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PROCEEDINGS OF THE 62nd ANNUAL MEETING OF THE

Entomological Society of Alberta

October 16 – 18, 2014

Lethbridge, Alberta

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The Entomological Society of Alberta

The Entomological Society of Alberta (ESA) was organized November 27, 1952, at a meeting held in Lethbridge, Alberta, as an affiliate of the Entomological Society of Canada. A certificate of incorporation was obtained under the *Societies Act* on February 19, 1953.

The membership of about 70 paid-up members at that time consisted mainly of Dominion (Federal) entomologists at the Science Service Laboratories in Lethbridge (now Lethbridge Research and Development Centre of Agriculture and Agri-food Canada), Suffield Research Station, the Forest Zoology Laboratory in Calgary, and students and staff from the University of Alberta.

The object of the ESA shall be to foster the advancement, exchange, and dissemination of the knowledge of insects in relation to their importance in agriculture, horticulture, forestry, public health, industry, the environment, and for its own sake, among the people of the province of Alberta.

Membership is open to anyone interested in Entomology. Annual dues are $20.00 ($10.00 for students). Membership application is available at https://entsocalberta.ca/about-the-esa/become-a-member/

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Program of the 62nd Annual Meeting of the Entomological Society of Alberta, Lethbridge, Alberta; October 16-18 2014

Thursday 16 October, 2014

17:00-20:00 Board of Directors Meeting (Willow Room)
18:00-21:00 Registration and Mixer (Anton's Ballroom)

Friday 17 October, 2014 (Cedar Ballroom)

07:30-08:45 Registration
08:45-10:00 Conference Welcome, Keynote Address
10:00-10:30 Coffee
10:30-12:00 Contributed Papers Session 1
12:00-13:00 Lunch and Poster Viewing
13:00-14:30 Contributed Papers Session 2
14:30-15:00 Coffee and Poster Viewing
15:00-16:30 Contributed Papers Session 3
18:00-19:00 Cash Bar (Anton's Ballroom)
19:00-22:00 Banquet (Anton's Ballroom)

Saturday 18 October, 2014

08:30-10:00 Contributed Papers Session 4 (Cedar Ballroom)
10:00-11:00 Annual General Meeting (Cedar Ballroom)
13:30-17:30 Post Conference Tour to Devil's Coulee

Scientific Program

Friday 17 October 2014 – Oral Presentations

08:45 Welcome and Announcements
09:00 Bee Time: Lessons From the Hive
Mark L. Winston

10:00-10:30 Coffee

Contributed Papers Session 1

10:30 The changing diversity of dung beetles on the Canadian prairies: a never-ending story
Floate, K.D.

10:45 Behavioural strategies of the sunflower beetle (*Zygogramma exclamationis*) against inducible sunflower (*Helianthus annuus*) plant defences
Kwok, K., Laird, R.

11:00 Effectiveness of pollination by wild bees in cranberry marshes as influenced by landscape composition and distance from natural habitat
Waytes, R

11:30 Tri-trophic influence of nitrogen on the development of a parasitoid wasp.
Hervet, V.A.D., Laird, R.A, Floate, K.D.

11:45 Effects of host species on larval development and fitness of the redbacked cutworm (*Euxoa ochrogaster*) (Lepidoptera: Noctuidae)
Batallas, R. Evenden, M.

12:00-13:00 Lunch

Contributed Papers Session 2

13:00 Temporal patterns of spore viability for the honey bee parasite *Nosema ceranae*
MacInnis, C.I., Keddie, B.A., and Pernal, S.F.

13:15 Native pollinators in Alberta's agricultural landscape
Sturm, A. Kohler, M. , Carlyle, C. , Manson, J.

13:30 Determinants of pollination, insect visitation, and nectar availability in commercial canola (*Brassica napus* L.)
Robinson, Samuel V. J., Cartar, R. V., Hoover, S. E. R., and Pernal, S. F.

13:45 Evaluation of potentially functional genetic variation in mountain pine beetle (*Dendroctonus ponderosae* Hopkins) across North America
Batista, P.D., Janes, J.K., Sperling F.A.H.

14:00 Sampling lygus in canola, part 1: beating around the bush.
Cárcamo C., Herle C., Daniels S., and Schmitke M.

14:15 Sampling lygus in canola, part 2: beating through the bush!
Schmitke M., Cárcamo H., Barnes A., Gabert K.

14:30-15:00 Coffee and Poster Viewing

Contributed Papers Session 3

15:00 Where the cutworms are: Three years of cutworm reports and collections in Alberta
Hummel, J., Otani, J., Broatch, J., Reid, P., Erlandson, M., Benn, A., Loberg, K., Dufton, S., and Floate, K. D.

15:15 Distribution of an invasive ground beetle, *Pterostichus melanarius*, in woodlands in Cypress Hills Inter-Provincial Park, Alberta
Philipsen, L., Woodman, S., Floate, K., Goater, C.

15:30 The genomic and geographic structure of interspecies hybrids in the spruce budworm complex.
Brunet, B., and Sperling, F.A.H.

15:45 Effects of extreme temperatures on the survival of the quarantine stored-product pest, *Trogoderma granarium* (khapra beetle)
Wilches, D, Laird, R., Floate, K. and Fields, P.

16:00 Impact of a leaf-galling wasp and nitrogen on an invasive plant species
Holmes, G.D., Laird, R.A., DeClerck-Floate, R.A.

Saturday October 18, 2014 - Oral Presentations

Contributed Papers Session 4

08:30 A lifetime well spent? Some determinants and habits of highly successful bees
Cartar, R.

08:45 Investigating the role of plant morphology in weed biocontrol
De Clerck-Floate, R., and Laird, R.

09:00 Relocation of *Tetrastichus julis* to enhance biological control of the cereal leaf beetle in the Prairies
Cárcamo H., Chelle C., Gavloski J.

09:15 The Lost World: The University of Calgary's insect collection
Swann, J.E. and Best, L.R.

09:30 Seasonal occurrence of Lygus bugs (Hemiptera: Miridae) and their parasitoids on alfalfa fields in Southern Alberta.
Fernández, D.C., Cárcamo, H., Herle, C., and Laird, R.

09:45 Bee Communities in Restored Landfills of the Niagara Region
Kutby, R. and Richards, M.H.

Contributed Abstracts (Alphabetically by presenting Author)

Oral Presentations

1. Effects of host species on larval development and fitness of the redbacked cutworm (*Euxoa ochrogaster*) (Lepidoptera: Noctuidae)

Batallas, R. Evenden, M.
University of Alberta, Edmonton, AB.

Early larval instars feed on foliage and roots, whereas mature larvae eat into the stem and sever seedlings. They are characterized for their generalist feeding behaviour on a wide range of hosts. Within this group, the redbacked cutworm (*Euxoa ochrogaster*) is regarded as the most widely distributed species in the Prairies Provinces. Despite their generalist behaviour, there are indications that it may prefer rapeseed crops. The objective of this study was to evaluate the effect of host plants on the development of redbacked cutworm larvae. We tested three host species: canola, spring wheat, peas and a meridic diet as control. Third instar larvae were housed individually in large petri dishes at controlled conditions. We monitored larval weight per instar, developmental time per instar and total. Individuals were sexed and weighted upon pupation. Results will discuss the influence of host plant on RBC larval performance, and relationship between larval development and host nutrient quality.

2.Evaluation of potentially functional genetic variation in mountain pine beetle (*Dendroctonus ponderosae* Hopkins) across North America

Batista, P.D., Janes, J.K., Sperling F.A.H.
University of Alberta, Edmonton, AB

Present throughout much of Western North America, mountain pine beetle (MPB) is a native forest pest that in recent years has seen frequent outbreaks leading to a northward range expansion. Historically a pest of lodgepole pine (*Pinus contorta*), the recent expansion has seen a shift on to a novel host, jack pine (*Pinus banksiana*), posing a threat to the boreal forest. The genetic structure of Canadian populations of MPB have previously been examined, revealing a split in North and South populations for British Columbia and Alberta. This study examines the genetic structure and diversity of 66 MPB populations across North America using 96 single nucleotide polymorphisms (SNPs) genotyped with the Sequenom iPlex method. This allows identification of genetic variability in MPB both larger and smaller geographic scales, identifying signatures of selection associated with host-plant shifts and adaption to different environmental conditions.

3.Sampling lygus in canola, part 1: beating around the bush.

Cárcamo, H.[1], Herle, C.[1], Daniels, S.[1] and Schmitke, M.[1,2]
[1]Agriculture and Agri-Food Canada, Lethbridge, AB
[2]University of Lethbridge

Lygus plant bugs (Miridae) are generalist pests of many crops in the Prairies including seed alfalfa and canola. In the last decade in southern and south central Alberta, lygus become numerous at the maturing pod stage, which is the most difficult stage to sample with a sweep net. Nevertheless, despite high variability among samplers, sweeping is the recommended method, but growers and agronomists would prefer a more practical method. Here, we report a study in progress where we are comparing sweep sampling with 3 other methods: shaking the plants onto sticky cards glued to a stake laid on the ground, vacuuming the bugs using a modified leaf vacuum from the canopy and the ground, and vacuuming with a lighter more portable model, the InsectaZooka. Results so far suggest that shaking the plants onto sticky cards can provide acceptable results to make control decisions with less physical effort.

