Boreus

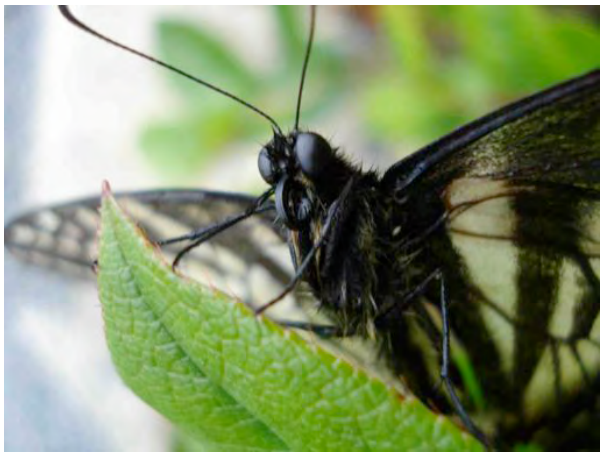
Newsletter of the Entomological Society of British Columbia

December 2008
Volume 28 (2)

Buprestis aurulenta at Helliwell Provincial Park, Hornby Island. Photo Dave Holden.

Bombus spp., Hornby Island, 2007.

Cameraria nemoris blotch mine on *Vaccinium ovatum* in Helliwell Park, Hornby Island. August 2008. Photo Dave Holden.



Swallowtail butterfly in the backyard, New Westminster, 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	**Sheila Fitzpatrick** Agriculture and Agri-Food Canada, Agassiz
President-Elect	**Tom Lowry** Agriculture and Agri-Food Canada, Summerland
Past-President	**John McLean** University of British Columbia, Vancouver
Secretary / Treasurer	**Lorraine Maclauchlan** B.C. Ministry of Forests & Range 515 Columbia Street, Kamloops, BC, Canada V2C 2T7
Editorial Committee (Journal)	**Hugh Barclay (Editor),** Canadian Forest Service, Victoria **Geoff Scudder,** University of British Columbia, Vancouver **Lorraine Maclauchlan,** B.C. Min. Forests & Range, Kamloops **Sheila Fitzpatrick,** Agriculture Canada, Agassiz
Editor (Boreus)	**Jennifer Heron,** B.C. Ministry of Environment, Vancouver
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Student Representative	**Melanie Hart,** Simon Fraser University, Burnaby
Honorary Auditor	**John McLean,** University of British Columbia
Regional Director of National Society	**Bill Riel,** Canadian Forest Service, Victoria
Web Page Editor	**Bill Riel**, Canadian Forest Service, Victoria
Web Page	http://www.sfu.ca/biology/esbc/

Publications of the ESBC

Journal of the Entomological Society of British Columbia

Lophocampa maculata (Subfamily Arctiidae) resting on Douglas fir, Hornby Island, August 2008. Photo Dave Holden.

The *Journal of the Entomological Society of B.C.* 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://www.sfu.ca/biology/esbc/), and should be sent to the Editor, Dr. Hugh Barclay, Canadian Forest Service, Pacific Forestry Centre, 506 West Burnside Road, Victoria, British Columbia, Canada,V8Z 1M5 Email: HBarclay@pfc.cfs.nrcan.gc.ca

The deadline for submissions to be included in the 2009 issue is **September 1, 2009**.

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 (Jennifer.Heron@gov.bc.ca).

The deadline for submissions to be included in the June 2009 issue is **May 1, 2009.**

Lophocampa maculata (Subfamily Arctiidae) caterpillar resting on a leaf.

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 Photographs:

Unidentified noctuid moth caterpillar, Helliwell Provincial Park, Hornby Island, August 2008. Photo Dave Holden	Yellow Collared Scape Moth, *Cisseps fulvicollis*, photographed at the Canadian Wildlife Service, Delta office, August 2008. Photo Jennifer Heron
Bluebottle fly, Vernon, July 2008. Photo Ward Strong	

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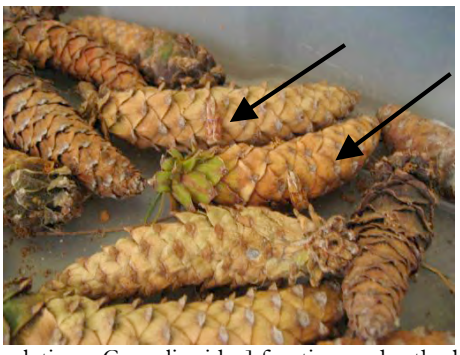
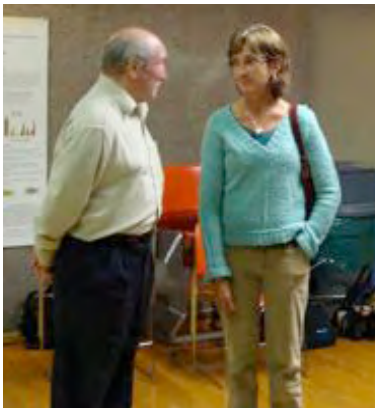


Left: a nasty bunch of *Pityopthorus sp.* [Coleoptera: Scolytinae; Curculionidae] feasting under the bark of a lodgepole pine twig at the Prince George Tree Improvement Station. Right: two adult *Dioryctria auranticella*, the ponderosa pine coneworm [Lepidoptera:Pyralidae], reared from western white pine cones collected in the Bailey Rd. seed orchard in greater Vernon B.C. Photos Jim Corrigan.

Random photos from the ESBC 2008 AGM at the West End Community Centre



ESBC Society Business

Minutes from the 2008 Fall Executive Meeting
University of British Columbia Forestry Sciences Centre
Room 4001 (Board Room), 2424 Main Mall
Thursday, October 2, 2008 at 4:30pm

Present:		**Regrets:**
John McLean	Jim Corrigan	Naomi Deluri
Sheila Fitzpatrick	Lorraine Maclauchlan	Rob McGregor
Hugh Barclay	Dezene Huber (by phone)	
Bill Riel	Richard Ring	
Michael Smirle	Jennifer Heron	

Agenda

1. Call to Order (John M.)
2. Approval of the Agenda
3. Minutes of the spring 2008 Executive Meeting (Lorraine M.)
4. Business arising from the meeting:
    a. 2007 AGM planning (Rob M.)
    b. Symposium and Public Forum Planning 2007 (John M.)
5. Correspondence (John M., Lorraine M.)
6. Reports
    a. Secretary/Treasurer (Lorraine M.)
    b. Journal Editor (Hugh B.)
    c. Boreus Editor (Jennifer H.)
    d. Website Editor (Bill R.)
    e. Regional Director (Bill R.)
    f. ESBC Library Report (Vince N.)
    g. President (John M.)
7. New Business
    a. ESC JAM 2010 (Bill R.)
8. Other Business
    a. Travel Awards

Spring Meeting Minutes

1) Call to Order @ 4:07 pm (J. McLean)
2) 1 & 2 Amendments to Agenda
3) Minutes of spring 2008 Executive Meeting (LM)
Motion to Approve (SF, MS)
4) Business arising from last meeting:

- President John asked Bill R. If there was still space on web site and clarified it was mainly an issue of condensing past issues of *Boreus*

Random photos from the ESBC 2008 AGM at the West End Community Centre

Peter and Elspeth Belton discus entomological topics with SFU students.

Gabriella Zilahi-Balogh (Canadian Food Inspection Agency) and Rob McGregor (Douglas College).

John McLean (ESBC President)

Don Griffiths (UBC) and Rex Kenner (UBC).

- CFS/CFIA cannot present talks during a federal election therefore
  John's talk has been moved to the symposium agenda.
- Lee Humble and Jon Sweeney's abstracts can still remain in symposium agenda although they will not be giving presentation. AGM starts later by 15 minutes and John M.'s talk shortened and moved to end of AGM speakers.
- John hands over gavel to Sheila at end of the AGM Business Meeting and Sheila officially calls the meeting to a close.
- West End Community Centre use is free (Fri and Sat)
- Babita Bains and Agnes Li are organizing "Nutrition Breaks" with biodegradable utensils and flat wear (1,000 coffee cups!). Lunch cost will be covered through registration fees ($20 Regular & $10 student)
- Potluck Caterers – trainers for future careers and will arrange for box lunches for symposium/Stanley Park field trip (must sign-up at AGM)
- Presentations projected on one wall & "photographs" projected on opposite wall
- Suggested to note winners of Travel Award on judges form for student talks
- **Symposium** has three scientific contributions, then more local interest talks, followed by tour of Stanley Park (48 signed up at last count). Tour buses courtesy of Vancouver Trolley (30-35 minutes) and can do 2 tours of about 120 people. Colour-coded buses so as to organize people into correct bus. When Registering for Symposium John need name & affiliation of registrants in order to write to sponsors with details and thank you's (# of attendees and Symposium details)
- Several people will lead different interest groups at symposium – front panel on wall was put together by UBC (6' poster) for Stanley Park Nature House and UBC Lab. John has provided questions for Public Forum. Report will be written and sent to supporters after Symposium (JM)
- John trying to save most of $600 grant to put toward Sheila's "Education Fund"
  - VanCity – community grant of $500
  - Vancouver Trolley – donated 3 buses
  - Faculty of Forestry will support costs up to $500
  - Kits Coffee – free coffee for day
  - BSI Biodegradable - $180 worth of plates, cups, flatware.
- JM- opportunity for this symposium was the windstorms of 2006. Prior to that no systematic sampling for insects (CFIA was first to initiate). Stanley Park Ecological Society really supported this study. Good job was done with restoration of roads/trails and Park clean up. Park is 120 years old and UBC is 100 years old. Parks forestry group now linked to

Random photos from the ESBC 2008 AGM at the West End Community Centre

Bernie Roitberg (Simon Fraser University), Robb Bennett (BC Min. Forests) & John Sweeney (Canadian Forest Service).

Cheema Mustafa (Simon Fraser University) and Abida (Canadian Food Inspection Agency).

Richard Ring (Univ. Victoria), Geoff Scudder (UBC), Elspeth Belton (SFU), Peter Belton (SFU).

Robb Bennett (BC Min. Forests) and Ward Strong (BC Min. Forests).

UBC Forestry for collaborative work.

- Jim Corrigan has tentative plans to apply for $600 education grant [to ESC] again on 2010 (if do not apply in 2009)

5) Correspondence

- Jim C. To Maya Evendan for ESC Grant
- John M. To manager West End Community Branch of VanCity (got $$ from Victoria branch)
- Secretary miscellaneous emails

6) Reports

a) Secretary/Treasurer Report (LM read) – motion to approve (BR, JC)

b) Journal Editor (HB) – see report submitted

- Mostly agricultural submissions; Vol. 105 on-target for December 2008; 14 papers submitted by deadline and 1 after deadline (tried to review). Most reviewers now waiting for authors to edit
- Wayside press, Vernon, printed journal
- Graphic for this edition from Ward Strong
- Would like to get more graphics
- Motion to approve (SF, RR)

c) ***Boreus*** **(JH)** – see report submitted

- Fun to produce and encouraging students to submit articles/photos
- Encourage everyone to continue submitting photographs and articles
- List at back of photo-credits
- Motion to approve (LM, HB)

d) Website Editor (BR) – see report submitted

- Smooth sailing & just updates
- Easy now to "snip" *Boreus* to Web (thank you to Jenny)
- **Action Item:** LM to send Bill Application for travel Award to Bill
- Motion to approve (MS, SF)

e) Regional Director Report (BR) – see report submitted

- Rapidly approaching 2008 meeting in Ottawa and 2010 meeting in Vancouver.
- Will have news after ESC JAM 2008 in Ottawa
- Rick West wants Regional Directors Report ASAP so Bill will send updated report following our AGM so as to include all the award winners and ESBC news
- Motion to approve (LM, JC)

f) ESBC Library Report (Vince Nealis)

- No report - not any new business to report. Good meeting of the Library Committee and this was noted in the last report. Clarification around the funds available for Library work

g) President's Report (JM) – read submitted report

- Motion to approve (SF, MS)

(Hugh Barclay left meeting)

New Business

- ESBC 2009 AGM– discussion of location and dates
- **Action Item:** determine Thanksgiving dates and ESC dates prior to setting 2010 – email discussion to finalize.
- Suggested Kamloops as a location (LM will look into venues)
- Grassland ecology suggested as theme for symposium
- Will invite North Okanagan Naturalists
- Bio. Survey of Canada should be concluding
- **Spring 2009 Executive Meeting – April 3rd, 2009, Kamloops (location to be determined)**

7) ESC JAM 2010 – Tom Lowery will be involved (based in Summerland)

- Bill, Jim & Lorraine are committee for planning venue
- Bill contacted Vancouver Conference Branch that helps in conference planning (very helpful) and received 9 locations – checked into those in downtown only
- Checked some venues & still negotiating rates (variable): 4 Season's; Empire Landmark on Robson; Coast Plaza on Denman
- Should decide and sign a contract very soon as Vancouver fills very quickly
- **Need the following to chair committees:**
  - **General Chair** (Bill volunteered) – should meet regularly; need sub-chairs
  - **Local Arrangements Chair** (should be in Vancouver)
  - **Science Program Chair** – suggested Ward Strong (MFR), Brian Aukema (CFS), Dezene Huber (UBC), Steve Pearlman (UVic)
  - **Treasurer** – suggested LM
- ESBC should suggest "theme" for JAM such as: ecological; diversity of landscapes & climate change; check what Winnipeg theme is then hold conference call
- Also will be "tag-on meetings" and groups with symposia
- Must not conflict with ESA dates (early is better)
- Suggest regular conference calls & emails to organize
- Bill will update members at AGM
- LM will announce location of 2009 AGM and symposium

8) Travel Awards 2008:

- **MSc Award -** Babita Bains, UBC
- **PhD Award** – David Jack, UBC

Meeting Adjourned @ 7:10 pm (BR, MS)

Random photos from the ESBC 2008 AGM at the West End Community Centre

Jeremy deWaard and Michelle Connolly.

