Boreus

Newsletter of the Entomological Society of British Columbia

December 2007
Volume 27 (2)

Bugs on a flower

Buprestid on a log, Sandy Island, 2007

Nadine Parker, Kevin Fort and Bill Woodhouse checking out the sand dunes on Sandy Island, June 2007.

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The Executive

The Entomological Society of British Columbia is a scientific Society founded in 1902 for the advancement of entomological knowledge in the province.

Entomological Society of BC Executive

President	**John McLean**
President-Elect	**Sheila Fitzpatrick**
Past-President	**Richard Ring**
Secretary / Treasurer	**Lorraine Maclauchlan,** BC Ministry of Forests, 515 Columbia Street, Kamloops, BC Canada V2C 2T7
Editorial Committee (Journal)	**Ward Strong (Editor)** **Lorraine Maclauchlan** **Geoff Scudder** **Sheila Fitzpatrick**
Editor (Boreus)	**Jennifer Heron**
Directors	**Jim Corrigan (1st)** **Rob McGregor (1st)** **Naomi DeLury, (2nd)** **Dezene Huber (2nd)** **Mike Smirle (2nd)**
Honorary Auditor	**Karen Needham**
Regional Director of National Society	**Bill Riel**
Web Page Editor	**Bill Riel**
Web page	http://www.sfu.ca/biology/esbc/

Publications of the ESBC

Journal of the Entomological Society of British Columbia

The *Journal of the Entomological Society of BC* is published annually. Papers for the *Journal* need not have been presented at meetings of the Society, nor is it mandatory, although preferable, that authors be members of the Society. The chief condition for publication is that the paper has some regional origin, interest or application. Line drawings or photographs as candidates for the cover are also accepted. Contributions should conform to the standards outlined in the Journal and the Website (http://esbc.harbour.com/), and should be sent to the Editor, Dr. Ward Strong, BC Ministry of Forests, 3401 Reservoir Road, Vernon BC, Canada V1B 2C7; tel 250-549-5696; fax 250-542-2230; e-mail Ward.Strong@gov.bc.ca.

The deadline for submissions to be included in the 2007 issue is **September 1, 2008**.

Boreus

Boreus, the Newsletter of the Society is published in June and December. It contains entomological news, comments, reports, reviews and notices of meetings and other events. While emphasizing the Society's affairs, *Boreus* provides members with a forum for their views and news of British Columbia entomology, as well as informal articles, notes regarding research projects, and anything else that may be of interest to entomologists. Please send correspondence concerning *Boreus* to the Editor, Jennifer Heron, BC Ministry of Environment, UBC Campus, 315-2202 Main Mall, Vancouver, BC V6T 1Z4; tel 604-22-6759; fax 604-660-1849; e-mail Jennifer.Heron@gov.bc.ca.

The deadline for submissions to be included in the June 2008 issue is **May 1, 2008**.

Membership of the Entomological Society of BC is available to anyone interested in entomology. Annual dues are Can$20.00 (regular member) or Can$10.00 (student member). Members receive the *Journal*, *Boreus* and *Occasional Papers* (the latter published intermittently).

Inquiries concerning membership and back issues should be sent to the Secretary/Treasurer, Dr. Lorraine Maclauchlan, BC Ministry of Forests, 515 Columbia Street, Kamloops, BC, Canada V2C 2T7; tel 250 828-4179; fax 250 828-4154; e-mail Lorraine.Maclauchlan@gov.bc.ca

Cover Sketch: *Boreus elegans* (Mecoptera: Boreidae); one of the more conspicuous snow scorpionflies in BC. Larvae and flightless adults live in, and feed on, moss and clubmoss. Adults appear in the fall and are active on snow on warm winter days. Credit Robert A. Cannings and Ward Strong

Cover Photograph: Robber fly, banks of the Kootenay River, Castlegar, B.C. Photo J. Heron

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Bugs and Beers event at Ward Strong's home, August 2007.


Babita Bains and David Jack


Entomological discussions after the meeting


Michelle Connolly and Claudia Copley

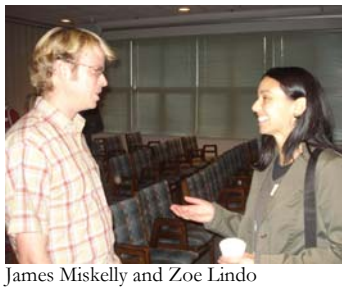

Ward Strong, Allan Carroll and Dave Raworth

Society Business

ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA

Annual General Meeting
October 19, 2007, Pacific Forestry Centre, Victoria, B.C.
Minutes recorded by L. Maclauchlan, Secretary/Treasurer

1. Richard Ring, ESBC President, called meeting to order at 3:35 pm
2. 2007Annual General Meeting Agenda:
   Motion to approve agenda R. Cannings; 2nd P. Belton Unanimous
3. Review 2006 Annual General Spring Meeting Minutes:
   Motion to approve: M. Clodius; 2nd K. Needham
4. Library Project: (R.Ring)
   - thank you to the efforts put into this project of which we are now seeing the culmination of 4-5 years of effort and hard work
   - MetaFor (Natural Resources Canada website) has instructions for access to the Library site – information cards were handed out at AGM
   - Professional Librarian wrote draft Library Policy in 2002 and thus set the stage to accept Library Policy (prepared by Leslie Hatch)
   - **Motion** to accept Library Policy as interim policy read by R. Ring; 2nd V. Nealis Unanimous
   - Discussion around whether membership is ready to vote on this understanding that the Policy document will be revised and scaled down as necessary once it is in place
   - Already must address moving to electronic format
5. Nominations for ESBC Executive (K. Needham, J. McLean, R. Ring):
   - Discussion to add a Graduate student position on ESBC Executive Committee
   - Question: will there be assigned duties? Probably nothing imposed.
   - G. Smith suggested updating school list; attend meetings; encourage students to join ESBC; present papers and assist in arranging Symposia
   - **Motion** to add Grad. Student position to ESBC Executive Committee: J. Myers; 2nd G. Smith, Unanimous
6. Planning for 2008 ESBC AGM/Symposium: recently we have had second day with a Symposium and it has been successful and well received
   - next year (2008) AGM & Symposium will be held in Vancouver, in Stanley Park at the Park Pavilion


James Miskelly and Zoe Lindo


Entomological musings


Michelle Connolly, Karen Needham and James Miskelly


Graham Gillespie, Darren Copley and Rob Cannings

7. Secretary/Treasurer Report (L. Maclauchlan): **Motion** to accept report: L. Humble; 2nd R. Bennett; Unanimous
   - "Richard Ring (Chair of Library Committee) – noted "the biggest spender of all time was a Scot"
8. Journal Editor Report (W. Strong): **Motion** to accept: W. Strong; 2nd M. Clodius; Unanimous
   - Ward still looking for "cover art"
   - Ward and ESBC Executive decided not to change submission deadline and that we would wait and see if the numbers of submissions increased
   - reminded group why deadline was changed – by publishing in year of cover date the journal may be included in the web-of-science and thus increase impact factor (Thompson Scientific Impact Factor)
   - publish 2nd week of December annually now
   - Ward will explore other printers in Vernon and Burnaby
   - R. Cannings gave thanks for Wards' work and efficiency
   - Bill Riel will put pdfs on the web and will get previous publications on web as allows
   - note – cite as much as possible from last two years JESBC
   - R. Ring has review of Impact Factors to be published in *Canadian Entomologist*
   - Suggest publishing review articles as they will be cited more
9. BOREUS: (J. Heron) **Motion** to approve: B. Riel; 2nd N. Delury; Unanimous
   - everyone likes the "new look" of Boreus and thanked Jen for her effort and style
10. Website: (B. Riel) **Motion** to approve: P. Belton; 2nd V. Nealis; Unanimous
    - Ward – asked if there were limitations of web space and discussion around the possibility of moving to a commercial provider to get more room
    - R. Bennett asked if Library Committee could put short introduction and link on web – **Action Item**
11. Regional Director Report: (A. Carroll) – no report as he did not attend ESC AGM this year but will update group as soon as possible
12. Presidents Report: (R. Ring) **Motion** to approve: J. McLean; 2nd R. Zilahi-Balogh; Unanimous
    - Special thanks to Vince Nealis, Greg Smith for all his work and efforts on the library project; many letter and emails have been received and

responded to over the duration of R. Rings' tenure – thank you for an excellent job!

NEW BUSINESS

13. Discuss keeping file/copies of all email correspondence
14. ICE 2012 – International Congress of Entomology – ESC & ESBC will support application that will be submitted in Durban, S. Africa next year for 2012 congress to be held in San Diego (chair Murray Isman); we can set-up a table at congress and there will be financial help as well
15. James Grant Award (North Okanagan Naturalists) – increased their donation for the award this year to $300
16. Harold Madson Award – also raised to $300 by ESBC until such time Phero Tech increases their donation
17. Whistler Bio-Blitz – R.Ring invited discussion/opinions on this event. Noted entomologists not well represented. B. Riel – executive will not officially sponsor as a Society
18. ESC JAM 2008 – Ottawa and then 2009 in Manitoba and presumably back in BC in 2010. R. Bennett noted this event needs two years planning.
19. Student Awards – Two travel awards and two awards for student presentations & possibly in future an award for best poster
    - Harold Madson Award - Zoe Lindo (Ph.D.)
    - James Grant Award – Hannah Bottomley (undergrad/MSc)
    - Winners of travel award: Zoe Lindo (Ph.D.) $500 and Maxence Salomon (Ph.D.) $500
20. Election Results
    - outgoing executive includes:
        - Past-President Karen Needham, Directors: Rob McGregor and Markus Clodius – thank you for the hard work!
    - New President Elect– Sheila Fitzpatrick
    - New Directors – Rob McGregor and Jim Corrigan
21. Announcement, Rob Cannings – new previously undescribed order of millipedes discovered in B.C. (Phil Lepage, Ken White (MOFR)) – last new order about 102 years ago. To be published in *Entomological News*.
22. Richard Ring presented gavel to incoming President John McLean.
23. J. McLean thanked and acknowledged R. Ring for his outstanding term as President and all his hard work and "spending" on the Library project.
24. **Motion to Adjourn:** R. Bennett; 2nd R. Cannings, Unanimous.


Robb Bennett, Babita Bains and Jim Corrigan


Elspeth Belton and Richard Ring


Peter Belton

Executive Reports
Annual General Meeting October 19, 2007

ESBC President's Report

The business of the Society this year (2006 – 2007) can be best described as occurring in fits and starts, the busiest periods being around the Spring 2007 Executive Committee Meeting and, by far, leading up to the Annual General Meeting and the Symposium. Perhaps the most satisfying activity this year was presiding over the culmination of our ESBC Library Project, an initiative that has been in the works for several years and involving many different people both within and without our Society. However, I think that special plaudits are in order for the roles played by Vince Nealis and Greg Smith (ESBC members at PFC), Jim Wood, Program Director at PFC, and Alice Solyma (Librarian) and her staff at Pacific Forestry Centre. Our library holdings are now fully catalogued, and this information is harmonized and integrated into the NRCan [Natural Resources Canada] network of libraries across the country. We still have some procedural problems to resolve, but I think I will leave this for our in-coming President, John McLean, to deal with. You will be able to see for yourselves our "library in action" when we host the luncheon during the AGM on Friday 19 October 2007 in the library setting.


Richard at the ESBC 2007 AGM

I have spent a great amount of time writing letters on behalf of the ESBC as well as responding to numerous e-mail enquiries. Letters of appreciation to the donors of our student awards in 2006 (1) Phero Tech for the Harold Madsen Award (for a Ph.D. student) won by Gwylim Blackburn, UBC and the North Okanagan Naturalists Club for the James Grant Award (for an M.Sc. student) won by Tim Hazard, SFU; and letters to all who helped organize our Library and who helped in cataloguing, shelving and (most important) in obtaining funds for the myriad of activities. The Alien Invasive Species Strategy supported jointly by the Canadian Forest Service and the Canadian Food Inspection Agency was the most important source of funding. So letters were sent to (1) Jim Farrell, Assistant Deputy Minister, CFS, (2) Gary Koivisto, Executive Director, CFIA, (3) Sue Farlinger,

Regional Director General, PFC, (4) Jim Wood, Program Director, PFC, (5) Linda DeVerno, Pacific Forestry Centre, (6) Alice Solyma, Librarian, Pacific Forestry Centre, (7) Vince Nealis, Pacific Forestry Centre and ESBC, (8) Sylvie Dufresne, Pacific Forestry Centre, (9) Margie Clarke, now at Camosun College, (10) Jeff Dechka, Pacific Forestry Centre and (11) Caroline Preston, Pacific Forestry Centre. I still have to write to Dr. Yvan Hardy, Chief Scientist of Natural Resources Canada in Ottawa.

