



Newsletter of the Freshwater Mollusk Conservation Society
Volume 17 – Number 2 **June 2015**

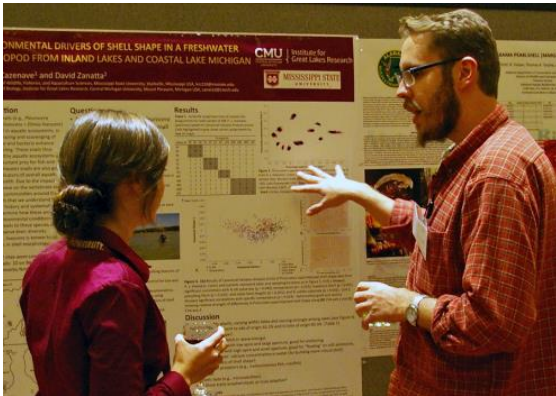
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St. Charles Meeting a Winner !

For those of you who missed it, we missed you too at our Ninth Biennial Symposium in St. Charles, Missouri. If you weren't able to come, you might also have forgotten that this was a joint meeting with the Upper Mississippi River Conservation Committee (UMRCC), the organization that first got the idea that it could be useful if folks interested in mussel conservation started meeting together.

From all of the reactions, it seems that everyone who was able to attend really enjoyed this meeting. In total, we had 325 registrants: 245 from FMCS and 80 from UMRCC. This year's participants hailed from 30 states, one Canadian province, Sweden, and the Czech Republic. We had 106 plenary and platform talks, and



50 poster presentations. These totals included 18 student platform talks and 14 student posters. Wednesday's joint sessions with UMRCC were well attended, and included a review of the progress made during the last 20 years concerning conservation of freshwater mollusks and other topics related to understanding and conserving aquatic ecosystems.

Before the official start of this Symposium, we offered a one-day propagation workshop. Around seventy people participated in this workshop,

learning about propagation and culture techniques, methods for tagging mussels, raising margaritiferids, and mussel genetics. Both novices and experienced culturists contributed to the discussions and found the experience useful for expanding skills and meeting colleagues who were working with similar species or techniques. The workshop committee hopes that those who attended the symposium for the first time because of the workshop will continue to participate in Society activities.



This year's auction and raffle also was a joint event with UMRCC. After providing UMRCC with a portion of the proceeds (based on the number of attendees from each organization), the FMCS share of the auction and raffle was \$6,522. These funds will be used to support FMCS student travel awards for the 2017 Symposium.

In addition to the auction, we received sponsorships for this meeting from nearly 20 organizations. We extend our sincere thanks to all of the individuals and organizations who sponsored the meeting, donated items, and participated in the auction and raffle. Your support allows us to continue pursuing the Society's



objectives and is greatly appreciated!

All three FMCS field trips were held on Thursday. The visit to the Ron Goellner Center for Hellbender Conservation at the St. Louis Zoo was a hit, with a full group of participants. The other field trips included a tour of the Mel Price Lock and Dam on the Mississippi River, and a visit to the Cahokia Mounds State Historic Site.

It (almost) goes without saying that the St. Charles Meeting would not have occurred without the dedicated efforts of the Local Committee. Steven McMurray, Heidi Dunn, Emily Grossman, and all of the other members of their great team of volunteers put in countless hours to organize the event and keep things running smoothly. Thanks to everyone who contributed time and effort to make this a very successful meeting. Thanks also to Janet Clayton and Mark Hove who took all of the pictures from the St. Charles Meeting used in this issue of *Ellipsaria*.



Here are some candid shots of our activities during the St. Charles Meeting.



More images from this meeting are posted on the FMCS facebook page.

Society News

Message from Our New President

Thanks to all of you for giving me the chance to lead the Society for a few years. Due in large part to my outstanding predecessors, the FMCS is a well-run organization that serves a critical purpose to conserve a resource that is near and dear to all of us. I am honored to be one of the 44 charter members of this Society, and it has been amazing to watch the Society grow to over 600 members in this short time! Because I spent the first part of my career in the Southeastern United States before moving to the Midwest, I am proud to call many of you friends and colleagues.