Tracy Hueppelsheuser (BC Ministry of Agriculture and Lands) and Judy Myers (UBC).

Secretary / Treasurer Report


Photo Lorraine Maclauchlan.

Memberships, subscriptions and exchanges remained relatively stable in 2008 at about 142. To date, 82 members (regular and student) have paid their 2008 ESBC dues. There have been a number of new student members join ESBC this summer and fall which is a promising trend. This year's election was a formality as there was the same number of candidates as there were vacant positions. The President elect is Tom Lowery, and the new Directors are Dezene Huber (second term), Alida Janmaat and Leo Rankin. The new position on Executive is the Graduate Student Representative, and Melanie Hart is our new representative. Congratulations to all and the Executive looks forward to another exciting year.

We received seven applications for the 2008 ESBC Travel Scholarship award to be determined and awarded at the 2008 AGM. There are 18 presentations scheduled for the AGM, a combination of student and member talks, and 3 posters. On behalf of the Executive I would like to acknowledge and thank John McLean and others for their hard work at organizing this years Symposium and field tour, "Biodiversity in Stanley Park". It is sure to be a landmark event.

The ESBC has been very fortunate in getting financial support for this year's Symposium thanks largely to our outgoing President John McLean and Jim Corrigan plus others. The Society has received support from Vancouver Parks and Recreation (free use of the WECC Auditorium for 2 days ~$800 – provided there is no charge for public symposium and forum), ESC Public Education Committee ($600 thanks to Jim Corrigan's efforts), VanCity ($500), UBC Forestry ($500), plus in kind from Vancouver Trolley Company (2 buses at lunch time), Kits Coffee Company and BSI Biodegradable Solutions. Thus far in 2008 (including some donations for Symposium), the Society saw $9,644.84 in deposits from membership dues, subscriptions and donations. A total of $14,044.15 was paid out for publication (2006 JESBC is included in this), library work, the AGM/Symposium and other miscellaneous costs. The current balance in the Interior Savings account is approximately $12,368.25. There are subscription and membership dues pending and income from the 2008 AGM that will be added prior to December 2008. The current balance, including Term Deposits and chequing account, is approximately $56,396.41.

Lorraine Maclauchlan
Secretary/Treasurer

ENTOMOLOGICAL SOCIETY OF BRITISH COLUMBIA

October 3, 2008, Financial Statement

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

FORWARDED

1. Bank balance statement, Interior Savings, August 31, 2008		**$11,798.40**

DEPOSITS for the past reporting year

1. Dues		
Memberships & subscriptions (±142 regular & student; 25+ subscriptions)	$4,104.84	
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	
7. Interest and exchange difference	$24.90	
8. Phero Tech (for scholarship)	$300.00	
9. Deposit – AGM/Symposium fees & ESBC dues	$2,175.00	
10. Govt. of Canada (JESBC from W. Strong)	$280.00	
11. Govt. of Canada (publ. charges Van Herk)	$408.10	
12. Entomological Society of Canada (for 2008 Symposium)	$600.00	
13. VanCity Savings (for Biodiversity Symposium)	$500.00	
14. UBC Forestry (for Biodiversity Symposium)	$500.00	
Total Receipts		**$9,644.84**

EXPENDITURES

1. Publication		
2006 Journal printing (350 copies; 76 pages; binding)	$4,937.50	
Typesetting for Vol. 103 (Jen Perry)	$425.00	
2. Brodart Co. (archival boxes, Library costs)	$594.12	
3. Cheque to SirsiDynix(archival boxes/library)	$2,071.07	
4. Cheque printing and service charges	$101.19	
5. Harold Madsen Award (Zoë Lindo)	$300.00	

6. ESBC Travel Scholarships (Zoë Lindo & Maxence Salomon)	$1,000	
7. James Grant Award (Hannah Bottomley)	$300.00	
8. Jen Perry (typesetting Vol. 104)	$500.00	
9. Wayside Press (JESBC Vol. 104 printing)	$1,999.27	
Taxes & financing	$265.73	
10. AGM & Symposium costs (see details on next page)	$1,453.27	
Min. of Finance Society Filing fee	$25.00	
11. Service charges & exchange rates	$72.00	
Total Expenditures		**$14,044.15**

Bank Balance Statement, Interior Savings, September 27, 2008 **$12,368.25**

OTHER ASSETS – Island Savings Credit Union

Term deposit @ 3.75% (matures 17 Jan 2010)		$6,000.00
Term deposit @ 3.8% (matured 17 Jan 2008; renewed)		$20,000.00
Term deposit @ 4.0% (matures 23 Nov 2008)		$17,000.00
Interest, shares		$1,028.16
3. Total Other Assets		**$44,028.16**

BALANCE

TOTAL ASSETS on October 3, 2008		**$56,396.41**

Statement prepared October 3, 2008 - Lorraine Maclauchlan, ESBC Secretary/Treasurer

Audited - Richard Ring, Past President

Journal Editor's Report

Photo source
http://cfs.nrcan.gc.ca/directory/hbarclay

Volume 105, 2008, is on target for publication in December. There were 14 manuscripts submitted before the September 1 deadline, and one manuscript was submitted late; it is being processed but may not be ready for Volume 105. I would like to thank subject editors: Sheila Fitzpatrick, Geoff Scudder and Lorraine Maclauchlan and various anonymous reviewers, for all their help and assistance so far in getting this volume together.

Volume 104, 2007, was printed and distributed in December 2007, marking a successful third year of distribution in the year of publication. It contained ten regular papers and four Scientific Notes. The marvelous cover photo of *Efferia coulei,* a robber fly, was kindly provided by Rob Cannings and Brent Cooke of the Royal B.C. Museum. Wayside Press at Vernon did printing from electronic files. PDF reprints were sent to authors and posted on the ESBC website.

I am searching for a cover graphics for future volumes. Any and all suggestions of entomological art relevant to BC, including line drawings and photos, will be entertained.

Respectfully submitted,

Hugh Barclay
Editor, JESBC

Boreus

Boreus is a fun newsletter to produce. We have had new submissions from a number of people over the past year, including photographs and summaries of research projects. Thank-you to Lorraine Maclauchlan for printing and distributing Boreus. Thank you to all the photographers who fill Boreus' pages with interesting entomological photos.

Looking forward to another great year,
Jennifer Heron
Boreus Editor

Website Editor

Photo source http://cfs.nrcan.gc.ca/directory/briel.

It has been smooth sailing with the website over the past year. Thanks to all who made submissions, caught errors and made suggestions.

Bill Riel
Web Editor

Regional Director

As you know, this year's Joint Annual Meeting is taking place in Ottawa, 19-22 October 2008 at the Crowne Plaza Hotel. Information and details can be obtained from the ESC website: http://www.esc-sec.org

Entomological Society Canada JAM in B.C. in 2010: We [ESBC] will be hosting the joint annual meeting in 2010. A preliminary ad-hoc steering committee has been struck to begin organization of the meeting. Committee members are Jim Corrigan, Lorraine Maclauchlan and Bill Riel. Preliminary investigation indicates that Vancouver will likely be the best host city and several suitable sites have sent bids to host the meeting and these are being evaluated. To organize a meeting of this magnitude a good team consisting of several committees is required. We will therefore be looking to recruit people for a number of positions relevant to the organization of this meeting.

Bill Riel
Regional Director, ESBC

Nick Page (Raincoast Applied Ecology) and Nicole Kroeker (Parks Canada) count Taylor's Checkerspot larvae, Denman Island, April 2008.

Nicole Kroeker (Parks Canada) watches as a Taylor's Checkerspot adult perches on her finger, Denman Island, May 2008.

President's Report

John McLean setting a malaise trap in Garry oak ecosystems at Rocky Point, May 2005. Photo Susanna Carson.

Our major Society gain over this last year is the electronic access to our ESBC Serials collections by way of the Natural Resources Canada database manager Metafore2a. Our collections have been assembled mainly through exchange programs for our own Journal for almost a century. Metafore2 is also a great resource for accessing NRCan literature and we are very fortunate to have been added to their database. My thanks to Vince Nealis, Richard Ring, Robb Bennett, Hugh Barclay and Gregg Smith for their helpful comments at a Library Committee Meeting in February. Web Editor, Bill Riel, has updated the web site in the Publications area to guide you through the accession process.

The winter storms of 2006/07 felled more that 10,000 trees in Stanley Park and many of us have been involved in helping to develop a restoration plan. You will hear more about that tomorrow at the Symposium. There was much concern as to what impact the excessive inventory of coarse woody debris might have especially with regard to bark and ambrosia beetles. Vancouver Parks and Recreation as well as the Stanley Park Ecology Society had little information about the insect fauna in Stanley Park and the opportunity was taken to supplement this year's AGM with a symposium on Biodiversity in Stanley Park. This is a joint endeavor with the Stanley Park Ecology Society on Saturday October 4th and is open to the public. An interesting program has been put together that includes some formal presentations in the morning, an optional hosted bus tour in the lunch hour followed by a public forum where interest groups will discuss some specific topics followed by a general reporting session back to the meeting as a whole. This is a new level of participation – yes, its experimental and I encourage you to come and contribute in a more public forum where we can see how our insects fit into the food webs of life that are found in a public park and help formulate some ideas that would be useful for those who have to manage these publicly cherished areas.

John McLean 's final duty as ESBC President; handing incoming President, Sheila Fitzpatrick, the ESBC gavel.

We have been fortunate to obtain funding support for the meeting that will cover the costs of the meeting room, the nutrition breaks, advertising and the bus tours. Of particular note is the support we have received from the Entomological Society of Canada's Public Education Committee. Other supporters are noted on the symposium program.

In closing I would like to thank the volunteers who have helped to make this day successful – Rob McGregor for assembling the program, David Jack for the AV, Babita Bains and Agnes Li for the food breaks and your executive committee who have fully supported our Society's activities throughout the year.

John McLean, President

Entomological Society of British Columbia
Annual General Meeting
Friday, October 3, 2008

West End Community Centre, 870 Denman Street, Vancouver B.C.

Agenda

8:15 am Registration

8:45 am Welcome – John McLean, President, ESBC

First Session (Moderator: Rob McGregor)

9:00 am **Carl Lowenberger** - Vector biology and immune responses to pathogens

9:15 **Jerry Ericsson**, Judith Myers, Carl Lowenberger - *Bacillus thuringiensis* and the cabbage looper immune system

930 am **M.T. Franklin** & J.H. Myers - Influence of dispersal on patterns of *Bt* resistance in greenhouse and field cabbage looper populations

9:45 am **Babita Bains**, John McLean & Ward Strong - The role of adelgid fundatrices and gallicolae in gall induction on the expanding buds of interior spruce trees.