The transition this year from our out-going Secretary – Treasurer Robb Bennett to our new, in-coming Secretary-Treasurer, Lorraine Maclauchlan has worked seamlessly, thanks, in large part, to their ability to collaborate closely with one another. The benefit of Robb's long experience (12 years) and working knowledge of this position on the Executive Committee was also a large factor. It is only now, I think, that Lorraine realizes the extent of the work involved in what is arguably the most important and arduous position on the Executive! On 16 March 2006 I held a reception for Robb at the University Club, Uvic, in recognition of his long service and dedication to the ESBC as Secretary – Treasurer for 12 years, above and beyond the call of duty. Over 25 people attended and a great time was had by all --- liberally sprinkled with jokes, puns and other "Bennettisms"! (See *Boreus* Vol. 27 (1), p. 50, June 2007).


Random butterfly occurrence, Manning Park, July 2007

Many thanks to Karen Needham (Past-President) for the excellent Symposium on Aquatic Entomology she organized at the Richmond Nature Park, Kinsmen Pavilion, on Saturday 14 October 2006, the day after last year's AGM. This was a great success, with at least 25 attendees plus a very distinguished list of speakers. Congratulations, Karen! (See *Boreus* Vol. 26 (2), pp. 20/21, December 2006 for the program). Thanks also to Bill Riel and Patricia Woods (both at PFC) for the re-design of our website and for securing the new website address http://www.sfu.ca/biology/esbc/. It looks terrific and is very informative. Bill asks that you send any information that you feel should be available but is not already present on the website directly to him.

Our Editors, Ward Strong and Jennifer Heron, continue to do an outstanding job of maintaining the high standards, quality and diversity of our Journal and Newsletter *Boreus* respectively. Ward has been able to attract an excellent

Editorial Board this year to replace the out-going Subject Editors, and we now have Lorraine Maclauchlan, Sheila Fitzpatrick and Geoff Scudder on Board, as it were. The most recent issue of *Boreus* looks splendid with its bright colours, numerous coloured photographs and easy -to- read format. It also covers a wide diversity of topics which should be of great interest to our readership. Keep up the good work, Ward and Jenny. Congratulations to Terry Shore who became the President of the Entomological Society of Canada at the recent Joint Annual Meetings of the ESC and ESS in Saskatoon. We look forward to working closely with him in concert with our Regional Director to the ESC, Allan Carroll.

It has been a distinct pleasure working with the other members of our Executive Committee this year. Everyone has been very willing to share the load when necessary, and I am convinced that the smooth running of the increasingly complex business of our Society would not be possible without this dedicated volunteer service.

Richard A. Ring
President, ESBC, October 19, 2007

Bugs and Beers event in Vernon, August 2007

Journal of the Entomological Society of British Columbia
Editor's Report


Ward at Bugs and Beers, Vernon, 2007.

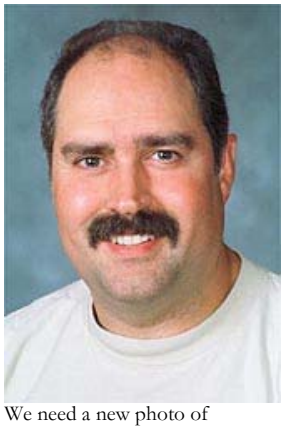
Volume 104, 2007, is on target for publication in December. There were 16 manuscripts submitted before the September 1 deadline, of which two were rejected before review for a lack of new data relevant to BC. Two manuscripts were submitted late: one is being processed but will not be ready for Volume 104; the other was withdrawn for submission elsewhere. I would like to thank subject editors Lorraine Maclauchlan, Sheila Fitzpatrick, and Geoff Scudder, various anonymous reviewers, and typesetter Jen Perry for all their help and assistance so far in getting this volume together.

Volume 103, 2006, was printed and distributed by December 14, 2006, marking a successful second year of distribution in the year of publication. It contained eight regular papers and one Scientific Note. A new feature was the publication of abstracts of the Aquatic Symposium which immediately followed the 2006 AGM. The marvelous cover photo of *Mastrus ridibundus,* an ichneumonid parasitoid of codling moth, was kindly provided by SFU student Zaid Jumean. Printing from electronic files was done by John Peters and crew at Simon Fraser University Reprographics. PDF reprints were sent to authors and posted on the ESBC website.

While manuscript submissions were low in 2005 and 2006, they are up to more or less normal levels this year. I have heard from several authors and potential submitters that the Sept 1 deadline is difficult because it follows too closely on the field season. A late winter or early spring deadline would be more appropriate for authors; we should discuss whether this is desirable and how a switch could be made.

I am still searching for a cover graphic for Volume 104. Any and all suggestions of entomological art relevant to BC, including line drawings and photos, will be entertained.

Respectfully submitted,
Ward Strong
Editor, JESBC, October 19, 2007



We need a new photo of Bill…watch out Bill, here I come with my camera! http://www.pfc.cfs.nrcan.gc.ca/profiles/riel-b_e.html

Web Editor's Report

This year saw a major change for the website, a move to a new home. The website is currently hosted at www.sfu.ca/biology/esbc and special thanks are due to Peter Belton and his colleague Dave Carmean for making this move possible.

We were able to seamlessly transfer the website with minimal disruption, and further benefit from the fact that we don't pay for this hosting service.

It has been an enjoyable year as web editor, and I am content to carry on in this capacity for the next year.

Bill Riel
ESBC Web Editor, October 19, 2007

Boreus Editor's Report

This past year there have been some exciting changes to Boreus, with a full colour printing of the June 2007 issue. I would like to thank Lorraine Maclauchlan for her enthusiasm about Boreus. Lorraine provided funding through B.C. Ministry of Forests to support full colour printing of the June 2007 issue (and forthcoming issues) and postage to allow for a much larger publication. Lorraine also has the task of stuffing and mailing envelopes, and thank-you for doing this time-consuming job. The colour printing of Boreus has increased the quality of the publication, and without these funds Boreus would not appear in each member's mailbox twice per year!

This year there have also been increased contributions to Boreus, with contributed articles and photographs from entomologists throughout the province. I want to thank all contributing authors for taking the time to write articles for Boreus, specifically John McLean, Rex Kenner, Karen Needham and Norbert Kondla.

Looking forward to further photographs and articles!

Jennifer Heron
Boreus Editor, October 19, 2007

Secretary-Treasurer's Report

Memberships, subscriptions and exchanges remain relatively stable in 2007. ESBC has about 151 active members with 142 Regular and Student memberships and 9 Life members. There have been a number of new student members join ESBC this summer and fall which is a promising trend. There was a good response to this years' election for new executive members with 53 ballots received. New accounts for the ESBC funds and savings have been established at the Kamloops Branch of Interior Savings Credit Union. This institution was chose because it offered the ESBC the lowest service charges and relatively good interest and savings options.


Lorraine hard at work at the ESBC meeting

In April 2007 funds were transferred from Island Savings ($15,588.16) to the new ESBC account in Kamloops. A cheque was sent to Simon Fraser to cover printing and binding of 350 copies of JESBC (76 pg per) ($4,937.50). Library work has continued in 2007 thanks to the hard work of Vince Nealis, with among other things archival boxes purchased (see detailed financial report). Since the Interior Savings account opened in April 2007 there has been a total of $16,743.27 in deposits and/or transfers and $7,527.76 in payments/withdrawals. The account balance as of October 12, 2007 was $11,373.41. In addition, ESBC has approximately $43,006.72 in Term Deposits. These are still held at Island Savings but will be transferred over to Interior Savings after the October 19, 2007, AGM as I have to personally sign the transfer papers. The current balance, including Term Deposits and chequing account, is approximately $54,375.13. In closing, I would like to thank all of you, including Robb Bennett, who provided assistance to me in my "rookie" year as Secretary-Treasurer, catching my errors or omissions during this transition time.

Lorraine Maclauchlan
Secretary Treasurer, October 17, 2007

ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA

October 18, 2007 Year-end Financial Statement

Interior Savings, St. Paul Street, Kamloops, B.C.

FORWARDED

1. Bank balance forwarded on October 12, 2007 (does not include $5.00 Interior Savings Share) (including share = **$11,373.41**)		**$11,368.41**

RECEIPTS

1. Dues Memberships (±142 regular & student) Subscriptions (24+)		 $2,642.44
2. Transfer from Island Savings Credit Union		$13,489.16
3. Cheque from EBSCO Subscription Services for 19 domestic ($380) & 3 international JESBC subscriptions ($72)		$452.00
4. Cheque from North Okanagan Naturalists Society		$300.00
6. Cheque from Island Savings		$2,607.96
6. Interest		$10.73
7. Total Receipts		**$19,502.29**

EXPENDITURES

1. Publication 2006 Journal printing (350 copies; 76 pages; binding) Typesetting for Vol 103 (Jen Perry)	 $4,937.50 $425.00	 $5,362.50
2. Brodart Co. (archival boxes, Library costs)		$594.12
3. Cheque to SirsiDynix(Natural resources Canada library work)		$2,071.07
4. Cheque printing and service charges		$101.19
5. Total Expenditures		**$8,128.88**

OTHER ASSETS – Island Savings Credit Union

1 Term Deposits		
Term deposits @ 3.75% (matures 17 Jan 2010)		$6,000.00
Term deposits @ 3.8% (matures 17 Jan 2008)		$20,000.00
Term deposits @ 4.0% (matures 23 Nov 2008)		$17,000.00
Savings		$1.72
2. Membership Equity Shares		$5.00
3. Total Other Assets		**$43,006.72**

BALANCE

TOTAL ASSETS on Oct 12, 2007		**$54,375.13**

Year-End Statement prepared 17 October 2007 by Lorraine Maclauchlan, ESBC Secretary/Treasurer
Audited by Karen Needham, Past President

ESBC Announcements

ESBC Library goes on-line

One of the greatest assets of the ESBC is its unique library with more than 600 periodical titles dating back to the late 1800s. The library has been housed at the Pacific Forestry Centre, 506 W Burnside Rd, Victoria, B.C. since the early 1990s but has been invisible to the scholarly world because of the absence of a catalogue and searchable listing with international bibliographic services. That problem has now been rectified through funds provided by Natural Resources Canada (NRCan) and the Canadian Food Inspection Agency *via* their Forest Invasive Alien Species program. Resources were used to hire a professional cataloguer, Margie Clarke, and technical assistant, Sylvie Dufresne, to work with NRCan librarian Alice Solyma to catalogue and incorporate the ESBC collection into the NRCan library network. Despite this seamless integration, the ESBC retains ownership and even its own identifier within the government library system. Check out your collection at: http://wwwint2.nrcan.gc.ca/Metafore/index.cfm?fuseaction=Catalogue.Catalogue_main&lang=e

We don't have photographs of the event, but we do have a photograph of this fuzzy caterpillar taken August 16, 2007 at Kenna Carthright Municipal Park, Kamloops. Do you know what this species is?

Unveiling of the on-line catalogue was made at the 2007 AGM at the Pacific Forestry Centre where ESBC members attended an in-library lunch and were introduced to the virtual catalogue as well as the physical elements of the collection now admirably organized and available to entomologists everywhere. There is even a small office within the PFC library available to the ESBC as its library headquarters. It now remains for ESBC members to develop a policy and support team for inter-library lending, collections development and maintenance in collaboration with NRCan libraries.

Vince Nealis
Library Committee

An Undescribed Order of Millipedes (Class Diplopoda) Discovered in British Columbia

A Summary of an Announcement made at the ESBC Annual General Meeting, Victoria, 19 October 2007

Several years ago I received an email from Phil LePage, BC Ministry of Forests in Smithers, asking me if I'd identify an invertebrate specimen collected in August 2004 by a Ministry of Forests crew studying ecosystem recovery on Pitt Island near Prince Rupert. When the specimen arrived in Victoria, I recognized it as an unusual millipede, but could not identify it, even to family, using Kevan and Scudder (1989). Puzzled and, as I usually do when in need of a millipede name, I sent it to my colleague Rowland Shelley, a millipede expert at the North Carolina State Museum in Raleigh. Even though he was shocked by the record, Rowland identified the specimen as a female of the genus *Glomeridesmus* Gervais (Glomeridesmida: Glomeridesmidae). His colleague, Dr. William A. Shear, agreed with the identification.

Unfortunately, we don't have a photograph of the specimen, but cyanide millipedes are still cool! This millipede was photographed at Buntzen Lake, July 2007

The specimen was fragile, pale yellow-white and only about 6 mm long and 2 mm wide. The Order Glomeridesmida is characterized by separate segmental sclerites, modification of the last two pairs of legs in males into "telopods," a small second tergite and pygidium, and the inability to roll up (Hoffman 1982). One of the least diverse diplopod orders, Glomeridesmida consists of one family with two subfamilies, each with a single genus. *Glomeridesmus* includes about 23 species that mainly live in the American tropics and southern Asia (Hoffman 1980).

Pitt Island is hardly the native environment of a tropical glomeridesmid and the existence of an introduced alien population is almost as difficult to believe. We published the discovery (Shelley *et al.* 2007) even though we couldn't offer a plausible hypothesis for a glomeridesmid's occurrence in northern coastal Canada, far from the group's documented range and preferred environment.

