



Newsletter of the Freshwater Mollusk Conservation Society  
Volume 14 – Number 2  
June 2012

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### 2012 Workshop Draws 120

The FMCS 2012 Workshop, “Incorporating Environmental Flows, Climate Change, and Ecosystem Services into Freshwater Mussel Conservation and Management” was held on Thursday and Friday, April 19 and 20, 2012, at the Holiday Inn in Athens, Georgia. This workshop was well attended, with a final registration of 120 people. The talks were informative and stimulated many hallway conversations. The student posters at the Social on Thursday evening were particularly well done, and the food was really good too! All in all, it was a very successful workshop!

The entire first day was devoted to talks and discussions on environmental flows, an important issue in many areas of the country. Andy Caspar from the U.S. Environmental Protection Agency led off with an overview of the issue and the different methods for determining environmental flows for rivers and organisms, concentrating on the state of the practice and emerging issues. Next, Mary Freeman from the U.S. Geological Survey (USGS) talked about translating environmental flow models into realistic policy than can be understood and implemented by managers and stakeholders. Laurie Fowler from the University of Georgia talked about the legal issues surrounding developing and implementing environmental flow policy, and presented a case study describing the many agency and stakeholder groups involved in this issue in the Appalachicola-Chattahoochee-Flint (ACF) River basin. Clint Robertson from Texas Parks and Wildlife gave an overview of the new Texas E-flow program, which involves teams of scientists and stakeholders, both making recommendations. Darran Crabtree from

The Nature Conservancy talked about some of the environmental flow projects that his organization has been involved in, emphasized that it is possible to manage for important components of the hydrograph even if completely natural flows aren't possible, and discussed the need for different plans for wet and dry years. Karen Herrington from the U.S. Fish and Wildlife Service presented a case study involving multiple entities working together to manage water releases to maintain flows for mussels and sturgeon in the ACF basin. Colin Shea from Tennessee Technological University discussed population modeling to predict mussel population persistence under different flow management scenarios. Heather Galbraith, USGS, described experiments and modeling efforts aimed at estimating persistent habitat for the endangered dwarf wedge mussel in the Delaware River. Robert Bringolf ended the session by presenting data on nonlethal methods (tissue biopsies and hemolymph chemistry profiles) that can be used to assess mussel responses to stressful low flow events. The talks were followed by an engaging discussion with the panel of speakers and audience discussing science and policy needs related to freshwater mussels and environmental flows.



Members of the Environmental Flows panel respond to questions from the audience.

The Friday morning session covered the new USGS Climate Science Centers and their work on climate change. Melinda Dalton, USGS, led off with an overview of the program. Jerad Bales, USGS, talked about climate change and how it is expected to affect water resources in the United States. Tom Kwak, USGS, discussed a multi-investigator project modeling climate change and land use impacts on mussels in the southeast and Upper Mississippi River. This was followed by a panel discussion that allowed audience members to pose general questions to the speakers.



Greg Cope, Moderator of the Climate Change panel, poses a question to the Workshop audience.





Members of the Ecosystem Services panel listen to a question from the audience.

The Friday afternoon session explored ecosystem services provided by mussels and ways to assign value to these services. Dan Spooner, USGS, presented a framework for ecological and economic valuation of ecosystem services with particular emphasis on collaborative work in the Chesapeake Bay watershed. Adam Riggsbee from Riverbank Ecosystems reviewed methods for assigning value to ecosystem services. Jennifer Green from TNC discussed how her organization is restoring oyster reefs and assigning value to the services

provided by reefs. Caryn Vaughn ended the session with a case study of how drought has decreased ecosystem services provided by mussels in the Kiamichi River, Oklahoma. These speakers also participated in a panel discussion, responding to questions from the audience.

Many thanks to the 2012 Workshop Committee: Caryn Vaughn (Chair), Robert Bringolf, Steve Golladay, Patty Morrison, Dan Spooner, Jason Wisniewski, and graduate student members Carla Atkinson and Andrea Fritts.

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**FMCS 2013 SYMPOSIUM, LAKE GUNTERSVILLE STATE PARK**  
**Guntersville, Alabama – March 10-14, 2013**  
**--- FIRST CALL FOR ABSTRACTS – DUE DECEMBER 3, 2012 ---**



The 8<sup>th</sup> Biennial FMCS Symposium will be held the week of March 10-14, 2013 at Lake Guntersville State Park, outside of Guntersville, Alabama. This will be a general symposium with presentations on a range of research and management topics in both oral and poster format. The meeting will be hosted by the Alabama Department of Conservation and Natural Resources.

**Call for Abstracts:**

This symposium will include both oral and poster presentations. Oral presentations will be limited to 20 minutes, including the question and answer period. Size of the poster presentations will be limited to four feet high by four feet wide. If you wish to bring a display unit, special arrangements can be made.

Abstracts for posters and oral presentations will be limited to 300 words. The title should appear in all caps and bold, and be followed by the author name(s), and affiliation(s). Please underline the name of the presenter. Abstracts, which should be written in Word utilizing Arial 11 point font, should include clearly stated objectives, brief methods, general results, and the basic conclusion. At the bottom of your abstract, please indicate your preference for oral or poster presentation, and your willingness to switch. The FMCS **abstract submission deadline for the March 2013 symposium is December 3, 2012**. Submit your abstract on-line at: [fmcs2013symposium@gmail.com](mailto:fmcs2013symposium@gmail.com)

Example abstract from a previous FMCS symposium:

**ASSESSING THE HAZARDS OF CURRENT USE PESTICIDES TO EARLY LIFE STAGES OF NATIVE FRESHWATER MUSSELS.** Robert B. Bringolf<sup>1</sup>, LeRoy F. Humphries<sup>2</sup>, Peter R. Lazaro<sup>1</sup>, Chris Eads<sup>2</sup>, Chris Barnhart<sup>3</sup>, Damian Shea<sup>1</sup>, Jay F. Levine<sup>2</sup>, and W. Gregory Cope<sup>1</sup>. <sup>1</sup>Department of Environmental and Molecular Toxicology, North Carolina State University, Raleigh, NC 27695; <sup>2</sup>College of Veterinary Medicine, North Carolina State University, Raleigh, NC 27606; <sup>3</sup>Department of Biology, Missouri State University, Springfield, MO 65804.

Native freshwater mussels (family Unionidae) are among the most imperiled faunal groups in North America. Approximately 67% of the nearly 300 freshwater mussel species are considered vulnerable to extinction or already extinct. North Carolina has historically supported 56 species of mussels; however, 82% of those species are currently listed as endangered, threatened, or of special concern by the U.S. Fish and Wildlife Service and the State of North Carolina. Although numerous stressors have been implicated in the decline of freshwater mussels, the effects of pesticides on native mussels is largely unknown. Timing of pesticide application combined with the unique life history and reproductive strategy of mussels makes them susceptible to pesticide exposure. The objective of this study was to determine the hazards of pesticides to early life stages of freshwater mussels. We performed acute toxicity tests with glochidia (7 species) and juveniles (6 species) exposed to a suite of current use pesticides (atrazine, fipronil, pendimethalin, and permethrin) and a reference toxicant (NaCl). Our results indicate that these pesticides, at concentrations approaching water solubility, were not acutely toxic to the species of glochidia and juveniles tested. However, in a 21-d chronic toxicity test performed with 4-month old juvenile *Lampsilis siliquoidea* exposed to atrazine, the 14-d atrazine LC50 was 15.8 mg/L (95% confidence interval 12.0-19.5) and the 21-d atrazine LC50 was 4.3 mg/L (95% confidence interval 2.8-5.8). Effects on growth and genotoxicity (single-strand DNA breaks) were also determined in the chronic test. Our results indicate that the relative risk associated with acute exposure of early life stages of mussels to the current use pesticides tested singly is likely low; however, survival and genotoxicity results indicate that chronic exposure of juvenile mussels to atrazine may be impacting mussel populations and warrants further investigation, as does the assessment of pesticide mixtures.

**At the bottom of the abstract page, please type:**

1. The name, address, telephone, fax, and e-mail of the presenting author;
2. Preference for Platform or Poster presentation and willingness (yes or no) to convert from one format to the other; and
3. Whether the presenter is a Regular or a Student attendee

Provided they meet eligibility requirements, all students submitting abstracts will be judged for the best student platform or poster presentations, unless otherwise indicated.

**Symposium Theme:**

The tentative theme for this meeting is: “*Species Recovery and Restoration - from Concept to Implementation.*” This proposed session will highlight implementation of river and mollusk recovery efforts. If you have an abstract that might fit well in this session, please contact Paul Johnson, the local committee chair at: [paul.johnson@dcnr.alabama.gov](mailto:paul.johnson@dcnr.alabama.gov)

**Symposium Registration:**

Formal advanced registration will be available on the FMCS website within a few months.

**Facilities:**

The convention facilities in the main lodge at Lake Guntersville State Park include two large rooms for presentations (concurrent sessions) and a large banquet room. Several smaller meeting rooms also are available that will accommodate committee meetings and other smaller functions.