10:00 am **Jordan Bannerman**, Bob Lalonde, Joe Shorthouse, Jason Pither - Variability of inhabitants associated with galls of *Diplolepis variabilis* (Hymenoptera: Cynipidae) across a biogeographical gradient

10:15 am COFFEE BREAK (Coffee and refreshments provided)

Second session (Moderator, Sheila Fitzpatrick)

10:45 am Adi Behar, Edouard Jurkevitch, Boaz Yuval – Bacterial populations associated with Ceratitis capitata, the Mediterranean fruit fly: fitness. Diversity, structure, distribution and impact on host fitness.

11:00 am **Leanne Harris**, Suzanne E. Kelly, Martha S. Hunter & Steve J. Perlman - Rapid spread of the bacterial endosymbiont *Cardinium* in the aphelinid parasitoid wasp *Encarsia pergandiella*

11:15 am **Michael J. Wogin,** Melanie M. Davidson, Ruth C. Butler - Two odours are better than one: improving thrips lure trapping efficacy

11:30 am **Brian O. Ma**, Brad H. Davis, David R. Gillespie, and Sherah L. Vanlaerhoven - A not so random walk? Dispersal of *Dicyphus hesperus*

11:45 am **Gabriella Zilahi-Balogh** - Establishment of apple clearwing, *Synanthedon myopaeformis* (Lepidoptera: Sessiidae) in BC

12:00 – 1:00 pm Lunch (provided)

Agenda

Third Session (Lorraine Maclauchlan, moderator)

13:00 pm **Jim Corrigan,** Lisa Lielich, Penny Major, Judy Murphy - Spin-off Effects of the Mountain Pine Beetle Epidemic in Interior
Pine Seed Orchards

13:15 pm **David Jack,** John McLean, and Gordon Wheetman – Can nitrogen fertilizer increase the natural defense of mature lodgepole pine trees against mountain pine beetle attack?

13:30 pm **Ward Strong**, Alvin Yanchuck, Mike Carlson, Jim Corrigan – Susceptibility to mountain pine beetle attack in lodgepole pine has a genetic basis.

13:45 pm **Christopher I. Keeling**, Maria Li, Hannah Henderson, Erin Clark, Dezene P. W. Huber, and Jörg Bohlmann - Mountain Pine Beetle Genomics

14:30 pm **Maxence Salomon,** Samantha Vibert & Robert Bennett - Natural history of a facultatively group-living spider in coastal British Columbia

14:45 pm **Rex D. Kenner** - Asymmetry of the Sutural Margins of Elytra: Implications for the Generic Classification of Haliplidae (Coleoptera)

15:00 pm **John A. McLean** & Agnes Li - An update on the 2007 studies of the insects of Stanley Park

15:15 pm **Jeremy R. deWaard,** Jean-Francois Landry, B. Christian Schmidt, Agnes Li, John A. McLean, and Leland M. Humble – In the dark in Stanley Park: DNA barcodes illuminate the park's moth fauna

Poster Presentations

M. Todd, F. L. Waterhouse, S. Saunders, J.M. Meggs, B.S. Lindgren, and B. Marcot - Monitoring ground arthropod functional communities to evaluate the effectiveness of structural retention for forest biodiversity conservation.

Peter Belton – The sound of one wing beating

Isobel Pearsall, Bill Beese and Glen Dunsworth – Fragmentation and Variable Retention: what can Carabid beetles tell us about effects on biodiversity?

ESBC 2008 Student Award Recipients

John McLean presenting David with his awards at the ESBC 2008 AGM.

David Jack

David is a PhD candidate in the Faculty of Forestry at the University of British Columbia. David is working with John McLean (UBC), Gordon Wheetman (UBC), Colette Breuil and Lorraine Maclauchlan (BC Ministry of Forests). David received one of the ESBC Travel Awards ($500) as well as the Harold Madsen Award sponsored by PheroTech for the best PhD presentation at an annual meeting ($300).

Thesis abstract:
Can nitrogen fertilizer increase the natural defense of mature lodgepole pine trees against mountain pine beetle attack?

David collecting lab samples. Photo Heather Jack.

British Columbia is currently experiencing the greatest mountain pine beetle (MPB), *Dendroctonus ponderosae* Hopk. (*Coleoptera: Curculionidae/Scolytinae*) epidemic ever recorded. This study is designed to investigate if the natural resilience of nutrient deficient mature lodgepole pine trees can be improved through the addition of nitrogen. A study site was established in BC's Southern Interior Montane Spruce forests. This site regenerated 160 years ago post-fire and is a mosaic of lodgepole pine, interior spruce and subalpine fir. In the summer of 2006, thirty 40m by 40m plots were established. Foliar analysis was used to determine the appropriate fertilizer treatments: control (no treatment), 200kgN/ha (recommended treatment), and 400kgN/ha (2x treatment). The three treatments were applied. A total of 8047 trees are being tracked within the 30 plots for the duration of this study. This presentation explored the results two years post fertilization. Phloem and foliar analysis confirms that a nitrogen gradient now exists across the fertilizer treatments. Three different fungal isolates were used to measure the pine trees' dynamic wound response to treatments. Dynamic wound response for each of the three fungal inoculants was found to

David counting MPB hits (attack) on a tree. Photo Heather Jack.

be significantly different, although the natural variation was greater than the treatment effect. Each of the 30 plot centre trees was baited with MPB tree bait. By the fall of 2007, 36% of the lodgepole pine trees showed signs of MPB attack, evenly distributed across all the plots. In the summer of 2008, every attacked tree was sampled by a 15cm X 15cm under-bark survey to establish brood success. The results of this survey were discussed.

John McLean presenting Babita with her awards at the 2008 ESBC AGM.

Babita Bains

Babita is a Masters student in the Faculty of Forestry at the University of British Columbia. Babita is working with John McLean (University of British Columbia) and Ward Strong (B.C. Ministry of Forests). Babita received one of the ESBC Travel Awards ($500) as well as the James Grant Award sponsored by the Okanagan Naturalists Club for the best MSc presentation at an annual meeting ($300).

Thesis abstract:

The role of adelgid fundatrices and gallicolae in gall induction on the expanding buds of interior spruce trees.

No rigorous experiments have clearly defined the role of two adelgid life stages in gall induction on spruce trees (*Picea* spp.). In a series of experiments we sought to understand what role an adelgid fundatrix and her offspring (gallicolae) play in gall formation on interior spruce shoots. We found that fundatrices induced early galling symptoms and her offspring were required to complete gall development.

Babita searching for galls, Kalamalka Research Station and Seed Orchard, Vernon. Photo Ward Strong.

Report on the Symposium and Public Forum

West End Community Centre
Saturday, October 4, 2008.

Program

9:00 a.m.	Registration
9:20 a.m.	Welcome and Introductions
	John McLean, President, Entomological Society of British Columbia
	Patricia Thomson, Executive Director, Stanley Park Ecology Society
9:30 a.m.	*Dr. Geoff Scudder*: **Parks, Protected Areas and Biodiversity Conservation in British Columbia**
9:55 a.m.	*Dr. John McLean*: **Some first systematic surveys of the insects of Stanley Park in 2007 & 2008**
10:20 a.m.	Nutrition Break with slideshow of Stanley Park compiled by Peter Woods
10:40 a.m.	*Peter Woods:* **A Fascination with Nature or "How big can small get?"**
11:05 a.m.	*Robyn Worcester*: **Challenges of Small Vertebrate Management in Stanley Park**
11:30 a.m.	*Jim Lowden*: **Stanley Park Restoration Project - Respond/Plan/Restore**
12 noon	**Hosted Bus Tour of Stanley Park** (approximately 45 minutes) including a short walk in an area where there was substantial blow down in the winter storms of 2006. The area has been planted and a series of semiochemical-baited traps deployed to survey some of the insect populations.
1:30 p.m.	**Introduction of the Public Forum and the discussion group leaders.**
	Bill Stephen – Management of the forest habitats

West End Community Centre
Saturday, October 4, 2008.

Program

Robyn Worcester – Management for small vertebrates

Jillayne Peers – Invasive weeds and their impact on biodiversity

Karen Needham/Rex Kenner – Management of the biodiversity in aquatic habitats

Troy Kimoto/Lee Humble –How do we plan for insect outbreaks or invasive species?

2:45 p.m. Nutrition Break

3:15 p.m. Reports from group scribes to the meeting

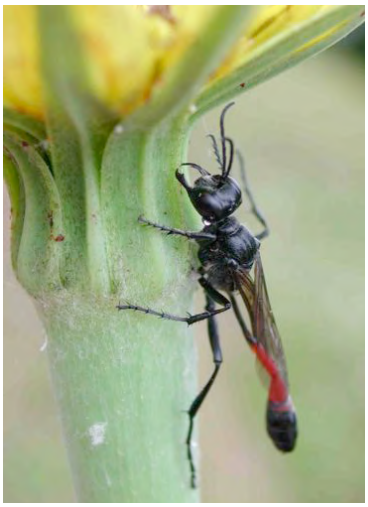
3:45 p.m. Concluding Remarks

Stanley Park Biodiversity poster designed by Jamie Myers, Editorial and Graphic Design Coordinator, Faculty of Forestry Deans Office. Photographs from Robyn Worchester.(Stanley Park Ecological Society files for public domain use).

Report on Biodiversity in Stanley Park Symposium and Public Forum, West End Community Centre Saturday, October 4, 2008.

The Biodiversity in Stanley Park Symposium and Public Forum was a great success. The Entomological Society of British Columbia and the Stanley Park Ecological Society jointly hosted the event on October 4, 2008. John McLean organized an amazing day and we all thank John for his hard work in making this symposium the best to date.

Attendees: 71 persons registered on the morning of the Symposium. Their affiliations are as follows (unknown and non-stated were classified as Public)



Ammophila sp., taken in Vernon, 2008. Photo Ward Strong.

Public	20
University of British Columbia	15
Stanley Park Ecology Society	8
British Columbia Institute of Technology	5
Agriculture and Agrifood Canada	4
BC Ministry of Forests and Range	4
Vancouver Parks and Recreation	4
Canadian Food and Inspection Agency	3
Simon Fraser University	3
High School Students	2
Department of Fisheries and Oceans	1
Vancouver Natural History Society	1
B.C. Ministry of Environment	1
Total	71

Lunch Time Bus Tours

The Vancouver Trolley Company supplied two buses. The tour guides were Jim Lowden and Bill Stephen from Vancouver Parks and Recreation. Both buses were at capacity and the tours lasted just over an hour. Three main stops/slow drive-by locations showed the challenges in removing a large volume of fallen timber and the subsequent rehabilitation and replanting of the sites. The main locations were Pipe Line Road east of Beaver Lake, the Merilees Trail area near Prospect Point and the southern border of the treed area of the park on the north side of Lost Lagoon. The tours gave participants a common experience of Stanley as it is today which greatly helped the

Biodiversity in Stanley Park Symposium
cont.

afternoon discussions. Several very favourable comments were received from the Symposium members who participated in these tours.

Public Forum:
Five sessions were set up in the afternoon to discuss various aspects of the management of biodiversity in Stanley Park. The session topics (and leaders) were:

1) Management of the forest habitats (Greg Farnden)
2) Management for small vertebrates (Robyn Worcester)
3) Invasive weeds and their impact on biodiversity (Jillayne Peers)
4) Management of the biodiversity in aquatic habitats (Karen Needham and Rex Kenner)
5) How do we engage the public in monitoring for invasive insects in Stanley Park (Troy Kimoto)

Groups discussed their specific areas of interest for about an hour. Group leaders reported back to the general assembly (now about 35 persons). Dr. Geoff Scudder who was the lead speaker in the morning's symposium offered summary comments.


Hmmmm…..which net would you choose?

Summary Synopses from break-out sessions

Biodiversity in Stanley Park Symposium cont.

Management of the forest habitats (Craig Farnden)

Threats and management challenges for ecosystems in Stanley Park are heavily influenced by several factors:

1. There are seven million human visitors per year, imposing a high degree of stress on park ecosystems and infrastructure. Forest areas are regularly impacted by factors such as ad hoc trails, garbage deposition, infrastructure development and management actions to protect public safety.
2. There are increasing populations of invasive species that are difficult to eradicate and in many cases are highly shade tolerant.
3. The park is isolated from other areas of similar forest, thus limiting migration of native species.