4.Relocation of *Tetrastichus julis* to enhance biological control of the cereal leaf beetle in the Prairies

Cárcamo[1]C., Chelle C.[1], Gavloski J.[2]
[1]Agriculture and Agri-Food Canada, Lethbridge, AB
[2]Manitoba Agriculture, Food and Rural Development, Winnipeg MB

The cereal leaf beetle (CLB) (*Oulema melanopus* L.), of Eurasian origin, is a serious invasive pest of wheat and other cereals throughout temperate regions of the world. It was first reported in the Prairies in southern Alberta in 2005 near Lethbridge. Other populations have been discovered in south central Alberta, south western Saskatchewan, in southern Manitoba and as far north as the Swan River region of this province. The eulophid parasitoid *Tetrastichus julis*, has followed the beetle to southern Alberta and some of the other regions. It can reduce its populations below damaging levels. However, not all infested regions throughout the Prairies have been invaded by the parasitoid. Hence, our objective is to ensure that areas with the pest also are colonized by the parasitoid. Laboratory colonies or field collections have been used in 2013 and 2014 to rear parasitoid adults or pupae and relocate them to sites that appear to lack the parasitoid. Over these two years, over 4,000 adults or pupae have been released in various locations in central and south central Alberta, southwestern Saskatchewan and Manitoba. It is expected that establishment of the parasitoid will result in satisfactory pest reduction to avoid insecticide application.

5. A lifetime well spent? Some determinants and habits of highly successful bees

Cartar, R.
Department of Biological Sciences, University of Calgary, Calgary, AB

Worker social insects obtain fitness indirectly through the amount and timing of their foraging contributions, whose payoff is through the reproductive success of their colony. Bees are herbivores who collect two nutritionally distinct and necessary resources from flowers: pollen and nectar. The collection of pollen and nectar typically requires different biomechanical processes, including how bee wings are used. Here's what we know from past research: Over her foraging lifetime, a bee's wings wear irreparably with use, becoming less effective as wear progresses. Wing wear also increases rate of mortality. Size and experience also affect foraging gain of workers. In this study, I present results from observational research with individually marked wild-foraging bumble bees in Alberta. I first consider how age, wing wear, body size, and nutritional resource (pollen vs nectar) collected combine to affect foraging gain and mortality rate (over the short term). I then examine how short-term foraging gain and longevity combine to determine lifetime foraging success (my measure of a lifetime well spent). In this system, mortality takes a back seat to foraging gain in explaining lifetime foraging success, particularly for nectar foragers. Nectar foraging appears to separate the wheat from the chaff.

6. Investigating the role of plant morphology in weed biocontrol

De Clerck-Floate, R.[1], and Laird, R.[2]
[1]Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB
[2] Department of Biological Sciences, University of Lethbridge, Lethbridge, AB

Knowledge of how plants grow, and interact with herbivores through growth, can be applied in the effective use of weed biocontrol. In illustration, the growth patterns of two invasive hawkweed species, *Pilosella officinarum* and *P. flagellaris* (Asteraceae) were compared in a greenhouse experiment with and without herbivory by a biocontrol agent; the stolon-galling wasp, *Aulacidea subterminalis* (Cynipidae). Whereas *P. flagellaris* is constrained in its growth, *P. officinarum* is more sprawling, largely due to the latter's greater propensity for early and rapid lateral stolon production from the first (main) stolons to develop. *Aulacidea subterminalis* appeared to be tracking the actively growing shoot tissues across plant species and age by producing more galls on the main stolons of young *P. flagellaris* plants and on the lateral stolons of older *P. officinarum* plants. Within galled plants, galled main stolons of *P. officinarum* generally produced more lateral stolons than ungalled main stolons, thus suggesting a local compensatory growth response. However, galling had no impact on total stolon production for either species when comparing galled and ungalled plants at harvest. Subsequent studies will determine if increasing the gall load on the main stolons of young *P. flagellaris* plants can possibly impede vegetative growth based on what we have learned here.

7. Seasonal occurrence of *Lygus* bugs (Hemiptera: Miridae) and their parasitoids on alfalfa fields in Southern Alberta.

Fernández, D. C.[1, 3], Cárcamo, H.[1], Herle, C[2] and Laird, R.[3]
[1] Agriculture and Agri-Food Canada, Lethbridge AB catalina.fernandez@agr.gc.ca
[2] Retired, Lethbridge, AB
[3] Department of Biological Sciences, University of Lethbridge, Lethbridge AB

Native plant bugs from the genus *Lygus* feed on a wide number of plant species and a few are economically important pests of crops such as seed alfalfa and canola. To mitigate their effect on alfalfa crops, management methods rely mainly on insecticides and few alternative methods have been developed. Biological control with native and exotic *Peristenus* parasitoid wasps (Hymenoptera: Braconidae: Euphorinae) that attack *Lygus* nymphs may provide one such alternative. Given their importance as potential biological control agents, a long term data set was collected from 2003 to 2013 to collect information about their seasonality, species composition, and synchronism with the pest. The dominant *Lygus* species were *L. elisus*, *L. keltoni* and *L. borealis*. Parasitism rate was determined by nymph rearing and dissections and in some dates and sites it reached up to 80%. Two dominant *Peristenus* species were recognized, and each one is univoltine attacking a different generation of lygus bugs. Predicting emergence and peak activity of adult parasitoids will help growers to time insecticide applications to avoid harming this beneficial wasp.

8. The changing diversity of dung beetles on the Canadian prairies: a never-ending story

Floate, K.D.
Agriculture and Agri-Food Canada, Lethbridge, AB; Kevin.Floate@agr.gc.ca

The fresh dung of large ruminants provides a moist and rich habitat for hundreds of insect species. Dung beetles (Scarabaeidae) are chief among these, dominating in terms of abundance, biomass and ecosystem function. The current presentation will examine how the assemblage of dung beetle species on the Canadian prairie has changed since the demise of the American bison and how these changes continue through to the present day.

9. Tri-trophic influence of nitrogen on the development of a parasitoid wasp.

Hervet, V.A.D.[1], Laird, R.A[1], Floate, K.D.[3]
[1] University of Lethbridge, Lethbridge, AB
[3] Agriculture and Agri-Food Canada, Lethbridge, AB

Cabbage looper larvae, *Trichoplusia ni* (Lepidoptera: Noctuidae), were reared on artificial diets containing various amounts of protein (casein). Half of these caterpillars were parasitized by the gregarious parasitoid *Cotesia vanessae* (Hymenoptera: Braconidae). Preliminary results show a decrease of fitness of both unparasitized caterpillars and parasitoids correlated with the decrease of the amount of protein in the diet fed to caterpillars.

10. Impact of a leaf-galling wasp and nitrogen on an invasive plant species

Holmes, G.D.[1,2], Laird, R. A.[1], DeClerck-Floate, R.A.[2]
[1] Department of Biological Sciences, University of Lethbridge, Lethbridge AB
[2]Agriculture and Agri-Food Canada, Lethbridge, AB

Invasive species that cannot be controlled effectively by chemical or mechanical means may be managed by classical biological control strategies. Invasive hawkweeds (*Pilosella* spp.) are a major concern in western North America as they form dense stands that out-compete native plants, and can also disperse with a very high number of seeds. In some cases hawkweeds have been controlled with the application of fertilizer, as they do not benefit as strongly in the presence of nitrogen as members of native flora. A potential biological control agent, the leaf-galling wasp *Aulacidea pilosellae* Kieffer, has been identified as a natural enemy of several hawkweed species (*Pilosella* spp) in central Europe. Therefore, the purpose of this study is to identify the impact that this wasp and the application of nitrogen have on the performance of the host, mouse-ear hawkweed (*Pilosella officinarum* L). The interaction between the agent and nitrogen will be identified by measuring different characteristics of plant growth and performance, including final plant biomass, and length and number of stolons. Wasp performance related to nitrogen treatments will also be assessed, by measuring numerous characteristics regarding wasp performance, including fecundity, adult size and emergence success.

11. Where the cutworms are: three years of cutworm reports and collections in Alberta

Hummel, J.[1], Otani, J.[2], Broatch, J.[3], Reid, P.[4], Erlandson, M.[5], Benn, A.[2], Loberg, K.[2], Dufton, S.[2], and Floate, K. D.[6]
[1] Lethbridge College, Lethbridge, AB; jeremy.hummel@lethbridgecollege.ca
[2] Agriculture and Agri-Food Canada, Beaverlodge, AB
[3] Alberta Agriculture and Rural Development, Lacombe, AB
[4] Agriculture and Agri-Food Canada, Saskatoon, SK
[6] Agriculture and Agri-Food Canada, Lethbridge, AB

Cutworms (Lepidoptera: Noctuidae) are significant agricultural pests on the Canadian prairies, causing early-season damage and stand reduction in field crops, specialty crops, and forages. Because of the broad ranging impact of these pests, grower organizations have identified a need for enhanced identification resources and information regarding cutworm biology and management. During the 2012, 2013, and 2014 field seasons, cutworm were collected from cropland across Alberta and the British Columbia Peace River Region. Collected specimens were identified and reared to assess parasitism status and to prepare developmental images and preserved reference specimens. Some of these resources are already in use for education and extension. Initial results will be presented, including aspects of species identification, parasitism, and resources produced during field collections and laboratory rearing.