A number of housing options exist at the park, including 112 hotel rooms and suites from \$80.10 or \$90.00 (bluff side) per night, 19 chalets that can accommodate up to 6 people at \$103.50 per night, and 15 lakeside cabins for up to 6 people (\$112.50 per night). The chalets and hotel rooms are adjacent to the main lodge, while the lakeside cabins are located approximately 1.25 miles from the (mountaintop) lodge. You can find more information about Lake Guntersville State Park on the web at: <http://www.alapark.com/LakeGuntersville/> To make reservations, call the park at: (256) 571-5440 or (800) 548-4553.

**Location and Travel:**

Lake Guntersville State Park is located in northeast Alabama, on the southeast side of Guntersville Reservoir (on the Tennessee River). The park is accessible by car off of US 431, about 38 miles SE of Huntsville and 34 miles NE of Gasden. The park is approximately 58 miles from the Huntsville International Airport (HSV), where several ground-transportation vendors and car rental facilities are available. Round trip shuttle service from HSV to the park is approximately \$150.00. The Birmingham International Airport (BHM) is 87 miles from the park and Hartsfield-Jackson International Airport (ATL) in Atlanta, Georgia, is 163 miles from the park. Both airports also have several car rental and ground transportation options.



**Student Travel Awards Available:**

CALLING ALL STUDENTS - To facilitate your participation in the 8<sup>th</sup> Biennial Symposium, travel awards are being offered by the FMCS. Support is provided as Society-paid lodging accommodations for the duration of the meeting at Lake Guntersville State Park. It is anticipated that eight awards will be made for the 2013 Symposium. A complete application package must be submitted by e-mail as a PDF file to Dr. Teresa Newton, FMCS Awards Committee, on or before **January 30, 2013**. For more information, application forms, and procedures, please see the Awards Committee web site at [http://molluskconservation.org/Mservices\\_awards.html](http://molluskconservation.org/Mservices_awards.html) or contact Teresa ([tnewton@usgs.gov](mailto:tnewton@usgs.gov), phone 608-781-6217).

**Area Attractions and Planned Trips:**

There are several other parks and attractions within an hour drive of Lake Guntersville State Park, so there will be plenty to do before or after the meeting. Possible organized trips through the FMCS symposium may include a trip to the Paint Rock River (44 mussel species) and/or to the US Space and Rocket Center in Huntsville; or a day trip to Cathedral Caverns and the Little River Canyon National Park. Other information can be found at the Marshall County Convention and Visitors Bureau Website: <http://www.marshallcountycvb.com/index.php>

Remember, the **abstract submission deadline for the March 2013 symposium is December 3, 2012**. Submit your abstract to: [fmcs2013symposium@gmail.com](mailto:fmcs2013symposium@gmail.com) . We look forward to seeing you next March at Lake Guntersville State Park !

## Society News

### **Spring 2012 FMCS Board Meeting Wednesday April 18, 2012 -- Athens, Georgia**

**Call to Order and Roll Call for Attendance:**

Caryn Vaughn, Heidi Dunn (via Skype), Greg Zimmerman, Greg Cope, Wendell Haag, Tom Watters, John Jenkinson, John Harris, Megan Bradley, Steve McMurray, Susan Oetker, Patty Morrison, Janet Clayton, Jeff Garner, Nevin Welte, Dan Spooner, Matt Johnson, Leroy Koch, Kevin Cummings, Catherine Gatenby.

Motion to approve November 2011 Board Meeting Minutes, as published in *Ellipsaria* – John Jenkinson  
Motion carried

**Treasurer's Report (Heidi Dunn):**

As of April 15 of this year, we have:

- \$4260 income from memberships,
- \$13,740 income from the Athens workshop registrations, donations, and t-shirts,  
(Virginia also will contribute \$500 to the workshop, not yet received as of 4-15-12), and
- \$4.20 income from credit card rewards.

Expenses include:

- \$1500 for webpage maintenance
- \$2750 for Walkerana set-up
- \$107.71 in credit card fees
- \$347.08 in Paypal fees
- \$460.64 for the Athens workshop t shirts

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Total income	\$18,004.20
Total expenses	<u>\$5,165.43</u>
Net income	\$12,838.77

We have retained earnings of \$100,037.77; Total in the bank of \$112,789.44  
Still need to pay for the Athens workshop expenses.

Heidi indicated that Wild Apricot was working fairly well. Duplicate names become an issue when member's emails are changed. Members with new email addresses have no way to get back in to the web site other than making a new account under the new email, which causes problems. If people cannot get into the system, they should email Greg Zimmerman or Heidi instead of making a new membership. New system merges contacts.

### **Secretary Report (Greg Zimmerman)**

Greg Zimmerman is now a signatory on FMCS finances in the event of an emergency or if we need access to accounts when Heidi is unavailable. We have 550 contacts in our database (400 to 500 members).

### **Committee Reports**

#### **Symposium (Patty Morrison)**

2013 Symposium - Guntersville, Alabama – week of March 10, 2013, Paul Johnson with Alabama DCNR is hosting. [See related article and call for papers on page 3]

2014 Workshop – New England is the probable location, with Mary McCann and Alan Christian taking the lead. Possible theme: “*Mussel Considerations for Dam Removals, Mussel Salvage, and Relocations.*” We want to include more northeastern participation, including tribes. For date, we need to make sure there is no conflict with the Society of Freshwater Science (SFS, formerly NABS) [that date is May 18 – 22, 2014, in Oregon]. Dave Berg was also interested in hosting a 2014 Workshop on Genetics with a possible venue of NCTC (Shepherdstown, WV). We will ask him if he would consider hosting this one in 2016.

2015 Symposium – “Homecoming” in St. Louis. 20 years after the symposium in St. Louis that led to the formation of the FMCS. There are many possible meeting locations downtown by the river.

Mussel Identification Workshop at SFS meeting. Steve McMurray is taking the lead to host a workshop in Louisville with sub-basin experts on Sunday, May 20, 2012.

#### **Awards (Greg Cope)**

Nothing new to report. The new judging form worked well in Louisville; sticking with this for future events.

#### **Outreach Committee and Website (Megan Bradley)**

Andy Roberts has stepped down as Co-chair. New Co-chair – Megan Bradley

Committees – need updated committee text and top three projects

Committee chairs – need to be updated on the website

#### **Information Exchange (Tom Watters and John Jenkinson)**

##### Walkerana – Tom Watters

- The first new issue of Walkerana is out! Our goal going forward is two issues per year. We already have two paper submissions for next issue. [See call for more submissions on page 11]
  - Practical considerations – Authors didn't always follow instructions with regard to page proof stage, figures, and tables. Also, we have major file maintenance issues, with too many files in the shared drive not being able to be cleaned out by the editors, resulting in too many versions of pending articles and clutter.
-

- Shane Hanlon has volunteered to scan and pdf past issues of *Walkerana*. Once scanned, we should make sure they are searchable (OCR recognition). Jack Burch has indicated he may release pdf of snails, which would be fantastic.

#### Ellipsaria -- John Jenkinson

Postings are staying on schedule: first of March, June, September, and December.

Starting this year, we have set a limit of three contributed articles per author in each issue.

It would be great if Committee Chairs would submit regular reports to *Ellipsaria*; this would be a good way to help the committees get help and achieve their goals.

#### **Environmental Quality & Affairs (Steve McMurray)**

The Environmental Quality and Affairs Committee recently provided comments for FMCS on two issues. First, was the proposed Habitat Conservation Plan (HCP) to cover gas pipeline construction and maintenance by NiSource. The proposed project would cover operations extending north-south from New York to Louisiana and east-west from Ohio to the Atlantic Ocean. This proposed HCP would cover 43 species and requests incidental take authorization for five native mussel species. The primary issues FMCS raised were the length of the HCP agreement being too long (50 years), avoidance of impacts in occupied habitats should be more strongly encouraged, all imperiled species should be considered in the cumulative impact assessment, monitoring requirements should be improved, and the support of mollusk augmentation research should be a condition of the HCP to improve its effectiveness as a conservation and mitigation tool. In addition, we suggested time-of-year restrictions for instream activities to reduce negative impacts on native fauna. These comments were submitted to the US Fish and Wildlife Service in December, 2011.

The second comment letter expressed support for the Critical Habitat (CH) designation for eight freshwater mussel species in southern Alabama and northwestern Florida under the Endangered Species Act. These eight species are the Alabama pearlshell (*Margaritifera marrianae*), round ebonyshell (*Fusconaia rotulata*), southern sandshell (*Hamiota australis*), southern kidneyshell (*Ptychobranhus jonesi*), and Choctaw bean (*Villosa choctawensis*) proposed as endangered, and the tapered pigtoe (*Fusconaia burkei*), narrow pigtoe (*Fusconaia escambia*), and fuzzy pigtoe (*Pleurobema strodeanum*) proposed as threatened. These species are found in portions of the Escambia River, Yellow River, and Choctawhatchee River basins of Alabama and Florida. The proposed critical habitat included nine units and encompassed 1,495 miles of stream channel in Alabama and Florida. The draft economic analysis estimated that incremental costs associated with the critical habitat designation would total \$1.41 million over 20 years. The FMCS supported CH designation for these eight mussel species because formal designation of CH facilitates priority recovery activities such as habitat restoration and reintroduction efforts. Thanks to Paul Johnson for his help drafting this letter.