Thatch ants, *Formica spp.*, Courtenay, BC.

Of primary concern is the long-term viability of forest ecosystems in a set of conditions that reflects natural variability. Small but incremental degradation to both the extent and health of Stanley Park's forests will continue to be a major threat.

One of the major initiatives required to manage and protect forest ecosystems is a consensus on a vision for what the forests should be. This will require ongoing consultations such as those that have occurred with the Recovery Plan and the Forest Management Plan currently under development, and should involve the public, Parks staff and the academic community.

Management for small vertebrates (Robyn Worcester)

What do Park users value about Stanley Park?

Although there are many different user groups in Stanley Park and they all value it for different reasons, we have determined that there are four major values: recreational, educational, health and wellness, and nature appreciation. Recreational values include the use of the park for sports activities, family outings, community events (i.e. parades and walks), picnics, etc. School groups, community groups and other people use the Park as an outdoor classroom and make use of its educational value. The park has a health and wellness value for many people who use it as a place to get exercise, to reconnect with nature, or

Biodiversity in Stanley Park Symposium
cont.

for general relaxation and serenity. Nature enthusiasts, photographers, bird watchers, and others use the park for its nature appreciation value. It is a place where natural processes and wildlife can be readily observed and appreciated.

What are some threats to vertebrate biodiversity in Stanley Park?

There are many different internal and external threats that may affect the diversity of vertebrate species in the park. It suffers from the negative effects of fragmentation and isolation, as it is a patch of forest bordered on all sides by ocean or human development. The extirpation of native species that are a part of the food web may have negative impacts on the species that remain. Invasive species may pose the greatest risk to native biodiversity as they can push native species out of their habitat and consume park resources that would otherwise

Leanne catching grasshoppers at Canadian Wildlife Service property in Delta, August 15, 2008. Photo Michelle Connolly.

able to native wildlife. Past and present human influences on the park's pe include human developments such as facilities, roads and trails, as he suppression of natural processes such as windstorms, insect ks and fire. The increasing human population in the areas surrounding Park may put more pressure on it in terms of visitor use and will also r and water quality in the region. The uninformed public can cause impacts such as the effects of off-leash dogs, wildlife feeding, off-trail gal mountain bike trails and other park user problems.

change is a large-scale problem that may have negative effects on the ertebrate populations. We may see the change or disappearance of lants and associated communities, as well as the increased spread or nment of new invasive species. If sea levels rise the park may once again an island and whether our climate becomes drier or wetter we will see changes to its hydrology. We may experience the increased severity and frequency of winter storms and there may also be an increased fire risk.

What are some of the gaps in knowledge about the Stanley Park's vertebrate wildlife?

There are many gaps in knowledge about the vertebrate species inhabiting the park. Aside from the obvious lack of recent inventory data and baseline information on many vertebrate taxa, there is also little known about historical species composition prior to the European or First Nations colonization's of the area. We know little about the natural disturbance or forest health history of the park prior to 1888. One thing that we will never be certain of is the future, but modeling may help us to understand it.

What are some recommendations for maintaining or enhancing the diversity of vertebrate species in the Park?

There are several ways that managers and other interested parties may be able to positively effect vertebrate populations in the Stanley Park. One essential component is the education of visitors through programming and/or signage so

that they become aware of their potential impacts and can help rather than hinder the park's wildlife. There may need to be restrictions in the park to control the concentrations of people into certain areas and to reduce the impacts of park visitors or park management activities. One way to help the vertebrate wildlife in the park would be to reduce the amount of fragmentation by decommissioning some trails, not adding new trails and by creating corridors (i.e. overpasses and underpasses). Another recommendation would be to reduce the amount of invasive species already existing in the park and even more importantly, to prevent the establishment of new invasives.

Random Photos from the Field

Noah looks on as his Mom, Lea Gelling, and coworker Leah Westereng (B.C. Conservation Data Centre), investigate their catch during freshwater mussel surveys in March 2008 at Kalamalka Lake.

David Jack setting a Lindgren funnel trap. 2008. Photo Heather Jack.

Taylor's Checkerspot surveys at Eagle Heights, Vancouver Island, June 2008. Photo Michelle Connolly.

Biodiversity in Stanley Park Symposium
cont.

Invasive weeds and their impact on biodiversity (Jillayne Peers)

The discussion on invasive plants and their impact on biodiversity focused on identifying issues with invasive plants as well as finding solutions to some of these issues.

The issues that were identified could be divided into two broad categories: impacts of invasive plants on ecosystems, and concerns as well as challenges with respect to managing invasive plants. Although the majority of the discussion focused on invasive plant management issues, the group did talk about the current extent of invasives, expansion of aquatic invasives in the Park, as well as potential shifts in invasive species distribution will occur with climate change.

With respect to management issues and concerns regarding invasive plant management, a number of issues were raised. First and foremost, there is a lack of education and understanding on invasives issues on the part of managers, parks workers as well as the general public. Another identified issue was the need for better management practices by the Park Board, as there are concerns that many activities as they are currently performed in the Park are facilitating the spread of invasives in the Park (e.g. brushing along trails and maintenance of plantation areas). Inconsistent management practices (due to shifting paradigms) and a lack of long-term invasives initiatives were also identified as major issues in the discussion.


Suzie Lavallee (UBC) and Michelle Connolly (consultant) during a butterfly survey at Stanley Park, July 2007.

The discussion on solutions focused on education, as many of the other raised issues require education in order to address them. To form a stronger management system through education, the group spoke about: having a sound definition of invasive plant species; the need for documentation such as management plans in place with realistic expectations (which would be followed!); clear messaging and transparent/accurate reporting on programs; and taking an integrated approach to invasives management with more communication between organizations such as the Park Board and Stanley Park Ecological Society.

Biodiversity in Stanley Park Symposium
cont.

Management of the biodiversity in aquatic habitats (Karen Needham and Rex Kenner)

Our group discussed at length possible rehabilitation of Beaver Lake and Beaver Creek after it became clear that both are lacking in aquatic insect biodiversity when compared with a similar water body (Jericho Pond in Jericho Park). Strategies focused on creating more open water by removing vegetation, especially water lilies, and increasing the depth of the pond by dredging. Removal of non-native predators, such as bullfrogs and carp, was also discussed, as this may give native species a better chance of establishing healthy populations. Educating the public to the dangers of these non-native introductions via signage and pamphlets might also be of benefit.

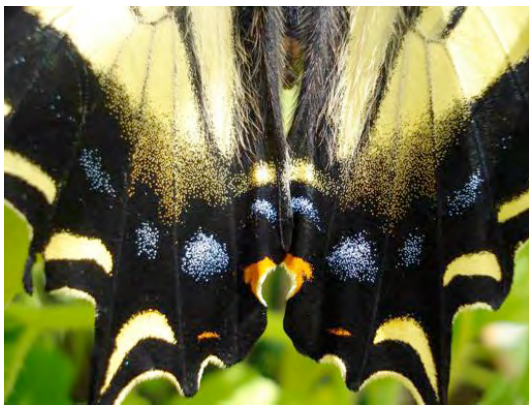
This type of aquatic habitat rehabilitation is especially critical since climate change scenarios predict wetter winters and drier summers for the Lower Mainland. Water levels in the pond and creek already reach dangerously low levels in the summer, so even drier summers could lead to the pond drying out completely, with the associated loss of biodiversity.

Stanley Park '8-8-8' at the Beaver Pond. From left to right, Jennifer Heron (BC MOE), Suzie Lavallee (UBC), Karen Needham (UBC) and Fred Beaulieu (Canadian National Collection) sampled throughout the park in honour of placing specimens in the UBC Spencer Entomological Museum with a det. Label '8-8-8'.

Biodiversity in Stanley Park Symposium
cont.

How do we engage the public in monitoring for invasive insects in Stanley Park (Troy Kimoto)

Canada is a large country with forest ecosystems from coast to coast. Due to the vast expanse of forested ecosystems and the high tree species diversity within Canadian forests it can be very difficult to detect invasive alien forest insects, especially when they are at low populations levels. The Canadian Food Inspection Agency (CFIA) plays an important role in protecting Canada's plant resource base from invasive forest pests. Although CFIA conducts ground (*i.e.* visual) and semiochemical-based surveys, some invasive forest pests, such as the Asian longhorn beetle in Toronto, have been detected by the public.


Swallowtail butterfly, July 2007.

The purpose of this breakout session was to explore possible ways to engage the public in surveillance of invasive alien forest insects in general and within Stanley Park in particular. The following summarizes the outcome of this session, which focused on groups based in Metro Vancouver. The 1st section explores potential groups who could become involved in surveillance projects. The 2nd discusses how these groups could be contacted to participate in a surveillance program and the last section outlines some activities that they could participate in.

1) Who could be involved in surveillance projects?
    a. General public
    b. Societies
        i. Nature Vancouver
        ii. Other naturalist societies
    c. School programs
        i. Develop directed studies projects for undergraduate students
        ii. Middle/high school programs
    d. Invasive plant councils/groups
        i. These groups actively participate in detecting and managing invasive plants. It might be possible, to contact these groups to gauge their interest in monitoring for invasive forest insects.
    e. City park staff

i. Maintenance staff, especially arborists, could be trained to notify park management/CFIA if unusual or unknown tree dieback or mortality is occurring within Stanley Park.

f. Research scientists
   i. Scientists (*e.g.* entomologists and pathologists) could be informed to notify park management or CFIA if trees are exhibiting unknown symptoms of decline or if non-indigenous insects are detected while conducting their research trials.

2) How would these groups be contacted?
   a. Pamphlets, newsletters and websites could be used to increase awareness of invasive forest insects.
   b. CFIA to give school presentations on invasive forest insects
      i. Middle/high school
      ii. Undergraduate university programs
   c. Signage
      i. Develop signage introducing the concept and impacts of invasive forest insects to increase awareness.
      ii. Develop interpretive signs depicting photographs of some potential invasive insects (*e.g.* nun moth, pink gypsy moth, *etc.*), which could assist in detection.


April 2008. Denman Island.

   d. Collaborate with Stanley Park Ecological Society
      i. Develop interpretive programs with the Society
      ii. Develop insect displays
         1. Native insects
         2. Non-indigenous insects
   e. Advertisement within the park
      i. Display readily identifiable invasive forest insects on trolley cars, carriage rides, *etc.*
   f. Increase awareness with park staff
      i. Develop programs to train park staff on identification of easily distinguishable invasive forest insects.
   g. Telephone/web hotline
      i. Develop website where photographs of potential invasives can be uploaded and then analyzed by taxonomists
      ii. Develop a general invasive alien species hotline to direct the caller to certain websites or provide other pertinent information.

3) What activities could these groups participate in?
   a. Digital photography

Biodiversity in Stanley Park Symposium
cont.

i. Naturalists can submit photographs of unusual insects for analysis by taxonomists or photos can be referenced with insect collections at interpretive stations/centres.

b. Directed studies/school programs
   i. Integrate a surveillance related project into an undergraduate course
   ii. Work with middle/high school class on a basic biosurveillance project within Stanley Park

c. Monitoring park lights for moths
   i. Groups could collect insects found at lights during the night time and compare with reference collection

d. Reporting on tree decline
   i. Enquire with park staff to develop programs to train maintenance staff/arborists on being aware and report unusual tree decline or insect activity
   ii. Develop signage to engage public to report tree decline

e. Develop interpretation programs
   i. Develop educational signs discussing basic concepts and impacts of invasives
   ii. Develop photographs and interpretive stations for readily distinguishable invasive forest insects
   iii. Develop reference collection of common native and non-indigenous forest insects
   iv. Provide pamphlets, guidebooks and other literature at interpretive centres.

Random Photos from the Field

Brenda Costanzo (BC MOE) and Jenifer Penny (Conservation Data Centre) during plant and bug surveys on Maine Island, May 2008.

UV LED light trapping with Gaeden Robinson (United Kingdom Natural Heritage Museum) in Mississippi, June 2008. Photo Dave Holden.

Biodiversity in Stanley Park Symposium
cont.