I believe in the adage 'if it's not broke, don't fix it', so I have no intention of making major overhauls during my Presidency. During the next two years, I'd like to focus on the following:

- Evaluating the committee structure of FMCS and revise it, as needed, in response to any new issues that are identified in the draft 2015 National Strategy.
- Look into establishing a mentorship program so we can get our younger scientists more involved in committees and give them leadership opportunities.
- Enhancing participation by international members to help ensure that the FMCS is a worldwide presence in mollusk conservation.
- Increasing involvement by scientists and managers working on gastropods within the Society, perhaps by having a Workshop focused on aquatic gastropods in the near future.
- Continuing to enhance beneficial services to our members, policy makers, and the public.

Stay tuned for more Society news as we transition into a new image for our journal, an updated website, and a revised National Strategy that I hope will be used at national, regional, and local levels to focus efforts to conserve native mollusks, their habitats, and the services they provide!!



Teresa Newton

Minutes of the Spring 2015 FMCS Board Meeting

March 22, 2015 St. Charles, Missouri

Call to Order, Roll Call for Attendance, and Declaration of Quorum– Patty Morrison

Attendees:

Art Bogan
Braven Beaty
Caryn Vaughn
Curt Elderkin

Dan Hua
Dave Berg
Emy Monroe
Greg Cope

Greg Zimmerman
Heidi Dunn
Janet Clayton
Jeremy Tiemann

John Harris	Mary McCann	Steve McMurray
John Jenkinson	Megan Bradley	Teresa Newton
Leroy Koch	Nathan Whelan	Tom Watters
Lisie Kitchel	Patty Morrison	Wendell Haag

Approval of the December 9, 2014 Fall Conference Call Board Meeting Minutes
 (published in March, 2015 *Ellipsaria*) Meeting Minutes Approved

Treasurer’s Report – Heidi Dunn

We generated \$10,388.92 in income in 2014. This includes \$9,910.00 in income for the 2015 symposium and \$6,060 of 2015 symposium expenses.

This year (through the end of February):

Income

Vest orders	\$ 570.00
Memberships	16,040.00
Symposium	<u>87,669.50</u>
Total Income	\$ 104,279.50

Expenses

Vests (includes award vests for Instigators)	\$ 604.00
Sponsorship for Buffalo Mussel meeting	1,000.00
Credit card/bank fees	2,220.22
2015 symposium expenses to date	<u>6,437.52</u>
Total Expenses	\$ 10,261.74

Total funds in the bank \$207,460.58

We expect an additional \$10,000 in symposium income, and expenses should be around \$95,000. We should generate enough income from this symposium to at least break even and potentially have some funds remaining. This is in part due to our generous sponsors, who have contributed nearly \$12,900 to date and we expect an additional \$1,250.00.

In the future, we should continue to encourage joint meetings (e.g., with UMRCC) and avoid conflicting dates with other similar conferences (e.g., Society for Freshwater Science).

Secretary’s Report – Greg Zimmerman

- We currently have 544 active members
- Working on assembling past Committee Chairs; Teresa Newton has made a list of past FMCS officers.
- Preparing to transfer files to new Secretary

Interim Actions of the EXCOM – Patty Morrison

(The order of the meeting was changed from the proposed agenda by Patty to better address important issues upfront while members were better-focused, and then review committee reports)

- Sponsorship of Second International Meeting on Biology and Conservation of Freshwater Bivalves, Buffalo, New York (\$1000)

OLD BUSINESS**Reports of the President's Ad Hoc Committees****2015 National Strategy** - Teresa Newton

We now have a nearly complete draft. There are a few holes for literature cited. Next step is FMCS internal peer review, then submit to *Walkerana* (soon to be *Freshwater Mollusk Biology and Conservation*). We have considered submissions to *Fisheries* and *Freshwater Science*, but the length of the article would likely preclude publication in those journals. We are considering a possible condensed version for these or another journal. The Strategy should be a good central piece for FMCS.

NEW BUSINESS**Long term Investment and Funding Strategies for the Society** – Heidi Dunn

A proposal has been submitted to FMCS by Joe Bartmess (financial consultant) for our consideration. Heidi proposes an investment strategy conference call after the symposium. We will put together an Expert Panel – Greg Cope, Patty Morrison, also Leroy knows a tax attorney. We did not accept mitigation monies last year as we were not confident we had a proper system to accept without risking tax issues or non-profit status. We will publish a request for members with financial expertise to assist with this task in *Ellipsaria*.

Proposed Procedure for Funding of Projects - Greg Cope

[A draft procedure (presented on Page 9) was distributed to the Board members prior to this discussion].