#### **Gastropod Status and Distribution (Jeff Garner and Jeremy Tiemann)**

In December, 2011, *Conservation Status of Gastropods of Canada and the United States* was submitted to the American Fisheries Society for publication in the journal *Fisheries*. It was accepted pending revision in February 2012, and useful comments were received from two reviewers. Most reviewer suggestions were focused on reducing the length of the article. The document is 32 pages, plus a species table (30 additional pages) and several additional figures. A total of 700 species in 16 families and 93 genera are recognized. The revision is to be resubmitted to the journal by June, 2012.

A September 2011 settlement between the Center for Biological Diversity and WildEarth Guardians and the US Fish and Wildlife Service (USFWS) requires the latter to make listing decisions on over 700 species during the next five years. Among them are 43 North American freshwater gastropods, mostly from southeastern US (26 Pleuroceridae, 8 Hydrobiidae, 5 Cochliopidae, 2 Lithoglyphidae and 2 Planorbidae).

In other snail-related USFWS news, final listing decisions have been made for *Pyrgulopsis bernardina* (Arizona) and *Pyrgulopsis trivialis* (Arizona, New Mexico) and they await publication in the Federal Register. A final determination for *Pyrgulopsis chupaderae* (New Mexico) should come during summer 2012. There is a 12-month finding package in the works in USFWS Region 8 that involves 14 snail species (1 Planorbidae, 2 Semisulcospiridae, 3 Amnicolidae and 8 Lithoglyphidae).



**Guidelines and Techniques (Nevin Welte)**

Tamara Smith is working on guidelines for surveyor qualifications. Matt Ashton and Greg Zimmerman are working on guidelines for FERC relicensing. Mussel handling guidelines still needed to be developed / posted.

**Mussel Status and Distribution (Arthur E. Bogan and John L. Harris)**

J.D. Williams et al. AFS Conservation assessment of freshwater mussels of US, Canada and Mexico. This document is in the final stages of revision and will be submitted to The American Fisheries Society Journal, Fisheries for publication in fall 2012. This is a revision of the Williams et al. (1993) first edition that was so successful.

Development of Mussel ID App - Susan Oetker. Progress continues on development of a mussel identification app. The committee has accepted a proposal from Stan Martin with NC State University, Raleigh. The mussel app would work much like topographic map apps, where the user downloads the state-level information onto their device for the sites that they will be visiting prior to going in the field. Once in the field, all of the information for their location will be native on the phone, allowing for full use of the app even in remote locations with no internet access. While we are planning to secure funding from outside grants to fully fund the app, FMCS has previously agreed to provide initial funding to start app development. [also, see below under New Business]

Atlas of Freshwater Mussels of North America. We have revised the concept of the Mussel Distribution Atlas to be a web-based document that will be dynamic, facilitate regular updates, and can be linked to the mussel id-guide being developed at Discover Life <http://www.discoverlife.org/>, which provides mapping abilities across multiple museum databases. At this time, we propose to retain the individual species account concept, with distributional information for each species on the FMCS website and linked to the Discover Life database. By October 1, our goals are to 1) settle on the species account format, 2) have regional reviewer(s) in place, and 3) have species account preparer(s) assigned for each species. We will continue to facilitate integration of additional museum collection data into the Discover Life database and explore the potential for linking other online information such as the Ohio State University Museum of Biodiversity fish host database (Tom Watters) to the Atlas. As a feature of the Atlas, we propose that a North American species list will be maintained, and the Status and Distribution Committee, in conjunction with the AFS Endangered Species Committee, will provide biennial reviews and revisions (if necessary) of taxonomy, distribution and conservation status for each species.

**Nominations (Leroy Koch)** – nothing to report. Next election will be in 2013.

**New Business**Mussel ID App. -- Suusan Oetker

Stan Martin, NC State is proposed to develop a mussel app. This would load up by regions, similar to topographic apps that download before fieldwork. The price estimate is about 50K with the request of FMCS kick-starting the development. Grants will hopefully be used for additional funds. Start with iPhone, then migrate to Android. Questions discussed included who would own the app? Science Apps, seed money grant Discover Life (John Pickering).

Motion – to provide \$5000 funding for the mussel app, second by Greg Z. Motion carried.

Redoing FMCS Traveling Display -- Megan Bradley

Replace with regional display(s) – smaller

Replace TV / VCR with a picture frame technology <\$300.

Where is the display now? We think it is in Louisville with Monte McGregor? Keep it there since upcoming SFS meeting is in Louisville this year and we may need it. Figure out how to track displays and the process for people to request them through the website.

Regarding upcoming meetings – do we have people to man the booth? Materials for handouts? Brochure? Does someone have any copies of the old Brochure and Membership Pamphlet? Who put the Word template together?? Web-based outreach materials? Add tab on the web page for educators? List of mussel educator tools? Trunks / keys, puppet animals – list of educator materials? Lots of good ideas were discussed. Megan volunteered to work on revising pamphlet for FMCS handout.

Translocation and Stocking Records -- Kevin Cummings

There was a lot of discussion on how to track translocation and stocking activities throughout the country. Kevin Cummings noted that reintroduction / propagation tracking in a central database is not happening and this information is critical for future conservation and distribution / genetics. National Fish stream registry database may be one avenue. Kevin Cummings volunteered to investigate / take lead on drafting a template to populate with data by the people doing releases and translocations.

Ad hoc committee on Ecosystem Services (Dan Spooner / Danielle Kreeger).

Obama whitepaper request; put together a paper on bivalve activities on eco services in the Chesapeake Bay ecosystem. What are ecosystem services? Filtration / excretion rates. But other things they are working on, habitat stability models. Indirectly mitigate nutrients, disease control. How do we value their services? Services not really included in valuation. Are they undervalued? Getting better quantitative models to provide better data. There are two ways to look at the issue – how much we've lost, or how much we gain from restoration. How much does it cost per taggable mussel?

Ad hoc committee on Regional Mollusk Meetings (Steve McMurray and Susan Oetker).

Steve presented results of questionnaire this committee sent out to various mollusk groups that have been meeting for many years. There were 20 responses. How can FMCS help these groups flourish, and possibly increase our membership through them? See full write-up as separate *Ellipsaria* article [below]. Greg Cope made a motion for the FMCS to offer \$100 per group each year to help these regional groups support their meetings. Motion carried. Greg Cope thanked the committee for all of their work.

American Fisheries Society Liaison (Jeremy Tiemann)

We are looking into developing a formal partnership with AFS.

A tribute for Carson Stringfellow in *Ellipsaria* is in the works [See page 63].

Revision of National Strategy (Patty Morrison and Catherine Gatenby)

The committee prepared a draft of revised issues and goals for the Board to review. They, then, did a brief brainstorming exercise to help insure that all relevant and timely issues are being addressed by the revised strategy. The proposed next step is an interactive web-based workshop in the November timeframe to get input from the Board and interested members on the new strategies to be adopted by FMCS through the published document. Following the workshop, the committee will draft its revised strategy and present at the March 2013 symposium, then go to final publication in *Walkerana*.

Reduced Dues for Students ? Tabled.

The next EXCOM meeting is proposed to be held sequential to or concurrent with the November 13-15, 2012 Ohio River Valley Ecosystem Mussel Group meeting at Thomas More College in Kentucky, near Cincinnati, Ohio. Target date for the Fall FMCS EXCOM meeting is November 13.

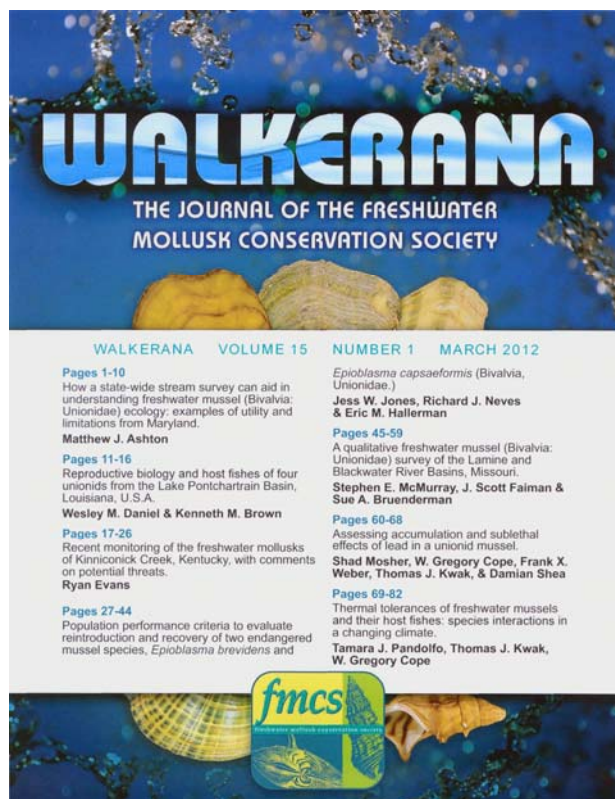
Meeting Adjourned.



## ***Walkerana* – Now the Official Journal of the FMCS**

As you may know, the first FMCS issue of *Walkerana* was posted on our web site in March 2012 [www.molluskconservation.org/Walkerana\\_CurrentCont.html](http://www.molluskconservation.org/Walkerana_CurrentCont.html). We are now accepting manuscripts for the September 2012 issue. Articles including all aspects of the biology of freshwater mollusks are welcome: ecology, physiology, toxicology, reproduction, etc. Survey results are acceptable if they have heuristic value and are used to compare previous studies and results; a simple list of taxa encountered is not acceptable. Brief notes and observations of a parochial nature are not acceptable and should continue to be submitted to *Ellipsaria*. New taxa cannot be described in a purely electronic journal such as *Walkerana* according to the International Commission of Zoological Nomenclature.