Eager to find more material of this weird millipede, Rowland traveled this year with his student, Mike Medrano, to Alaska and the BC north coast on a National Geographic research grant. They linked up with Ken White and Erin Havard, BC Ministry of Forests (Smithers) and Dr. Kristiina Ovaska (Victoria) and diligently searched suitable habitat in the region for over a week. Ken had

already found a second specimen on 10 June 2006 on Yeo Island, near Bella Bella, far south of Pitt Island, and the team discovered a third on Ridley Island on 5 August 2007. All specimens were collected under thick layers of wet moss; the Pitt and Yeo Island specimens were on the ground and the Ridley Island one was on a Sitka Spruce log.

After making these collections, Rowland returned home and met with Dr. Shear and another American colleague, Dr. Richard L. Hoffman, at the latter's lab at the Virginia Museum of Natural History. Carefully examining this additional material and comparing it to collections of verified glomeridesmids, they unanimously agreed that the specimens are not *Glomeridesmus* but rather represent an entirely new order. The collection sites are well separated – Yeo Island is about 260 km south of Ridley Island.

For further information look at the National Geographic website http://magma.nationalgeographic.com/ngm/missions/map.html

In the past month Rowland has found two more specimens in his Ridley Island samples. One specimen is 12.3 mm long and 2.9 mm wide, considerably larger than the others.

Unidentified millipede from the Como Watershed, Coquitlam, June 2007. Photo Pamela Zevit

The specimens are sufficient for Rowland to describe the new order, family, genus, and species. But more material is always useful for detailed studies. Rowland and I encourage others with an interest in collecting soil and litter invertebrates and who are able to travel to the north and central coast to search for more specimens.

Discoveries of new species and genera of arthropods happen every day but discoveries of new families are relatively uncommon, and ones of new orders are exceedingly rare. The last discovery of a previously unknown order of millipedes occurred 113 years ago. The new order from BC belongs to the infraclass Pentazonia (subclass Chilognatha) and definitely is most closely related to the order Glomeridesmida, thus Rowland's and Dr. Shear's original misidentifications. Most millipedes belong to the infraclass Helminthomorpha, the long, slender, worm-like forms that occur worldwide; Pentazonians, some of which can roll into a ball, have a shorter, broader body and many morphological differences.

Rob Cannings
Royal British Columbia Museum

References

Hoffman, R. L. 1980. Classification of the Diplopoda. Muséum d'Histoire Naturelle, Genève, Switzerland. 237 pp.

Hoffman, R. L. 1982. Diplopoda, pp. 689-724, *In* S.P. Parker (ed). Synopsis and Clas-sification of Living Organisms. Vol. 2. McGraw Hill, New York, USA. 1232 pp.

Kevan, D.K. McE. and G.G.E. Scudder. 1989. Illustrated keys to the families of terrestrial arthropods of Canada. 1. Myriapods (Millipedes, Centipedes, etc.) Biological Survey of Canada Taxonomic Series No. 1. Biological Survey Of Canada, Ottawa, Canada. 88 pp.

Shelley, R.M., R.A. Cannings, P.T. LePage and K.J. White. 2007. A glomeridesmid milliped in Canada (Diplopoda: Glomeridesmida). Entomological News, 118(2): 199-202.

Candid Photos from the Field

Junxia Zhang and Peter Midford in Stanley Park, July 7, 2007

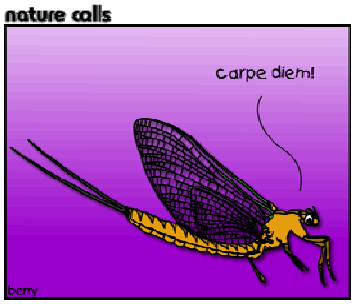
Laura Matthias and volunteers with entomologist James Miskelly and landowner Pat Parkes at the site of the first Dun Skipper collection for Salt Spring Island, July 25th, 2007. Photo Robin Annischild

2007 ESBC Annual General Meeting Speakers List

The 2007 Annual General Meeting and Symposium on Alien Invertebrate Species in British Columbia was another great success. Over sixty people attended the meeting, with many students presenting their work.

Como Watershed, Coquitlam.
Photo Pamela Zevit

ESBC AGM Speakers October 19, 2007	
Presentation	**Authors**
Corticolous oribatid mite community similarity with vertical distance from the ground	**Zoë Lindo,** University of Victoria
Understanding the role of adelgid fundatrices and gallicollae in gall induction.	**Babita Bains*,** John McLean & Ward Strong, *University of British Columbia
The effect of nitrogen fertilizer on mountain pine beetle associated fungi.	**David Jack**, Simon Fraser University
An update on 2007 insect studies in Stanley Park	**John McLean**, University of British Columbia
Infrared radiation from conifer cones attracts *Leptoglossus occidentalis*.	**Hannah Bottomley*,** Stephen Takacs, Iisak Andreller, Robb Bennett, Ward Strong & Gerhard Gries, *Simon Fraser University
Evaluation of soybean oil as a contact and volatile insect repellant using *Aedes aegypti* (L.) (Diptera: Culicidae).	**Cory Campbell,** Regine Gries & Gerhard Gries, Simon Fraser University
Migration time and autumn control of the rosy apple aphid, *Dysaphis plantaginea*, in British Columbia.	**Amanda Brown** and Judy Myers, University of British Columbia
Repellancy of the dusky wireworm, *Agriotus obscurus* L., to insecticides in a soil-less bioassay.	**Wim van Herk,** Bob Vernon & Bernie Roitberg, Simon Fraser University



Cartoon, Berry Wijdeven

ESBC AGM Speakers cont. October 19, 2007	
Presentation	**Authors**
Refuges in reverse: the spread of *Bt* resistance to unselected populations of cabbage looper, *Trichoplusia ni*.	**Michelle Franklin** & Judy Myers, University of British Columbia
Induced tolerance to *Bacillus thuringiensis kurstaki* (*Bt*) exposure is associated with changes in cellular and humeral immunity in *Bt*-susceptible cabbage loopers, *Trichoplusia ni* (Hubner).	**Jerry Ericsson*,** A. Janmaat, J.H. Myers & C. Lowenberger**,** *University of British Columbia
Apple maggot has arrived in BC – the repercussions from a pest management and regulatory perspective.	**Gabriella Zilahi-Balogh**, Canadian Food Inspection Agency
Evidence for individual-specific mate marking pheromone in the parasitic wasp *Ooencyrtus kuvanae* (Hymenoptera: Encyrtidae).	**Kelly Ablard*, Paul Schaefer & Gerhard Gries,** *Simon Fraser University
The effects of parasitism and oviposition site selection on long term fitness parameters in *Aedes aegypti*	**Kendra Foster***, Shahra-Sad Warsame, Carolina Perez-Orella & Carl Lowenberger, *Simon Fraser University
Are pupation site foraging larvae of the codling moth attracted to or arrested by larval-produced aggregation pheromone?	**Zaid Jumean,** Charlene Wood & Gerhard Gries, Simon Fraser University
Pheromonal communication among European earwig, *Forficula auricularia* (Dermaptera: Forficularidae)	**Gagandeep Hehar,** Regine Gries, Grigori Khaskin & Gerhard Gries, Simon Fraser University
Female German cockroaches, *Blatella germanica* L. (Dictyoptera: Blatellidae), join conspecific groups based on auditory cues.	**Rosanna Wijenberg,** Melissa Cook, Stephen Takacs & Gerhard Gries, Simon Fraser University
Bioacoustic communication in Lymantriid moths: short range orientation signals.	**Eloise Rowland,** Paul Schaefer, Stephen Takacs & Gerhard Gries, Simon Fraser University

Posters presented at the ESBC AGM October 19, 2007.	
Presentation	**Authors**
After dark in Stanley Park.	**Jennifer Derhousoff**, Agnes Li & John McLean
The effects of the trehalase inhibitor, Validoxylamine A, on the development and energy reserves of *Aëdes aegypti* (Diptera: Culicidae) adults.	**Carolina I. Perez Orella** & Carl A. Lowenberger

Candid Photos from the Social Field

Jenny Cory, Michelle Franklin and Judy Myers at the Entomological Society of Canada Annual General Meeting in Saskatoon, October 2007

Richard Ring, Robb Bennett, Samantha Vibert and Jennifer Bennett-Terpenning exploring the cultural intricacies of Richard's homeland after a long day in the field (March 2007). Photo Maxence Salomon

Student Award Recipients

Richard awarding Zoë the Harold Madson Award for best Ph.D.

Harold Madson Award for best Ph.D. presentation at the ESBC AGM was awarded to Zoë Lindo, Ph.D. Candidate, Department of Biology, University of Victoria. Email: zlindo@uvic.ca Website: http://web.uvic.ca/~canopy

Abstract from Zoë's presentation: Arboreal oribatid mite communities are dissimilar from the forest floor suggesting a distinct arboreal assemblage. This separation in community structure was observed to occur at 5 m above the forest floor based on a study of oribatid mites inhabiting tree trunks. High arboreal diversity is attributed to high habitat complexity of canopy microhabitats.

Suspended soil at 30m above ground in western redcedar in Walbran Valley. Photo Zoe Lindo.

Walbran Valley Project publications to date:

Lindo, Z. & Winchester, N.N. 2006. A comparison of microarthropod assemblages with emphasis on oribatid mites in canopy suspended soils and forest floors associated with ancient western redcedar trees. *Pedobiologia*, 50: 31-41.

Lindo, Z. & Winchester, N.N. 2007. Resident corticolous oribatid mites (Acari: Oribatida): Decay in community similarity with vertical distance from the ground. *Écoscience*, 14: 223-229.

Lindo Z., & Winchester N.N. 2007. Local-regional boundary shifts in oribatid mite (Acari: Oribatida) communities: Species-area relationship in arboreal habitat islands of a coastal temperate rain forest, Vancouver Island, Canada. *Journal of Biogeography*, 34: 1611-1621.

Lindo Z., & Winchester, N.N. 2007. Oribatid mite communities and foliar litter decomposition in canopy suspended soils and forest floor habitats of western redcedar forests, Vancouver Island, Canada. *Soil Biology & Biochemistry*, 39: 2957-2966.

Lindo, Z. and Winchester, N.N. 2008. Acari: Oribatida communities associated with litter input in western redcedar tree crowns: Are moss mats "magic carpets" for oribatid mite dispersal? *In*: Bruin, J. et al. (Eds.), XIIth International Congress of Acarology Proceedings, August 21-26, 2006, Amsterdam, The Netherlands.

Lindo, Z., & Winchester, N.N. 2008. Scale dependent diversity patterns in arboreal and terrestrial oribatid mite (Acari: Oribatida) communities. Accepted article in Ecography.

Zoe Lindo climbing western redcedar in Walbran Valley. Photo Zoe Lindo

Hannah accepting her award from Richard Ring, 2007 ESBC President

James Grant Award sponsored by North Okanagan Naturalists Club for best undergrad/MSc presentation at the ESBC AGM was awarded to Hannah Bottomley, Simon Fraser University. Hannah's presentation was titled Infrared radiation from conifer cones attracts *Leptoglossus occidentalis*.

Maxence pondering the arboreal spiders of the west coast. Photo http://www.sfu.ca/~msalomon/

The **2008 ESBC travel award winners** were Zoë Lindo (Ph.D.), University of Victoria (see information about Zoë above); and Maxence Salomon (Ph.D.), Simon Fraser University, Email: msalomon@sfu.ca; Maxence's research explores the evolutionary significance of microhabitat settlement behaviours in web-building spiders. Specifically, his research focuses on the behaviour of the western black widow spider, *Latrodectus hesperus* (Araneae: Theridiidae), a species that is native to western North America. In coastal British Columbia, where this study takes place, *L. hesperus* naturally co-occurs with two species of European house spiders: the giant house spider, *Tegenaria duellica* and the hobo spider, *Tegenaria agrestis* (Araneae: Agelenidae). Both *Tegenaria species* were introduced to the Pacific Northwest in the early 20th century, rapidly spread and have now become invasive. It is yet unclear how all three species interact where they are sympatric. For Maxence's dissertation he is investigating the dynamics of cohabitation among and between native western black widow spiders and introduced European house spiders. For additional information on Maxence's work see his website at Website http://www.sfu.ca/~msalomon.

Tropical butterfly caught by Michelle Connolly in Stanley Park, July 7, 2007. Must have escaped from the Amazon Gallery butterfly exhibit.

Cabbage white butterfly, Stanley Park, July 7, 2007

recently documented introduction, *Meconema thalassinum*, photo taken in New Westminster

Alien Invertebrate Species Symposium October 20, 2007

Alien species are arguably the largest threat to British Columbia's native ecosystems. With the movement of people and goods around the globe, it is not surprising that alien species occurrences are increasing in our province. *A Symposium on Alien Invertebrate Species in British Columbia* is a third in a series of yearly symposia organized by the Entomological Society of B.C. This symposium brings together the scientific community, with the objective to engage effective dialogue in mitigating the impacts of alien species, and discussing further solutions to this growing threat.