Teresa Newton proposed that we require these funding requests to go through the committees to reduce red tape and empower committees. Recommendations from one or more committees can then be sent to EXCOM for approval. The 'Mussel App' is a good example. One part of the Financial Expert Panel's duties could be to figure out how much project funding should be available to go along with our long term plan, percent of reserve, etc.

Possible Standard Letter of Support for Proposals – Patty Morrison

We had a request for a FMCS letter of support during a recent call for proposals under a grant. This begged a larger question: Should we have a standard letter of support? Caryn Vaughn indicated that we wouldn't know what other projects were competing for such a grant and to provide a fair recommendation would mean assigning someone to read the proposal and then all the competing proposals. The Board consensus was not to provide letters of recommendation. Instead, the submitters should refer to the 2015 National Strategy to provide support for their proposals.

Potential Lifetime Dues, Is it Time yet? – Heidi Dunn

Close, but we still need to get operating costs of the journal and other fees worked out. This idea also keys back to financial expert committee and how to invest the lifetime funds so that we don't lose money on younger members. This should be worked out by next symposium.

Lower Registration for Retirees? - Lisie Kitchell

Should we allow retirees to register at the student rate? Members that retire from an organization no longer have a funding source, making participation difficult. However, many retirees also still work as consultants, books, etc. making a distinction of those in need difficult. This issue was previously discussed, but no final decision had been reached. Suggest that those

in need make a direct special request to the Board but designate no official retiree rate yet. Perhaps in the future this will be covered under proceeds from “lifetime” dues. Those special cases that request and receive a Professional Travel Award would have to give a talk or poster to contribute to the Society.

COMMITTEE REPORTS (Chairmen were asked to focus was on Action Items needing attention by the Board). All committees should be meeting and electing Chairs this week.

Symposium Committee Updates – Teresa Newton and others

- **2015 St. Charles Workshop**-- 69 attendees, Propagation Committee will now be larger.
- **Upcoming 2016 Workshop on Genetics** -- Curt Elderkin. Will be an actual workshop, not just a symposium “lite;” however, will have a plenary talk. The location is National Conservation Training Center (NCTC). Middle of February, 2016. Start as a “Genetics for Dummies” with a plenary likely at the end. Calling for others to help organize. Matt Patterson at NCTC is a good start. (See announcement on page 18.)
- **2017 Symposium Options** –For one of the first times we have two strong competing symposium proposals. Propose a side-meeting to see if one is willing to take 2019. We will present a decision to the full membership Tuesday night at the Business Meeting.

Awards – Greg Cope, Emy Monroe

31 student presentations, every student will have 4 judges. Slightly fewer presentations this year but probably because only one presentation or poster can be judged per student. The reduced student participation also may have coincided with a reduction in federal funding. There were nine student travel awards, each receiving 4-nights lodging. There were five M.S. students and four Ph.D. students, including international participation. Some professional awards will be announced during the Business Meeting.

Nominations and Election – Leroy Koch.

Propose possibly holding the balloting at the symposia? We have had consistently low response for voting online. Some of this likely due to a lack of competition for some positions. We should increase participation on this committee. Greg Cope suggested EXCOM could identify nominees, as in his experience this is how it works best. Otherwise, getting effective candidates is difficult.

Official 2015 Election Results:

<u>President Elect:</u>	Heidi Dunn
<u>Secretary:</u>	Janet Clayton
<u>Treasurer:</u>	Emily Grossman

Outreach – Megan Bradley

Working with Curt Elderkin to get 2016 Workshop data up. Greg Zimmerman working on Committee chairs record. Greg suggests adding in Symposium Chair Category to Wild Apricot membership database. Add website search function needed without breaching site security. Web page meeting in St. Charles will iron out these issues, hopefully.

Gastropod Status and Distribution – Nathan Whelan, Jeremy Tiemann

Gastropods Names will stay a subcommittee under Status and Distribution Committee. Guidelines for names will be on the website soon. The starting list will be based on Johnson et al., 2013. There will be a mechanism to submit updates to the list, then peer reviewed name

changes every symposium. This is modeled after AFS – and we will put up list of names on FMCS website. Guidelines were developed jointly by bivalve and gastropod subcommittees, meeting separately. Draft procedures will go into procedures manual. Next step then likely to go after regional groups for more specific expertise.

Guidelines and Techniques –Mary McCann

Nevin Welte is stepping down from the committee as co-chair. Protocols for taking photos of mussels is next on the list, using existing procedures. Also, assembling protocols for surveys by state, with web links by state. Next steps - Where do we want to go as a committee? What we want to do will be determined this week at the Committee meeting. Mussel Kill values – AFS is heading that up but we will be working on providing expert information.