12. Bee communities in restored landfills of the Niagara Region

Kutby, R. & Richards, M.H.
Department of Biological Sciences, Brock University, St. Catherines, ON.

We examined the impact of habitat restoration on bee fauna (Hymenoptera: Apoidea) of the Niagara Region, Ontario, Canada, where we studied bee abundance and diversity in three restored landfills. The sites varied in their timing of restoration, the oldest being restored from 2001-2003, and the youngest restored in 2011. We compared these to control sites at Brock University where bees have always been present. A total of 7,173 bees were collected using pan traps and flower collections, in the summers of 2011 and 2012. Bees were classified to five families, 21 genera and sub-genera, and at least 78 species. Bee abundance was not detectably different among control sites and the 3 restoration levels, which suggests that habitat restoration resulted in restoration of the bee community. Further evidence of the success of restoration, bee species richness was highest in the newly restored sites. With respect to bee diversity and abundance, to habitat restoration on abandoned landfills was successful.

13. Behavioural strategies of the sunflower beetle (*Zygogramma exclamationis*) against inducible sunflower (*Helianthus annuus)* plant defences

Kwok, K., Laird, R.
University of Lethbridge, Lethbridge, AB

Herbivory results in varying loss of plant tissue causing decreasing plant fitness. For this reason, a wide variety of plant defences have evolved to reduce the extent of this fitness loss by preventing or reducing the impact of herbivory. However, these plant defences are costly in terms of energy and resources, and so many are inducible. Inducible plant defences are only expressed or up-regulated once a prerequisite stimulus is applied to the plant, such as tissue damage. Plant defences typically reduce herbivory, and so reduce herbivore fitness. To reduce this loss in herbivore fitness, herbivores have evolved counter-defensive strategies, also termed as herbivore offence. These strategies can be physiological or behavioural in nature. Though these strategies increase herbivore fitness, they allow for increased plant tissue damage and so reduce plant fitness. This dynamic between plant defence and herbivore offence has resulted in an evolutionary arms race.

This presentation investigates three potential behavioural strategies utilized by the sunflower beetle (*Zygogramma exclamationis*) to counter plant defences expressed by their host, the common annual sunflower (*Helianthus annuus*). Specifically, it will investigate selective oviposition, feeding avoidance, and gregarious feeding.

14. Temporal patterns of spore viability for the honey bee parasite *Nosema ceranae*

MacInnis, C.I.[1,2], Keddie, B.A.[2], and Pernal, S.F.[1]
[1]Agriculture and Agri-Food Canada, Beaverlodge, AB
[2] University of Alberta, Edmonton, AB

A myriad of factors have been affecting the health and vitality of honey bees (*Apis mellifera* L.) worldwide. These factors include pesticides, lack of forage, and various parasites and pathogens. *Nosema ceranae* is a recently introduced unicellular microsporidian parasite now known to cause nosema disease, a prominent malady among adult honey bees. The only effective chemotherapeutic treatment against *N. ceranae* has been on the market for over 50 years, and was originally designed to treat infections caused by *Nosema apis*. Unlike its congener, the methods of transmission for *N. ceranae* remain to be elucidated. Here we present methods used to determine the viability and infectivity of *N. ceranae* spores in hive products to determine possible routes of transmission and management strategies. Spore viability was assessed over time after exposure to treatments at -20, -12, 20, and 33° C, using propidum iodide (PI) and 4', 6-diamidino-2-phenylindole (DAPI). Infectivity experiments were conducted by inoculating individual newly emerged (>24hrs) bees. Preliminary data suggest greater spore viability in honey than in other hive matrices and will be further discussed.

15. Distribution of an invasive ground beetle, *Pterostichus melanarius,* in woodlands in Cypress Hills Inter-Provincial Park, Alberta

Philipsen, L.[1,3], Woodman, S.[1,3], Floate, K.[2], Goater, C.[1]
[1]Biological Sciences, University of Lethbridge, Lethbridge AB
[2]Agriculture and Agri-Food Canada, Lethbridge, AB
[3]Contributed equally

Since its introduction, the European ground beetle, *Pterostichus melanarius,* has colonized extensively throughout British Columbia and the Prairie provinces. However, the results of survey studies within western Canada have shown that its regional and local distributions are typically associated with urban habitats and/or agroecosystems. Surprisingly, high population sizes of the beetle were observed within intact forest stands in Cypress Hills Park over 2 years, yet were absent on disturbed grasslands. Across a range of forested habitats, *P. melanarius* was often the only ground beetle present within an array of 270 pitfall traps. At one site near Elkwater, mark-recapture estimates of total population sizes ranged from 1.2-2.5 beetles/m^2. From a sample of over 500 beetles collected from pitfall traps, we also evaluated spatial variation in sex ratio and in the proportion of winged versus non-winged individuals. The broad distribution of *P. melanarius* across several habitat types, its high local density, and the relatively high proportion of non-winged individuals, provides evidence that this invasive species is now a dominant component of the arthropod community in Cypress Hills. These

results also indicate that the distribution of this species is not limited to urban or agriculture habitats.

16. Determinants of pollination, insect visitation, and nectar availability in commercial canola (*Brassica napus* L.)

Robinson, S. V.J[1]., Cartar, R.V[1]., Hoover, S.E.R[2]., and Pernal, S.F.[3]
[1]University of Calgary, Calgary, AB
[2]Alberta Agriculture and Rural Development, Lethbridge, AB
[3]Agriculture and Agri-Food Canada, Beaverlodge, AB

Commercial canola (*Brassica napus*) is an important part of the agricultural landscape of Alberta. In addition to forming a valuable cash crop, the nectar and pollen of *B. napus* flowers constitute a valuable resource to pollinating insects. It is frequently visited by wild and managed insects, such as honey bees, leafcutter bees, and hover flies, making it both an economically and ecologically important plant. However, it is unclear how *B. napus* crops interact with sources of pollinators, such as wild insect habitat or honeybee apiaries. Insect visitation decreases with depth into *B. napus* fields, which may contribute to higher pollination rates at the edge of crops. Composition of insect visitors may change with depth into the field, so regional differences in visiting insect communities may cause differing effects on evenness of pollination. I will present some of our preliminary investigation into these topics, specifically addressing the relationship between nectar availability, pollen deposition, and insect visitation to *B. napus* at varying field depths.

17. Sampling lygus in canola, part 2: beating through the bush!

Schmitke, M. [1,2], Cárcamo, C.[1], Barnes, A.[3] and Gabert, K.[3]
[1]Agriculture and Agri-Food Canada, Lethbridge, AB
[2]University of Lethbridge, Lethbridge, AB
[3]Canola Council of Canada, Lethbridge, AB

A sweep net is the standard tool used to sample lygus plant bugs in field crops to determine action thresholds. Canola at the pod stage forms dense mats, which are difficult to sample and operator may have a large effect on the catches. Hence, this study was conducted to determine the variation in Lygus bug catches among different sweep samplers. Six samplers were categorized according to gender, height, perceived fitness, and sampling experience. They demonstrated their method of sweeping and its accuracy by sweeping a canola field at the mid pod stage. The results varied with respect to most categories, especially height and gender, but some were confounded. Our results will help to train samplers to improve their ability to sample lygus to make correct decisions about controlling them.

18. The genomic and geographic structure of interspecies hybrids in the spruce budworm complex.

Brunet, B., and Sperling, F.A.H.
Dept. of Biological Sciences, University of Alberta, Edmonton, AB

The semi-permeable nature of genomes can help to identify genes associated with species boundaries and/or adaptive introgression. Here, we examine differential introgression between two pairs of spruce budworm species, *C. fumiferana* and *C. occidentalis* and the latter and *C. biennis*, representing deep and recent divergences along the spruce budworm phylogeny, respectively, to identify loci exhibiting non-neutral patterns of divergence. Whereas the gradient in ancestry coefficients between *C. fumiferana* and *C. occidentalis* was steep, suggesting strong selection against hybrids, that between *C. biennis* and *C. occidentalis* was linear and gradual. Directional selection was the predominant form of selection acting between species in both comparisons, and may relate to differences in cross-attraction and egg weight between these species.