The ESBC would like to thank those individuals who have volunteered with the planning, organization and logistics the symposium. We would specifically like to thank each of the speakers, who have volunteered their time to present at the symposium. The venue was coordinated by Vince Nealis. Greg Smith organized and coordinated the audiovisual equipment. The symposium is sponsored by the ESBC, British Columbia Ministry of Environment and Natural Resources Canada Pacific Forestry Centre.

Bug discussions at lunch during the ESBC Alien Invertebrates Symposium

Alien Invertebrate Species Symposium October 20, 2007 Pacific Forestry Research Centre, Victoria, B.C.	
Presentation	**Authors**
Alien Gastropods in B.C.	Kristiina Ovaska and Lennart Sopuck, Biolinx Environmental Research Ltd., Sydney, B.C. Email: kovaska@shaw.ca and Biolinx@shaw.ca
Ticks and tick-borne diseases	Muhammad Morshed, B.C. Centre for Disease Control, Vancouver, B.C. Email: Muhammad.Morshed@bccdc.ca
Back from the brink: pests, packaging and pathways	Lee Humble and Eric Allen Canadian Forest Service, Victoria, B.C. E-mail: lhumble@nrcan.gc.ca
From all over the Map: Museums and the public's role in documenting new or expanding populations	Robert A. Cannings Royal B.C. Museum, Victoria, B.C. Email: Rcannings@royalbcmuseum.ca
Climate-induced range expansion by the mountain pine beetle: Assessing the potential for boreal invasion	Allan Carroll Canadian Forest Service, Victoria, B.C. Email: acarroll@pfc.cfs.nrcan.gc.ca
Invasive alien species: regulatory challenges	Gabriella Zilahi-Balogh, Canadian Food Inspection Agency, Kelowna, B.C. Email: zilahibaloghg@inspection.gc.ca
Non-indigenous inter-tidal species in British Columbia	Graham Gillespie Pacific Biological Station, DFO, Nanaimo, B.C. Email: gillespieg@pac.dfo-mpo.gc.ca
Challenging invasive species	Judith Myers University of British Columbia Vancouver, B.C. Email: myers@zoology.ubc.ca
Invasives at our fingertips	Vince Nealis Canadian Forest Service, Victoria, B.C. Email: vnealis@NRCan.gc.ca
Vector Control Pest Management	Christy McDougal Vector Control, City of Port Coquitlam Port Coquitlam, B.C. Email macdougallc@portcoquitlam.ca

Executive Profiles

Naomi Delury, Director (2nd).
Photo Naomi Delury

Naomi DeLury, Director (2nd) is currently working with Howard Thistlewood as an Insect Ecology Technician for *Agriculture and Agri-Food Canada* at the Pacific Agri-Food Research Centre in Summerland. The Western Cherry Fruit Fly, *Rhagoletis indifferens* and other associated *Rhagoletis* species, have been the main focus of her research since joining the laboratory in 2003. In association with providing knowledge to further integrated pest management of this pest, Naomi has been fortunate in being able to maintain her interest in parasitoids with two species, *Pachycrepoideus vindemmiae* and a *Halticoptera* species, that use cherry fruit fly as a host. Initial studies of mite complexes in cherry orchards should add an interesting dimension to their future research.

Sheila Fitzpatrick, President-elect

Sheila Fitzpatrick, President-elect is research scientist with Agriculture and Agri-Food Canada at the Pacific Agri-Food Research Centre in Agassiz, BC. Insect behaviour and ecology are my primary research interests; integrated pest management of berry crops is my research mandate at AAFC. Sheila's current projects include *Ecology and Integrated Pest Management of Cranberry Girdler* - (research results will help to minimize yield losses due to cranberry girdler); providing information on the behavior and dispersion of insect and mite pests and their natural enemies; developing reduced risk technologies and best management practices guidelines for management of insect and mite pests of berry crops; and the ecology and integrated pest management of cranberry girdler. Sheila's complete bio is published in the Boreus June 2007 issue.

Jim Corrigan, Director

Jim Corrigan, Director (1st) became a BC resident in the spring of 2006, accepting a full-time position with BC Ministry of Forests and Range as the Interior Seed and Cone Pest Management Biologist at the Kalamalka Forestry Centre in Vernon BC. On a personal level, Jim is a competitive curler, and an enthusiastic (if not too skilled!) fly fisher, a reader and a sports fan. Jim's complete bio is published in the Boreus June 2007 issue.

Mike Smirle, Director (2nd) is a research scientist with Agriculture and Agri-Foods Canada. Mike's expertise includes insecticide toxicology, evaluating the effects of synthetic and natural product insecticides on insect pests and their natural enemies; determination of the biochemical mechanisms responsible for insecticide resistance, and the development of strategies to manage resistant pest populations; evaluation of natural products, mostly from higher plants, as insecticide active ingredients or synergists for synthetic materials;assessment of hazards of pesticides to pollinators; development of integrated pest management strategies for pests of tree fruits and other high-value crops such as berries, grapes and vegetables. Mike's current projects include providing information on the biology and ecology of insect and mite pests an their natural enemies; providing information on the morphology, physiology, pathology and response to pesticides of insects and mite pests, and their natural enemies and non-target organisms; and developing reduced risk technologies and BMPs for management of insect and mite pests of orchard crops. Photo Mike Smirle.

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Bugs and Beers

Bugs and Beers is an informal setting for amateurs, enthusiasts, and professionals to meet and talk bugs. Come out and meet other entomologists!

This year's Bugs and Beers Schedule is

Monday, January 21, 2008 6 pm	**The Orange Room** 620 Sixth Street, New Westminster Telephone: 604-520-6464 www.theorangeroom.ca
Monday, February 18, 2008 6 pm	**The Whip Gallery Restaurant** 209 East 6th Ave @ Main St, Vancouver BC Telephone: 604 874 4689 www.thewhiprestaurant.com
Monday, March 17, 2008 6 pm	**Foggy Dew Irish Pub** 405 North Road, Coquitlam Telephone 604-937-5808 www.foggydewirishpub.com
Monday, April 21, 2008 6 pm	**Spinnaker's Brew Pub** 308 Catherine Street, Victoria, BC Telephone 1-877-838-2739 http://www.spinnakers.com/brewpub/index.htm
Monday, May 19, 2008 6 pm	**The Dream Café** 67 Front Street, Penticton Telephone: 250-490-9012 This fabulous café brings together food and music that makes one feel like on vacation. The beer and the great atmosphere will make for an enjoyable evening. http://www.thedreamcafe.ca/
Monday, June 21, 2008 5 pm	**Cranbrook Area** **Granny Cottle's British Café & Ice Cream Parlour** 400 Cranbrook Rd., Cranbrook Telephone: 250-426-2817 OK, there likely isn't too much beer, but perhaps there is beer-flavored ice cream? We can move to a local pub after the ice cream.

New and Upcoming Publications

Historical (pre-European settlement) ecosystems of the Okanagan and lower Similkameen valleys – applications for species at risk.
Author: Ted Lea
Presented at: *Saving the Pieces – Restoring Species at Risk Symposium*, School of Environmental Studies, University of Victoria Summer Institute 2007: Advances in Ecological Restoration June 14-16, 2007, Victoria, BC.

Historical (Pre-European Settlement) Ecosystems of the Okanagan and Lower Similkameen Valleys – Applications for Species at Risk
Maps compare the 1800, 1938 and 2005 ecosystems in the Okanagan and Lower Similkameen Valleys. Much of the gentle slope valley bottom ecosystems have been replaced by urban and agricultural development. Analysis of the areal extent of historical and remaining areas has been done for specific ecosystem types that are important for many species at risk and are themselves important ecosystems at risk. These include: Ponderosa pine – bluebunch wheatgrass gentle slope forest; Western Birch – red-osier dogwood riparian shrub; Stream ecosystems; Cattail Marsh; Idaho fescue – bluebunch wheatgrass grassland; Big sagebrush shrub-steppe and Antelope-brush – needle-and-thread grass shrub-steppe. For two of these ecosystems, over 90 percent of the original ecosystem has been lost.

The historical ecosystem mapping was done on 1:12,000 scale 1938 air photos, which have been extrapolated back to 1800 ecosystems using ecological attributes. Mapping for 2005 was extracted from recent Terrestrial Ecosystem Mapping (TEM).
Uses of this mapping for conservation of species at risk are presented, including applications to status assessment, quantification of threats, informing restoration projects, and providing data on the importance of the remaining areas of ecosystems that have been severely depleted. The presentation concludes that it is important to focus on conservation of ecosystems in order to maintain species at risk.

Historical ecosystem mapping has been used to assess the status of some invertebrate species at risk, determine potential sites of historic occurrences, and prioritize survey sites. Ted Lea has completed historical mapping for Garry Oak and associated ecosystems, and the grasslands surrounding Kamloops/Vernon areas. Contact Ted Lea at Ted.Lea@gov.bc.ca for further information.

Notes from the Field

Entomologists around the province are working on some exciting research. This section of Boreus profiles some of their work.

Jeremy deWaard
University of British Columbia
PhD Student
Email: Jeremydeward@gmail.com

I'm currently working on my PhD at UBC under the supervision of Lee Humble (Pacific Forestry Centre) and Yousry El-Kassaby (UBC Forest Science). I'm looking at employing genetic techniques for rapid biodiversity surveying and for measuring diversity effects of disturbance in BC's forests. My focus (and pet group) is the geometrid moths for which our province is blessed with about 330 species (and counting). I've spent my first year building the genetic library for these species by visiting several Canadian collections and field collecting at various dark spots around BC. Next year I'll be putting my money where my mouth is (or traps where the moths are?) to evaluate our technique for quantifying the effects of silviculture and mountain pine beetle on three different levels of moth biodiversity.

Jeremy deWaard (UBC) sheet-collecting for moths near Oliver. Photo: Jeremy deWaard

A leg is removed from *Macaria oweni* for DNA analysis at the Canadian National Collection in Ottawa. Photo: Jeremy deWaard

Some Forest Entomology Highlights from the Southern Interior

by Lorraine Maclauchlan

"Hello Lorraine! Do you have any new data on the mountain pie beetle or other local insect issues?" I have been getting calls like this since I started with the Forest Service in Kamloops in 1987, but 20 years ago I used to think to myself – gosh, another slow news day, so they had to phone the "bug-lady"! However, the past few years the public is much more informed and concerned about the state of our working forest and the urban forest around us. The mountain pine beetle (*Dendroctonus ponderosae)* outbreak coupled with the global concern around climate change has put forest entomology front and centre. A few "oh wow" outbreaks are always good for the profession! The mountain pine beetle outbreak, and more locally the western spruce budworm, has become a main-stay of the media throughout the B.C. interior thus raising awareness of both insect dynamics and impacts as well as our profession.

Giant Mountain Pine Beetle. Photo Lorraine Maclauchlan

Dendroctonus brevicomis adult by exit hole. Photo: Dion Manastyrski

The Southern Interior is experiencing numerous, concurrent outbreaks which is making my life very interesting and hectic. The mountain pine beetle has neared its peak in the Kamloops area but is still expanding in the Okanagan and Cascades. In our aerial overview mapping of the south central interior (former Kamloops Region) this summer we estimated over 818,000 ha of lodgepole pine, 73,000 ha of Ponderosa pine and almost 3,000 ha of white bark pine had been killed as a result of the 2006 beetle flight (red trees mapped in 2007). Much of the Ponderosa pine mortality is due to western pine beetle, *D. brevicomis*, as well as mountain pine beetle, assisted in many cases by *D. valens* and *Ips*. A large part of my field research over the past 3 summers has been to quantify and investigate the impact and changing susceptibility of our young (20-50 year) lodgepole pine forests.

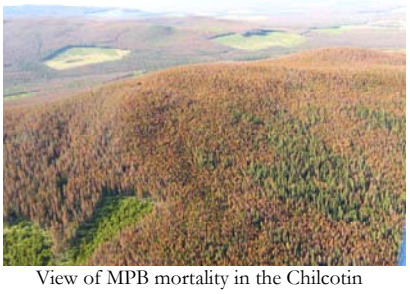
Young pine killed by MPB – Bonaparte Plateau. Photo: L. Maclauchlan.

On a lighter note, this August, Peter Hall, our Provincial Entomologist, and I hosted a group of American and Canadian entomologists in Kamloops, taking them on an aerial and ground tour to view the mountain pine beetles' "footprint". A Beechcraft aircraft was chartered and took 20 eager entomologists (and a few foresters as well) on a 3 hour tour of red and grey forests. Tim McConnell, who spent most of his career mapping bark beetles in the USA, noted that he had observed similar intensity of attack before but never the extent and continuum of severity that he saw in our flight which only covered a small portion of the entire outbreak area in the province. As we continue to experience changes in our weather patterns and greater stresses in our forested ecosystems I think we will see ever increasing insect outbreaks and not necessarily by the "usual suspects".