(Later Committee Meeting report presented on page 10)

Environmental Quality and Affairs – Steve McMurray, Braven Beaty

Working on what we can do to be proactive instead of reactive.

Genetics – Dave Berg, Curt Elderkin

Most work focused on 2016 Workshop. [See Symposium Report (above) and Workshop Announcement on Page 18.]

Information Exchange – Tom Watters, John Jenkinson

FMCS Journal – We are excited to be moving to Allen Press to cover editorial and publishing. Allen Press recommended a name change for better marketing value and clarity. Committee recommends changing the name to *Freshwater Mollusk Biology and Conservation*. Allen Press will promote the journal. Flyers to publish to be distributed at the Buffalo Mollusk Meeting, etc. Allen Press will improve all aspects of the submission and review process; we are going through the procedures now. More to present at Business Meeting. Art Bogan asked if the journal was Open Access, and would have page charges? Tom stated that the journal would be open access and would not have page charges. A formal motion was made to change the name of the Journal to: “*Freshwater Mollusk Biology and Conservation*.” That motion was approved.

Mussel Status and Distribution – Art Bogan, John Harris

- Williams et al. mussel status update article will be published in *Fisheries* likely in summer 2015.
- The Mussel App is pending under Susan Oetker and is ready for Beta testing. 206 of 300+ species have photographs.
- We are working on the Mussel Atlas. Pairing junior members with senior members. Two year expected turn-around for problem taxa and changes.

(More details presented in full Committee Report on Page 11)

Propagation, Restoration, and Re-Introduction – Dan Hua

Propagation and Reintroduction – are they two major topics? Reintroduction is more habitat and population dynamics. Under the new national strategy, could it be considered a separate topic for habitat restoration and reintroduction? Compare aquaculture and fisheries; these are two different topics. Dan Hua suggested splitting the Propagation committee into two groups. TBD after Committee meetings this week.

(Later Committee Meeting report presented on Page 11.)

Motion to adjourn, motion carries.

Special and Committee Reports Submitted to Support the March 22, 2015 Board Meeting

Draft Addition to the Procedures Manual Concerning Funding Requests

(See discussion under New Business, above on Page 6)

Funding of Society or Committee initiatives or projects may be formally solicited in writing to the Executive Committee at any time of the year, but at least 60 days prior to the next semi-annual (Spring or Fall) Board meeting. Any Society member in good standing or a Committee Chair or Co-Chair may request funding, provided it meets the following criteria:

1. The funding request will be used for mollusk or aquatic resource-oriented projects;
2. Funding requests will not be used for politically-oriented activities; and
3. The funded activity would be conducted through the Committee, a collaborative non-profit conservation organization, or an entity that qualifies as a 501(c) 3 organization.

Written requests for funding, at a minimum, should (1) identify the requestor, (2) state the funding activity or request, (3) state the amount of funding requested, (4) provide a brief overview of the expected results and how they would benefit the Society, and (5) state how funds meet the specified criteria listed above. A Society member or Committee can only make one funding request annually for an identified funded project. Funding requests from outside the Society, such as those from other Societies or other conservation organizations, can be considered subject to the availability of funds, real or perceived benefits, and other Society funding obligations, so long as the requests are consistent with Society Mission and Goals. These requests should meet the criteria and requirements set forth for requests for funding Society initiatives and projects.

The Executive Committee will review all funding requests and, upon unanimous favorable vote, can fund the request directly if the amount is \$1,000 or less. If the funding request is greater than \$1,000, the Executive Committee will present the request to the Full Board of Directors at the semi-annual Board meeting. If a funding request requires approval by the Full Board, the Executive Committee will make the proposal available for review by Board members at least 15 days prior to the Board meeting. A majority favorable vote of the Full Board of Directors will be necessary to approve the funding request.

All funding requests that are approved by the Executive Committee or the Full Board will be identified to the membership at the Biennial Symposium during the Treasurer's Report. All funding recipients will be required to submit annual progress reports and a final report to the President and Executive Committee, detailing disbursement of funds, and results and impacts of the funded activity. The Board reserves the right to provide incremental funding for projects approved for greater than \$1,000 in total costs, pending satisfactory progress, and to terminate disbursement of funds to non-performing projects.

Outreach Committee – Megan Bradley and Jennifer Archambault

Megan Bradley continues as a committee chair and Jennifer Archambault was selected as the new committee co-chair.