19. The lost world: The University of Calgary's insect collection

Swann, J.E.[1] and Best, L.R.[2]
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[2] Calgary, AB, lrbest@gmail.com

The University of Calgary's insect collection has rarely been used for faunal initiatives such as the recent work on North American bumble bees and the Lepidoptera of Alberta. Some potential discoveries that were missed by these initiatives and some of the discoveries that have been made by large faunal studies that have used material in the University's collection only highlight the need to publicize the insect collection's holdings. Its lack of visibility online and possible solutions to this will be discussed as a solution to this valuable resource's lack of discovery by researchers

20. Effectiveness of pollination by wild bees in cranberry marshes as influenced by landscape composition and distance from natural habitat

Waytes, R[1,2].
[1]Dept. Biology, Kalamazoo College, Kalamazoo, MI, USA
[2]Department of Biological Sciences, University of Calgary, Calgary AB

Wild bees are a potential source of pollination services for agricultural crops, but their services may be affected by landscape composition, which influences the availability of foraging and nesting resources. The objectives of this research were to determine if pollination by wild bees varied with landscape composition and distance from edge of natural habitat. Sites were chosen at cranberry marshes with differing composition of their surrounding landscape. Pan traps measured wild bee abundance. Visitation rates to and resulting seed count of two species of sentinel plants placed in fields were used to measure visitation and pollination success.

Abundance of wild bees was positively correlated with amount of surrounding woodland, but was uncorrelated with amount of surrounding agriculture. Seed count was not directly affected by honey bee presence or landscape composition, but there was a positive trend between seed number and percent surrounding agriculture in landscapes without honey bees. Seed number did not vary with distance from natural habitat. Based on these observations, wild bees may be a viable alternative to honey bees, particularly in landscapes with large amounts of woodland.

21. Native pollinators in Alberta's agricultural landscape

Sturm, A. [1], Kohler, M. [2], Carlyle, C. [1], Manson, J. [2]
[1]Department of Agricultural, Food, and Nutritional Sciences, University of Alberta, Edmonton, AB
[2]Department of Biological Sciences, University of Alberta, Edmonton, AB

Pollination is an essential ecosystem service. With growing concerns over the current declines in commercial bee populations, attention is increasingly being focused on native pollinators. Native pollinators have the potential to act as a failsafe to commercial pollinators or provide sole pollination services in areas lacking commercial bees. We have initiated a new study to measure bee abundance and diversity in native grasslands and adjacent canola fields across Alberta. Bees will be collected using pan traps and netting in order to address two major questions. First, we will examine how bee communities vary with land-use across Alberta's major agro-climatic zones. Second, within rangelands we will examine how grazing management and associated ecosystem changes affect bee communities. Our findings will contribute to the conservation and management of native pollinator communities by increasing awareness about native bee communities, establishing monitoring strategies for bees, and identifying management practices that support native bees across Alberta.

22. Effects of extreme temperatures on the survival of the quarantine stored-product pest, *Trogoderma granarium* (khapra beetle)

Wilches, D.[1,2], Laird, R.[1], Floate, K.[2] and Fields, P.[3]
[1] Department of Biological Sciences, University of Lethbridge. Lethbridge, AB
[2]Agriculture and Agri-Food Canada, Lethbridge, AB
[3]Agriculture and Agri-Food Canada. Winnipeg, MB

The khapra beetle, *Trogroderma granarium* (Coleoptera: Dermestidae) is a pest of stored grain in north Africa, Turkey, Middle East, Pakistan and India. It is a quarantine insect for much of the rest of the world. It is often intercepted in USA and Canada in food imports. Khapra beetle can be controlled with methyl bromide, but this fumigant is restricted to quarantine and pre-shipment uses and is to be phased-out. Thus, there is an urgent need to find new methods of control, such as extreme temperatures. The survival for all life stages; eggs, larvae, diapausing larvae, acclimated larvae, pupae, and adults at sub-zero temperatures and at high temperatures (40 to 60°C) will be presented.

23. Bee Time: lessons from the hive

Mark L. Winston
Simon Fraser University, Burnaby BC; winston@sfu.ca

There are powerful lessons to be learned from bees about how we humans can better understand our place in nature, engage the people and events surrounding us with greater focus and clarity, interact more effectively in our relationships and communities, and open ourselves to a deeper understanding of who we are as individuals, communities and a species. Dr. Winston will talk about his experiences over 30 years of walking into apiaries, and the lessons learned from a life spent among the bees.

Posters

24. *Wolbachia* and the microbiome of *Drosophila suzukii*

Wilches, D., Floate, K. and Coghlin, P.

25. Assessment of the diversity of *Aphthona* beetles for the biological control of leafy spurge on the prairies.

Bourchier, R., Coghlin, P., Dunlop, B., Ostrander, D., Lesage, L., and Floate K.

Index to Authors

Minutes of the Entomological Society of Alberta
Executive/Board of Directors Fall Meeting
Lethbridge October 16 2014

Meeting called to order at 6:08pm

Chair: Mike Dolinski (President)

In Attendance: Mike Dolinski (President), Ken Fry (Secretary), Caroline Whitehouse (Treasurer), Vincent Hervet (Southern Director), Mark Oliver (Central Director), Amanda St. Onge (Proceedings Editor)

Regrets: Felix Sperling (Past-President), Alec McClay (Webmaster), Kevin Judge (Northern Director), Rob Longair (Regional Director to ESC)

Additions to Agenda as amended and approval

MOVED by John, Seconded by Vincent that the agenda, as amended be approved; Carried

Approval of Spring Executive Meeting Minutes

MOVED by Caroline, Seconded by Mark that the minutes as amended be approved; Carried

3. Report from the Treasurer (Caroline Whitehouse)
- See attached report
- Discussion about current meeting deficit
- Can there be fund raising efforts (e.g. at bioblitz)
- Can education funds from national society be used to prepare pop up displays for the ESA
    - Action item for new V-P to investigate design and ordering of pop-up banners for each region

MOVED by Caroline, Seconded by Amanda that the Treasurer's report be received; Carried

4. Report from Secretary (Ken Fry)
- See attached report
- Raised question of archiving Secretaries files on Google Drive under the ESA Google account
    - Consent to upload digital documents and go forward using shared documents
    - Restrict access to only executive so that confidentiality is preserved

MOVED by Ken, Seconded by John that the digital archives of the ESA be uploaded to the cloud with access restricted to the Executive; Carried.

MOVED by Ken Fry, Seconded by Amanda that the Secretary's report be accepted; Carried

5. Regional Reports

a. Report from Northern Director (Kevin Judge)

- No report submitted

b. Report from Central Director (Mark Oliver)

  - See attached report

c. Report from Southern Director (Vincent Hervet)

- See attached report

d. Regional Director to the ESC (Report presented for Rob Longair)

- See attached report

MOVED by Caroline, seconded by Amanda, to accept the reports as submitted;
Carried

6. Report from Webmaster (Alec McClay)

- See attached report
- Honorary member bios need to be updated
- Need to indicate which honorary members have passed away and need to update list of all honorary members
  - Action item Amanda to scour proceedings for past honorary members

MOVED by Ken, Seconded by Mark to accept the Webmaster's report; Carried

7. a. Fall Meeting Plans Update

- Vincent provided update on status of meeting
- Volunteers have been assembled
- Concerned about how few rooms were booked therefore will be penalised by the hotel
- Lesson is to underestimate number of rooms to be booked

b. Student Awards

- Awards Committee chair recused from evaluating submissions due to conflict of interest (supervisor for undergraduate nominee, nominator of F.S. Carr nominee)
- Undergrad award: unanimous agreement
- F.S Carr: unanimous agreement

8. Old Business

a. Honorary members

- Need to determine status of current members

- Notify membership at this AGM of possible opening for next year, will notify membership of whether nominations will be

b. Archives

- Transfer is complete of paper material
- When is the audit to be finished? Not a priority so nothing heard yet
- Framed cow hide with founding members names still resides in Lethbridge

9. New Business

a. Resolutions

- none

b. 2015 meeting

a. North to host

i. Jasper was suggested as a site
ii. Overlander Resort just outside of Jasper was suggested
iii. Could get park biologist as guest speaker
iv. Local organising committee to investigate

1. Mike Dolinski to head initial investigation

c. Bioblitz

a. July 10-12th
b. t-shirts possible
c. Asking for at least 6 ESA members in order to qualify for funding

i. Lodging and meals for ESA volunteers to be paid for by University of Calgary
ii. Liaison with public, training, processing material
iii. Collection permits will be supplied
iv. Material to be processed over time and not having to be done all at once

d. Society amalgamation

a. Approach neighbouring societies about the possibility of merging

i. Action item Mike to contact other presidents about this issue

e. Proceedings - Amanda St. Onge

a. Not ready for this meeting but will be soon
b. Treasurers report will be the spring year end and not the fall update

Adjournment

MOVED by John, Adjourn the meeting at 8:20pm

Minutes of the Entomological Society of Alberta

62nd Annual General Meeting

Lethbridge, Alberta October 18, 2014

Minutes prepared by Ken Fry, ESA Secretary

Attendees:

Ronald Batallas	Gerald Hilchie	Tom Oliver
Philip Batista	Gregory Holmes	Rosanna Punko
Robert Bercha	Shelley Hoover	Samuel Robinson
Héctor Cárcamo	Jeremy Hummel	Felix Sperling
Ralph Cartar	Brad Jones	Amanda St. Onge
Diana Catalina Fernández	Monica Kohler	Ashton Sturm
Rose DeClerck-Floate	Kevin Kwok	John Swann
Mike Dolinski	Robert Laird	Lynae Vandervalk
Kevin Floate	Courtney MacInnis	Riley Waytes
Ken Fry	Chris Miluch-Fulkerth	Caroline Whitehouse
Vincent Hervet	Mark Oliver	Diana Wilches