A group of happy entomologists enjoying Sun Peaks Resort after a flight over the Mountain Pine Beelte outbreak. Back row (left to right): Iral Raginovich, Lea Speigel, Dan Peterson, Jennifer Burleigh. Front row (left to right): Mike Johnson, Ken White, Tim McConnell, Peter Hall, Robb Bennett, Katherine Bleiker. Photo Lorraine Maclauchlan.

View from Beechcraft over Bonaparte Plateau
Photo: Lorraine Maclauchlan

View of MPB mortality in the Quesnel District.
Photo: Lorraine Maclauchlan



View of MPB mortality in the Chilcotin
Photo: Lorraine Maclauchlan

Candid Photos from the Field

Gwylim Blackburn and Wayne Maddison looking for *Habronattus* jumping spiders at the top of a mountain in the Sierra Nevada of California (July 2006). Photo Maxence Salomon

Jennifer Perry collecting water striders at William's Lake (April 2007) Photo Maxence Salomon

Tom Cowan preparing some delicious camping food in the field near Squamish (April 2007) Photo Maxence Salomon

777

Written by Karen Needham
University of British Columbia
Spencer Entomological Museum

Q: What does an entomologist do with a new millennium?
A: Your mission, if you choose to accept it…

Ever since March 3, 2003, Rex Kenner and I have been going out collecting on these 'triple-digit days', so that cool dates like 03/03/03 and 04/04/04 can be preserved forever on specimen labels in the Spencer Entomological Museum. OK, so perhaps this is exciting to only a few of you out there, but if you are one of those who get it, read on.

Rex Kenner sampling the aquatic insect fauna at Beaver Pond, Stanley Park, July 7, 2007

This year, since July 7, 2007, fell on a weekend, we decided to invite others to join us on our calendar quest. Fourteen entomologists were contacted and of those seven showed up on the day – coincidence? I think not! We convened at high noon at Beaver Lake in Stanley Park to receive details of our mission. The 777 crew consisted of Suzie Lavallee, Jennifer Heron, and Michelle Connolly on aerial net patrol, Junxia Zhang and Peter Midford stalking the wily arachnid, and Rex Kenner and myself tracking what lurks beneath the murky depths of the lake itself. We agreed to reconvene in a few hours, a seemingly scientific amount of time - oh and also when our parking was up.

Suzie Lavallee, Michelle Connolly and Karen Needham sampling insects at Beaver Pond, July 7, 2007

The day was spectacular – sunny, warm, and (as you can imagine) perfect for park visitors. Now I remember why we don't collect at tourist destinations on a summer weekend! I think we ended up spending more time chatting with the public than securing our specimens, which was great, really, since any opportunity to educate the public on the importance of insects (and the corresponding need for entomologists!) is welcome.

Some highlights of the day included the beautiful fuchsia and black, and decidedly tropical, swallowtail butterfly captured by Michelle – our best guess an escapee from the Amazon Gallery at the Vancouver Aquarium. Junxia and Peter, from Wayne Maddison's jumping spider lab at UBC, captured not a single jumping spider between them but did take home some of their friends and relatives (Table 1). Thanks to Junxia for identification of these specimens, and to Robb Bennett for shattering illusions of spider greatness by categorizing all species on the list as unexceptional. A highlight for Rex and I was confirmation that the blue-listed dragonfly, *Pachydiplax longipennis*, is alive and well, at least at Beaver Lake in Stanley Park (Table 2).

The 777 trip was actually part of a larger project initiated by John McLean (UBC Forestry) in the spring of this year. Thanks to his efforts, several entomologists now have access to the park in order to conduct insect surveys, primarily concerning the after-effects of the large blow down that occurred there last winter. Rex and I have been surveying Beaver Lake on a monthly basis since May 2007 and hope to continue until at least May 2008. Watch for results from this more comprehensive project in the near future.

Thanks to all who braved the wilds of Stanley Park to help us with our mission. Our fearlessness was rewarded with a refreshing beverage at the Stanley Park Pavilion at the end of the day. Now that's what I call field work. We hope you already have 888 marked in your calendars for next year!

777 Crew left to right: Junxia Zhang, Peter Midford, Rex Kenner, Karen Needham, Michelle Connolly, Jennifer Heron and Suzie Lavallee (kneeling)

Table 1. Identification of Spiders Collected from Stanley Park, Vancouver, BC 2007-07-07	
1. Fam. Araneidae	
Unknown genus	1 juvenile
2. Fam. Titanoecidae	
cf. *Titanoeca* sp.	4 juveniles
3. Fam. Anyphaenidae	
cf. *Anyphaena* sp.	1 female 1male
4. Fam. Philodromidae	
Philodromus sp.	1 female
5. Fam. Uloboridae	
Hyptiotes sp.	1 female
6. Fam. Clubionidae	
Clubiona sp.	3 juveniles
7. Fam. Theridiidae	
cf. *Neottiura* sp.	2 females
8. Fam. Theridiidae	
Achaearanea sp.	8 females
9. Fam. Theridiidae	
Achaearanea sp.	4 females
10. Fam. Theridiidae	
Theridion sp.	1 female 1 juvenile
11. Fam. Theridiidae	
Theridion sp.	1 female
12. Fam. Theridiidae	
Theridion sp.	2 females 2 males
13. Fam. Theridiidae	
Unknown genus	2 juveniles
14. Fam. Linyphiidae	
Linyphia sp.	2 females
15. Fam. Linyphiidae	
Neriene sp.	1 female
16. Fam. Linyphiidae	
Pityohyphantes sp.	1 female
17. Fam. Linyphiidae	
cf. *Agyneta* sp.	3 females

Table 2. Aquatic Insects from Beaver Lake, Stanley Park, 07/07/07

Order	**Family**	**Genus**	**Species**
Coleoptera	Dytiscidae	Agabus	anthracinus
		Hydroporus	sp.
	Gyrinidae	Gyrinus	picipes
Hemiptera	Corixidae	Callicorixa	vulnerata
		Hesperocorixa	laevigata
		Sigara	omani
	Gerridae	Aquarius	remigis
		Gerris	buenoi
		Gerris	incognitus
		Limnoporus	notabilis
Odonata	Aeshnidae	Rhionaeschna	multicolor
	Coenagrionidae	Ischnura	cervula
	Libellulidae	Libellula	forensis
		Libellula	quadrimaculata
		Pachydiplax	longipennis
		Platythemis	lydia
Trichoptera	Lepidostomatidae	Lepidostoma	sp.
	Limnephilidae	Limnephilus	sp.
TOTALS	9		18



Photos taken in Stanley Park, July 7, 2007

Interesting Entomological Information

Websites

- What's That Bug? http://www.whatsthatbug.com/
- Insects on the Web, shameless promotion of insect appreciation http://www.insects.org/
- The New Zealand Stick Insect website http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/phasmatodea/
- Iowa State University's Tasty Insect Recipes http://www.ent.iastate.edu/misc/insectsasfood.html

Events

- **National Insect Week – United Kingdom** http://www.nationalinsectweek.co.uk/resources.htm

Insect Fear Film Festival

- From the website: **The Insect Fear Film Festival** - scaring the general public with horrific films and horrific filmmaking since 1984. The 25th Insect Fear Film Festival will be held in February 2008 in Foellinger Auditorium! Check back here in a few months and we'll have some updates on the movies roster. In the meantime, see below for a history of the IFFF and movies we've shown at past festivals http://www.life.uiuc.edu/entomology/egsa/ifff.html

Parawana tiger beetle hunting at White Lake near Penticton, May 2007.

Butterfly hunting at White Lake near Penticton, May 2007.

Upcoming Meetings and Conferences

- **58th Joint Meeting of the Entomological Society of Canada with the Entomological Society of Ontario,** October 19-22, Crowne Plaza Hotel, Ottawa, Ontario
- **XXIII International Congress of Entomology, *Breaking the Barriers*,** July 6-12, 2008, in Durban, South Africa. This event is sponsored by the Entomological Society of South Africa. *URL*: http://www.ice2008.org.za
- **International Joint Meeting on Ephemeroptera and Plecoptera 2008**, 8-14 June; Stuttgart, Germany; http://www.jointmeeting08.naturkundemuseum-bw.de/index.html
- **Canadian Society of Zoologists 2008**, 19-23 May, Halifax, NS http://www.csz-scz.ca/cszanglais/engmeeting.htm or Tamara.Franz-Odendaal@msvu.ca
- **IV International Colloquium on Soil Zoology 2008**, 25-29 August, Curitiba, Brazil http://www.unicenp.edu.br/icsz
- **72nd Annual Purdue Pest Management Conference** will be held January 7-11 in West Lafayette, Indiana. Contact Susan Umberger at 800-359-2968 or sumberger@purdue.edu.
- **3rd Molecular Approaches to Malaria Meeting** will be held at the Mantra Erskine Beach Resort, Lorne, Victoria, Australia, February 3-7, 2008. Email: enquiries@mamconferences.org. URL: http://www.mamconferences.org
- **18th Biennial International Plant Resistance to Insects Workshop** will take place on February 10-13, 2008, in Fort Collins, Colorado. *Contact*: Frank Peairs, phone 970-491-5945, Frank.Peairs@ColoState.Edu.
- **USDA Forest Service's 4th Hemlock Woolly Adelgid Symposium** will be held at the Hartford Hilton Hotel in Hartford, Connecticut, February 11-15, 2008. Contact Dennis Souto at dsouto@fs.fed.us, Victoria Smith at victoria.smith@po.state.ct.us or Katherine McManus at kmcmanus@fs.fed.us. *URL:* http://na.fs.fed.us/fhp/hwa
- **16th annual Nebraska Urban Pest Management Conference** will take place February 19-20, 2008 in Lincoln, NE. For more information, contact

Dr. Shripat T. Kamble at 402/472-6857. Brochure available at http://www.pctonline.com/files/pdf/NebBroch.pdf.

- **56th Annual Meeting of the Southwestern Branch of the Entomological Society of America** will be held February 23-26, 2008 in Fort Worth, Texas at the Doral Tesoro Hotel and Golf Club. More information at http://swbesa.tamu.edu.
- **82nd Annual Meeting of the Southeastern Branch of the Entomological Society of America** will be held March 2-5, 2008 at the Wyndham Jacksonville Riverwalk Hotel in Jacksonville, Florida. More information at http://n-fl-bugs.ifas.ufl.edu/SEB/index.htm.
- **79th Annual Meeting of the Eastern Branch of the Entomological Society of America** will be held March 9-11, 2008 in Syracuse/Liverpool, NY at the Holiday Inn and Conference Center. More information at http://www.ebesa.ento.vt.edu/index.html.
- **63rd Annual Meeting of the North Central Branch of the Entomological Society of America** will be held March 24-27 at the Hyatt Regency Columbus at the Greater Columbus Convention Center in Columbus, Ohio. More information at http://esa.ent.iastate.edu/meeting.
- **92nd Annual Meeting of the Pacific Branch of the Entomological Society of America** will be hel March 30 - April 2, 2008 at the Embassy Suites in Napa, California. Contact: Larry Godfrey, ldgodfrey@ucdavis.edu.
- **5th International Crop Science Congress** will be held April 13-18, 2008, in Jeju, Korea. *URL*: http://www.cropscience2008.com
- **"Can biotechnology provide new tools for locust control?"** is the topic of a meeting July 1-3, 2008 in Rabat, Morocco—one week ahead of the International Congress of Entomology in Durban, South Africa. Participation is limited. For more information contact thomas.miller@ucr.edu and visit the website: http://biopesticide.ucr.edu.
- **6th Meeting of the European Association of Acarologists** will be held July 21-25, 2008 in Montpellier, France. URL: http://www.montpellier.inra.fr/CBGP/Montpellier2008.
- **American Phytopathological Society Annual Meeting** is slated for July 26-30, 2008, in Minneapolis, Minnesota. *URL*: http://www.apsnet.org

Here's a tachinid on a poppy in the Huber Garden. Photo Dezene Huber

- **93nd Annual Meeting of the Ecological Society of America** is slated for August 3-8, 2008, in Milwaukee, Wisconsin. *URL*: http://www.esa.org
- **2008 Entomological Society of America Annual Meeting** November 16-19, 2008, at the Reno-Sparks Convention Center in Reno, Nevada. *Contact*: ESA Annual Meeting, 10001 Derekwood Lane, Suite 100, Lanham, MD 20706, phone 301-731-4535, fax 301-731-4538 http://www.entsoc.org/annual_meeting/index.htm
- **International Joint Meeting on Ephemeroptera and Plecoptera 2008** June 8-14th, 2008 in Stuttgart, Germany http://www.jointmeeting08.naturkundemuseum-bw.de/
- **Australian Entomological Society 39th Annual General Meeting** and Scientific Conference 2008 Orange Agricultural Institute Orange, New South Wales 28th September - 1st October 2008 http://aes2008.org

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Rob Cannings and Claudia Copley looking for dragonflies on northern Vancouver Island. Photo James Miskelly

James Miskelly with his net on his back in the Selkirk Mountains.. Photo Justine McCulloch. Contact James Miskelly for photograph information.