Epilogue (John McLean)

Stanley Park is appreciated as a place to stroll and appreciate nature. It is a highly diverse environment where trails to accommodate human passage intersect with life requirements of plants and animals that live their whole life in the park. Food webs that support the native flora and fauna are at risk from invasive species that smother habitats. Natural processes of succession will also change habitats over time – something that is especially true for Beaver Lake which is being fully invaded by water lilies and silting up on its way to becoming a marsh/wetland without open water. Invasive species such as bullfrogs and carp disrupt natural food webs and greatly reduce the biodiversity of the aquatic habitat.

Stanley Park seawall shortly after it was reopened, January 2008.

Stands in several areas were badly affected by the winter storms of 2006/07. Recovery plans have removed excessive inventories of coarse woody debris. Extensive clearings have been replanted and will go through a shrub succession as the new trees struggle for light and eventual dominance. These processes will be monitored by a series of sixty permanent plots that have been set up around the park. Fine woody debris adjacent to trails has been cleared to reduce the risk of fires. The successional patterns will need to be followed carefully to ensure that invasive and exotic species do not take over the habitats. It will be important that exercises such as trail clearing do not inadvertently create colonization corridors for weed species. Field staff needs to be made aware of the risks as they are on the front line in this battle. Food webs will re-establish in the recovering areas to support both the invertebrate and vertebrate components of the ecosystems.

Over the last two years, a start has been made in compiling some baseline inventories of both the forest itself and the organisms dependent on it. Our moth survey in 2007, for example, inventoried 190 species that included 30 species rated as introduced and 3 as non-native migrants. Three species were recorded for the first time in North America and one species was a first record for BC. This alerts us to the need for vigilance on account of the proximity of Stanley Park to the Port of Vancouver. Future surveys will be able to compare the species richness of the day with what we have been able to record for 2007. Baseline inventories are also being assembled for other groups.

Entomological Society of Canada Post-graduate Award Recipients

Michelle Franklin


Photo Michelle Franklin.

Michelle Franklin received the Entomological Society of Canada Post-graduate Award for a student working towards a Ph.D. Michelle is a Ph.D. candidate in the department of Zoology at the University of British Columbia and is working with Judy Myers. For more information email Michelle at franklin@zoology.ubc.ca.

Thesis title: The influence of local and long-distance dispersal in determining *Bt* resistance in cabbage looper populations: a molecular analysis

Low environmental risk and high efficacy of *Bacillus thuringiensis* (*Bt*) for the control of caterpillar pests has led to a dramatic rise in the use of *Bt*. The continued use of *Bt* products in vegetable greenhouses in British Columbia (BC) Canada has, however, been threatened by the rapid evolution of resistance in *Trichoplusia ni* (cabbage looper) populations. The spatial and temporal patterns of *Bt* resistance in *T. ni* greenhouse and field populations strongly suggest that resistant moths disperse from greenhouses treated extensively with *Bt* to 'unselected' neighboring greenhouse populations early in the growing season. To quantify dispersal patterns, we have performed a genetic analysis using amplified fragment length polymorphism (AFLP) techniques. Our analysis confirms that there is significant movement of moths between greenhouses located within 20 km of one another. Furthermore, patterns of genetic diversity indicate that populations that persist through the annual winter cleanup in greenhouses do not undergo population bottlenecks and are thus able to colonize neighboring greenhouses before field populations are present. It has been proposed that long-range migrants from California


Photo Michelle Franklin.

colonize fields in BC each spring; however this has yet to be confirmed. Cabbage loopers along the proposed migration route remain susceptible to *Bt* and therefore have the potential to dilute resistance in greenhouse populations in BC. A molecular analysis, using AFLP techniques and mitochondrial sequence variation is currently underway to track the movements of long-range migrants and results are forthcoming.

Amanda Brown


Photo Amanda Brown.

Amanda Brown received the Entomological Society of Canada Post-graduate Award for a student working towards an M.Sc. Amanda is in the department of Zoology at the University of British Columbia and is working with Judy Myers. For more information email Amanda at amandabrown@mosphere.ca.

Thesis title: Integrated pest management of the rosy apple aphid, *Dysaphis plantaginea,* through understanding its variability in population size and the role of its alternate host, *Plantago major*, in organic apple orchards in the Similkameen Valley of British Columbia.

I am currently working on my MSc at the University of British Columbia under the supervision of Dr. Judy Myers. My research was undertaken at the request of B.C. organic apple growers to study the rosy apple aphid and ultimately to design an IPM strategy for this pest. The rosy apple aphid is a serious pest of apples in British Columbia and especially in organic orchards where conventional controls cannot be used. The goals of this study were to conduct an economic assessment on the damage associated with aphid feeding activity and to understand the factors correlated with aphid population size variability. This research also led to questions of the interactions between the aphid and its alternate host during the summer generations. On the control side, the goals were to determine the timing of the autumn migration of the rosy apple aphid using pheromone traps, to test several chemical control methods applied in the autumn, and to test two novel autumn mechanical control methods targeting the aphids while on their alternate host, *Plantago major*.


Photo: Amanda Brown.

I monitored populations in twenty-four organic orchards in the Similkameen Valley of British Columbia, Canada in June 2007 and 2008 and found that population size of the rosy apple aphid varies widely among orchards, and economic damage in

extremely infested orchards can reach $20,000 per acre. Although abundance of the alternate host, foliar nitrogen, tree age, and tree planting density were not correlated with aphid population size, the architecture of the alternate host proved to be important. More aphids survived through the summer on plants with larger, low angle leaves and this structure seemed to be affected by mowing. Mowing prior to spring aphid migration was associated with a four-fold increase in the number of both alatae and apterae surviving and reproducing on the plantain in the orchard. The timing of the gynoparae and male migration was determined to occur at about 12 hours of daylength and 11 hours, respectively. Aphid densities in the spring of 2008 were very low in all treatments and control plots, making comparisons difficult. Although not statistically significant, Bartlett's Superior oil treatments showed a trend towards reduced spring aphid levels and Surround (kaolin clay) showed a trend towards increased spring aphid levels. Neither mowing nor rotavating prior to and during autumn migration had a significant effect on spring population levels. For photo information contact Amanda Brown.

Photo Amanda Brown.

Random photos from the ESC AGM, Ottawa, 2008

Jenny Cory, Vince Nealis, Judy Myers

Jennifer Heron, Michelle Franklin, Amanda Brown

Michelle Franklin & Babita Bains

David Jack

Entomological Society of B.C.

H. R. MacCarthy Memorial Education Fund

Ever wanted to raise caterpillars in your classroom, collect insects on a spring field trip, or set up an ant farm? Now is the time. The Entomological Society of British Columbia is offering small grants to schools in BC to help fund insect-related projects. These grants, usually from $50-$150 apiece, will provide the funding required to purchase equipment and supplies for entomological class projects. Teachers teaching grades K-12 are eligible, or the school can apply for supplies for general use.

The H.R.MacCarthy Memorial Education Fund is offered every3 years or so. Funds can be used for the purchase of entomological equipment like butterfly nets or display cases; for reference materials such as books and posters; or for class projects such as butterfly or silkworm rearing, to name but a few.

To apply for the funds, please send in a one-page application; with the details of a specific project that you would like to pursue and an itemized list of equipment or materials needed. Send applications to Sheila Fitzpatrick either by post or email (see information below).

The deadline for applications is February 28th, 2009. Applications will be reviewed and decisions made by mid-March, 2009. This should give time for spring projects if desired, or the grant can be used for fall projects in the following school year.

Good luck!

Sheila Fitzpatrick, Ph.D.
Chair, Education Committee, ESBC
Agriculture and Agri-Food Canada
Pacific Agri-Food Research Centre
PO Box 1000,
6947 Highway 7
Agassiz, BC V0M 1A0
Email: fitzpatricks@agr.gc.ca

Announcements

For more information about the ESC/ESM AGM contact:
Brent Elliott
Local Arrangements Chair,
brent.elliott@gov.mb.ca

Entomological Societies of Canada & Manitoba
ESC ESM 2009
Winnipeg, 18-21 October

To be held at Fort Garry Hotel, Winnipeg, Manitoba
Noon Sunday 18 October – Noon Wednesday 21 October 2009
See ESC website for further details http://www.esc-sec.ca/

Plenary symposium:

Climate Change: from Geology to Ecology - Speakers
James Teller, University of Manitoba
Camille Parmesan, University of Texas
Shelley Hunt, University of Guelph


Ward Strong, Terry Shore and Andrew Smith at the Joint Annual Meeting of the Entomological Societies of Canada and Saskatchewan in Saskatoon, 2007.

Symposia:

- **Apiculture: Bee - Virus Interactions**
- **Arthropod Host-symbiont Relationships**
- **Diversity, Distribution and Ecology**
- **Biological Survey of Canada Symposium**
- **Entomological Issues in Potato Production**
- **Extension Entomology**
- **Graduate Student Symposium**
- **Pollination Biology**
- **Protecting Urban Forests and Structures from Insects**
- **Wood to Soil: the Role of Arthropods in Forest Nutrient Cycling**

Heritage lecture:

History of Beekeeping Research in Western Canada -Donald Dixon

Retirements

On September 24, 2008 a reception to celebrate the retirement and career of John McLean was held at the Botanical Gardens, University of British Columbia. Here is a collection of photographs over John's productive tenure at U.B.C. Faculty of Forestry, from 1977 – 2008.

Posters before plotters. Photo John McLean.

Fieldwork before WCB. Photo John McLean.

Photo John McLean.

Photo John McLean.

John's lab in the mid 1990's.
Photo John McLean.

Photo John McLean.

Photo John McLean.

Peter Hall

A reception was held on September 17, 2008 at the Royal Victoria Yacht Club to celebrate Peter Hall's retirement and career as the Provincial Forest Entomologist. Peter worked 28 years for the B.C. Forest Service and initiated the western spruce budworm program and the provincial gypsy moth program.

Peter receiving his retirement gift. Photo Lorraine Maclauchlan.

Peter's reception at the Royal Victoria Yacht Club.

U.B.C. Forest Entomology crew with their field van. 1979. Left to right, Jose Zanuncio, John McLean, Tom Maher, Peter Hall, Terry Shore. Photo John McLean.

Entomological Society of Canada
Gold Medal Award
for outstanding Achievement in Canadian Entomology 2008
Presented to Bernard D. Roitberg
Ottawa, Ontario October 19, 2008.

Written by Paul Fields and reprinted from the 2008 ESC-ESO JAM Program, pages 16-17.

Photo from Bernie's SFU homepage http://www.sfu.ca/biology/faculty/roitberg/

The 2008 recipient of the Entomological Society of Canada's Gold Medal for Outstanding Achievement in Canadian entomology is Dr. Bernard Roitberg. This award is presented in recognition of his extensive and innovative work on behavioural ecology and his service to the Entomological Society of Canada.

Bernie Roitberg did his undergraduate training at Simon Fraser University, where he learned the basics of entomology from John Borden (ESC Gold Medal 1988), Thelma Finlayson and others of the "Belleville alumnus". He completed a M.Sc. in 1977 from the Department of Zoology and the Institute of Animal Resource Ecology at the University of British Columbia under the guidance of Judy Myers (ESC Gold Medal 2004). He went on to do his Ph.D. in the Department of Entomology at the University of Massachusetts, Amherst, with Ron Prokopy. Since 1982, Bernie has been a member of the Department of Biological Sciences at Simon Fraser University in Burnaby, British Columbia and is currently a full professor.

Over his 30-year career as an ecologist and entomologist, Bernie has made extensive advances in our knowledge of the behaviour, behavioural ecology and evolution of insects and their natural enemies. He has been fascinated by the behaviours of insects surrounding prey choice and the complementary prey defences. He has worked on a diverse range of insects, with an emphasis on the rhagoletid fruit flies, aphids and their parasitoids and more recently on anopheline mosquitoes. With these and other experimental systems, combined with mathematical modeling, Bernie has developed and demonstrated many novel ideas that do much to advance our understanding of insects. These novel ideas have made applied contributions to the IPM, and biological control of insects. Some examples of these follow.