Meeting called to order at 10:22AM by Mike Dolinski (President)

1. Approval of agenda

MOVED to accept, Rose DeClerck-Floate; seconded, Gerald Hilchie: Carried

2. Approval of minutes from the 2013 AGM

MOVED to accept as amended, Héctor Cárcamo; seconded, Robert Bercha; Carried

3. Webmaster's Report (Ken Fry for Alec McClay)
- see attached report

MOVED to accept, Ken Fry; seconded, Kevin Floate; Carried

4. Secretary's Report (Ken Fry)
- see attached report

MOVED to accept, Ken Fry; seconded, Vincent Hervet; Carried

5. Report from Regional Director to Entomological Society of Canada (Ken Fry for Rob Longair)

- See attached report

MOVED to accept, Ken Fry; seconded, Amanda St. Onge; Carried

6. Treasurer's Report (Caroline Whitehouse)
See attached report

MOVED to accept, Caroline Whitehouse; seconded, Kevin Floate; Carried

7. Nominations (Felix Sperling): nominations were presented as follows:

President –John Swann
Past President – Mike Dolinski
Vice President – Shelley Hoover
Treasurer – Caroline Whitehouse
Secretary – Ken Fry
Southern Director – Jeremy Hummel
Central Director – Mark Oliver
Northern Director - Kevin Judge
Proceedings Editor – Amanda St. Onge
Webmaster – Alec McClay

MOVED that nominations cease, Mike Dolinski; seconded, Ken Fry; Carried.

Nominated slate Acclaimed.

8. Appointment of society financial auditors
- Ashton Sturm and Monica Kohler accepted.

9. Resolutions: the following resolution was prepared and read by Ronald Batallas and Ashton Sturm;

Whereas the 2014 Annual Meeting of the Entomological Society of Alberta was a resounding success and exceedingly memorable, be it resolved that the success of the meeting can be attributed to the hard work and organisational ability of

- the meeting chairs, Shelley Hoover, Kevin Floate, Vincent Hervet
- the local arrangements committee, Kevin Floate, Vincent Hervet
- the scientific programme committee chair, Shelley Hoover
- registration and finance committee, Caroline Whitehouse
- plenary presenter, Mark Winston
- after dinner speaker, Wendy Sloboda
- and staff of the Lethbridge Lodge Hotel

- and the fine support of the Canola Council of Canada, City of Lethbridge, Alberta Agriculture and Rural Development

be it resolved that we shall provide a round of applause and the President will write a letter of thanks to Lethbridge Lodge Hotel.

MOVED that the resolution be accepted, Ashton Sturm; seconded, John Acorn; Carried.

Old Business

10. Archiving (Kevin Floate)

- hide with original signatories and 50th anniversary still in Lethbridge
- need physical copies of proceedings to be deposited at archives
- analogue and digital material will also be deposited every ten years with provincial archive

New Business

11.1 Honorary Members

- two members have passed away recently
- society should consider putting forward nomination for honorary member
- nominations need to be 30 days in advance of AGM

11.2 2015 meeting

- Jasper has been suggested as a possibility to host the North Version
- government employees may not be able to attend as resort areas not looked upon favourably
- to maximize attendance, have it in Edmonton
- investigate Hinton or other sites
- one aspect to consider is to visit all the facilities where entomology is practiced and add value like bioblitzes or other activities at the facility
- need to be aware of competing meetings such as the WFPM
- local organising committee is tasked with deciding

11.3 Society Amalgamation

- do we join with other prairie partners?
- many regulatory hurdles to incorporating federally
- Saskatchewan is shrinking but one or two new positions are to be added at Agric. Can. Saskatoon
- no downside to asking other societies
- could have joint meetings instead of formal amalgamation
- may be slide in attendance if meetings are too far away

11.4 BioBlitz

- need a maximum of 12 ESA people
- need to know by December to assure space
- presented description of the event and benefits for those that participate
    - lodging, meals, collection permits
    - what would be needed in terms of participation?
- ESA banners would be an approved expenditure for educational funds
- looking for sponsors for the t-shirts
- contact Neil Holiday as Chair of Education of ESC

11.5 $250 Student Paper Prize supplied by Mike Dolinski

- Vincent Hervet and Courtney MacInnis were deserving winners

11.6 Proceedings

- 2013 version to be ready next month
- contact Amanda for images of this meeting

12. President's Address

- presented oral remarks
- acknowledged Caroline and Ken for their service and stated that volunteering would be simpler due to their efforts
- acknowledged local organising committee and their good work
- major accomplishment of movement of archives
- thanked members for attending
- remarked about his absence from the society meetings for many years but upon his return saw how high quality the papers were, particularly of the students and pleased to see so much agricultural content
- if you as students or professionals need help with samples from crops, he can obtain them from across the Prairies, can also assist with looking at landscapes
    - students should be aware of soils and plants
    - can provide maps of variability of soils on fields
- remarked that agriculture is moving to variable rate applications so we need to be aware of this trend

13. Adjournment

MOVED to adjourn, Héctor Cárcamo

- meeting adjourned at 11:43AM

Entomological Society of Alberta

Webmaster's Report

Since the October 2013 meeting, the site has been updated with the 2014 Board information and a revised version of the membership application form, and the 2011 and 2012 proceedings have been posted. A notice of a Ph.D. position at the University of Calgary was posted on the Positions Available page.

Information on the 2014 Annual Meeting was posted as received, and Paypal buttons were installed to receive registration and membership payments. Updates on registration numbers were provided to the meeting organizing committee when requested.

Unfortunately I been slow to take action on a redesign of the site. There are three possible candidates interested in taking this on and I will seek proposals from them soon.

As always I thank all those members who have provided information or pointed out changes that need to be made to the site, and I welcome these suggestions at any time.

Respectfully submitted

Alec McClay, Webmaster

October 14, 2014

Report of the Regional Director to the Entomological Society of Canada

The Joint Annual Meeting of the Entomological Society of Canada and the Entomological Society of Saskatchewan was held in Saskatoon, SK at the Radisson Hotel from 28 September - 1 October 2014.The Annual General Meeting of the Entomological Society of Canada was held on 30 September 2014. Meetings of the Board of Governors of the ESC were held in conjunction with the JAM - the outgoing board met on 27 September and the incoming board on 30 September.

Governance and administration of the Society

The Society is, for the near future, in reasonable financial circumstances given income from publications and the sale of the headquarters building (see below). Membership renewals are of some concern.

Motions discussed at the Board of Governor's meeting and passed at the AGM included the following:

Motion to approve negotiation of a 3-year contract with Strauss Associates of Winnipeg, MB to act as an Association Management Company for the society. This company, which manages aspects of the operation of other scientific societies, will handle a large number of administrative tasks, including membership, conference arrangements and registration. Strauss is headquartered in Winnipeg. Legal requirements that ESC maintain an office in Ontario until other arrangements have been made have been met by using the Strauss lawyer's address for official purposes.

The Board of Governors moved to proceed with the sale of the house in Ottawa which houses the offices. The house is becoming increasingly decrepit and mouse-infested and maintenance issues plus operating costs have made retaining it financially unfeasible. The intention is to sell the house by March. Funds will be used to alleviate financial difficulties of the society and for investments.

Several issues were required to bring the Society into compliance with the new Canada Not-for-Profit Corporations Act. These included:

- Change of the Society's financial year end to 30 June beginning 2015
- Change of the Scholarship Fund financial year end
- Scholarship Fund finances are now to be reported separately to comply with separation of Fund from Society finances

Acceptance of Revised Standing Rules

There was a discussion and acceptance of moving ESC investments into a somewhat less conservative set of funds to increase return on these (from almost nothing).

Membership continues to be an issue with ESC, as it is for many entomological societies, with fewer renewals and new members than we would like to see.

A new membership category, the Early Professional Membership was approved for recently graduated members with a 25% reduction in fees.

The society is beginning efforts to have material archived, including scanning a number of documents.

There was discussion of greater interaction with other societies involved in aspects of applied entomology, including the Canadian Weed Science Society and the Canadian Phytopathological Society.

Future Meetings

The next AGM of the Entomological Society of Canada will take place at the JAM with the SEQ (Quebec Entomological Society) in Montreal from 8-11 November 2015.

Planning continues for the International Congress of Entomology in Orlando, Florida in 2016. There will be no JAM that year. There was discussion of grants/scholarships for students to travel to the ICE.

Additional joint meetings with the ESC, ESBC and ESAmerica will be going forward in 2018 in Vancouver (certain) and possibly in 2022 (when ESAmerica will be in Vancouver again). This latter date may not involved the regional society.