Manuscripts must be submitted through the Author Portal on the FMCS website: [www.molluskconservation.org/Walkerana\\_upload.html](http://www.molluskconservation.org/Walkerana_upload.html). Hard copy or emailed papers will not be considered. Please read the Instructions for Authors concerning manuscript preparation and file uploading conventions. Manuscripts must represent original research and must not be currently considered for publication elsewhere. All material published in *Walkerana* is the property of the Freshwater Mollusk Conservation Society.



## **Potential FMCS Support for Regional Freshwater Mollusk Meetings**

Submitted by **Steve McMurray, Susan Oetker, and Greg Cope**

The *Ad hoc* Committee on Regional Mollusk Meetings was formed at the Louisville Symposium to review and assess the relationship between FMCS and the many informal regional mollusk meetings that are held each year around the country. The intent of this review was to determine how or whether FMCS might facilitate these meetings. The *ad hoc* committee was tasked with developing a survey or questionnaire to gather information about the regional meetings and their potential interest in FMCS assisting with their meetings to achieve our common goal: bringing people together who work with freshwater mollusks to exchange information and to conserve and protect the fauna.

In total, we received 20 responses to our questionnaire; thanks to all of our colleagues that completed one of the surveys. Most of the regional groups have been in existence for >5 years (n=14), cover multiple river basins or states (n=14), meet annually (n=13), and last for >1 day (n=10). All of the regional meetings are attended by a large array of individuals, including agency personnel, academia, private citizens, scientists, and others.

One of the most important items the Executive Board wished to know was the needs of the various regional groups that could be met or assisted by FMCS. A majority of the regional groups indicated they were interested in monetary support from FMCS to help defray the costs of their meetings. At the Spring Board meeting in Athens, Georgia, prior to the 2012 Workshop, the Executive Board approved a motion to grant up to \$100 to each regional mollusk group to help defray the costs associated with hosting their meeting. The Awards Committee offered to develop an application process and manage these funds, which could be applied for by an active FMCS member. The application form and procedure should be available for review at the Fall 2012 FMCS Board Meeting and, if approved, meeting grant funds would be available for application in calendar year 2013.



## Regional Meeting Reports

### Report on the Second Annual Interior Highland Mollusk Conservation Meeting, North Arkansas Community College, Harrison, Arkansas, April 10-11, 2012

Contributed by **Shawn Hodges**

The second annual meeting of the Interior Highland Mollusk Conservation Meeting (IHMCM) convened at the North Arkansas Community College central campus, near the Buffalo National River headquarters in Harrison, Arkansas. A total of 23 were in attendance for six presentations concerning freshwater mussels and an endangered species listing update for the Neosho mucket (*Lampsilis rafinesqueana*) and rabbitsfoot (*Quadrula cylindrica cylindrica*) mussels. The meeting opened with a welcome by Barbara Wilson, the Chief of Fire and Resource Management at the Buffalo National River.

Presentations included:

- Shawn Hodges presented the history of freshwater mussels of the Buffalo National River.
- Amy Cravens presented her undergraduate project on the viability, metamorphosis, and juvenile condition of larval fatmucket (*Lampsilius siliquioidea*) brooded for 6 and 18 months.
- Barbara Wilson covered the actions being taken by the Buffalo National River to ensure zebra mussels are not introduced from surrounding, infested lakes.
- Bryan Simmons discussed the protection and enhancement program for the Lower Osage River.
- David Johnson presented his thesis work on the impact of parafluvial ammonia concentrations on caged freshwater mussels in the Buffalo River.
- Shawn Hodges lead an open discussion on the impacts climate change might have on the freshwater mussel populations within the Interior Highlands with an emphasis on the loss of endemic fish species.

Before the meeting was adjourned, Dan Mosier stated that Kansas would be willing to host the meeting in 2013. The time and location of that meeting will be determined at a later date.

## Upcoming Meetings

**June 16 – 21, 2012** -- The American Malacological Society 2012 Annual Meeting, in the Philadelphia, Pennsylvania area. Scientific sessions of interest to FMCS members include “Magnitude of Molluscan Diversity, the known and the unknown”, and “North American Mollusk Conservation”.  
<http://www.malacological.org/meetings/index.php>

**August 19 – 23, 2012** – American Fisheries Society 142 Annual Meeting, Minneapolis-St. Paul, Minnesota Theme: “Fisheries Networks: Building Ecological, Social, and Professional Relationships”  
<http://afs2012.org/>

**September 4 – 7, 2012** -- International Meeting on Biology and Conservation of Freshwater Bivalves, Campus of Santa Apolónia of the Polytechnic Institute of Bragança, Bragança, Portugal  
<http://esa.ipb.pt/bivalves/>

**November 11 – 15, 2012** -- Society of Environmental Toxicology and Chemistry (SETAC) 33<sup>rd</sup> North American Annual Meeting, Long Beach, California Theme: “Catching the Next Wave: Advancing Science through Inovation and Collaboration” <http://longbeach.setac.org/>

**March 10 – 14, 2013** -- FMCS 8<sup>th</sup> Biennial Symposium, Guntersville State Park, Guntersville, Alabama Tentative Theme: “Species Recovery and Restoration - from Concept to Implementation.”

## New Publications

Mosher, S., W. G. Cope, F. X. Weber, D. Shea, and T. J. Kwak. 2012. Effects of lead on Na<sup>+</sup>,K<sup>+</sup>-ATPase and hemolymph ion concentrations in the freshwater mussel *Elliptio complanata*. *Environmental Toxicology*. 27(5):268-276. For a reprint, please contact Greg Cope (e-mail: [greg\\_cope@ncsu.edu](mailto:greg_cope@ncsu.edu) ).

Haag, Wendell R. [2012] *North American Freshwater Mussels: Natural History, Ecology, and Conservation*. Cambridge University Press. Hardback, 536 pages, 123 b/w illustrations, 21 color illustrations, 3 maps, 30 tables. \$140.00 Available August 2012. Order at: [www.cambridge.org/us/9780521199384](http://www.cambridge.org/us/9780521199384) or call 1/800/872-7423. Before 12/31/2012, enter Discount Code F2HAAG at checkout to receive a 20% discount (cuts price to \$112.00).

Hoke, Ellet. 2011. The Freshwater Mussels (*Mollusca: Bivalvia: Unionoida*) of Nebraska. *Transactions of the Nebraska Academy of Sciences* 32:1-46. PDF downloads available from <http://digitalcommons.unl.edu/tnas/> .

**Abstract:** This paper reports the results of the first statewide survey of the freshwater mussels of Nebraska. Survey goals were: 1) to document current distributions through collection of recent shells; 2) to document former distributions through collection of relict shells and examination of museum collections; 3) to identify changes in distribution; 4) to identify the primary natural and anthropomorphic factors impacting unionids; and 5) to develop a model to explain the documented distributions.

The survey confirmed 30 unionid species and the exotic *Corbicula fluminea* for the state, and museum vouchers documented one additional unionid species. Analysis of museum records and an extensive literature search, coupled with research in adjacent states, identified 13 additional unionid species with known distributions near the Nebraska border. Some of these unionids may have formerly inhabited the state. Seven documented species have probably been extirpated, and the ranges of 15 others have contracted significantly. Only nine species are relatively stable at present, and one of these is extremely rare and federally endangered. Diversity is concentrated in the formerly glaciated portion of eastern Nebraska, and drops abruptly along the Missouri River to the east and in the Great Plains westward.

The primary natural factors influencing unionid distributions in Nebraska include availability of perennially flowing waters, host fish diversity, substrate composition and stability, and formerly heavy sediment loads. Anthropomorphic factors are surface and subsurface irrigation withdrawals, construction of canals and reservoirs, channelization, erosion, intensive grazing, contaminants, and the introduction of invasive species. Unionid presence and diversity largely correlates with substrate stability. Stream orientation and morphology in portions of eastern Nebraska promote slow currents, and substrates composed of mud, sand, and rock provide greater stability than the shifting sand substrates common elsewhere in the state. In central and western Nebraska, unionid populations are concentrated in headwaters, backwaters, and side-channels of rivers, and canals, reservoirs, and small tributaries, while the generally shifting sand habitats of most rivers provide relatively little viable habitat. In the historic Missouri River, unstable substrates and (formerly) heavy sediment loads limited diversity to silt tolerant species, and viable habitat largely to backwaters, sloughs, attached lakes, side-channels, and relatively few main channel environments.

Today, upstream dams have greatly reduced the sediment load in the Missouri River, but unstable substrates restrict mussels to backwaters, side channels, pools below wing dams, revetments, and other areas sheltered from strong currents. Channelization and erosion/sedimentation have destroyed or drastically impacted stream habitats in eastern Nebraska resulting in the loss of much of the original unionid diversity. Surface and subsurface irrigation, coupled with related declines in water tables, have eliminated habitat in western Nebraska, though losses for some species are partially compensated by colonization of viable reaches of newly created impoundments and canals. Intensive grazing along streams and agricultural pollution further exacerbate habitat degradation and pressure remaining unionid populations. Invasive species directly compete with native mussels for sustenance and living space and may become serious threats to the survival of remaining unionid species in some habitats.

