



**Newsletter of the  
SOUTHWEST ASSOCIATION OF FRESHWATER  
INVERTEBRATE TAXONOMISTS**

Greetings SAFIT members,

Pretty soggy up here on the North Coast but should be a good year for the bugs. Is anyone out there including annual precipitation in their bioassessment analysis? Member input to the STE is always welcome and encouraged. We also continue to solicit material that may be useful to membership to include in the newsletter, including photos. If anyone has photos of interesting collecting sites, bugs, or anything else related – please send them in.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!  
Jon Lee, Editor

**ANNOUNCEMENTS  
SAFIT MEETINGS**

The board of directors meets via conference call on the 3<sup>rd</sup> Friday of the month. Please contact one of the officers if you have anything you want on the Board of Director's Meeting agenda. The contact information for the officers is at the end of the Newsletter.

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## OTHER UPCOMING MEETINGS AND EVENTS

**2011 California Aquatic Bioassessment Workgroup.** The next CABW meeting will be 9 and 10 November 2011 at the same location (as recent meetings) on the UC Davis campus so put it on your calendar. There will be a mini-workshop in the morning of the 9th on examining targeted or point-source bioassessment data; however, none of the presentations are confirmed at this date. Please let me know if you have any suggestions on topics or speakers.

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NABS ANNUAL MEETING 2011: RESPONDING TO THE GLOBAL WATER CRISIS.

**Rhode Island Convention Center, Providence, Rhode Island, USA, May 22 – 26, 2011.** The NABS Technical Issues Committee will be hosting the 13th annual taxonomy fair. Bring along those tricky specimens to the meeting and get help with identifications by leaders in the field... all for FREE! We have an excellent panel of experts this year (please see the list below). So, bring your bugs and prepare those specimens on your slides! Click here <http://www.benthos.org/Annual-Meeting/2011-Providence/Workshops.aspx> for more information (including other workshops).

### Taxonomy Fair – Providence, Rhode Island

<b>Taxonomist</b>	<b>Taxonomic Group</b>	<b>Representing</b>
Gail Corkum	Taxonomic Certification Program	Acadia University
Bill Crouch	Diptera (Chironomidae)	Fish and Wildlife Service
Karen Gaines	Odonata	University of New Mexico
Don Klemm	Hirudinea	US Environmental Protection Agency
Tracy Morman	Aquatic Coleoptera	North Carolina DEHNR
Dan Pickard	Mayflies	California Department of Fish and Game
Christopher Rogers	Crustacea	Kansas Biological Survey at Kansas University
Dave Ruitter	Caddisflies	Unaffiliated
Ken Stewart	Stoneflies	University of North Texas, Dept of Biological Sciences
Rebecca Winterringer	Mollusca (Unionidae)	Ecological Specialists, Inc.
Mark Wetzel	Oligochaetous Clitellata	Illinois Natural History Survey

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If you have any questions, feel free to contact me, Dave Feldman ([dfeldman@mt.gov](mailto:dfeldman@mt.gov)).

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## EMPLOYMENT OPPORTUNITIES

Please contact the editor if you would like to post on an employment opportunity.

### FIELD & LAB

*A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Contact the editor to contribute or comment.*

Detecting invasive aquatic species through ambient assessment programs  
by  
Raphael Mazor

The New Zealand mudsnail (*Potamopyrgus antipodarum*) is one of the most invasive freshwater invertebrates in California, generating great alarm at its spread throughout the state. It was first discovered in the Snake River, Idaho and populations are known in Putah Creek in the Central Valley, the Owens River, and a number of North Coast locations. *P. antipodarum* is a particularly alarming invader because of its habit of spreading into otherwise undisturbed areas, where it can dominate the benthic communities to the exclusion of other taxa. Bioassessment samples from infested reaches may contain over 70% *P. antipodarum*. As a parthenogenic livebearer, invasions can occur spectacularly, with reported densities of over 500,000 per m<sup>2</sup> (Hall et al., 2006).