Awards

The ESC Gold Medal was awarded to Dr. David Gillespie, the C. Gordon Hewitt Award to Dr. Patrice Bouchard and the Bert & John Carr Award to Mr. Todd Lawton. Mr. Brian Olson, of Hazlett, SK, received the Norman Criddle award. Additional information is/will be available in the Bulletin of the ESC.

Publications

The new editor-in-chief of *The Canadian Entomologist* is Kevin Floate, taking over from Chris Buddle. The journal is doing well, with a high level of manuscript submissions. The Board of Governors agreed to continue the same level of support for an editorial assistant, whose efforts are critical to TCE. A “hybrid” model of publishing with Cambridge University Press has been adopted which allows authors the option of paying a one-time fee (currently $2700/article) to make a paper Open Access, a requirement of some sources of funding for research.

Changed the guideline for abstracts to only requiring an abstract in the language of submission of the manuscript.

Members of all societies were encouraged to submit items for various blogs, newsletters, etc.

ESC Directors

The new executive for 2015-2016 includes:

Societal Directors (Name, Position, Year term ends)

- Staffan Lindgren (President; 2015)
- Terry Wheeler (1st Vice-President; 2016)
- Neil Holliday (2nd Vice-President; 2017)
- Zoe Lindo (Director-at-Large; 2015)
- Kirk Hiller (Director-at-Large; 2016)
- Chris Cuthbert (Director-at-Large; 2017)
- Rebecca Hallett (Past President/2015)

Regional Directors

- ESBC - Bill Riel (2015)
- ESAB - Rob Longair (2016)
- ESS - Jeff Boone (2017)
- ESM - Barb Sharanowski (2017)
- ESO - Patrice Bouchard (2015)
- SEQ - Annabelle Firlej (2016)
- AES - Gaetan Moreau (2016)

Rob Longair - 8 October 2014

Entomological Society of Alberta
Central Region Report, October 2014
Autumn Executive Meeting October 16, 2014
Submitted by Mark Oliver, Central Director

University of Calgary

Insect Collection (Manager: John Swann, jeswann@ucalgary.ca)

The U of C's collection is continuing to grow:

- Two students with Dr. Wic Wildering and John Swann successfully completed fourth year independent study projects looking at elastic proteins in flies – spectacular results that beg graduate research
- This fall we have four honours theses/2 semester research project students working in the lab, two with Ralph Cartar, one with Mary Reid and one with Steve Vamosi
- Continued to have 10-12 student volunteers assisting in upgrading the curation of the collection
- Curation of the collection is currently focused on Apoidea and Odonata to upgrade the curatorial standards of those two groups and make material available for researchers
- Starting to get portions of the collection into a relational database that is web compatible/ready
- Currently cataloguing the second donation of Dr. Rex Kenner's aquatic beetle collection from his estate before sending it out for external appraisal
- John was asked to contribute a chapter for the 'Catalogue of Colombian Diptera' which has been accepted by the editors
- Was just asked to contribute a chapter to 'The Manual of South American Diptera' that will be published in 5-6 years

Graduate and other research news

(Dr. Mary Reid, **mreid@ucalgary.ca**)

- Mathias Kaiser completed his MSc thesis in June 2014: "Acoustics of mountain pine beetle and lodgepole pine"
- Haydeé Peralta-Vázquez is continuing her PhD work on the interactions between mountain pine beetles and mites. She was awarded an Honourable Mention at the Canadian Society for Ecology and Evolution for her poster "Symbiont communities in an expanding range".
- Megan Goulding is a new MSc student who is planning to examine interactions between spruce beetles and their host trees

(Dr. Ralph Cartar, **cartar@ucalgary.ca**)

There are three new entomological graduate students:

- Rola Kutbi is working on bumble bee foraging ecology and life history (PhD)
- Samuel Robinson is studying pollination ecology of canola (PhD, co-supervisor is Shelley Hoover, Alberta Agriculture and Rural Development)
- Riley Waytes is working on pollination of canola by wild and native pollinators (MSc, co-supervisor Shelley Hoover)

(Dr. Rob Longair, **longair@ucalgary.ca**)

- Patrick Piekarski, the winner of the 2013 Undergraduate Award from the ESA, has entered a Master's programme at the University of Manitoba supervised by Barb Sharanowski. Patrick attended the 8th Conference of the International Society of Hymenopterists in Cusco, Peru and presented a paper entitled "Monophyly of eusocial wasps (Hymenoptera: Vespidae): molecules and morphology tell opposing histories".

University of Calgary Field Courses

- A new tropical field course, "Biodiversity and Conservation Biology in Belize" will run in May 2015 at the Lamanai Outpost Lodge, Orange Walk District, Belize. The course, offered by Rob Longair and Robert Barclay, will introduce 16-20 students to tropical biology and biodiversity with an emphasis on insects, including social wasps (of which there are more than a few), and vertebrates, particularly bats.
- The "Insect Biodiversity" field course at the Barrier Lake field station of the Biogeoscience Institute of the University of Calgary in Kananaskis ran again this past summer with 14 students enrolled.

Olds College (Dr. Ken Fry, esalberta@gmail.com)

The Horticulture program has had significant changes:

- Implementation of the new Horticulture programme at Olds College has resulted in a condensing of entomology instruction into a combined pest management course in each of three years of the four year programme. The agriculture Management Diploma has a combined pest management course with entomology content. There are no longer any stand-alone entomology courses at Olds College. The collection will continue to be supported.

There are several projects underway on campus:

- Students have been hired to participate and contribute to several projects on campus, including lily beetle management supported by the Alberta Regional Lily Society, elm bark beetle monitoring and alien invasive species monitoring for urban tree pests

supported by the Society to Prevent Dutch Elm Disease, and alien invasive species monitoring for fruit and vegetable pests supported by Alberta Agriculture and Rural Development.

The College has been active in training with various organizations:

- Olds College hosted the CanoLab spring training school for the Canola Council of Canada and the Spring Production School for the Alberta Farm Fresh Producer's Association and Alberta Agriculture and Rural Development. Both activities featured the insects and insect pest management.

Field Trips/Outreach

Dry Island Butterfly Count, July 6, 2014 (Dr. Charles Bird)

The following is a summary of Charley's report, to be published in the Alberta Lepidopterists' Guild's Fall 2014 newsletter. For Charley's full report, please refer to the newsletter.

The 16th Annual Dry Island Butterfly Count was held on July 6, 2104, led by Dr. Charley Bird at Dry Island Buffalo Jump Provincial Park, Red Deer River Valley, east of Huxley. The day was sunny and between 20-26 C. There was an excellent turnout with 41 observers. The Count, being in a Provincial Park, was catch, identify and release. All agreed that this Park is one of the most beautiful in Alberta and all hoped that, with continued good management, it will remain so.

The count started in the Upper Viewpoint/Parking Lot at 10 AM, where five species of butterflies were seen. After lunch, the importance of the park and several natural history topics were discussed. The large group was split into three teams, led by John Acorn, David Lawrie and Vic Romanyshyn, and Charley Bird.

25 species of butterflies and 214 individuals were observed, as well as two species of dragonflies and one damselfly. Two of the butterflies, Lycaena hyllus (Bronze Copper) and Euphyes vestis (Dun Skipper), had not been seen on any of the previous counts. Charley notes that this is the second record of the latter species in Alberta, Charley having identified the first near Erskine in 1999.

The flight times of butterflies often correspond with the flowering times of various plants; therefore, notes were kept of the plants that were seen in flower. Forty-four species of flowering plants were noted. The complete list is in Charley's report.

Ellis Bird Farm Bug Jamboree, August 9, 2014 (Dr. Charles Bird)

The following is a summary of Charley's report, to be published in the Alberta Lepidopterists' Guild's Fall 2014 newsletter. For Charley's full report, please refer to the newsletter.

The Bug Jamboree at the Ellis Bird Farm, located southeast of Lacombe, was held on August 9, 2014, organized by Myrna Pearman and team. The purpose of the event is to introduce children

to the wonderful world of entomology through displays, activities, exposure to experts and a Butterfly Count. Over 250 adults and children attended.

John Acorn introduced the event with a selection of "Acorn – the Nature Nut" songs. Various entomological authorities are invited to attend and set up displays in their various areas of interest. Vic Romanyshyn and David Lawrie represented the Alberta Lepidopterist's Guild. Ken Fry presented on garden insects and Charley Bird again had a display of butterflies and moths (at least his 11th consecutive year) as well as literature relating to both groups. There were several other displays, including ones about parasitology, tropical insects and a leaf-cutter bee hotel. Adrian Thysse had a display of insect photographs and also served as the judge of the pollinator photo contest, which was held for the first time.

There are also garden tours to look at garden insects, the ever-popular pond dipping station at the pier, and crafts for the children such as constructing and taking home their own bumblebee box.

The Butterfly Count commenced at 3:00 PM. The leaders for this year's count were Charley Bird, David Lawrie, Vic Romanyshyn and John Acorn.

There were 58 participants in this year's Butterfly count and seven species (112 individuals) were encountered.

Publications (Dr. Charles Bird, cdbird@xplornet.com)

Bird, C. D. Fall 2014. Dry Island Butterfly Count. Alberta Lepidopterist's Guild Newsletter. In press.