## Contributed Articles

The following articles have been contributed by FMCS members and others with interest in freshwater mollusks. These contributions are incorporated into *Ellipsaria* without peer review and with minimal editing. The opinions expressed are those of the authors.

### **What is the Correct Generic Name of the Invasive Tropical Thiariid Species Occurring in Israel and Elsewhere that was Described Originally as *Buccinum scabrum* Müller, 1774?**

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The use of the name *Thiara scabra* (Müller, 1774) for a tropical freshwater snail belonging to the family Thiariidae, which is rapidly invading all types of freshwaters in Israel and elsewhere outside of its native area of distribution, has recently been questioned by Glaubrecht et al. (2009). They transferred this species, which had been described originally as *Buccinum scabrum* to the genus *Plotia* Röding, 1798. Recently, Bogan (2012) followed this name change.

Although Glaubrecht et al. (2009) might be correct in considering *Thiara scabra* not congeneric with the type of the genus *Thiara* Röding, 1798 (which is *Helix amarula* Linnaeus, 1758), the transfer of *Thiara scabra* to the genus *Plotia* Röding, 1798 is incorrect. Röding (1798) introduced the generic name *Plotia* for fifteen species. Five of these names were introduced without descriptions or reference to any former description or figure; these so-called nude names are: *turrita*, *lurida*, *fossilis*, *dentata* and *dubia*. The remaining ten names were given to species belonging to four different families: Thiariidae (*minuta*, *fuscata* and *atra*), Bulimulidae (*virginea* and *puellaris*), Pyramidellidae (*lineata*, *filata* and *punctata*) and Nassaridae (*vittata* and *tranquebarica*) (Forcart, 1950). Röding did not select a type species for the genus *Plotia*.

The first attempt to select a type species for the genus *Plotia* was carried out by Brot (1874, and not 1877 as mentioned in Glaubrecht et al, 2009). Brot selected *Melania spinulosa* Lamarck, 1822 as the type of that genus. That selection is not valid, however, because, as Pilsbry & Bequaert (1923) quite correctly remarked, the name *spinulosa* is not among the ten valid names mentioned in Röding 1798.

In order to exclude the name *Plotia* from the nomenclature of Melanians (Thiariidae), Pilsbry & Bequaert (1923) selected *Plotia lineata*, a Pyramidellid species, as the type of the genus *Plotia*. Unfortunately the type selection by Pilsbry & Bequaert (1923) has been overlooked by subsequent authors and some continue to use the name *Plotia* while others use the generic name *Thiara* Röding. *Thiara* has as type species *Helix amarula* Linnaeus, 1758 (Figure 1), not by monotypy as mentioned by Glaubrecht & al. (2009), but by subsequent designation by Brot (1874), because two valid species were originally included by Röding in the genus: *Thiara: amarula* (Linnaeus, 1758) and *Thiara cancellata* Röding, 1798 (Morrison, 1954).

Winckworth (1945) was apparently neither aware of Brot's invalid type selection, nor the valid type selection by Pilsbry & Bequaert, and selected *Plotia minuta* Röding, 1798, as the type of *Plotia*. In that way *Melanoides* Olivier, 1804, with its type species *Melanoides fasciolata* Olivier, 1804 = *Melanoides tuberculata* (Müller, 1774) (Figure 2), should have become a junior synonym of *Plotia*, because *Plotia minuta* Röding is a junior synonym of *Melanoides tuberculata*. A year later, Winckworth (1946) corrected his designation and accepted the type selection by Pilsbry & Bequaert, and added: "Thus *Plotia* antedates *Pyramidella* Lamarck 1799, which is an exact synonym."

Back to "*Thiara*" *scabra*. Abbott (1948) listed this species as *Thiara (Plotiopsis) scabra*. *Plotiopsis* Brot, 1874 has as type species by original designation *Melania balonnensis* Conrad, 1850 (Figure 3). However, according to Glaubrecht et al. (2009), *Plotiopsis balonnensis* is, from the molecular point of view, quite different from *scabra* and they are therefore not congeneric; i.e. the genus *Plotiopsis* cannot include the species *scabra*.



Forcart (1950) briefly reviewed the *Plotia* puzzle and reached the conclusion that, for the species similar to *scabra*, a subgeneric name was lacking within the genus *Thiara*. He erected the new subgenus *Pseudoplotia*, with *Buccinum scabrum* Müller, 1774 as type species (Figure 4). At the same time, he made the same mistake as Winckworth (1945) and selected *Plotia minuta* Röding, 1798 as the type species of *Plotia* Röding, 1798. Rehder pointed out to Forcart that he had overlooked the type designation by Pilsbry & Bequaert and together they asked the International Commission of Zoological Nomenclature for a ruling, not only involving *Plotia* but also *Pyramidella* (Rehder & Forcart, 1952). Their request was endorsed by Opinion 386: *Plotia* [Röding] 1798 suppressed under the plenary powers for the purposes of the Principle of Priority but not for those of the Principle of Homonymy (Anonymous, 1956). In other words, although *Plotia* Röding, 1798 is a senior synonym of *Pyramidella* Lamarck, 1799, the latter name has precedence over the former.

For those who have lost their way in this review, the main point reads: if the Thiarid species usually known as *Thiara scabra* cannot be maintained in the genus *Thiara* as proposed by Glaubrecht et al. (2009), then this invasive tropical freshwater gastropod should be placed in the genus *Pseudoplotia* Forcart, 1950 and, therefore, its correct name should be *Pseudoplotia scabra* (Müller, 1774) (Figure 4).

### Acknowledgements

I thank Arthur E. Bogan for pointing my attention to the nomenclatorial Gordian knot involving the name of this highly invasive freshwater gastropod which may cause conservation problems in many (sub-) tropical countries, Matthias Glaubrecht for pointing out some typographical errors in the manuscript, and last, but not least, my friend and colleague Oz Rittner at the Tel Aviv University for the photographs illustrating this article.

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Figure 1. *Thiara amarula* (Linnaeus, 1758).



Figure 2. *Melanoides tuberculata* (Müller, 1774).



Figure 3. *Plotiopsis balonnensis* (Conrad, 1850).



Figure 4. *Pseudoplotia scabra* (Müller, 1774).

## On the Presence of the Invasive Mimic *Lymnaea Pseudosuccinea columella* in Israel (Gastropoda, Lymnaeidae)

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The Mimic lymnaea or American ribbed fluke snail *Pseudosuccinea columella* (Say, 1817), Family Lymnaeidae, is the only recent species currently recognized within the genus *Pseudosuccinea* F.C. Baker, 1908. As the generic name already indicates, it looks very much like an Amber snail belonging to the family Succineidae. While the latter are terrestrial snails usually living in a wet habitat, *Pseudosuccinea columella* is principally an aquatic species with an amphibious habit: i.e. it is often leaving the water voluntarily and crawling around on the wet mud of the banks just above the waterline.

This Lymnaeid species is easily differentiated from all other species by the fine sculpture of incised spiral lines crossed by axial growth lines. This sculpture is especially evident when the shell surface is dry. Empty shells usually have a light horn-brown colour; however, living snails look almost coal-black due to the dark colour of the animal.

In its original, natural distribution, it is restricted to North America. Since an early stage in man's history, it has been dispersed over extensive areas, however especially during the second half of the 20<sup>th</sup> Century and the beginning of the 21<sup>st</sup> Century, its establishment outside its natural range seems to be rather explosive. Everywhere it turns up in botanical gardens, plant nurseries, commercial hothouses of (semi-)aquatic plants, garden centres. From there, it is transferred to ponds in private gardens and public parks, from where it often manages to establish itself in more natural waters like ditches, canals, slow running streams, ponds, lakes, and marshes. Today it is not only known from North, Middle, and South America, but also from many countries in Europe, Asia, Africa, Australia, and New Zealand.

The first records of *Pseudosuccinea columella* from Israel date from the period 1965-1967 when Daniel Gold carried out fieldwork throughout the boundaries of Israel pre-Six Day War for his Ph.D. thesis dealing with the presence of Liver flukes *Fasciola* in Israel (Gold, 1972). During that time, the only locality of *Pseudosuccinea* in Israel turned out to be a small pool in the Botanical Garden of the Tel Aviv University when that institute was still located at Abu Kabir, Tel Aviv-Yafo (Gold & Lengy, 1970). Gold mentions another locality in his doctorate (1972): Ramat Gan, Park HaLeumi, in an artificial lake. That find took place probably in the period 1970-1971. His prediction that the species would turn up in additional localities throughout Israel has become a fact. It is now known from a large variety of natural and artificial aquatic habitats throughout the country and the number of locations is increasing rapidly.



Figure 1. *Pseudosuccinea columella* from the ventral (aperture) and dorsal side.



**Distribution of *Pseudosuccinea columella* in Israel**

The following records show that *Pseudosuccinea columella* occurs in Israel from the extreme north in Upper Galilee and the Golan Heights down to Beersheva in the south at the border of the Negev desert. Collection dates are listed in this form: Day.Month.Year. Only the first record at each locality is mentioned. Most records are based on material present in the following collections:

HUJ – Mollusc Collection, National Natural History Collections of the Hebrew University of Jerusalem;

IES – the former collection of the Inland Waters Ecological Survey of the Nature Research Authority assembled by Dr. R. Ortal, now incorporated in the HUI-collection;

TAU MO – Mollusc Collection, the Steinhardt National Collections of Natural History of the Tel Aviv University;

TAU – Collection of the Institute for Nature Conservation Research at the Tel Aviv University.

