected by annual paper or electronic ballot and shall fill the office of the President when it becomes vacant.

ARTICLE XIII.2

"The Society may publish a newsletter. Its title, frequency method of publication shall be determined by the Executive."

Becomes:

"The Society may publish a newsletter. Its title, frequency, and method of publication shall be determined by the Executive."

ARTICLE XIV.3.b.

[the editorial board shall]

"At the request of either of the Editor, interpret editorial policy and adjudicate material submitted for publication in the Society's official publication."

Becomes:

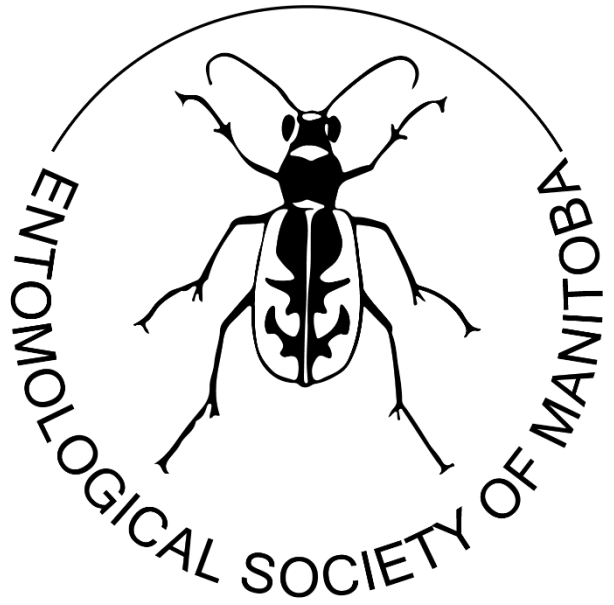
"At the request of any of the Editors, interpret editorial policy and adjudicate material submitted for publication in the Society's official publication."

ARTICLE XXIII.5

"Unless approved by a two-thirds majority of the Active Members present at the Annual Meeting, they shall from that time cease to have force and effect."

Becomes

"Unless approved by a two-thirds majority of the Active Members present at the Annual Meeting, rules and regulations prescribed by the Executive shall from that time cease to have force and effect."



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