The stream monitoring program of the Stormwater Monitoring Coalition (SMC) provides an opportunity to assess the extent of this invader in southern California streams—a region where it is known to have been a problem. Prior to 2009, targeted sampling by California Department of Fish and Game, as well as mapping efforts by the Santa Monica Bay Restoration Commission, identified *P. antipodarum* in several tributaries of Malibu Creek and in coastal streams along Santa Monica Bay.

In 2009, the SMC sampled 121 sites in southern California perennial wadeable streams (2<sup>nd</sup> order and higher). We detected *P. antipodarum* in 8 of these samples. Because these sites were part of a probabilistic study design, we can estimate the true extent of this organism at 3%, or 50 km ( $\pm 16$  SE) of stream-length in the region. *P. antipodarum* were more pervasive in urban streams ( $6\% \pm 2$  SE) than undeveloped ( $0.3\% \pm 0.3$  SE) streams.

All 8 sites were found within two watersheds: Santa Monica Bay in Los Angeles County and the San Juan Creek watershed in Orange County. Within the Santa Monica Bay watershed, which includes Malibu Creek, infestations were estimated at 28 km ( $\pm 9$  SE)

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of stream-length; within the San Juan watershed, infestations were estimated at 20 km ( $\pm$  11 SE).

At two sites (one in each watershed) relative abundances were very low (<5%); however, relative abundance exceeded 40% at the other 6 sites, with a maximum of 75% at one site in the Santa Monica Bay watershed. The weight-adjusted mean percent among all samples from infested areas was 47.6%. Scores for the Southern California Index of Biotic Integrity (IBI) were poor or very poor at all these sites, with scores ranging from 9.2 to 36.4.

These estimates only apply to the target population of streams of the SMC program (that is, perennial, wadeable streams that are 2<sup>nd</sup> order and higher). The extent of *P. antipodarum* invasion in 1<sup>st</sup> order streams remains unknown. Furthermore, although *P. antipodarum* cannot tolerate drying, they are able to persist in standing pools or other wet refugia in non-perennial stream reaches.

Probabilistic bioassessment programs like the SMC can effectively monitor the extent and spread of non-native species. In addition to mud snails, data collected by the SMC can assess the distribution of other invasive invertebrates (like zebra mussels), or invasive riparian plants (such as *Arundo* or *Tamarix*). Directed mapping, such as the studies conducted by the Santa Monica Bay Restoration Commission, will always provide a better assessment of the extent of exotics, and with greater spatial resolution. However, these efforts are too intensive for application across large regions, like Southern California. Therefore, ambient surveys provide an opportunity for detecting the spread and assessing the distribution of invasive species in large areas.

Despite the concern about the spread of *P. antipodarum* in California, the subject remains poorly studied, with few published articles on this subject in most bibliographic databases. A recent article by SAFIT member Dave Herbst (Herbst et al., 2008) examined ecological limits to *P. antipodarum* populations in the Owens River.

For more information on the biology of *P. antipodarum*, the University of Montana maintains an excellent website, as well as a database of known records for this species at <http://www.esg.montana.edu/aim/mollusca/nzms/>. New observations can be reported at this website. Information on preventing the spread of invasive species, and on proper gear decontamination methods can be found at [http://www.swrcb.ca.gov/water\\_issues/programs/swamp/ais/decontamination.shtml](http://www.swrcb.ca.gov/water_issues/programs/swamp/ais/decontamination.shtml). Information on the SMC monitoring program can be found at <http://socalsmc.org/>, or by contacting Raphael Mazar at [raphaelm@sccwrp.org](mailto:raphaelm@sccwrp.org).

Hall Jr., R.O., M.F. Dybdahl, and M.C. Vander Loop. 2006. Extremely high secondary production of introduced snails in rivers. *Ecological Applications* 16:1121-1131.

Herbst, D.B., M.T. Bogan, and R.A. Lusardi. 2007. Low specific conductivity limits growth and survival of the New Zealand Mud Snail from the Upper Owens River, California. *Western North American Naturalist* 68:324-333.



*Potamopyrgus antipodarum* specimens from southern Orange County samples collected in 2010 as part of the SMC program. Photograph and determination by Wendy Willis.