Although this material is already kept in the so-called wet-collection of the Steinhardt National Collections of Natural History, so far it has not been released for incorporation in its Mollusc Collection, collection numbers are therefore lacking.

**Localities:**

GOLAN HEIGHTS: Upper Daliyot, pond-like part south of the road, H.K. Mienis & O. Rittner, 16.05. 2011 (TAU MO 73066).

UPPER GALILEE: Dan, southern ponds, D. Kolodny. 28.05.2008 (HUJ 51993); "Galil", Y. Sinai, 2009 (TAU MO 64345).

HULA VALLEY: Hula Nature Reserve, Western Pond, Ch. Dimentman, 14.03.1999 (HUJ 50999); Stat. 9, T. Strud, 28.05.2002 (HUJ 53617); Stat. 10, T. Strud, 25.06.2002 (HUJ 53615); HaSadooq, T. Oron, 14.06.2001 (HUJ 53595).

Hula Agmon, exit, Sh. Ashkenazi, 24.03.1996 (HUJ 5163); Southern enclosure, Sh. Ashkenazi, 20.04.1996 (HUJ 53603); On *Nymphaea*, E. Yasur, 19.03.1996 (HUJ 53604); North, on *Potamogeton*, Ch. Dimentman, 03.09.1996 (HUJ 53605); North-East on *Potamogeton*, Ch. Dimentman, 30.09.1996 (HUJ 53607); Ma'agan, Ch. Dimentman, 25.11.2000 (HUJ 51019); Jordan Canal, benthos, Ch. Dimentman, 17.09.1998 (HUJ 53593); On *Potamogeton*, Ch. Dimentman, 21.08.1996 (HUJ 53606); Stat. 302/3, on *Ceratophyllum*, Ch. Dimentman, 03.11.1998 (HUJ 53602); Stat. 303/2, Ch. Dimentman, 28.11.2001 (HUJ 53621); Stat. 308, Ch. Dimentman, 22.12.1999 (HUJ 53622); Stat. 403, Ch. Dimentman, 23.03.2001 (HUJ 53625); Stat. 403/2, Ch. Dimentman, 28.10.2001 (HUJ 53626); Dam 1111 East, Ch. Dimentman, 06.04.2001 (HUJ 53613); Stat. 1170, Ch. Dimentman, 29.06.2000 (HUJ 53627); Stat. 1180, Ch. Dimentman, 28.11.2000 (HUJ 53608); Stat. 1184 East, Ch. Dimentman, 29.06.2000 (HUJ 53628); After a dam, Ch. Dimentman, 06.01.2001 (HUJ 53614); Near a dam, Ch. Dimentman, 26.05.2001 (HUJ 53629); Farshal, Ch. Dimentman, 25 November 2000 (HUJ 53609).

NA'AMAN RIVER DRAINAGE AREA: Afeq springs, propagation basin, D. Milstein, 03.03.2011 (TAU MO 72787).

EN HASHOFET: educational farm, commercial freshwater pond, D. Milstein, 03.03.2011 (TAU MO 72790).

AVIEL DRAINAGE AREA: stat. 1.1, Y. HersHKovitz, 08.03.2007 (TAU); stat. 1.2, Y. HersHKovitz, 08.03.2007; stat. 3.1, Y. HersHKovitz, 13.03.2007 (TAU); stat. 3.2, Y. HersHKovitz, 13.03.2007 (TAU).

TEL AVIV: Meir Garden pond, H.K. Mienis, 14.03.1995 (HUJ 40548); Abu Kabir, old botanical garden of the Tel Aviv University, pond, 1965-1967 (Gold & Lengy, 1970; Gold, 1972); Ramat Aviv, Tel Aviv University, Botanical Garden, in northern pond and stream, H.K. Mienis, 05.03.1995; In pond of the tropical garden, H.K. Mienis, 09.03.1995 (HUJ 40494); In southern pond and stream, H.K. Mienis, 09.03.1995 (HUJ 40517); In pool with *Nymphaloides indica*, H.K. Mienis, 03.03.2005 (TAU MO 72104); In "Oasis En Gedi", H.K. Mienis, 25.05.2010 (TAU MO 69573); Pond at the end of "Oasis En Gedi", H.K. Mienis & O. Rittner, 26.01.2012 (TAU MO 751652); Ramat Aviv, Tel Aviv University, Zoological Garden, in ponds, H.K. Mienis, 21.04.2005 (TAU MO 51382); Ramat Aviv, in ornamental fishpond at the corner of Einstein and Brodetsky Street, H.K. Mienis, 03.02.2000 (TAU MO 29986); Ornamental pond in Einstein Street, H.K. Mienis, 14.02.2012 (TAU MO 72907).

RAMAT-GAN: Park HaLeumi, large artificial lake, 1970-1971? (Gold, 1972); Bar Ilan University, in pond with water-lilies, H.K. Mienis, 03.5.1995 (HUJ 12656).

YARQON RIVER DRAINAGE AREA: Nuphar pool, on *Nuphar lutea*, H.K. Mienis, 1975 (Mienis, 1995); Train bridge west of Nuphar pool, Y. HersHKovitz, 18.07.2000 (TAU); 40 Dam, Y. HersHKovitz, 01.07.2001 (TAU); Hadarim drainage, Y. HersHKovitz, 01.07.2001 (TAU); Mitug, Y. HersHKovitz, 12.09.2006 (TAU); Lavnon Pool, Y. HersHKovitz, 12.09.2006 (TAU); Near the entrance of the Qana River into the Yarqon River, R. Ortal, 03.10.1978 (IES 1354).

RISHON LEZIIYON: "Shafdan", in Dana Milstein's wetland, D. Milstein, 08.04.2005 (TAU MO 50802); "Banana Lake" near "Superland", H.K. Mienis, 19.08.2007 (TAU MO 58885); Park HaAgam near "Superland", H.K. Mienis, 12.04.2009 (TAU MO 63646).

NETZER SERENI: In aquarium, D. Kressel, 08.1982 (HUJ 983); Pond near dining room, H.K. Mienis, 07.03.1984 (HUJ 982).

REHOVOT: In a ditch near the old railway station, H.K. Mienis, 04.1983 (HUJ 1301).

GEZER: 'En Vered (= 'Ein Yered), H.K. Mienis (TAU MO).

JERUSALEM: The Wohl Rose Garden opposite the Knesset, in pond, H.K. Mienis, 26.02.1995 (HUJ 40550); Givat Ram, Hebrew University, Botanical Garden, in pond near Neve Sha'anani Gate, H.K. Mienis, 19.02.1995 (HUJ 40479); In basins of the Freund Centre for Plant Introduction and Propagation, H.K. Mienis, 19.02.1995 (HUJ 40480); In pond in front of the Chaim Weizman Memorial Laboratory, H.K. Mienis, 17.08.2008 (TAU MO 60813).

BEERSHEVA, Ben Gurion University of the Negev, pond near the Biology Department, R. Ortal, 04.03.1989 (HUJ 40489).

### Interceptions:

BEN GURION AIRPORT, intercepted from a shipment of *Anubius*, E. Sharef, 1996 (TAU MO 62631).

Intensive studies during a number of years have revealed the common presence of it in both the Hula Nature Reserve and the re-established Hula Agmon by Chanan Dimantman and the upper, clean part of the Yarqon River by Yaron Hershkovitz. In both areas, the transfer of *Nuphar lutea* from the Botanical Gardens of the Tel Aviv University has probably played a crucial role in the establishment of *Pseudosuccinea*.

*Pseudosuccinea columella* has been encountered so far mainly on *Nymphaea alba*, *Nuphar lutea*, *Nymphaloides indica*, *Potamogeton nodosus*, and on the stems of *Typha* species (Dimantman et al., 1996 & 1997; and personal observations H.K. Mienis). At numerous places, it is also found crawling just above or below the water edge.

During our research, we were able to register predation on *Pseudosuccinea columella* by the introduced American leech *Helobdella triseriata* in Netzer Sereni (Mienis, 1986 as *Helobdella punctatolineata*, see Bromley, 1994) and, most recently, in the Botanical Garden of the Tel Aviv University (Mienis and Rittner, unpublished). In addition, it is preyed upon by two aquatic/wading birds: Moorhens *Gallinula chloropus* (Mienis, 1987) and Green sandpipers *Tringa ochropus* (Mienis, 1990). Both occasions took place in a ditch near the old railway station of Rehovot. Without doubt, other bird species known to feed regularly on freshwater molluscs will probably carry out predation on this invasive species (Mienis, 2004, 2009a & 2010b).

We repeat the prediction by Gold (1972) done in the early eighties: in the near future, we expect this invasive species to occur in numerous additional localities in Israel. An unfortunate event because the native inland aquatic mollusc fauna of Israel has more and more to cope with the success of an increasing number of invasive species (Mienis, 2009b & 2010a; Roll et al, 2009). Besides competition with the autochthonous freshwater gastropods, we still have to mention another negative aspect of its introduction and establishment in Israel: it is known as a highly suitable host of the liver fluke *Fasciola hepatica*, a parasite of domestic sheep and wild representatives of the Bovidae.