XXII International Congress of Entomology 2008

6 – 12 July 2008: International Convention Centre: Durban

CONFERENCE ORGANIZERS
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ICE 2008 INTERNATIONAL CONGRESS OF ENTOMOLOGY

Dear Colleague

It is our privilege to host the ICE meeting in 2008 in Durban, South Africa. We are looking forward to organizing a Congress that will be both exciting in terms of scientific input and interesting in that delegates will have an opportunity to meet in Sub-Saharan Africa for the first time in the history of the ICE.

With the emphasis on the advancement of all fields of entomology, ICE 2008 will provide a dynamic forum for the exchange of new information and ideas relevant to entomologists of all persuasions while providing industry with an excellent opportunity to promote and sell their products. The congress will be a thoroughly international gathering of delegates from many countries in both hemispheres, the West and the East and from the developed and developing world.

Gerhard Prinsloo
Chairperson: Congress Management Committee; South Africa

Online Courses posted on "Iowa State Entomology Index of Internet Resources

http://www.ent.iastate.edu/list/directory/102

- Distance Master's Degree in Entomology - University of Nebraska-Lincoln (UNL) offers a full curriculum distance M.S. degree in Entomology.
- Distance Master's Degree in Entomology - University of Florida (Gainesville) offers M.S. degree (non-thesis) programs in entomology and pest management for place-bound students, and certificate programs/courses for undergraduate and graduate students interested in taking courses but not enrolling in degree programs.
- Entomology and Acarology - The University of Queensland, through its Entomology Program, now offers instruction in the sciences of Entomology and Acarology at both the undergraduate and postgraduate levels for Australian and overseas students
- Forest Entomology and Pathology - forest entomology and forest insect pests of Canada. From Sir Sandford Fleming College.
- II Curso de Iniciación a la Entomología - Introductory course about invertebrates and insects. 21 pages and 38 figures. In Spanish.
- III Curso de Introducción a la Entomología - introductory course of Entomology. Ed. in 1998 by Asociación Naturalista Altoaragonesa Onso. 16 pages and 43 figures. In Spanish. Non-credit.
- Insect Classification - three-credit distance education course offered via CD-ROM. From University of Florida.
- Insects and Human Society - three-credit web-based course for non-entomology majors. From Virginia Tech.
- Insects and Society - two-credit web-based course covering a variety of interactions between insects and humans. Primarily for non-entomology majors. From Iowa State University.
- Introduction to Insects - one-credit six-week web-based introduction to insect diversity, biology and management. From Iowa State University.
- IPM Online Homestudy Courses - from University of Connecticut. Non-credit.
- Management of Insect Pests - two-credit course. Introduction to insects and their lifestyles. Theory and application of pest-management practices. Examples drawn primarily from field crops. From Iowa State University.
- Principles of Entomology - three-credit beginning course for entomology

majors or anyone desiring a thorough introduction to the world of insects. Students must meet for lab at a University of Florida/IFAS Research and Education Center.

- The Snodgrass Tapes - Three audio lectures by Robert E. Snodgrass given in 1960. Transcripts included.

Notes from the Field

Sand-verbena Moth Restoration at Goose Spit

Sand-verbena moth is the only endangered moth in Canada. The species is found at eight sites in the world, all within the Georgia Basin-Puget Sound Region. Sand-verbena moth is dependent on large patches of yellow sand-verbena that grows in coastal sand dunes and spits. Sand-verbena habitat is threatened by invasive species and vegetation encroachment, coastal development, shoreline erosion, vehicle use and intensive recreation. Ongoing restoration work by Nick Page.

Sand-verbena Moth restoration at Goose Spit near Courtenay, BC. Exposed sand after a large patch of moss cover has been removed. Photo Nick Page

Sand-verbena moth food plant, *Abronia latifolia*, planted at Goose Spit. The wire mesh prevents deer and rabbits from eating the plant. Photo Nick Page

Close-up of the dense layer of bryophyte cover that prevents the growth of yellow-sand verbena plants. Photo Nick Page.

Notes and News

Advances in Applied Ecology: a Celebration of Judy Myers' Career
Cecil Green College
September 15, 2007

Judy Myers at her retirement symposium

Judy's reception, where it was announced that Sally Otto would become the Judith Myers Professor of Ecology and Evolution. Photo information contact Michelle Franklin

In honour of Judy Myers' retirement a celebration was held at Cecil Green College on September 15th, 2007. The symposium "Advances in Applied Ecology: a Celebration of Judy Myers' Career" filled the day with interesting talks from past and present students, colleagues, and her son and daughter, Isla and Iain. The celebration continued into the evening with a wonderful dinner, live music, and a humorous skit performed by her students. The celebration was a great success and a great day was had by all!

Two of Judy's former students performing a skit as part of the general roast. Photo Judy Myers

Symposium attendees. Photo information contact Michelle Franklin

Submitted Articles

The Need for Insect Collecting

by Gregory Pohl
Natural Resources Canada, Canadian Forest Service
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Introduction

Taylor's Checkerspot larval web, Denman Island June 2007.

Concerns over the practice of insect collecting are periodically raised by uninformed people who equate insects with birds and mammals, and attempt to curtail our activities. This often leaves entomologists scrambling to justify and defend their legitimate work. In response to a recent challenge of this nature, I have compiled the following information detailing the need to collect insects in the course of entomological research. Much of this information is certainly not new to the entomological community. I present "the case for collecting" here in a form appropriate for the layperson, as a resource for entomologists facing similar challenges.

The Entomologist's Position on Insect Collecting

Insect collecting is a valid pursuit that leads to a greater understanding and appreciation of insects and of the natural world. It contributes to their protection and ongoing security far more than it threatens them. By far the greatest threat to insects is habitat loss resulting from human activities. Of the many ways that humans directly and indirectly kill insects - urbanization, deforestation, pesticide use, car windshields, and bug zappers to name but a few - insect collecting is the only one that actually contributes to protecting insects, by increasing our understanding of them and the crucial roles they play in the ecosystems that sustain us. Insects are incredibly numerous and prolific, so the effects of collecting on their populations are minimal. Because we know little or nothing about most insect species, and they are very difficult to identify, it is necessary to kill and collect them to study them. Collecting insects is a vital part of most entomology research, including taxonomic, diagnostic, biodiversity, and pest management work. As well, most of the information critical to the protection of endangered insect species is derived from insect collecting activities. A significant amount of valuable research is carried out by amateurs, who have often become world-class experts by collecting insects.

We recommend that collecting be limited to sampling a population, not unnecessarily depleting it, and that restraint should be exercised where the health of a particular insect population is unknown. To ensure their value for scientific study, collected specimens should have locality and date information attached, and they should be safeguarded to ensure their long-term safety. Properly labeled and cared-for specimens are extremely valuable to scientific researchers; private collections should be made available to qualified researchers for examination, and when no longer required or wanted by the collector, they should be offered to a public facility where they will be available to future workers as well.

BC Conservation Corp Invertebrate Species At Risk crew, aquatic insect surveys in the lower Similkameen River, June 2007.

In Canada, the commercial market for insect specimens is very small, and is driven by a very few butterfly and beetle collectors who are not interested in the biological aspects of insects, but simply in the acquisition of specimens. A clear distinction must be drawn between that form of collecting, and the many amateur hobbyists who pursue insects to learn more about them.

The impacts of insect collecting are overwhelmingly positive. Any undue restrictions on this activity would be an impediment to scientific study, and ultimately to insect conservation. We wish to see insect collecting encouraged, rather than discouraged, so that we may more fully document the diversity of these wonderful and fascinating creatures.

Why are insect populations resilient to collecting?

Insects are very different from birds and other vertebrates in that they have short generation spans, they have a phenomenal capacity for reproduction, and their populations regularly number in the billions. Insects are so abundant that their numbers simply cannot be considered in the same terms as those of vertebrates. Think of the thousands of insects that a single songbird eats during its lifetime; while each species is important in the ecosystem, a given individual of each species do not have the same ecological importance. The vast majority

of insect species are so abundant and prolific that it is very difficult to affect insect populations by collecting.

The special challenges of entomology

Diversity: To understand why entomologists must collect specimens, one must first grasp the enormous diversity of insects, and the special challenge this presents to entomologists. Insects are incredibly diverse; they comprise over 2/3 of the approximately 2 million known species of living things on the planet, and scientists estimate there are millions more species of insects remaining to be discovered. Although the most recent count of insect species that are known from Canada is just under 30,000 (Danks 1979), there are probably closer to 100,000 species that actually live here. Thousands of species living in Canada have yet to be documented, and every year entomologists discover unnamed species here, completely new to science. Compared to birds and other vertebrates, the sheer number of insect species is staggering. There are over 10 times as many known kinds of beetles in the world as all vertebrates – birds, mammals, reptiles, amphibians, and fish – combined. This is the special challenge that entomologists deal with every day – identifying, recognizing, describing, and cataloguing the millions of species of insects is almost overwhelming.

Few resources are put into the study of insects, with the exception of the relatively few species that have economic or health impacts on people. There are at least as many ornithologists in Canada studying our 471 bird species as there are entomologists studying our approximately 100,000 insect species, so it is no wonder we know so little about our insects! Entomologists are still in the exploratory stage of discovering and naming species. Contrast this with the relatively mature fields of ornithology and mammology, where virtually all the species have been discovered, and most new research consists of ecological work. Entomologists are probably 200 years behind the vertebrate researchers because of the enormity of the task, and the lack of skilled people and resources to carry it out.

The comfortable position that birders are in today is built on a strong taxonomic foundation. Because of the mature state of ornithological knowledge, they have a stable taxonomy, and comprehensive guidebooks with detailed illustrations and range maps, so that people can identify birds reliably and apply names to them consistently. This state of knowledge exists now because at one time people collected birds and studied their skins and skeletons

so they could describe and distinguish species, and thus arrive at a stable nomenclature and classification. For entomologists, that level of knowledge is a dream that is still decades or even centuries away. In entomology we are still building that foundation, and are highly dependent on insect collecting to do so.

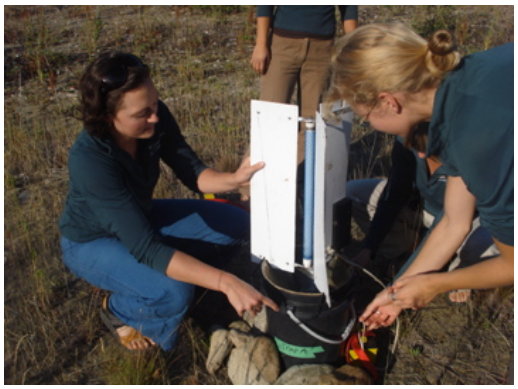
Lack of knowledge: Because insect taxonomy is such an incomplete science, we simply do not possess the knowledge required to put together comprehensive guide-books to most insect groups. We know precious little about the vast majority of species, and most existing information is scattered among obscure scientific publications. Many species have no published information on them at all, with the exception of a brief description in a journal article, often over 100 years old and with no illustrations. Many species cannot be identified at all with our present state of knowledge. This makes field identifications of living specimens impossible for all but a few of the better known species. Most insect field guides cover only a few representative species, and omit the myriad lesser-known but very similar-looking ones. Even among the relatively well-known butterflies, there are groups for which we have not adequately delimited the "species" (for example in the genera *Boloria* and *Polygonia*). So, we are still a very long way indeed from the situation that birders find themselves in, where comprehensive field guides exist and accurate field identifications can be made without killing specimens.


Candid photo, Samantha Vibert surveying populations of hobo spiders at Iona Beach in Vancouver (May 2007) Photo Maxence Solomon

Another reason that many insects are so difficult to identify is because they are so small. With the exception of a few large and distinctive species like some butterflies and moths, the majority of insects need to be examined under a microscope to make an accurate species identification. Often, specimens need to be dissected and their internal reproductive organs examined, in order to do so. Needless to say, this precludes identification of living specimens in all but a slim minority of insect groups. Thus, killing and collecting insects is a necessary part of almost all entomological research that requires species identifications.

Why is it necessary to collect insects?

Taxonomy: A field of entomological research that is heavily dependent on collections is taxonomy - the discovery and description of new species. To describe and name a new species, a "type specimen", or ideally a "type series", must be designated and safeguarded so that future workers can re-examine the organism in detail. These types are the basis of our nomenclature and are required for a stable system of names. Insect collections are the repository for existing type material, as well as the source for future types. It is not an exaggeration to say that for taxonomists, just as many exciting discoveries are made among historical specimens in collections, as they make in the field themselves with net in hand. I cannot stress enough the importance of collections for doing taxonomic research. The accumulation of unidentified specimens, as long as they are properly labeled, is exactly the substrate from which crucial new discoveries are made. The existence of a whole new insect order, the Mantophasmatodea, was discovered recently among old museum specimens obtained years earlier in the course of general collecting. It may not seem valuable to an observer or even a collector at the time, but well labeled and curated specimens of all but the most common species are a useful addition to any collection. It is misguided to think that we already have enough insect specimens, so we don't need to collect more. We should be encouraging more general collecting, to help us better understand the poorly known world of insects.