1. Hi studies on the behavioural ecology of a malaria vector, *Anopheles gambiae,* focused on aspects of resources location generally disregarded in studies of mosquitoes and malaria. Bernie and his graduate students linked human host location with the behaviours and trade-offs associated with the mosquitoes filling other resource needs, such as nectar for flight energy and oviposition sites, with strategies used by the

mosquito for evading attack. A model has been developed that places these foraging behaviours in the context of payoffs for malaria mitigation strategies such as house spraying and bed nets.

2. The role of alarm pheromones in the biology and ecology of aphids has been a recurring theme in Bernie's lab. This has led to a greater understanding of the role of disturbance in fitness, and pest management of aphids. A paper on adaptive suicide in aphids laid the foundations for an understanding of the evolution of altruistic behaviours in colonial organisms.
3. Bernie and collaborators Thomas Hoffmeister and the late Ronald Prokopy have been leaders in development of theory and experiments on oviposition pheromones and mate finding in tephritid fruit flies. This work has led to the development of control practises for insects such as apple maggots.
4. Bernie and collaborators have also developed theory and carried out experiments of state and frequency dependent games to show how game theory is necessary to understand a variety of phenomena from decay rates in marking pheromones to aggregation of resources to siblicide.
5. Through experiments on theory related to the impact of behaviour on predator-prey dynamics in agricultural settings, Bernie and collaborators have been able to explain conditions under which host discrimination is likely to impact host population dynamics. This work has led to a demonstration of how phenotypic plasticity can be exploited by biocontrol practitioners.

During his career Bernie has been an author or co-author on over 37 peer reviewed papers, chapters and other contributions. He has mentored 21 Masters of Pest Management students, 13 M.Sc.'s, 8 Ph.D.'s and 7 postdoctoral fellows. Eighteen of his former students and post docs hold faculty positions in Canada, the USA and Israel. In addition he has inspired countless undergraduates in biology ecology and pest management, and has been unstinting in his interactions with his many friends, colleagues and collaborators.

Bernie has served as a member and chair of the NSERC ecology and evolution grants committee. Despite his busy laboratory and teaching load found time to serve the ESC first and as Director (1988 – 1991) and then as President of the Society (2001 – 2002). Also he served as president of the Entomological Society of British Columbia (1986 – 1987). He has been on the editorial board of *The Canadian Entomologist* and *American Naturalist*. He is an honorary scientist with the Korean Rural Development Agency, and a recipient of the

Entomological Society of Canada's Hewitt Award. His numerous invitations to present seminars and keynote addresses give evidence that Bernie is truly one of Canada's international science stars.

Bernie's outstanding scientific achievements in the area of insect population and behavioural ecology a, as well as his service to the ESC, makes him a most worthy recipient of the 2008 Gold Medal.

Entomological Society of Canada and Entomological Society of Ontario JAM 2008

The JAM 2008 Logo (from the ESC-ESO JAM 2008 program)
The insect in the centre is a stylized lampyrid beetle (Coleoptera: Lampyridae).

The red maple leaf symbolizes Canada.

The top of the leaf, with the white circle, symbolizes the Peace Tower to indicate that Ottawa is the host city.

The light bulb is the theme of the annual meeting: IDEASs.

International Congress of Entomology

ICE 2008 Congress Proceedings are now available on the congress website: http://www.ice2008.org.za/ConferenceProceedings.asp

Allan Carroll (left) and colleague on the pier along Durban's waterfront during the International Congress of Entomology, Durban, South Africa, July 2008.

Student Profile

Junxia Zhang is a Ph.D. student working with Wayne Maddison in the Department of Zoology, University of British Columbia. Junxia is working on Salticid spiders, and recently presented a paper at the American Arachnological Society AGM in Berkley, California, July 2008.

Presentation abstract: Phylogeny and biogeography of the subfamily Euophryinae (Araneae: Salticidae)

As one of the largest subfamilies of jumping spiders (Salticidae), the Euophryinae currently contains at least 95 genera and more than 800 species. Its systematics is currently messy, and delimitations of many genera are not clear. Euophryinae is the only major group of jumping spiders to have diversified into many genera in both the Old and New World, which makes its historical biogeography particularly interesting. This project aims to clarify the phylogeny of the subfamily and its placement in jumping spider phylogeny. Five genes (mitochondrial DNA: COI, 16SrDNA, NADH1; nuclear DNA: 28S rDNA, Actin) were amplified and sequenced. 119 euophryine species (97 identified species of 42 genera and 22 unidentified species) and 35 outgroups are included in the phylogenetic analysis. The result strongly supports the monophyly of euophryines and confirms close relationships of some euophryine genera proposed by morphological studies, for instance, *Cobanus* and *Sidusa*. Mapping distribution on the phylogenetic tree shows that most euophryines from the New World are more closely related to each other than to those from the Old World, vice versa. This finding is consistent with other analyses that suggest much of salticid diversification occurred after the separation of the continents of the Old World and New World.

Junxia in the field, Guangxi, China in 2006. Photo Junxia Zhang.

Random Photos from the Field

Suzie Lavallee (UBC) and Fred Beaulieu (CNC) enjoy a break at Kitsilano Beach after a day of collecting in Stanley Park, August 8, 2008.

Doug Currie, Tracy Lewis, and Andrew Bennett at the International Congress of Entomology, Durban, South Africa, July 2008.

Dave Holden (CFIA) light trapping at Canadian Wildlife Service property, Delta, August 15, 2008.

Jeremy deWaard, James Miskelly and Michelle Connolly play an intense game of "Bugopoly". March 2008.

Jennifer Heron (B.C.MOE), Jenny Cory (SFU) and Judy Myers (UBC) enjoy a social night at the International Congress of Entomology, Durban, July 2008.

Do you want to be a part of the B.C. Lepidopterists Guild?

The B.C. Lepidopterists Guild focus is to bring together the Lepidopteran expertise in B.C., share knowledge and help to build and strengthen these taxonomic groups, collections and baseline biodiversity data. Dave Holden, an amateur microlepidopterist from Port Coquitlam, is interested in forming a B.C. Lepidopterist Guild, mirroring the Alberta Lepidopterist Guild. If you have an interest in this subject, please contact Dave Holden at holdend@inspection.gc.ca to get started!

Hera Buck Moth, *Hemileuca hera*, taken in south Okanagan, 1994. Photo Orville Dyer. This moth is ranked S1 in B.C.

Undescribed Micropterigid in the lower mainland caught Spring 2008. Photo Dave Holden.

Moth trapping in Mississippi, July 2008. Photo Dave Holden.

Tiger moth, *Grammia spp.*, Osoyoos, August 2007. Photo Nick Page.

Upcoming Conferences and Meetings

XIV International Congress of Entomology – Daegu, South Korea 2012

Hosted by the Entomological Society of Korea, in Daegu.

Members of the host committee for the XXIV International Congress of Entomology 2012.

Theme of the Congress: New Era in Entomology

- **Background:** 21st Century Entomology: molecular biology, genetic engineering, bio-robotics, computer-aided ecology, industrial application
- **Purpose:** toward one world for better human society harmonized with nature and entomological benefits sharing between developed and developing countries
- **Theme:** global development of industrial entomology; global conservation of insect biodiversity.

Special Funding Programs

- **Student Accommodation**
  - Dormitory of Kyungpook National University: US$ 10/night (500 students)
- **Funding for Young Entomologists**
  - 20 Ph.D students and postdocs within 3 years: Waiver of registration fee, airfare & free dormitory
- **Funding for Delegates from Developing Countries**
  - 20 entomologists selected by the committee: Waiver of registration fee, airfare & free dormitory
- **Further Supports**
  - ICE Council & Organizers of symposia: Funding for organizing & supervising program. From 2000 participants of early bird registration: more benefit to developing countries and students.

Pre/Post Congress Tours

- Mt. Seoraksan
- Jeju World Natural Heritage Site
- Butterfly and Insect Eco-Parks
- Mt. Geumgangsan

Daegu, Host City Facts

- 80 km from the southeast coast and 293 km from Seoul
- 885km2 and 2.54 million people
- City of education, environment, IT & international sports.

Conference website www.ICE2012.org

Upcoming Conferences and Meetings

Year 2009

The 20th USDA Interagency Research Forum on Invasive Species will be held January 13-16, 2009 at the Loews Annapolis Hotel in Annapolis, MD. Contact Kathy McManus at 203-230-4330 or kmcmanus@fs.fed.us

The 3rd International Symposium on Biological Control of Arthropods will be held February 8-13, 2009 in Christchurch, New Zealand. URL: http://events.lincoln.ac.nz/isbca09/default.htm

The International Symposium on the Asian Tiger Mosquito, hosted by the Center for Vector Biology at Rutgers University, will be held February 12-13, 2009. For information regarding poster presentations, please contact Kristen Bartlett-Healy, krisb@rci.rutgers.edu. For further information regarding the Symposium, please contact, Mark P. Nelder, PhD, mnelder@rci.rutgers.edu and visit http://www.rci.rutgers.edu/~vbcenter/atmsymposium.php for future updates.

The Annual Meeting of the Southwestern Branch of the Entomological Society of America will be held February 23-26, 2009 in Stillwater, Oklahoma.

The Annual Meeting of the Southeastern Branch of the Entomological Society of America will be held March 8–11, 2009 at the Renaissance Hotel and Spa in Montgomery, Alabama.

The Annual Meeting of the North Central Branch of the Entomological Society of America will be held March 15-18, 2009 at the Hilton at the Ballpark in St. Louis, Missouri.

The Annual Meeting of the Eastern Branch of the Entomological Society of America will be held March 20-23, 2009 in Harrisburg, Pennsylvania at the Hilton and Towers.

The Sixth International IPM Symposium, "Transcending Boundaries," will be held in Portland, Oregon March 24–26, 2009 at the Portland Convention Center. Contact Elaine Wolff at 217-333-2880 or wolff1@uiuc.edu. URL: http://www.ipmcenters.org/ipmsymposium09

The Department of Entomology at Virginia Tech's Golden Jubilee Celebration will be held March 27-28, 2009. All alumni are welcome. For more information, contact L. T. Kok at ltkok@mail.vt.edu or call 540-231-6341. To update or create your alumni profile, visit www.alumni.vt.edu/gateway.

The 93rd Annual Meeting of the Pacific Branch of the Entomological Society of America will be held March 29 – April 1, 2008 at the Bahia Resort Hotel on Mission Bay in San Diego, California. For more information call 559-646-6527.

The 6th Annual Arbovirus Surveillance and Mosquito Control Workshop will be held at AMCD,

St. Augustine, Florida, March 31-April 2, 2009. For workshop information, please contact Dr. Rudy Xue at 904-471-3107 or visit AMCD's website: www.anastasiamcd.org. For hotel information, please call Holiday Inn (860 A1A Beach Boulevard, St. Augustine, Florida 32080) at 904-471-2555 and ask for the rate for the mosquito control meeting.

PestEx 2009 will be held at Excel in London, UK. April 22-23, 2009. Contact: Frances McKim Active Solutions, Tel: +44 (0) 1509 233219; Email: frances@activesolutions.uk.com.

A Bean Beetle Curriculum Development Workshop will be held at Emory University, Atlanta, Georgia, from May 20-22, 2009. The purpose of the workshop is to introduce faculty who are currently teaching laboratory courses at US colleges and universities to this exciting new model system for teaching undergraduate laboratory courses and engage them in designing new laboratory protocols using bean beetles in the fields of physiology and neurobiology. More info at http://www.beanbeetles.org/network/workshop.html.

The 8th Meeting on Soil Insect Pests will be held August 26-28, 2009, in Monterrey, Mexico. For more information contact rodriguez.luis@inifap.gob.mx.

The 7th International Conference on Plant Protection in the Tropics will be held August 27-29, 2008 at the Hotel Nikko in Kuala Lumpur, Malaysia. URL: http://www.mapps.org.my/7thICPPT/

The Australian Entomological Society 40th Annual General meeting and Scientific Conference, September 25 – 28th, 2009, Darwin, Northern Territory, Australia. A joint meeting with the Society of Australian Systematic Biologists and the Australian Coral Reefs Society. Website: http://aes2009.org.