Bird, C. D. Fall 2014. Ellis Bird Farm Bug Jamboree. Alberta Lepidopterist's Guild Newsletter. In press.

Retirement of Associate Editor C.D. Bird, The Canadian Field-Naturalist

It should be noted that Charley, after serving The Canadian Field-Naturalist as Associate Editor for almost 40 years, stepped down in early 2014. He primarily reviewed botanical submissions but also some in entomology and general natural history. Charley was made an Honorary Member of the Ottawa Field-Naturalists' Club in 2005 in recognition of his contributions.

Entomological Society of Alberta
Southern Director's Report
Fall Executive Meeting
16 October 2014

Events and outreach:

Southern entomologists are pleased to be hosting the 2014 meeting of the Entomological Society of Alberta in Lethbridge. We welcome everyone back to Lethbridge and hope everyone has a very nice time! The tour of Devil's coulee planned for Saturday after the meeting has unfortunately been canceled due to the presence of grizzly bears in the area.

On August 16 southern entomologists put on for the fourth time an Insect Discovery Day at the Alberta Birds of Prey Centre in Coaldale. Like during previous years, entomologists shared their passion of insects with the visitors of the center that day, which were invited to collect insects from a pond and a meadow. There were also live and pinned insects displayed. The event is becoming increasingly notorious every year with a constantly increasing attendance (doubled from last year?). Next year's event will take place on Aug. 15.

People:

- Kevin Kwok (supervised by Rob Laird – University of Lethbridge) successfully defended his Biology Master's thesis on June 29, entitled "Inducible anti-herbivore defenses of the annual sunflower (*Helianthus annuus*) against a specialist sunflower beetle (*Zygogramma exclamationis*).

- Haley Catton, who recently defended her Ph.D. (cf. last report) started a short post-doctoral position in the Dept. of Biological Sciences at the University of Lethbridge in September.

- Graduate students working on entomology-related topics:

    - Greg Holmes (on-going M.Sc - co-supervised by Rob Laird, U of L, and Rose De Clerk-Floate, AAFC): Study of a leaf-galling wasp, *Aulacidea pilosellae* (Cynipidae) as candidate for the biocontrol of invasive hawkweeds in Canada. He is studying the interactions between the wasp, its host plants, and environmental factors (e.g., nitrogen), to aid in the development of an effective biocontrol strategy.

    - Diana Catalina Fernández (on-going M.Sc - co-supervised by Rob Laird and Héctor Cárcamo, AAFC): Assessment of ecological effects of a parasitoid (Hym.:

Brac.) for classical biocontrol of *Lygus* bugs (Hem.: Myr.), and biological studies of this parasitoid species.

- Diana Wilches-Correal (on-going M.Sc - co-supervised by Rob Laird and Kevin Floate, AAFC): Assessment of temperatures on important quarantine insects pests, and study of their associated symbiotic bacteria.
- Vincent Hervet (on-going Ph.D. - co-supervised by Rob Laird and Kevin Floate): Study of parasitoid-host interactions in a system involving Braconidae (Hymenoptera) and their noctuid hosts (Lepidoptera).
- Samuel Robinson (Ph.D, started May 2014, co-supervised by Ralph Cartar, U of C, and Shelley Hoover, AB Agriculture and Rural Development): Investigates what are the pollinators of canola and their effects on yield.
- Riley Waytes (M.Sc, started September 2014, co-supervised by Ralph Cartar and Shelley Hoover): Looking at pollinator behavior related to yield of canola.

· Lynae Vandervalk has been extended for another 2 year as technician in Shelley Hoover's lab.

· Shelley Hoover and Danice Baines (AAFC) are working on honey bee and leaf cutter bee cell lines and the application of probiotics to treat bee diseases.

· Dr. Tim Lysyk retired earlier this year after 29 years of public service as research scientist. Tim received a B.Sc. (Honors) in Zoology from the University of Alberta, a M.Sc. in Entomology from South Dakota State University, and a Ph.D. in Medical-Veterinary Entomology from North Carolina State University in 1985. He started his career at the Canadian Forestry Service in 1985. Then moved to Agriculture and Agri-Food Canada Lethbridge in 1989. Tim was adjunct professor at the University of Lethbridge (1994-2014) and the University of Calgary (2010-2014). Tim's research was mainly on population ecology, quantitative ecology, physiological ecology, and management of veterinary arthropods, including ticks, tick paralysis, and various biting flies. Awards: In 1996 Tim was awarded the C. Gordon Hewitt medal award from the Entomological Society of Canada. Tim was also awarded 3 Entomological Society of America Outstanding Service Awards: Editor of Environmental Entomology (2000), Chair of Journal of Economic Entomology editorial board (2006), Subject Editor for J. Econ. Ent. (2007). Tim also received the Livestock Insect Worker's Conference Lifetime Achievement Award in Veterinary Entomology (2010). Tim published over 90 peer reviewed articles and 12 book chapters.

- Dr. Peter Harris sadly passed away on August 26. As we all know, Peter was an honorary member of the Entomological Society of Alberta. Peter came from England in 1950 to obtain his B.Sc. in the Faculty of Forestry at UBC, completed a Ph.D. in entomology at the University of London (1958), and was subsequently hired as a research scientist in biological control by Agriculture and Agri-Food Canada in 1959. First based at the Research Institute in Belleville, ON until its closure in 1972, then at the Research Centre in Regina, SK until its closure in 1992, and finally at the Lethbridge Research Centre, AB until Peter's official retirement in 1995. However, Peter continued to work at the research centre until early 2014 as an emeritus scientist. Peter was a highly respected pioneer in classical weed biocontrol and regarded internationally as a leader in his field. Amongst his accomplishments are the work he did on the biocontrol of leafy spurge and knapweeds in North America; his involvement in the screening, release, and impact assessment of 36 insects and one nematode species; implementing the first economic assessment of weed biocontrol; publications in both Nature and Science in 1969 reporting on how mosquitoes sometimes benefit from feeding on insect haemolymph; was awarded the 125th Anniversary of Canadian Confederation in 1994; was awarded the Entomological Society of Canada's gold medal in 1997; became a member of the Order of Canada in 1997. Peter's advances in science and many successes in weed biocontrol are his legacy to the society.

Respectfully submitted,
Vincent Hervet
ESA Southern Director

Herald photo by David Fuller

Six-year-old Hudson Dow swings a net through the tall grass in an attempt to catch some bugs as a part of the annual Insect Discovery Day at the Alberta Birds of Prey Centre Saturday afternoon.

CLOSE ENCOUNTERS OF THE BUG KIND

Birds of Prey Centre gives close-up look at insects

Melissa Villeneuve
For The Herald

Insects definitely aren't aliens, although under a microscope they sure can look that way. Visitors to the fourth-annual Insect Discovery Day at Alberta Birds of Prey Centre in Coaldale were treated to "Close Encounters of the Bug Kind" on Saturday.

Visitors of all ages had the opportunity to catch and identify a variety of insects found in southern Alberta and meet bug scientists from the Entomological Society of Alberta, sponsored by the TD Canada Trust Friends of the Environment Foundation. Activities included pond dipping, butterfly catching and viewing static displays of beautiful and hideous insects from around the world.

Manager Colin Weir says Insect Discovery Day is always one of its most popular summer events.

"It's always a special day for us, lots of kids and lots of excitement," said Weir. "They can bring the bugs back, get them identified and release them into the wild. The cool thing about this is the vast variety of insects we have around here. We often look upon them as a nuisance but they have a very positive role in our environment. The entomologists are celebrities for a day and they enjoy sharing their passion with kids. The kids are just totally excited about bugs, so it's just a great day for everybody."

Weir said the Alberta Birds of Prey Centre is trying to become established as a nature centre as well.

"Our centre has a lot more to offer than just hawks, eagles and owls," he said.

"We're trying to get established as a nature centre because we have a beautiful wetland around us and we've got a lot more to offer in addition to the birds of prey we have on site. A few years ago we did a presentation to the Entomological Society of Alberta and we floated the idea to them that this was a great venue for them to come down and get kids interested in their area of expertise, that's where the idea came from."

At the Indoor Insect station, visitors could watch a live beehive behind glass, view live bugs under a microscope, and hold a Madagascar hissing cockroach and several types of caterpillars. There were also mounted specimens on display from southern Alberta as well as around the world.

Shelley Hoover, research scientist for Alberta Agricultural and Rural Development, works on bees, specifically honey bees, leafcutter bees and pollination. She says events like this help people learn the importance of insects to our environment.

"There are so many species of insects. They are all around us and people don't know that much about them," said Hoover. "Honeybees and leafcutter bees are important down here because we need them to pollinate our crops.

"All of the canola seed that is produced in our region is pollinated with honeybees and leafcutter bees, so without those bees there would be no canola seed. At the base of all these food production systems is our insects."

Hoover said events like this show children they don't have to be afraid of insects.