### Acknowledgements

We like to thank Drs. Chanan Dimantman (Hebrew University of Jerusalem) and Yaron Hershkovitz (at that time of the Tel Aviv University) for lodging their collected material respectively in the Mollusc Collection of the Hebrew University and the Tel Aviv University.



Figure 2. *Pseudosuccinea columella* with egg-mass.

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## Exotic and Invasive Freshwater/ Limnic Mollusks in Brazil: a Quick Review of Current Knowledge, with Special Emphasis on the Southern Region

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Until the month of January 2012 had a record field of 12 species of exotic and invasive continental freshwater/ limnic mollusks forms: eight gastropods (2 Prosobranchia/ Caenogastropoda and six Pulmonata); and four bivalves (one mussel and three clams) occurring in the wide Brazilian territory, mainly in the Southern region (Agudo & Bleicker 2006; Simone 2006:306-307, 312; Agudo-Padrón & Lenhard 2010; Pereira 2010:7; Agudo-Padrón 2011b).

Of this total, the asiatic golden mussel *Limnoperna fortunei* (Dunker, 1857) (Agudo 2004; Agudo-Padrón 2006, 2007a-c, 2008b; Agudo-Padrón & Lenhard 2010:38) (Figure 1) and the afro-asiatic snail *Melanoides tuberculatus* (Müller, 1774) (Agudo-Padrón 2008a, 2010, 2011a) (Figure 2) are now the most important invasive exotic freshwater/ limnic mollusks present in this country, mainly due to anthropogenic implications for the economy and public health.



**Systematic Species List****GASTROPODA**

Family AMPULLARIIDAE

*Pomacea paludosa* (Say, 1829)

Family THIARIDAE

*Melanoides tuberculatus* (Müller, 1774)

Family PHYSIDAE

*Aplexa rivalis* (Maton & Rackett, 1807)

Family LYMNAEIDAE

*Lymnaea columella* Say, 1817

Family PLANORBIDAE

*Biomphalaria pfeifferi* (Krauss, 1848)*Bulinus tropicus* (Krauss, 1848)*Helisoma caribaeum* (d'Orbigny, 1845)*Helisoma duryi* (Wetherby, 1879)**BIVALVIA**

Family CORBICULIDAE

*Corbicula fluminalis* (Müller, 1774)*Corbicula fluminea* (Müller, 1774)*Corbicula largillierti* (Philippi, 1844)

Family MYTILIDAE

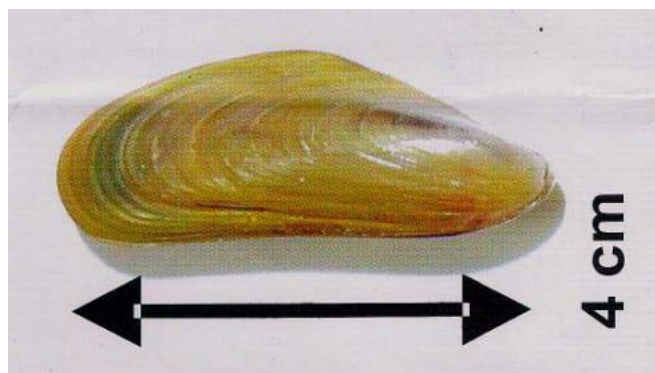
*Limnoperna fortunei* (Dunker, 1857)

Figure 1. Asiatic golden mussel *Limnoperna fortunei* (Dunker, 1857)



Figure 2. Afro-asiatic limnic snail *Melanoides tuberculatus* (Müller, 1774)

Finally, in addition to the above confirmed introduced species, there is an unresolved issue about whether the limnic pulmonate snail in the Family PHYSIDAE *Physa acuta* Draparnaud, 1805 (Agudo-Padrón & Lenhard 2010:39) is native or exotic. It is considered native in Brazil by Simone (2006: 101, 307).

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### **New geographical record of amphibian slugs *Omalonyx* (Gastropoda: Pulmonata: Succineidae) in the North of Santa Catarina's State, Southern Brazil**

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In southern Brazil, *Omalonyx convexus* (Heynemann, 1868), representative pulmonate gastropod species of the genus *Omalonyx* d'Orbigny, 1837 and family Succineidae Beck, 1837, is present in the Rio Grande do Sul/ RS (Arruda & Thomé 2011) and Santa Catarina/ SC States. Until recently, however, in the territory of Santa Catarina this little amphibian slug species was known only in the following municipalities, from South to North: São João do Sul, Criciúma, Santa Catarina Island (in Florianópolis), Palhoça, Paulo Lopes and Camboriú (Agudo-Padrón 2008: 154, 2009, 2011 a).

On March/ April 2012 (in rainy day), specimens of *Omalonyx convexus* (Heynemann, 1868) – dozens of them walking by on the premises and macrophytes – were detected and photographed by a colleague naturalist, Luis Adriano Funez (<https://sites.google.com/site/biodiversidadecatarinense/home>) in creating ponds of fingerlings located in a ornamental fish farm ("Peixinhos Lange Ltda.") on Timbó, Rodovia (Highway) SC 417, Timbó Municipal District – 26°49'22"S & 49°16'19"W (Figure. 1), North to the State, densely populated by aquatic plants/ macrophytes *Eichhornia* spp and *Pistia stratiotes* used for spawning carp (Figure 2). This is the second confirmed record – after the Municipal District of Camboriú – of amphibian slugs in the Northern section of the Santa Catarina's State located in the domain of the Itajai-Açu River Basin Valley (Agudo-Padrón 2011 b).



Figure 1. Location of the Municipality of Timbó in the geographical context of the Santa Catarina's State/ SC



Figure 2. Amphibian slug *Omalonyx convexus* (Heynemann, 1868) of Timbó, SC Photo: Luís Adriano Funez

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### **A New Emerging Scientific Continental Malacological Collection - II - in RS State, Southernmost Brazil: Augusto Ruschi Zoobotanical Museum, Passo Fundo University - UPF, Passo Fundo Municipal District, RS (CMOUPF)**

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Since October 2006, the specific scientific mollusc collection deposited in the Zoobotanical Museum "Augusto Ruschi" - MUZAR (CMOUPF) is developed, counting the months until July 2011, a total of 68 species; 36 of which are freshwater forms (20 Gastropoda & 16 Bivalvia), distributed in 11 families and 19 genera; and 30 terrestrial gastropod forms distributed in 13 families and 22 genera, and even two marine/ eurihaline forms (11 Gastropoda & Bivalvia) in their turn divided into two families and two genera. In addition, there are still a number of lots waiting to be properly processed.





Figure 1.- Location of the Municipal District of “Passo Fundo” (red color) in the Rio Grande do Sul State - RS, southernmost Brazil (left), and the headquarters of the Zoobotanical Museum “Augusto Ruschi” - MUZAR (right).

The specimens are cataloged as well as geographic locations belonging provenance, emphasis in the Municipalities of the Santa Catarina's State - SC (with 143 lots - 96 Gastropoda & 47 Bivalvia) (Agudo-Padrón 2008b), and the Brazilian States of Rio Grande do Sul - RS (with 14 lots - four Gastropoda & 10 Bivalvia); Paraná - PR (with 11 lots - 8 Gastropoda & 3 Bivalvia); Mato Grosso do Sul - MS (15 lots - 13 Gastropoda & 2 Bivalvia); Rio de Janeiro - RJ, Ceará - CE and Maranhão - MA (with only one batch of each Gastropoda); Pará - PA (with two lots - 1 Gastropoda & 1 Bivalvia); Amazonas - AM (with 5 lots - 1 Gastropoda & 4 freshwater Bivalvia); and finally the “Department of Salto” from the neighboring country of the Oriental Republic of Uruguay (with 13 lots of limnic species - 7 Gastropoda & 6 Bivalvia) (Agudo-Padrón 2006, 2008a).

Each related species is presented accompanied by the following minimum information: number of lot/CMOUPF lot, city and State of origin, number of specimens contained in the lot. The 205 lots recorded so that by the time said make up the collection are listed in a digital file organized in taxonomic order to the species level (... except for the cases still pending establishment of their identity!).

For more complete and detailed information concerning the species recognized to date in this scientific establishment, please contact the author of this contribution.

The scientific biological collections (molluscs including) are fundamental in the study of biodiversity in various fields of basic and applied research, which is extremely important in the correct and responsible driving and conservation (Agudo-Padrón 2011).

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## 2011 Freshwater Mollusk Bibliography

Compiled by Kevin S. Cummings

Illinois Natural History Survey, Champaign, Illinois

The following are papers on freshwater mollusks that have been published up to and including 2011 that have not appeared in previous FMCS bibliographies. Citations for Aquatic Mollusca will be split into five groups for the convenience of researchers: Unionoida, Sphaeriidae, Corbiculidae, Dreissenidae & other Bivalves, and Gastropoda. Those papers which list taxa from more than one of the above categories will be included in each group. A web searchable database of over 18,000 references on freshwater mollusks (including all previous FMCS bibliographies on freshwater mollusks) can be found at:

<http://ellipse.inhs.uiuc.edu:591/mollusk/biblio.html>.