The committee discussed old business; the possibility of replacing the old FMCS display board with new, lighter technology. New business included adding an outreach committee tab to the FMCS Facebook page (which has occurred), and investigation of new means for making opportunities available to members. This led to significant discussion about updates to the

FMCS webpage. If you're interested in getting involved with the Outreach Committee please one of the committee chairs (Contact information for all committee chairs is on Page 65).

Guidelines and Techniques Committee – Mary McCann and Ryan Schwegman

Attendees:

Mary McCann	Chad Lewis	Brent Tweedy
Janet Clayton	Lisie Kitchel	Clarissa Bey
Patty Morrison	Marty Huehner	Mark Hove
Becca Winterringer	Ryan Schwegman	
Gregg Zimmerman	Matt Johnson	

The meeting started with announcement that committee Co-chair Nevin Welte was stepping down. As Co-chair, Mary volunteered to remain as co-chair, if the committee members approved, and asked for a volunteer to replace Nevin. The committee approved for Mary to continue as co-chair and Ryan Schwegman volunteered to co-chair with Mary. The committee approved Ryan's position.

The first topic of discussion was led by Janet Clayton. Janet explained the book "*Investigation and Monetary Values of Fish and Freshwater Mussel Kills*", AFS special publication #30 was being updated and the Propagation committee was involved. Part of the evaluation involves mussel field techniques; therefore, would the Guidelines committee be interested in providing input for the updated book? The committee agreed that would be a valuable effort. Janet will coordinate with the Propagation committee and the provide committee members interested in participating with the appropriate contact information. A conference call was being scheduled for May to discuss the planned updates to the new book.

Mary summarized the two tasks that were pending for the committee. Task 1 was to develop draft protocols for photo documentation of mussels during field surveys. Ryan volunteered to take that task over for Nevin. It was noted that Bob Howell of Texas had developed some protocols, and that Art Bogan may have some already prepared. Ryan will check with these sources and report to the committee.

Under Mary's lead, the second active task was to compile available state and federal mussel survey protocols, including web links when available, so these could be posted to the Guidelines committee webpage. Mary noted that she had collected a few, but that many states did not have protocols or guidelines. The ones collected so far include WV, VA, WI, OH, MA, MN, and a FWS protocol for GA/FL. Chad noted he had a protocol for Indiana and someone noted protocols for PA and MI, and draft ones for TN. Mary stated she would compile the list and website links that she had and send out to the committee members for review and additions. Then the committee would decide how the information should be posted to the committee webpage.

Mary asked if there were any suggestions or ideas for new tasks. Patty noted the FMCS new strategy would drive the committees in the future so our task/goal may change.

Greg Zimmerman suggested developing recommendations for mussel surveyor qualifications, with the understanding that FMCS does not want to be in the place of issuing any 'certifications'. Becca noted, for example that as a consultant proposing on a mussel survey job, there was an implication that one needed to be FMCS approved. Greg suggested we provide an outline of the proposed recommendations for the Board. After further discussion, the recommendation was to bring the subject up with the FMCS Board at the next EXCOM meeting.

Mussel Status and Distribution Committee – Arthur E. Bogan and John L. Harris

1. **J. D. Williams et al. AFS Conservation assessment of freshwater mussels of US, Canada and Mexico.** This is a revision of the Williams *et al.* (1993) first edition. The manuscript was originally submitted to AFS in November 2014 for review, and it was returned to Williams in early December with the request that it be reduced in length and that several of the tables and figures be removed. It was reduced in length and tables and most figures removed and resubmitted to AFS in January 2015. We are currently awaiting reviews from AFS. Publication is likely late summer 2015.
2. **Development of Mussel ID App** - Susan Oetker. We've come a long way, baby. While we are still missing many species photos, the app will be ready for beta release shortly. We have acquired useable photographs for 206 of 300 taxa addressed in the app, and the team continues to search for high quality photos to complete the North American set. As planned, the app allows users to identify to species based on location and any characters they are able to determine. After the conference, final QA/QC will be conducted and the app will be released to an initial group of beta testers for comments. The app will be previewed at the FMCS Symposium presentation on Wednesday (March 25th) at 4:00 p.m. (Session 19, Platform 92)
3. **Atlas of Freshwater Mussels of North America.** Currently, 134 of the approximately 365 taxa addressed in the Atlas have volunteer authors for species accounts. We have received 13 first draft accounts as of March 19, 2015. Distribution data for most of these accounts is still being acquired.
4. **Mussel Scientific and Common Names Subcommittee.** John Harris and Paul Johnson drafted guidelines for the mussel and gastropod names subcommittees and distributed this working paper to subcommittee members in February 2015. A joint meeting of the subcommittees was held 2:00-4:30 p.m., March 22nd to discuss and finalize guidelines. We expect the final guidelines to be provided to the Board in summer 2015.