Arwyn Moore and Sophie-Anne sampling Copablepharon absidum at Brilliant sand flats, July 2007.

Invertebrate survey crew working with Leah Ramsay, BC Conservation Data Centre, May 2007.

Diagnostics: Because insects are so difficult to identify, and identification guides are lacking, insect collections are a vital tool for making identifications. A comprehensive synoptic collection is essential to make accurate species determinations. Such a collection is never complete, because discoveries are continually being made. As entomologists encounter new species, they add these to the collection, and acquire voucher specimens from other research (see below). Thus as material from various sources is added to the collection, it becomes an ever-expanding "identification guide" to the insects of a given region.

Getting a correct identification on a sample is important in scientific research and in pest management. An incorrect species determination can result in costly

pest management actions being applied in error to a non-pest species, including needless application of pesticides, or in failing to detect a new outbreak in the early stages.

Vouchers: Because the nomenclature does change over time as we discover new species and refine our understanding of existing species, it is very important, in all entomological research, to collect and save vouchers of the species being studied. Over the years, as our understanding and definition of a species changes, we can then go back and re-examine the vouchers from past research and determine what species was really being studied, and thus ensure the ongoing scientific value of the work. For example, the symbiotic relationship between yuccas and yucca moths has been the subject of many studies over the past century. Until very recently all these pollinator moths were thought to be a single widespread species, *Tegeticula yuccasella*. Pellmyr (1999) showed that this species was in fact a complex of 13 very similar species with different biologies, identifiable only via microscopical examination. Thus much past ecological work on yucca moths is only of enduring value if proper vouchers were kept. Old research and inventory work is constantly being corrected and refined when museum voucher specimens are re-examined.

A voucher collection is also very important in the legal realm, to stand as proof that a particular species existed at a particular time and place. This can be very important information when a corporation fights against environmental restriction on resource development. Vouchers are also important when legal action or trade sanctions are pursued over exotic pest issues; they can prove what was intercepted in a shipment, and whether or not a species occurred in an area at a given time.

Inventory and biodiversity work: Insects are also collected to do inventory work - to fully understand which species live in a given area, and what the range and habitat associations of a given species is. Such information on many species forms the basis of biodiversity information. By sampling and identifying the insects that live at a given location, researchers measure the composition and diversity of the insect community there. They can then use the insect community as a tool to assess the relative "ecological health" of the area, and compare it to other areas - this is very important to identify biodiversity hotspots, to determine which areas should be set aside for protection, and to assess whether existing areas adequately protect biodiversity. Researchers also use this biodiversity information to measure the environmental effects of

human activities like agriculture, mining, forestry, and urbanization on the environment. Because many insects are extremely sensitive to pollutants, the relative health of a lake or stream is often measured by the composition and diversity of the insect community living in it, discovered by collecting those insects. By its very nature, biodiversity work requires broad sampling of many individuals of an insect community, to generate the data that will lead us to more sustainable land use decisions, and, ultimately, more protection for all wildlife.

James Miskelly and Michelle Connolly identify grasshoppers and butterflies at a study site in Kamloops, August 2007.

Baseline data: Collections of old specimens are very useful in studying past environmental and climatic conditions. Each specimen represents proof of the historical occurrence of a species at a particular place and time. This information allows us to retroactively track the arrival and extinction of various species, and forms a baseline for the study of the effects of human disturbance and climate change.

DNA: Another use of old specimens is the extraction and analysis of DNA. With modern techniques, it is now possible to take a single leg from a specimen, up to several decades old, and extract and sequence DNA from it. This provides another tool for researchers to check identifications, discern species relationships, and to study changes in the genetic make-up of populations over time. This is an incredibly powerful tool that could not have been imagined when many of these old specimens were first collected. Old specimens can also yield parasites and phoretic mites, and plant and fungus spores, helping us make ecological associations. Thus, specimens from inventory and biodiversity work, voucher collections and "bycatch" from pest monitoring programs, all continue to provide valuable information.

Pest management: Pest control in agriculture, forestry, and human health obviously accounts for the deaths of millions of harmful insects, but many beneficial insects are killed in pest control operations as well. Some pest monitoring work, which is vital to the protection of our agricultural and forest products and our health, involves the unavoidable collection of beneficial insects. Monitoring programs for exotic forest pests depend on traps that broadly sample insects, and collect beneficial as well as harmful species.

Likewise, mosquito traps for monitoring West Nile Virus carriers inevitably collect non-pest species as well. However, this supposed "bycatch" is not wasted; it is examined and often yields new species records, including unexpected introduced pests.

Education and training: An insect collection can also be a valuable educational tool. It is a wonderful tool to open people's eyes up to the beauty and wonder of the natural world right in front of them. The process of building of an insect collection is a valuable training tool as well - there is no better way to get to know the species in an area than to make an insect collection. The pool of people with the expertise to reliably identify significant numbers of insect species is a small one. Of the relatively few expert identifiers of insects in Canada, virtually all of them developed and continue to develop their expertise by building and maintaining an insect collection.

Amateurs versus hobbyists:

When presented with the above information, critics of insect collecting will generally concede the need for such activities by professionals. They are less likely, however, to recognise the validity of insect collecting by so-called "amateurs" or "hobbyists". This distinction between "amateur" and "professional" is largely artificial. Just about everyone involved in entomology was drawn to the field by a love of the subject. We are all passionate about what we do, but some of us are lucky enough to get paid for it, while others do it on their own time at their own expense. The quality of the resulting information often has nothing to do with whether or not the researcher got paid to do the work. Some of the most knowledgeable people in entomology are people who are self-taught, and carry out their passion in their spare time. This is especially true in taxonomy, where all one needs to do excellent work is a microscope, access to specimens, and an aptitude for the subject. In this era of "fiscal restraint", governments provide little support for basic taxonomic research. Thus the discovery and inventory of non-pest species is largely left to those who do it for the love of it. Knowledge of the

Beth Tanner, looking through moth specimens collected at Brilliant, BC, August 2007.

distribution of many beetles, butterflies, and moths in Canada is based primarily on the work of amateur collectors over the past 150 years. Besides gathering all this vital information, amateurs are almost always willing to share it freely, and the vast majority ultimately offer their collections to public facilities.

Another role of amateurs is that they are often our future experts, as noted above. The young people who might be casual hobby collectors today are the world-class experts of tomorrow. Not every "hobby collector" becomes a world-class taxonomist, but there is no doubt that every world-class taxonomist started out as a "hobby collector". If we discourage the casual collectors, we will have no experts in the future. Undue restrictions placed on insect collecting would effectively relegate it to the "paid professionals" only, and we will lose a huge resource of valuable specimens, information, and expertise.

Insect Conservation:

In the past, insects were ignored by conservationists. Now, we are beginning to protect insects, through the the Arthropod Specialists Subcommittee of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and comparable provincial committees. However, we cannot protect species that we do not know well. The information required to get a species listed as endangered, is derived from specimen data in insect collections. Other than perhaps the Monarch butterfly, there would be no formal protection of any insect species in Canada, if it were not for the ongoing efforts of insect collectors.

Maxence Salomon and Gwylim Blackburn hiking in the Yosemite Wilderness of California in search of delightful jumping spiders (June 2007). Photo Maxence Solomon

Insects are also making a major contribution to the conservation of vertebrates and their habitats. An example of this is the Yucca habitat, occurring in Canada only in an extremelly restricted area of southeastern Alberta. The plant is already listed as endangered, federally and provincially. However, three moths and one skipper butterfly, all obligate yucca associates, have also been or are in the process of being evaluated for protected status. The addition of these four insects to the endangered species list will lend much greater voice to the protection of this unique community. These insects can only be assessed if they are well known taxonomically, so it remains necessary to kill some insects, in order to protect the rest.

Collecting and Endangered Species: While it is true that over-collecting may pose a threat to species that are already endangered, those species did not become endangered as a result of collecting. Habitat loss is by far the most significant threat to insects in Canada. Of all the insects listed by COSEWIC, not one of the species assessments lists insect collecting as a significant threat. The insect species that are recognized as threatened or endangered are protected by legislation. It is illegal to collect protected species on crown lands, and it is illegal to collect them or any other species in provincial or national parks and protected areas, without a research permit. This is adequate protection for these species from overzealous collectors. For the vast majority of insects that are not well enough known yet to make accurate assessments of their rarity, we need MORE collecting, not less, in order to gather that information.

Taylor's Checkerspot, Denman Island, June 13, 2007.

Conclusion

The positive impacts of insect collecting, to scientific knowledge, public awareness and environmental conservation, far outweigh any possible negative impacts of collecting activities. Existing legislation protecting endangered species and federal and provincial lands is adequate for the protection of insects from improper collecting. The real problem that insects face is habitat destruction, not insect collecting. Insect collectors are concerned about insects and their environment, and are contributing to their protection by gathering knowledge on them. They are working to discover and document the information that is vital to protecting species and native habitats. Rather than fighting against collectors, we ask that other concerned naturalists direct their fight against the real enemy, which is the destruction and degradation of native habitats and NOT legitimate scientific research.

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Pellmyr, O. 1999. Systematic revision of the yucca moths in the *Tegeticula yuccasella* complex (Lepidoptera: Prodoxidae) north of Mexico. *Systematic Entomology* 24(3):243-271.

The Entomology Position

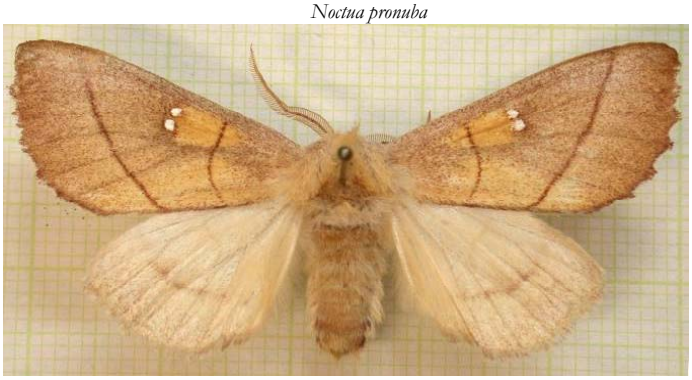
John McLean, University of British Columbia, Faculty of Forestry

Those of us who deal with insect specimens, on pins, in draws, know that there are very specific guide lines that we need follow so that our insects are up to voucher specimen standards. The Lepidoptera, especially the moths, are required to be displayed in a position that few would ever see the field. While we were collecting moths in Stanley Park this summer it occurred to us to photograph the specimens in a natural pose before euthanizing them. Most people see moths as they settle by outside lights in the evening. There, the living insect is in its natural pose. Here are two examples:

At rest

The entomology position

Noctua pronuba



Nadata gibbosa, white-spotted prominent

Photographs by Jennifer Derhousoff. Contact John McLean for information on Jennifer's photos

Geometrids moths have striking patterns that serve to camouflage them as they sit on tree trunks or among foliage.

In light of these observations, I encourage you to take a camera with you in your travels – preferably one with some close-up capability and see what insects you can find in their natural position. Butterflies are favourites as their closed wing colourations are often quite distinct from their open wing positions. At next year's AGM I hope we can have a photo salon where we can show off the fruits of your labour for any insects that you photograph in Stanley Park.

Insect Rearing – Tool for Detection of Non-indigenous Wood Boring Insects

Written by Troy Kimoto[1] and Lee Humble[2]

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Introduction

Non-indigenous insects such as the emerald ash borer (*Agrilus planipennis*) and Asian longhorned beetle (*Anoplophora glabripennis*) have recently become established in Canada. These insects were probably introduced through wood packaging material associated with imported commodities. Since 1998, the Canadian Food Inspection Agency (CFIA) has used traps baited with semiochemicals to detect non-indigenous wood boring insects at high risk sites in urban areas. Although these chemicals can attract a variety of insects, they were primarily developed to target coniferophagous bark and ambrosia beetles. As such, insects that are not attracted to these chemicals will unlikely be detected using this method.

In 2005, staff from the Canadian Forest Service (CFS) and CFIA formed a committee to recommend alternative methods to detect established populations of non-indigenous wood boring insects by the CFIA. Rearing insects from logs was recommended as any species that develop under the bark or in the wood can be recovered from the attacked host rather than only those that respond to the specific lure in a trap. In 2006, the CFIA in partnership with the CFS, City of Surrey, City of Toronto, City of Montréal and Halifax Regional Municipality (HRM) initiated this survey as a pilot project.