The XVIIth International Congress for Tropical Medicine and Malaria (ICTM2008) will be held in Jeju Island, Korea, September 29 - October 3, 2008. URL: http://www.ictm17.org

The 2009 Entomological Society of America Annual Meeting will be held on December 13-16, 2009, at the Indianapolis Convention Center in Indianapolis, Indiana.
Website: http://www.entsoc.org/am/

Royal Entomological Society Verrall Lecture: Fly smell – function and evolution of the Drosophila olfactory system in a natural setting. March 4, 2009. Flett Theatre, Natural History Museum, South Kensington, London. Tea at 16:30, lecture at 17:00. http://www.royensoc.co.uk/meetings.shtml

Royal Entomological Society joint meeting with the Royal Meteorological Society "Insects, Weather and Climate" Venue: Blacklett Lecture Theatre, Prince Consort Road, Imperial College, London. March 18, 2009.

Royal Entomological Society, Insect Conservation Special Interest Group Meeting. "Conservation of Aculeates". Venue: Rothamsted Research, Harpenden. April 1, 2009. http://www.royensoc.co.uk/meetings.shtml

Darwin and Wallace Celebratory Meeting, Royal Entomological Society. Venue: Rothamsted Research, Harpenden. Title:*'Insect evolution below the species level: ecological specialization and the origin of species'*. April 22, 2009. http://www.royensoc.co.uk/meetings.shtml

Insects and Sustainable Agriculture Special Interest Group meeting, Royal Entomological Society. Venue: Rothamsted Research, Harpenden . Title: Agri-environment schemes and invertebrates. A joint meeting with the BES Agricultural Ecology Special Interest Group. May 12, 2009. http://www.royensoc.co.uk/meetings.shtml

Insect Festival 2009, July 4, 2009. Venue: York Museum Gardens, York, UK. A festival celebrating the insect world, open to the general public. The Insect Festival will take place every two years, in the summer, in the North of England. http://www.royensoc.co.uk/meetings.shtml

10th International Congress of Orthopterology, Antalya, Turkey, July 21 – 25th, 2009.

http://www.ico2009.org

Royal Entomological Society Orthopterists' Special Interest Group meeting and supper, November 4, 2009. Venue: Dorothea Bate Room, Natural History Museum, London http://www.royensoc.co.uk/meetings.shtml

Royal Entomological Society Aphid Special Interest Group meeting. Venue: Rothamsted Research, Harpenden. November 16, 2009. http://www.royensoc.co.uk/meetings.shtml

Lepidopterist Society 2009 Meeting Location Chetumal, Quintana Roo, Mexico. Website: http://w2.ecosur-qroo.mx/ElenIII/indexingles.htm

Year 2010

IXth European Congress of Entomology, 22 – 27 August 2010, Budapest Hungary www.nhmus.hu/ECE2010

The 73rd 2009 Annual Pest Management Conference, Purdue University, West Lafayette, IN. Website: http://extension.entm.purdue.edu/events.html

The 2010 Entomological Society of America Annual Meeting will be held on December 12-16, 2010, at the Town and Country Hotel and Convention Center in San Diego, California. Website: http://www.entsoc.org/am/

Dragonfly surveys, June 2005. Photo Leah Ramsay.

Kathy Bleiker chops out an *Atropellis* canker. Photo Ward Strong.

New Publications

- 500 Insects: A visual reference. Stephen A. Marshall. *From the publisher:* "A selection of 500 of the most interesting and representative insects from N and S America, the Caribbean, Australia and New Zealand, each illustrated by a photograph in their natural habitat and captioned with informative factfiles". Published by Firefly Books. 528 pages.
- Pheromone: the insect artwork of Christopher Marley. Christopher Marley. *From the publisher:* "This magnum opus presents a comprehensive array of the works of the world's leading bug artist. Christopher Marley sets out the philosophy of design that informs his work. Leafing through the book takes you on a guided tour of the globe's most exotic bugs. The colors are entirely natural, and to render the reproductions as accurate as possible some have been reproduced with fifth-color metallic inks and highlighted with spot varnish". Published by Pomegranate Communications.

Random photos from the field

Ken White (Entomologist, Smithers) and Erin Havard (Forest Health Tech, Smithers) helping Lorraine Maclauchlan with some young pine/MPB surveys this summer & obviously enjoying themselves. August 21, 2008. Photo Lorraine Maclauchlan.

Wayne Maddison (UBC Zoology) taking a nap in between spider collecting bouts in California (July 2006). Photo Maxence Salomon.

David Jack (Ph.D. Student, UBC) installing pitfall traps. 2008. Photo Heather Jack.

Sylvie Desjardins (UBC Okanagan) collects *Leptoglossus*, Kalamalka Research Station and Seed Orchard, Vernon, 2008. Photo Ward Strong.

Available Student Awards

Susan Senger, Gwylim Blackburn, Jason Peterson, Brian Ma, and Judy Stamps in a "meeting" at SFU. April 2008. Photo Maxence Salomon.

Jen Perry and Jason Peterson debate entomological theories over lunch. May 2008. Photo Maxence Salomon.

Richard Ring and Samantha Vibert sacrificing a fabulous cake made by Robb Bennett's wife Jenny. November 2007. Photo Maxence Salomon.

Entomological Society of B.C. Student Awards

New to the ESBC website is a page that allows students quick access to potential funding opportunities.

Available awards include:

- **James Grant Award,** sponsored by the North Okanagan Naturalists Club, for the best M.Sc. presentation at the ESBC Annual General Meeting. Award value $300.
- **Harold Madsen Award,** sponsored by Phero Tech for the best Ph.D. presentation. Award value $300.
- **ESBC Graduate Research-Travel Awards,** one PhD ($500) and one M.Sc. ($500)

Entomological Society of Canada

(from the ESC website http://www.esc-sec.ca/studentawards.html)

Refer to ESC website for yearly application deadlines

- **ESC Post Graduate Awards:** The Entomological Society of Canada offers two postgraduate awards of $2,000 each to assist students in study and research leading to a postgraduate degree in entomology. The postgraduate awards will be made on the basis of high scholastic achievement. The Society will normally award one scholarship to a M.Sc. student and one to a Ph.D. student. The applicant must be a postgraduate student enrolled at a Canadian university and their studies and research must be carried out at a Canadian university. A student who was unable to gain admission or enters graduate school as a qualifying candidate is not eligible to receive an award.

- **Graduate Research-Travel Scholarship** To foster graduate education in entomology, the Entomological Society of Canada will offer two research-travel scholarships, awarded annually on a competitive basis. The intent of these scholarships is to help students increase the scope of the graduate training. These scholarships, up to a maximum of $2,000, will provide an opportunity for students to undertake research or course work pertinent to their thesis subject that could not be carried out at their own institution, and that represents a significant addition to the planned thesis research or course work. Applications will be judged on scientific merit. To be eligible, a student must: 1) be enrolled as a full-time graduate student 2) be studying at a Canadian University 3) be pursuing scientific studies on insects or other related terrestrial arthropods.

- **J.H.Borden Scholarship**: In honour of Dr. John H. Borden, and his prestigious contributions in the field of forest pest ecology, the Entomological Society of Canada is offering one postgraduate award of $1,000 to assist students in postgraduate programs who are studying Integrated Pest Management (IPM) with an entomological emphasis. The award will be made on the basis of high scholastic achievement and innovative research in IPM. Documented evidence of sustained accomplishment and dedication to the field will be considered in evaluation of applicants.

- **Keith Kevan Scholarship**: In memory of Dr. D. Keith McE. Kevan, the Entomological Society of Canada offers one postgraduate award of $1,000 biannually to assist students in postgraduate programs who are studying systematics in entomology. The award will be made on the basis of high scholastic achievement and excellence in insect systematics. Eligibility Applicants must be members of the Entomological Society of Canada at the time of application. The successful applicant must be a postgraduate student at the time of

application, studying at a Canadian university or be a Canadian citizen studying abroad.

- **Ed Becker Conference Travel Award**: This cash award was established to provide some financial assistance for a student or students to travel to Joint Annual Meetings to present a paper or poster. One or more awards of $500 each may be presented yearly. The annual occurrence of the award and number of awards presented yearly will depend on the financial standing of the Society. This award honours the memory of Dr. Ed Becker, a distinguished entomologist, Honorary Member and Fellow of the Society, who served for 25 years as Treasurer and also as the Editor of the Senior Entomologist's Newsletter. The naming of this award after Dr. Becker is particularly apt as he attended 49 consecutive Annual Meetings. The competition for the ESC ED Becker Conference Travel Award(s) is open to students with active membership in the ESC (i.e., paid for the current year), who are either in a graduate or undergraduate program at a Canadian university. Students must present a paper or a poster at the Joint Annual Meetings of ESC on their own original research. No student may receive more than one ESC Ed Becker Conference Travel Award while registered for the same degree.

If you know of another entomology student award please forward the information to Bill Riel, web page editor, for inclusion in the ESBC student awards section of our website.

- **Biological Survey of Canada Scholarship** In recognition of the Biological Survey of Canada, the ESC offers one postgraduate award of $1000 to assist a student studying insect or terrestrial arthropod biodiversity in Canada. The award will be made on the basis of high scholastic achievement and excellence in faunistics, and will be offered in alternate years to the Keith Kevan Scholarship. Applicants must be post-graduate students at the time of application, be studying at a Canadian university, and be carrying out a project on insect (or terrestrial arthropod) faunistics in a Canadian habitat.

- **President's Prizes:** The Student Paper/Poster Committee appointed by the Regional Society hosting the Joint Annual Meeting has the responsibility of coordinating its Society's and the ESC's President's Prize student paper and poster competitions and awards. Regional societies may have their own award(s) and set of rules or traditions for their student paper or poster competition that may bind them to handling the competition in a certain way. Having a corporate sponsor that traditionally presents a prize, or a rule that winners must be members of the regional society, or that students must be single authors on the papers etc. may preclude merging the regional and national societies' competitions. The regional society may choose to skip their own competition in favour of a single joint meeting competition, hold their own competition separately, or they may want to incorporate their own award into the meeting. In any case it is the responsibility of the Student Paper/Poster Committee to ensure that the various national and regional society's competitions are clearly defined and coordinated and that the prizes for each competition are ready for presentation. Consultation with the chair of the ESC Student Awards competition is encouraged to ensure coordination. General rules governing the ESC student paper competition are: the student must be enrolled in a graduate degree program or have graduated from the program less than six months previously, the student must be registered at the meeting, the student must be the principal investigator and principal author of the paper, the student does not have to be a member of the ESC. Some variations on awards that have been given out at previous meetings include:
    - An award for the best student paper for each paper session
    - An award for the best student poster
    - Awards for the best overall student papers by a Ph.D. and by a Master's student
    - Additional awards for runners-up
    - An award for the best paper by a member of the regional society.

Wayne Maddison, Gwylim Blackburn, Samantha Vibert, and Leticia Aviles enjoy some pitchers in Vancouver. April 2008. Photo Maxence Salomon.

Notes from the field:

The Whistler Biodiversity Project

Written by
James Miskelly Victoria (James.Miskelly@gmail.com),
and Bob Brett, Whistler Biodiversity Project, Whistler, BC
(bob@whistlerbiodiversity.ca)

Further information at www.whistlerbiodiversity.ca

Background

With its close proximity to Vancouver, ease of access, and elevation range of almost 2000 m, you would expect that Whistler would be a popular collecting destination with a well-documented fauna. This is not the case. In fact, even the most popular and well-known insects are largely unsampled in Whistler and the surrounding area. Trying to come to terms with Whistler's insect fauna is one of the goals of the Whistler Biodiversity Project (WBP).

The **Whistler Biodiversity Project** is a multi-year effort to catalogue and help conserve Whistler's native species. The project was born from the realization that local habitats are subject to massive alterations with a complete absence of good baseline data. The project aims to catalogue as much of the local biota as possible by 2010, which is both the year that Whistler will host the Olympic games and the United Nations International Year on Biodiversity. The primary approach is structured surveys conducted by professional biologists. A secondary approach is a program of public outreach and community events, such as the Whistler BioBlitz, designed to stimulate a broader interest in biodiversity. The study area for the WBP extends to the boundaries of the Resort Municipality of Whistler. This area has a number of features of interest from a biodiversity perspective. The area is transitional from coastal to interior habitat types, has a number of peat lands, and has an elevation range from 570 m above sea level in the Brandywine River valley to over 2400 m at the summit of Blackcomb Mountain.