Map of *P. antipodarum* observations from the first year of sampling by the Stormwater Monitoring Coalition. The SMC region extends from the Mexican Border through Ventura County. The two watersheds where mud snails (i.e., Santa Monica Bay and San Juan Creek) were detected are highlighted.

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**Miscellaneous bug notes** (anecdotal notes, including distributional records in the SAFIT region, which may be helpful to SAFIT members). To make contributions or comments contact the editor: [jlee@humboldt1.com](mailto:jlee@humboldt1.com).

**Some spring creek Simuliidae** (by Jon Lee). Spring creek BMI samples are often missing in bioassessment surveys; therefore some interesting critters are missed. While attempting to collect *Paracapnia* larvae in spring creeks in northern California (pictures below) some infrequently collected (at least in my experience) black fly larvae were found in the benthic samples. These included (my determinations not confirmed by a specialist): *Tlalocomyia andersoni* Currie, Adler & Wood and *Greniera humeralis* Currie, Adler & Wood in the same sample; and *Twinnia* sp. and *Stegopterna xantha* Currie, Adler & Wood, as well as *Prosimulium secretum* Currie, Adler & Wood in the same sample. Although *Prosimulium* turns up fairly regularly and *Stegopterna* occasionally I had never seen the other three genera. *Twinnia* is particularly distinct in lacking labral fans while *Tlalocomyia*, *Greniera* and *Stegopterna* all have a trilobed appearing hypostoma. Currie et al. (2004) do a great job (in my opinion) treating the family Simuliidae; including keys to adults, pupae and larvae, many illustrations, and information and distribution maps for each species.

Adler, P.H., D.C. Currie and D.M. Wood. 2004. The black flies (Simuliidae) of North America. Cornell University Press, 941 pp.



*Capnia fialai* habitat.



*Paracapnia baumanni* habitat where *Tlalocomyia* and *Greniera* were collected.



*Paracapnia humboldta* habitat.



Overlooking a portion of the Willow Creek watershed, Humboldt County, CA.

### LATEST LITERATURE

*If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards ([arichards@csuchico.edu](mailto:arichards@csuchico.edu)) for inclusion in the next issue of the SAFIT Newsletter.*

*Thanks!!*

**Asterisk (\*) indicates author is a SAFIT member.**

#### **Mollusca**

Hershler, R., H. P. Liu, and J. J. Landye. 2011. Two new genera and four new species of freshwater cochliopid gastropods (Rissooidea) from Northeastern Mexico. *Journal of Molluscan Studies* 77:8-23.

Hovingh, P. 2011. Distribution of a unique limpet (Gastropoda: Ancyliidae) in the Colorado River Drainage Basin, Western North America. *Western North American Naturalist* 70:508-515.

#### **Crustacea**

Aguilar, A. 2011. Weak phylogeographic structure in the endemic western North American fairy shrimp *Branchinecta lynchi* (Eng, Belk and Erickson 1990). *Aquatic Sciences* 73:15-20.

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Glazier, D. S. and T. J. Deptola. 2011. The amphipod *Gammarus minus* has larger eyes in freshwater springs with numerous fish predators. *Invertebrate Biology* 130:60-67.

Rocha-Ramirez, A. and A. Penaloza-Daniel. 2011. *Caecidotea xochimilca* (Isopoda, Asellidae), a new species from Lake Xochimilco, Mexico, with a key to Mexican species of the genus *Caecidotea*. *Crustaceana* 84:93-106.

### **Ephemeroptera**

McCafferty, W. P., D. R. Lenat, L. M. Jacobus, and M. D. Meyer. 2011. The Mayflies (Ephemeroptera) of the Southeastern United States. *Transactions of the American Entomological Society* 136:221-233.

### **Odonata**

Fulan, J. A., R. Raimundo, D. Figueiredo, and M. Correia. 2011. Abundance and diversity of dragonflies four years after the construction of a reservoir. *Limnetica* 29:279-285.

Gade, G., P. Simek, and H. W. Fescemyer. 2011. Adipokinetic hormones provide inference for the phylogeny of Odonata. *Journal of Insect Physiology* 57:174-178.