"One thing I like about this day, for the kids especially, is that we have insects they can hold that we know won't hurt them," said Hoover. "They can get up close and personal with honeybees in an environment that's safe to teach them you don't have to be afraid of these insects. Just because it's an insect, it doesn't have to be scary or gross, it's something we can appreciate."

Mathis Schafer, age 6, was brave enough to hold the Madagascar hissing cockroach and said it's his favourite type of bug, along with caterpillars. "It was awesome. I like bugs."

The Fluttering Fields station was popular as parents and children took to the fields with nets to catch all kinds of winged and jumping creatures.

Katie Gallagher, age 8, caught a lot of bugs with her net.

"I think I've lost count. I caught a few butterflies and one grasshopper, and one beetle, I think, that's it," she said. "It's difficult to catch the grasshoppers. The butterflies not as much, and the beetles, they just appear in your net."

The Pond-dipping station gave kids the chance to dip into the pond and pick out different aquatic insects.

Weir said there are many great reasons to come visit the Alberta Birds of Prey Centre. "We're just getting to the end of our baby bird season," he said.

"We've got some baby short-eared owls, they're almost grown up now, and we've got our flying station where we fly hawks and eagles through the daytime and feeding our world famous ducks out there is always a highlight for children as well."

Hours for the centre are 9:30 a.m. to 5:00 p.m. seven days a week until Sept. 10.

Vice-president's report for education/outreach 15 OCT 2014

Bioblitz in Kananaskis July 2015

I'm in discussion the Dean of Science's office (U of C) for money for a bioblitz in Kananaskis this coming July on a weekend – as we discussed at our previous executive phone meeting. So far if we provide half a dozen people minimum (I count as one since it would be OT for me and I said I would eat that as part of the society's contribution), we get food and lodging in 2 half duplexes (capacity is 12) from Friday night through Sunday night. That's the in-kind contribution of the station. The Bio Department is kicking in lots of entomological supplies eg. 70% ethanol, pins, batteries to run black lights (3750$ worth). I'm trying to get the Dean's office to kick in the money for t-shirts with all the sponsors including the society on them. I'll hopefully have the date from the field station by the end of October as well as hearing from the Dean's office by then. We would also get featured in the media as a sponsor (since I'm going to be doing that via the Dean's office) and it would be open to the whole public to come out a Sat. afternoon thru Sunday to participate. If the Dean's office says no to the money then I'll try to find another sponsor – I suspect 400-500 t-shirts for the participants and general public will run about 8K tops based on what I could see online at custom t-shirt places.

Respectfully,

John Swann

Entomological Society of Alberta
Secretary's Report
Fall Executive Meeting
16 October 2014
Report for the Period October 11, 2013 – October 16, 2014

I received/tracked two (2) items in my capacity as ESA Secretary:

1. Archives move to Provincial Archives
2. 2014 Meeting Arrangements

I retained discussions and correspondence conducted via email totaling two hundred seventy six (276) messages.

As Secretary I issued eleven (11) Email & FaceBook notices to the executive or membership:

1. Insect Collecting Shirt.....Dec 4 2014
2. Devonian Botanic Garden Collection Video .....Dec 5 2014
3. ESC Awards Nomination Announcement .....Feb 10 2014
4. ESA Archive Move Announcement .....Feb 10 2014
5. Missing Entomologist Announcement.....Mar 26 2014
6. Entomology Job Opportunity.....Apr 14 2014
7. ESA Annual Meeting Announcement .....May 13 2014
8. ESA Annual Meeting 2nd Announcement.....Aug 28 2014
9. ESA Annual Meeting 3rd Announcement .....Sep 9 2014
10. Registration deadline extension .....Sep 18 2014
11. COSEWIC committee recruitment .....Oct 10 2014

Letters/items retained

1. Letter of Announcement for ESC Awards
2. Society's Annual Return to the Province

Caretaking items:

- The FaceBook membership has 127 members up from 91 members. 46 postings (not including follow-ups to individual postings) were made to the group since October 10, 2013
- One member deleted for posting spam
- Two messages deleted as spam
- Numerous applications for membership denied due to lack of connection to entomology
    - This is an on-going issue

Respectfully submitted,

Ken Fry

Financial Report
Fall Annual General Meeting
Entomological Society of Alberta
17 October 2014

Memberships - 2013:

Total Memberships (on the books / in good standing)	
Regular	80 / 45
Student	68 / 30
Honorary	5
Free Library	20
Subscription Library	2 / 1

Opening Balance January 1, 2013:

Assets		
Cash (bank account)	$11,548.02	
Term deposits	$15,000.00	
Common shares (Credit Union shares)	$653.49	
Total Assets		$27,201.51

Liabilities & Equity		
Total Liabilities	$0.00	
Equity	$27,201.51	
Liabilities plus Equity		$27,201.51

Olds, AB -- ESAB Annual Meeting 2013

Costs		
Student awards	$1,500.00	
Liquor purchase	$252.02	
Speaker expenses/honourarium	$312.28	
Paypal fees	$47.70	
Total Costs*		$2,112.00

Revenues		
Registration	$2,870.00	

Reception revenue	$18.00	
Total Revenues		$2,888.00
AGM Revenues minus Costs		$776.00

Other Transactions

Credits:

Investment Interest	$202.50	
Membership Renewals	$870.00	
Paypal balance from 2013 joint meeting (mechandise, banquet tickets, etc.)	$443.06	
ESAB share of the remaining balance of 2013 joint meeting account	$16,201.02	
Merchandise purchase	$50.00	
Patronage payment	$4.81	
Paypal credit	$2.34	
Total Credits		$17,773.73

Debits:

Lloyd Dosdall (JAM 2012 reimbursement)	$350.00	
Greg Courtney (JAM 2012 reimbursement)	$350.00	
Krisztina Mosdossy (2012 travel award)	$300.00	
JAM seed money reimbursement	$4,000.00	
2012 Proceedings printing cost	$285.55	
ESC – scholarship donation	$9,972.59	
Service fees	$25.25	
Postage	$33.08	
Total Debits		$15,316.50

Total Credits plus Debits	$2,457.26

Closing Balance December 31, 2013:

Assets

Cash (bank account)	$15,060.03

Term deposits	$15,000.00	
Common shares (Credit Union shares)	$679.55	
Total Assets		$30,739.58

Liabilities & Equity

Amanda St. Onge – AGM travel award	$200.00	
Gordon Gilchrist – AGM Speaker honorarium	$100.00	
Total Liabilities	$300.00	
Equity		$30,739.58
Liabilities plus Equity		$30,739.58

* Catering ($2,175.80) not invoiced and paid until March 2014.

Photos 62 nd Annual General Meeting

2014 (Lethbridge)

Hector Carcamo (left) and Michaela Schmitke (right) both described research about sampling methods for *Lygus* bugs

Left: Phil Batista

Centre: Gregory Holmes spoke about biocontrol for hawkweed

Right: Vincent Hervet spoke about parasitoid wasps

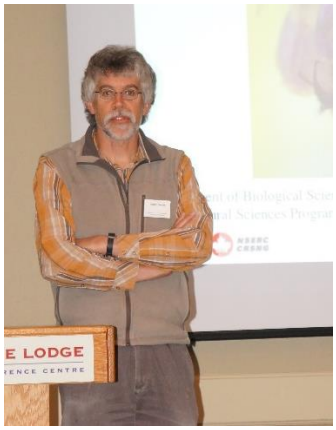
Left: Laurens Philipsen reported on invasive ground beetles

Centre: Felix Sperling spoke the spruce budworm complex

Right: John Swann spoke about the U of C's invertebrate collection

Jeremy Hummel reported on cutworm occurrence in Alberta.

Diana Wilches reported on effects of temperature on khapra beetles in stored products.



Ralph Cartar explained how to be a successful bumble bee.

Rose DeClerke-Floate reported on the role of plant morphology in week biocontrol.

Rola Kutby described bee community recovery in restored landfills.

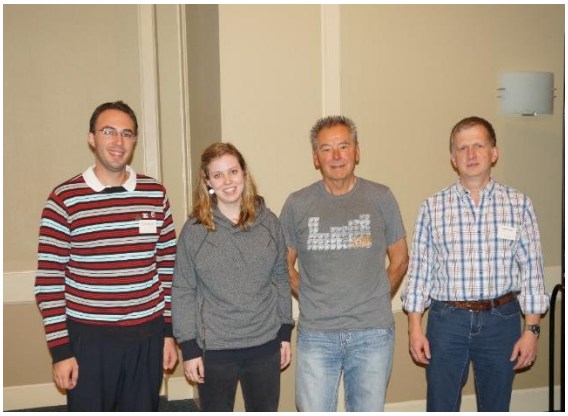
Conference banquet and awards ceremony

Conference participants examine paleontological exhibits from the Devil's Coulee Paleontological Reserve.

Left: Felix Sperling presents Ron Batallas with a student travel award

Right: Felix Sperling presents Courtney MacInnes with a student travel award

Felix Sperling presents Robert Bercha with the Frederick S. Carr Award



Vincent Hervet, Courtney MacInnes, Mike Dolinski, John Swann

Vincent Hervet, Amanda St Onge, and Courtney MacInnes