To insure that papers are cited correctly, researchers are encouraged to send pdf's or reprints to: Kevin S. Cummings, Illinois Natural History Survey, 607 E. Peabody Dr., Champaign, IL 61820. email: [ksc@inhs.illinois.edu](mailto:ksc@inhs.illinois.edu)

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*Ellipsaria* is posted on the FMCS web site quarterly, early in March, June, September, and December. This newsletter routinely includes Society news, abstracts, job postings, meeting notices, publication announcements, informal articles about ongoing research, and comments on current issues affecting freshwater mollusks. Contributions may be submitted at any time but are due by the 15<sup>th</sup> of the month before each issue is posted. Anyone may submit material for inclusion in *Ellipsaria*; however, only current dues-paying members of FMCS can access it on-line. Information for possible inclusion in *Ellipsaria* should be submitted via e-mail to the editor, John Jenkinson, at [jjjenkinson@hotmail.com](mailto:jjjenkinson@hotmail.com).

MSWord is optimal for text documents but the editor may be able to convert other formats. Graphics should be in MSExcel, PhotoShop, TIF, GIF, BMP, or EPS format; again, the editor may be able to translate other formats. Please limit the length of informal articles to one page of text. Note that submissions are not peer reviewed but are checked for clarity and appropriateness for this newsletter. Feel free to contact the editor with any questions about possible submissions or transmission concerns.

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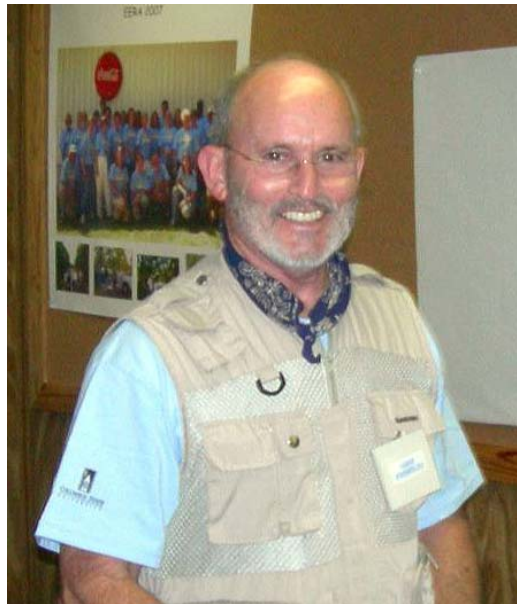
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## Obituary -- Rufus Carson Stringfellow (1946 – 2012)



On January 15<sup>th</sup>, 2012 the mussel community lost a friend and colleague in the unexpected passing of Rufus Carson Stringfellow. Carson, as he was better known, earned his Bachelor of Science Degree in Biology from Columbus State University (CSU), Columbus, Georgia in 1970 and later earned his Master of Science Degree in Environmental Science in 1997 from CSU. Carson's thesis research "A survey of freshwater bivalves in five creeks located in west-central Georgia" drew him into the world of mussels and he never looked back. His continued research and work with mussels evolved into a faculty position at CSU. He conducted research involving freshwater mussels across Georgia, Florida, and Alabama, as well as leading several international classes abroad to Africa, China, Australia, Ecuador, and Costa Rica.

Carson advised several graduate students while investigating the early life-histories of *Elliptio chipolaensis* and *Elliptoideus sloatianus* in the Apalachicola-Chattahoochee-Flint (ACF) Basin of Alabama, Florida, and Georgia. Additionally, Carson was a critical component in teaching many state, federal, non-governmental, and budding biologists in the art of ACF mussel identification through annual workshops or during a malacology class offered at CSU.

In 2005 Carson began organizing annual ACF Mussel identification workshops which have been held annually at the J.W. Jones Ecological Research Center in Newton, Georgia. While sampling the Flint River during the 2006 workshop, participants rediscovered *Amblema neislerii*, which was presumed to be extirpated from Flint River. Ironically, the 2008 workshop participants collected the first record of *Elliptio nigella*, which was presumed extinct since 1958. Carson also helped organize additional mussel identification workshops for the Mobile Basin in 2006 and Altamaha Basin in 2011, as well as setting up local arrangements for the Georgia Mussel and Crayfish meetings held periodically at CSU. Additionally, Carson was always eager to assist state and federal mussel biologists in sampling various sites throughout Georgia and always showed up with a crew of interested students. His love and enthusiasm for freshwater mussels was contagious and he took every opportunity to teach about his beloved aquatic critters. Carson was a great champion for mussel conservation that will be greatly missed.

Carson is survived by his parents, Juanita Nail and Rufus Cephus Stringfellow, wife Marie Stringfellow of Waverly Hall, Georgia (GA); daughters, Joy Grenier (Beau) of Birmingham, Alabama and Brooke Stringfellow of Columbus, GA; son, Andrew Houston (Melanie) of Ellerslie, GA; sisters, Jane Smith (Charles) of Columbus, GA, Rebecca Wolfe of Columbus, GA, Janet Fowler (Scott) of Manchester, GA and Charlene Baker (Jimmy) of Hamilton, GA; brother, Terry Stringfellow (Becky) of Columbus, GA; four grandchildren, and many nieces and nephews.



## Obituary -- James Conrad Widlak (1952 – 2012)



James Conrad (Jim) Widlak, 59, died peacefully on February 10, 2012, in Cookeville, Tennessee. He was born on Oct. 6, 1952 in Buffalo, New York, the son of the late Witold Andrew Widlak and Florence Lumberg Widlak. He served in the US Air Force stationed at Cannon AFB in New Mexico. He received his undergraduate degree from the University of New Mexico and his Masters Degree in Wildlife Services from Virginia Tech.

Jim was a U.S. Fish and Wildlife Service biologist for 30 years, in the Cookeville, Tennessee Field Office. His job as an Endangered Species Consultation Biologist allowed him to work with agencies to ensure that their projects were implemented using the best practices possible to protect endangered species. Although it may be impossible to quantify the impact of these consultations on species conservation, the cumulative impact of Jim's efforts were noticed by those who care that the birdwing pearlymussel, Appalachian elktoe, snail darter, spotfin chub, boulder darter, Nashville crayfish, Ruth's golden aster, and Indiana bat can still be found in Tennessee and the southeastern United States.

Jim is survived by his wife, Suzanne Deaton Widlak and his son Jamie Hill Widlak; his brother and sister-in-law Andrew and Cheryl Widlak; his aunts and uncles, Aileen Widlak, Henry and Dorothy Widlak; Dorothy Lumberg, Francis and Mary Lumberg, nieces; Kristi Gomes and Leigh Powell, and a nephew Bill Widlak.

A memorial service to celebrate his life was held on March 15, 2012, at one of Jim's favorite places: on the Duck River at Lillard's Mill just outside of Chapel Hill, Tennessee. Donations in Jim's honor may be made to the American Lung Association, 1301 Pennsylvania Ave, NW, Suite 800, Washington, DC 20004 or online at [www.lung.org/donate](http://www.lung.org/donate).

This untitled poem was written by Jim Widlak

Out of sight, out of mind,  
Living in a fluid world;  
Sunlight filters down in refracted beams,  
Warming their liquid environment.

Drawing nourishment from the myriad  
Minuscule creatures that drift by.  
Anchored in place by sand and gravel underfoot;  
No need to move.

Days gone by; the river bottom paved with living flagstones;  
Line upon line, rank upon rank;  
As numerous as the grains of sand.

Shells; round, square, oblong, smooth, winged, corrugated, bumpy;  
Brown, black, yellow; plain or decorated with green rays or chevrons;  
Feet of white, orange; mantles gray, speckled, or iridescent white;  
Living still-life portraits hidden from unsearching eyes.

The river, once coursing like a snake through untouched forests and yawning gorges  
Is now a line of placid pools; thick forest now rows of corn, cotton, pasture.

The winding highway that once carried crude log and bark craft  
Powered by strong arms wielding paddles,  
Now carries the mighty engine-driven traffic of industry that sustains ever-growing cities.

Time marches on; seasons pass, rivers flow;  
Flagstones of shell lie in piles  
Or stand empty as silent headstones to their passing; reclaimed by the river.  
Here, there, for reasons known or unknown, new generations are absent;  
Many still remain, but they are too few;  
They will pass without a sound; unheard, unseen;  
Will they be missed?

Eagles soar over glimmering lakes;  
Geese take wing on misty mornings;  
Wolves howl on crisp, moonlit nights;  
Sights and sounds that remind us of the beauty of all things wild;  
A living inheritance for future generations;  
To be cherished, protected;  
Mussels disappearing quietly in their fluid world;  
Out of sight, out of mind.

## Parting Shot



A specimen of the Panel Elimia, *Elimia laqueata*, grazing on a rock in the Kentucky section of the Big South Fork of the Cumberland River, within the Big South Fork National River and Recreation Area. This picture was taken with a Pentax Optio w90 on super macro mode, which allows for focusing within 1cm. The camera has three LED lights around the lens for use with pictures that are too close for the regular flash. Photograph by David M. Hayes, Eastern Kentucky University.

If you would like to contribute a freshwater mollusk-related photograph for use as a **Parting Shot** in *Ellipsaria*, e-mail the picture, caption, and photo credit to [jjjenkinson@hotmail.com](mailto:jjjenkinson@hotmail.com).