Raebel, E. M., T. Merckx, P. Riordan, D. W. Macdonald, and D. J. Thompson. 2011. The dragonfly delusion: why it is essential to sample exuviae to avoid biased surveys. *Journal of Insect Conservation* 14:523-533.

### **Plecoptera**

Baumann, R. W. and B. C. Kondratieff. 2011. Collecting endemic and rare stoneflies (Plecoptera) in California, U.S.A. *Perla* 29:13-19.

### **Coleoptera**

De Jong, G. D. 2011. Report of *Graphoderus occidentalis* Horn (Coleoptera Dytiscidae) from Mississippi, with distributional notes on *Graphoderus* Dejean in the contiguous United States. *Coleopterists Bulletin* 64:388-389.

Klecka, J. and D. S. Boukal. 2010. Lazy ecologist's guide to water beetle diversity: Which sampling methods are the best? *Ecological Indicators* 11:500-508.

### **Diptera**

Arslan, N., O. Ayik, and Y. Sahin. 2011. Diversity and structure of Chironomidae (Diptera) limnofauna of Lake Uluabat, a Ramsar Site of Turkey, and their relation to environmental variables. *Turkish Journal of Fisheries and Aquatic Sciences* 10:315-322.

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Gelbic, I. and J. Olejnicek. 2011. Ecology of Dolichopodidae (Diptera) in a wetland habitat and their potential role as bioindicators. *Central European Journal of Biology* 6:118-129.

Plant, A. R. 2011. Hemerodromiinae (Diptera: Empididae): a tentative phylogeny and biogeographical discussion. *Systematic Entomology* 36:83-103.

### **Miscellaneous**

Brua, R. B., J. M. Culp, and G. A. Benoy. 2010. Comparison of benthic macroinvertebrate communities by two methods: Kick- and U-net sampling. *Hydrobiologia* 658:293-302.

Burlakova, L. E., A. Y. Karatayev, V. A. Karatayev, M. E. May, D. L. Bennett, and M. J. Cook. 2011. Endemic species: contribution to community uniqueness, effect of habitat alteration, and conservation priorities. *Biological Conservation* 144:155-165.

Caires, A. M., M. R. Vinson, and A. M. D. Brasher. 2011. Impacts of hikers on aquatic invertebrates in the North Fork of the Virgin River Utah. *Southwestern Naturalist* 55:551-557.

Campbell, E. Y., M. E. Benbow, S. D. Tiegs, J. P. Hudson, G. A. Lamberti, and R. W. Merritt. 2011. Timber harvest intensifies spawning-salmon disturbance of macroinvertebrates in southeastern Alaskan streams. *Journal of the North American Benthological Society* 30:49-59.

Clements, W. H., J. L. Arnold, T. M. Koel, R. Daley, and C. Jean. 2011. Responses of benthic macroinvertebrate communities to natural geothermal discharges in Yellowstone National Park, USA. *Aquatic Ecology* 45:137-149.

DeWalt, R. E. 2011. DNA barcoding: a taxonomic point of view. *Journal of the North American Benthological Society* 30:174-181.

Dos Santos, D. A., C. Molineri, M. C. Reynaga, and C. Basualdo. 2010. Which index is the best to assess stream health? *Ecological Indicators* 11:582-589.

Judson, S. W. and C. R. Nelson. 2011. Diversity, phenology, and elevational distribution of Ephemeroptera, Plecoptera, and Trichoptera in American Fork Canyon, Utah. *Western North American Naturalist* 70:526-540.

Kondratieff, B. C. and R. S. Durfee. 2010. Aquatic insects (Ephemeroptera, Odonata, Hemiptera, Coleoptera, Trichoptera, Diptera) of Sand Creek Massacre National Historic Site on the Great Plains of Colorado. *Journal of the Kansas Entomological Society* 83:322-331.

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Nelson, S. M. 2011. Response of stream macroinvertebrate assemblages to erosion control structures in a wastewater dominated urban stream in the southwestern U.S. *Hydrobiologia* 663:51-69.

Resh, V. H. 2011. *Aquatic Insects of California* (1956): a landmark event and unique collaboration in benthic biology. *Journal of the North American Benthological Society* 30:1-10.

## **THANK YOU FOR YOUR MEMBERSHIP!**

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