Figure 1. Logs suspended from the ceiling rack. Photo Dave Holden

Insect Rearing Facility

Steel marine transport containers were modified into climate-controlled rearing facilities (Figure 1). Layout of the rearing facilities was designed by Lee Humble. Within each facility there are 2 types of rearing systems: ceiling racks (Figure 2) and sonotubes (Figure 3). Logs are suspended from 2 sets of ceiling racks that occur on both sides of a central aisle. Mesh sleeve cages are placed around each log and emerging insects are collected in a plastic bottle attached to the bottom of each sleeve. Logs up to 40 cm in diameter and 1 m in length can be placed in the sleeve cages (Humble unpublished). In addition to the ceiling racks, there are 5 wooden dollies in each facility that hold 6 sonotubes modified to collect insects. The sonotubes were designed by Peter de Groot and Jon Sweeney (CFS) and are able to hold logs 7 inches in diameter and 24 inches

long. In total there is room for 147 logs (117 mesh sleeves and 30 sonotubes) in each facility.

Figure 3. Insect rearing facility modified from a 40 ft marine transport container. Photo Dave Holden

Figure 2. Rearing tubes beneath mesh cages. Photo Dave Holden

Methods

One rearing facility was placed in Surrey, Montréal and Dartmouth while 2 were placed in Toronto. In order to minimize costs, logs were originally targeted through each city's hazard tree removal program. Each city was given a map of high risk sites and was requested to contact the CFIA when trees were going to be removed from these areas. Prior to removal, CFIA, CFS and city staff assessed each tree. If the tree met specific criteria (e.g. signs of insect activity, symptoms of decline, recently dead or dying, etc.), it was selected for inclusion in this survey (Figure 4).

Figure 4. Collecting logs from Stanley Park. Photo Dave Holden.

When insect attack occurred throughout the tree, 1 log was taken from breast height and the other from the crown. If attack occurred in localized areas on the tree, 2 logs were removed from that area. When the tree was in decline and insect activity was not observed, 1 log was taken from breast height and the other was taken from the area of decline. Logs were transported to the facility where the cut ends were covered in paraffin wax to prevent rapid desiccation of

the wood and bark (Figure 5). Logs were then placed in sonotubes or suspended from the ceiling racks (Figure 6).

Figure 6. Applying paraffin wax to the cut end of a log.. Photo Dave Holden

Figure 5. Using a hydraulic lift to suspend a log from the ceiling rack. Photo Dave Holden

All sonotubes and cages were marked with a unique tag that lists the tree species, collection date, location and collector names. Undiluted propylene glycol was poured into the collection bottles of the mesh cages and sonotubes to capture and preserve emerging insects.

Temperature and relative humidity was monitored by dataloggers and an analog thermohygrometer. Every 2 weeks the facility was visited by CFIA staff to monitor the internal climate and collect emerged insects. Specimens were placed in 75% ethanol and forwarded to the CFIA entomology lab in Ottawa for identification.

Results

In the City of Surrey, log collection began in August 2006 and will continue through December 2008. Approximately 80 logs have been collected. To date, ambrosia beetles, weevils, bark beetles, longhorn beetles and metallic wood borers have been reared from a variety of softwood and hardwood species. Although a few naturalized non-indigenous species have been collected, most

of the reared insects are native. To date, there have not been any new records of introduced species.

Acknowledgments
We would like to thank the following for their contributions to the development and establishment of this survey in British Columbia. Tamara Cormier, Hume Douglas, Rob Favrin, Nancy Furness, Bruce Gill, Vasily Grebennikov, Karen McLachlan-Hamilton, David Holden, Wendy Deevy-Laviolette, France Morin, Doug Parker, Josie Smith and Shaun Wallace, Canadian Food Inspection Agency. Peter de Groot, Pierre Desrochers, Ken Harrison, Anthony Hopkin and Jon Sweeney, Natural Resources Canada, Canadian Forest Service. Stephen Godwin, Shawn Gurney and Greg Ward, City of Surrey.

Here's a clear wing moth (Synanthedon spp.???), in Fort George Park in Prince George. Photo Dezene Huber

Polyphemus moth found on James Island, June 2007. Photo Nick Page.

Book Reviews

Ladybugs of Alberta: Finding the spots and connecting the dots

Book written by John Acorn
The University of Alberta Press 2007
169 pages ISBN 978-0-88864-381-0

Book review written by Don Griffith, volunteer, Spencer Entomological Museum, UBC

This is a book primarily aimed at the interested amateur. It is both a field guide covering the complete Alberta Coccinelid fauna (75 species each given a page) and an intriguing discussion of their biology, life history and ecology. Acorn (of the Nature Nut TV series) brings an infectious enthusiasm to the topic—you have to love a guy who tastes his beetles to understand their chemical defences better. His light writing style makes the book accessible and a pleasure to read while still packing in a lot of sound information. His approach reveals itself early in a discussion of what to call Coccinelids. While agreeing "ladybeetles" might be more correct, he sees no need to fight popular opinion and so uses "ladybugs". On what to call a Coccinellidologist he states a preference for "ladybugster".

The first four chapters are an examination of the natural history of ladybugs. One of them is dedicated to the people who have studied and are now studying ladybugs in Alberta. He encourages the amateur to get involved and suggests how they can contribute to current research. The other three chapters cover such issues as collecting techniques, polymorphism, warning colouration, mimicry, reflex bleeding for defence, ladybug use for biological control, habitat change, and introduced species and the field of invasion biology. Regularly the specifics are expanded to reflect larger ecological questions and the discussion is easy to read yet rich enough that it should be thought-provoking for the expert as well as the beginner. Acorn does not shy away from controversy. He pretty much debunks the use of ladybugs for aphid control by the home gardener. Most controversially he has an extended discussion of the furore over introduced species. The intentionally introduced Seven Spot (*Coccinella septempunctata*) has spread across the continent and become the most common species in many habitats. Without summarising his multifaceted argument I will say his viewpoint is no longer that it is an ecological disaster. Acorn uses the specifics of this case to discuss the science of invasion biology in general. Whether you end up agreeing with him or not, what can be better in a book than giving us an interesting new way of looking at things? I think this chapter will provide that for most readers.

The rest of the book is a more traditional field guide. Ladybugs are not an intimidating family in general. Identification can be as easy as counting the dots. However as Acorn states "Nature is so wonderfully but frustratingly complicated". The common Two Spot (*Adalia bipunctata*) for example can come with two spots or four

spots or two bands or no spots at all! In the case of one species pair, *Chilocorus stigma* and *C. hexacyclis,* it seems examination of the chromosomes is necessary to separate them conclusively. The book does not contain technical scientific descriptions or keys and Acorn readily admits that all species won't be positively separated with this guide. However readers should be able to identify successfully the majority of specimens they come upon and get to genus level with almost all. In addition they will gain a good understanding of the diversity out there.

Most species have photos of live specimens in the field. Having started doing a bit of this myself I was very impressed with the photos. They are not only crisp and clear but beautiful and informative. Of course photos have limits so there is a useful gallery of habitus sketches more or less to scale. These are uncredited so I presume Acorn did them himself. Although not as lovely as the stunning photos they adequately serve the purpose. Having personally struggled with variability while sorting Coccinelids I appreciate that he gives more than one sketch of the more variable species.

Each species is given a discussion of the origin of its name, a note on identification, some general notes on range and habitat and a rhymed couplet. These verses seemed odd at first but give them a chance. They actually contain lots of information about the specific beetle in a catchy way. (Just why was Colonel Casey notorious?) I acknowledge that many amateurs are uncomfortable with scientific names, however I am still not sure it was a good idea to slap his own new common names on every beetle without one.

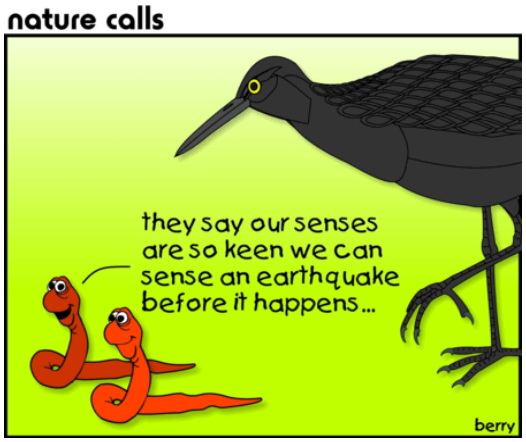
This is an Alberta guidebook so the obvious question is, "Is it of any use to a BC entomologist?" At the species level there is a significant difference in the BC fauna. *The Checklist of Beetles of Canada and Alaska* (Bousquet,Y. ed.) lists 32 of B.C.'s 94 species as not occurring in Alberta, however most of the common species are found in both provinces. Not to discourage someone who would like to write a BC specific guide, but this book will give the reader a good general understanding of BC's ladybugs and allow you to identify most specimens you would come across.

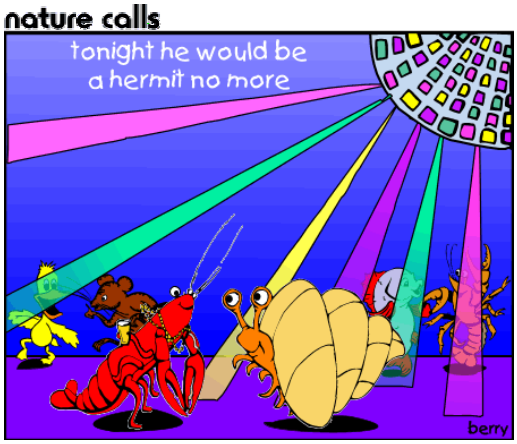
I asked earlier what could be better than a book giving us a new view. Well, maybe a book with the enthusiastic passion to make us better understand and appreciate the beauty and wonder of the natural world around us. This book would be excellent to encourage any nascent entomologist. Excuse me, I mean budding bugster. Highly recommended.

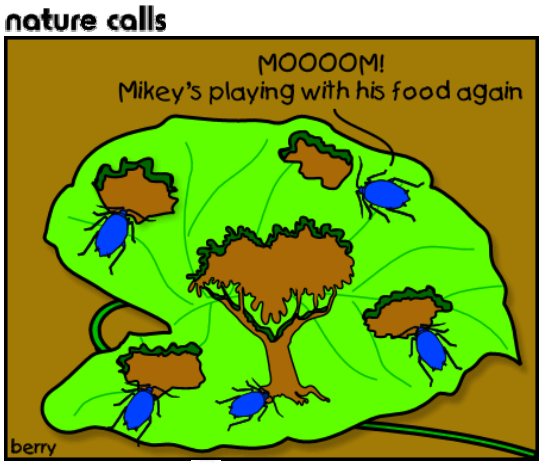
Do you have artistic talent? Do you have a good entomological joke? Send your ideas to the Boreus editor for the June 2008 issue

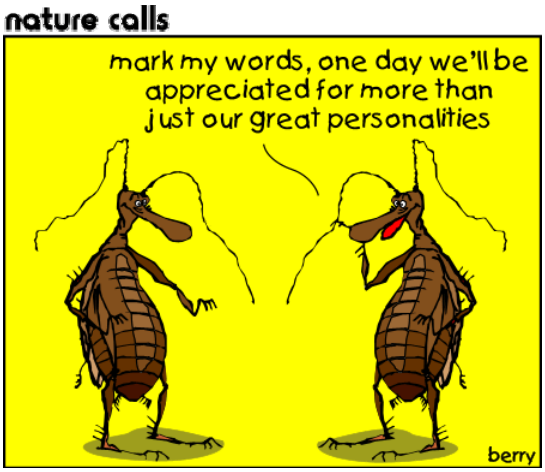
Entomological Humour

Berry Wijdeven is a Species At Risk Biologist for the BC Ministry of Environment in Queen Charlotte/Haida Gwaii. Berry has had his work published in McLeans, the National Post, Vancouver Sun and numerous other weekly publications. Among his artistic talents, he creates the weekly comic *Nature Calls*. Register for Berry's weekly email comics by sending him an email at Berry.Wijdeven@gov.bc.ca









Requests for Photographs

Dear ESBC Members;

I would like to invite members of the Entomological Society of British Columbia to consider submitting photos to the E-Fauna BC photo galleries. We have now developed the capability to post photos in many faunal groups, and this ability will expand over the next few months. In browsing through back issues of your newsletter, *Boreus*, I noticed many excellent shots of interesting insect and other species found in the field. It would be nice to see these photos remain in the spotlight. If we can consider E-Fauna as both an important source of photos for BC wildlife, and as a publicly accessible archival storage spot for photos and documentation of species, then this will both enhance E-Fauna and promote the work and findings of your members. The archival role of the E-Fauna photo galleries is an important one, and we hope to encourage expansion of this.

To submit photos to E-Fauna BC, photographers simply register with us via the link at the bottom of the home page. We provide a password and user name that allows access to our image bank. Photos can be uploaded any time, and the details that accompany a photo can be expanded or edited continuously.

Developing an archive of photos for BC species that are properly identified by experts would be a valuable scientific tool and catalogue of BC biodiversity.

Cheers,

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