Darren Copley (left) and James Miskelly (right) examining a grasshopper on Whistler Mountain, August 2008. Photo Bob Brett.

The WBP has had great success in cataloguing birds, plants, fungi, reptiles, and amphibians. Insect surveys to date have focused primarily on groups that are relatively easy

to sample and identify. The groups that have the most completely sampled are Orthoptera, Odonata, and butterflies. Even these relatively well-studied groups have yielded surprises in the WBP study area.

Orthoptera

Ten species of Orthoptera have so far been recorded in the WBP study area. Though this is not a particularly large number, a few species are notable. In subalpine forests on Blackcomb Mountain, we have recorded *Pristoceuthophilus cercalis* (Rhaphidophoridae). This rarely collected camel cricket is known from only a handful of locations in British Columbia. This is only the second record from west of the Okanagan Valley, the other being from near Prince Rupert.

One typically interior species, *Cyphoderris monstrosa* (Prophalangopsidae) is found in Whistler from the valley bottom to subalpine areas. Whistler is one of the only places in B.C. were this species has been recorded from the Coastal Western Hemlock or Mountain Hemlock Biogeoclimatic Zones. It occurs here at some of the same sites as *Myrecophilus oregonensis* (Myrcemophilidae), a typically coastal species.

Odonata

Twenty-nine species of dragonfly and damselfly have so far been recorded in the study area, representing a full third of the provincial fauna. This high diversity is the result of an unusual overlap between species typical of southern valleys, species typical of northern or mountain habitats, and peat land specialists. Contrary to expectation, this diversity is not the result of the large elevation range in the study area. Few species have yet been recorded in the mountains; most species occur in close proximity to each other in the large wetland complexes in the valley bottom.

Melissa Arctic, *Oeneis melissa*, taken in the Whistler area, August 2008. Photo: Bob Brett.

Butterflies

This most-collected group of insects is surprisingly poorly documented in the Whistler area. We have so far recorded 33 species. This number is expected to go up in future years, as no surveys have yet targeted species that are in flight in the spring. Surveys have focused primarily on higher elevations, where results have been counter to expectation. Species typical of the southern part of the Mountain Hemlock Biogeoclimatic Zone, such as *Speyeria hydaspe* (Nymphalidae) and *Parnassius clodius* (Papilionidae), were observed rarely or not at all in the WBP study area in 2008. Instead, the most common species were more typical of interior mountain habitats. Examples include Arctic Fritillary (*Boloria* [*Clossiana*] *chariclea*) and Melissa Arctic (*Oeneis melissa*) (Nymphalidae). A number of typically interior species that are rarely

recorded in the southern Coast Mountains were observed in 2008, such as *Pyrgus centaureae*, *Hesperia comma* (Hesperiidae), *Lycaena cuprea* (Lycaenidae), *Clossiana astarte*, *Speyeria mormonia*, and *Oeneis chryxus* (Nymphalidae).

Conclusions

The Whistler area supports a rich and interesting suite of insects that remains largely unsampled. More specialists are needed to continue documenting this fauna. If you are interested in exploring the area for your taxon of interest, please contact Bob Brett at bob@whistlerbiodiversity.ca.

Random photos from the field

Lea Gelling, B.C. Conservation Data Centre, on a dragonfly hunt in greater Victoria, June 2006. Photo: Leah Ramsay.

First weevils, then mountain pine beetle. Photo Lorraine MacLauchlan.

Gwylim Blackburn suits up in anticipation of mosquito country in California (June 2007). Photo Maxence Salomon.

Chris Borkent, Rob Cannings and Patricia Perkins enjoy a day of dragonfly surveying in Victoria. June 2005. Photo Leah Ramsay.

Nick Page (Raincoast Applied Ecology) and Brian Reader (Parks Canada) survey Taylor's Checkerspot, Denman Island, May 2008.

Do you have artistic talent? Do you have a good entomological joke? Send your ideas to the Boreus editor for the December 2007 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

In Memory

Dr. Edward Coulton Becker

1923 – 2008

Dr. Ed Becker passed away on May 13, 2008 at the age of 85. He was a research scientist at Agriculture and Agri-Food Canada from 1952-1980, working as a taxonomist at the Canadian National Collection (CNC) of Insects, Arachnids and Nematodes in Ottawa. His area of expertise was the systematics of click beetles (Coleoptera: Elateridae), which include many Canadian crop pest species. During his life, he published 36 scientific articles, book chapters and reviews (see list of publications). Following retirement, he became an honourary research associate at the CNC and continued to come into work nearly every day for the past 28 years.

Ed was born on March 15, 1923 in St. Louis, Missouri to Coulton and Grace Becker and was the first of six children, and a twin. He spent his early years on the family farm near Williamsville MO. After high school, he attended the University of Missouri where he took three years of agricultural studies before joining the US Marine Corps. The war ended just as he was being shipped to Japan, but he was able to visit that country and saw the devastation the atom bomb had on Nagasaki.

After the war, Ed met Martha Mae Elliott at a church camp at Lake of the Ozarks and they were married in 1948. The newly married couple soon moved to Honduras, where Ed worked as an entomologist for the Standard Fruit Co. They returned and Ed attended the University of Illinois, earning his PhD in entomology in 1952 with a thesis on the taxonomy of *Agriotes* (Coleoptera: Elateridae). By good fortune, Agriculture Canada was looking for a taxonomist to work on click beetles at the CNC and he and Martha soon moved to Ottawa.

Among his 36 systematics publications are monographic revisions of the large and economically important click beetle genera *Agriotes* and *Athous* (Coleoptera: Elateridae) of North America. This work was central to controlling a major North American crop pest problem. Together, his work has been worldwide in scope, spans several beetle families, and includes descriptions of 53 new species and two new genera. Towards the end of his research career, Ed co-authored a series of major scientific articles with the Japanese scientist Hitoo Ôhira. Becker's systematic research was innovative, in that he wrote the most rigorous, detailed descriptions and keys for Elateridae to date and pioneered new unexplored morphological character systems.

In addition to Ed's research, he was active in many entomological societies and organizations, working as treasurer of the Entomological Society of Canada (1961-1985), Section A representative and governing board member of the Entomological Society of America (1982-1984), Editor of *The Coleopterists Bulletin* (1983-1990) and President of the Coleopterists Society (1971-1972). Perhaps his biggest contribution to entomology was through the CanaColl Foundation, a non-profit organization that Ed helped create and almost single-handedly nurtured for the past 36 years. The foundation promotes taxonomic research at the CNC by providing funds to visiting entomologists who curate the collection. The foundation currently has investments of $475,000 and has awarded over $200,000 in grants to nearly 300 researchers. In addition, Ed wrote and distributed a quarterly newsletter for retired entomologists and their spouses for the past 18 years. For many years, he also visited public school classrooms to promote entomology, often with a tarantula named Carmen at his side. Ed was recognized for his work by receiving the Queen's Silver Jubilee Medal (1978), the Canada Commemorative Award (1984) and was made a Fellow of the Entomological Society of Canada (1974) and an Honourary Member of the Entomological Society of America (1997), at one time, the only person to be so honoured by both societies. His tireless efforts to promote entomology and the CNC have had far-reaching effects not only in Canada, but also throughout the world. He was very well known in the entomological community, partly because of his friendly, social nature, but also because he attended every single ESC meeting for the past 49 years! Outside of entomology, Ed was a devoted family man who helped raise five daughters and was married for nearly 60 years. He was a Scout leader and was also deeply involved with his church, Rideau Park United, where he held numerous positions.

Ed enjoyed good health until quite recently, but in the last two months, he developed severe congestive heart disease. He died in Ottawa surrounded by family and is survived by his wife Martha and daughters Barbara, Marcia, Debra, Lynda and Patricia and three grandchildren. Ed's cheerful, positive attitude, sense of humour and love of bowties will be sadly missed.

Donations in Ed's memory can be made to the CanaColl Foundation, c/o Andy Bennett, 960 Carling Ave., Ottawa, ON, K1A 0C6.

Obituary written by Andrew Bennett and Hume Douglas

This article has been reprinted from the Bulletin of the Entomological Society of Canada (September 2008, page 130-).

In Memory

Dr. Judy Nelson

1940 – 2008

Written by Bernie Roitberg and Dave Gillespie

On April 21st, we lost a dear friend when Judy Nelson suddenly died at the age of 67. Below is the obituary for Judy that was published in the Vancouver Sun. Here, we add a few thoughts on our association with Judy at SFU.

Judy joined the ranks of professional entomologists as an undergraduate student in Mark Winston's first course, "Introduction to Entomology" at Simon Fraser University, with Dave and Staffan Lindgren as TAs. It was clear from the first day that Judy had found her true vocation, and her curiosity and enthusiasm for both science and entomology was infectious. Many students from that particular class eventually completed Ph.D. degrees in entomology or a related field. The atmosphere that Judy helped to create in the class probably had as much to do with the career choices of approximately 15 students as the course content and skills of the instructors. Dave vividly recalls Judy handing in a wonderfully organized insect collection consisting of approximately 6 insect boxes plus alcohol and slide material, with each specimen meticulously mounted, and labeled (with handwritten labels in those days). Hers was, of course, the top collection, and it immeasurably exceeded the course requirements. Summer student positions with BP Beirne (assisting Dave to complete the final field season of his Ph.D. research) and with Bob Costello at the BC Ministry of Agriculture, gave her hands-on experience in the field. Judy's approach to science was to understand completely what one is doing, do it perfectly, and take joy in working with others.

Judy joined Bernie's lab as a M.Sc. student in 1983. She turned out to be a natural at working on parasitoid behavior. She was someone who could be described as having great hands; she seemed to have excellent intuition on how to tweak a protocol to get her wasps to perform under difficult situations. Her experiments on patch time allocation in Opiine wasps are cited to this day as classic work in this field (see Wajnberg, 2006, Behav Ecol Sociobiol). Judy returned to Bernie's lab in 1995 as a post-doc for one year to manage a biocontrol project. Judy was a big ray of sunshine in the lab, nurturing graduate students, helping out whenever and wherever possible and never forgetting a birthday. She apparently kept a master list of birthdates and a big supply of candles. Judy saw it as her job to keep lab morale as high as possible but she also had very high standards and provided positive criticism on a regular basis.

All of us will miss Judy and her upbeat approach to life and science.

From obituary published in Vancouver Sun:
NELSON Judith "Judy" (nee Foex) It is with tremendous sadness that we announce the sudden passing of our sweet, caring mother on April 21st, 2008 at the age of 67. Judy was born in Chatham, Ontario on October 16th, 1940 to Harold and Phyllis Foex and attended Chatham College, Neuchatel Junior College in Switzerland followed by Victoria Collegiate at the University of Toronto where she met her husband.

Following her marriage, Judy and her family moved to Vancouver and the North Shore where she raised her children and settled for the past 40 years. Apart from a few years when she relocated to Davis, California to complete her PhD in the field of Entomological Science, Judy had always called North Vancouver her home. She is loved and sadly missed by her daughter Andrea (Xavier), son Brian (Deborah), her 4 grandchildren (Braeden, Abby, Cameron and Maeryn), sisters Caroline (Jerry) and Elizabeth, Roger and many, many dear friends and acquaintances. Mom had a generous and exuberant personality that drew friendships wherever she went. She was smart, loved a joke, was quick with a smile and genuinely enjoyed doing things for others. Judy adored spending time with her children and grandchildren and cherished the fact that she played such an important part in their lives. She loved to cook and bake - many loved ones were the lucky recipients of her pies and custom-created birthday cakes. Judy loved to play games with whoever would join her, from her regular bridge club get-together, to teaching new games to her grandchildren. Judy also enjoyed singing, reading, listening to music, quilting, knitting, and spending time with friends. She was a Master Gardener and volunteer with the Van Dusen Botanical Garden Association and an enthusiastic member of the Cecilia Ensemble choir. A proud mother, devoted Nana, and dear friend to many, Judy will be greatly missed by all who knew her. A Celebration of Life will be held on Tuesday, April 29 at 2 p.m. at the West Vancouver Yacht Club, 5854 Marine Drive. In lieu of flowers, donations in memory of Mom may be made to the Lions Gate Hospital Foundation or the Cecilia Ensemble. "Anyone for a game of Hearts?"

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