Propagation, Restoration, and Re-Introduction Committee – Dan Hua and Rachael Hoch

- Christopher Owens has stepped down as co-chair; the new elected co-chair is Rachael Hoch.
- We hosted a mussel propagation workshop at this Symposium. Member involvement was high, with approximately 70 people in attendance, representing state, federal, private, and academics entities.
- We are continuing to maintain a propagation/stocking/relocation database. The database is active and updates are currently being compiled. Once updated, the committee plans to make portions of the database available to the public through the FMCS website.
- We are continuing to develop and compile “best practices” guidelines and white paper.
- We are assisting the Techniques and Guidelines Committee in developing mussel value estimates for a revision to the American Fisheries Society’s Investigation and Monetary Values of Fish and Freshwater Mussel Kills publications.

**FMCS Business Meeting March 24, 2015, 6:00 – 8:00 PM
Grand Ballroom, Embassy Suites, St. Charles, Missouri**

Call to Order (6:45 PM): Patricia Morrison, FMCS President

Patty thanked the hosts of the meeting, Steve McMurray, Heidi Dunn, and UMRCC for a great venue and all their hard work on implementation. Over 310 attendees and participants from across the world. The organization has truly become internationally recognized as a leader in mollusk conservation and research.



Treasurer’s Report: Heidi Dunn, FMCS Treasurer

Heidi presented an abbreviated Treasurer’s Report (a more complete report is presented in the Board Meeting Minutes, above on Page 5).

Society Accomplishments and News

The state of our Society is strong. FMCS is now recognized as leader in mollusk conservation. Patty reviewed our accomplishments over the last two years:

- 2015 National Strategy -- Teresa Newton has been working on this with Patty and others. It is nearly complete and undergoing internal and peer reviews.
- Journal News -- Greg Cope updated everyone on changes coming for the Society’s journal. We are contracting with Allen Press to cover editorial management and publishing our journal. The Journal will now be known as “*Freshwater Mollusk Biology and Conservation (the Journal of the Freshwater Mollusk Conservation Society)*”. (See more details in the FMCS Board Meeting minutes, above on Page 8.)

Preview of FMCS 2016 Workshop: Dave Berg

The Genetics Workshop will be held Feb 16-19, 2016 at the National Conservation Training Center (NCTC) in Shepherdstown, West Virginia. This Workshop will include an entry-level review of mollusk genetics basics, followed by more complex topics to meet the needs of both resource managers and researchers in the field.



Plans for Future FMCS Symposia

- 2017 Cleveland, Ohio – Becca Winterringer and Greg Zimmerman discussed Cleveland as the site for the next FMCS Symposium in mid-late March, 2017. The likely focus of this meeting will be on water quality and mollusks, as Cleveland and the Cuyahoga River were the impetus for the Clean Water Act. The site will be downtown, with easy, cheap train access from the airport. Nearby attractions include the Cuyahoga River, Great Lakes Science Center, Rock and Roll Hall of Fame, and nightlife.
- 2019 Austin, Texas – Charles Randklev and Neil Ford invited everyone to come to Texas in 2019. Likely topics include water rights and minimum flows. Austin is an exciting town with a lot to offer in terms of biodiversity, food, and entertainment.

Announcement of Election results: -- Leroy Koch

<u>President Elect:</u>	Heidi Dunn
<u>Secretary:</u>	Janet Clayton
<u>Treasurer:</u>	Emily Grossman

Presentation of Student and Professional Awards: Teresa Newton and Emy Monroe
(See articles starting on Page 13 concerning these awards.)

Installation of New President

Patty Morrison presented Teresa Newton with the traditional FMCS “Viking” helmet, now adorned with pig tails. Teresa noted that this would probably be the only time anyone would ever see her in a hat. Teresa went on to discuss the nearly complete FMCS National Strategy and how it would be guiding the future of the Society and, potentially, the structure and focus of the FMCS Committees (See related article on Page 4.)



Recognition of Outgoing Officers: -- Teresa Newton

- Patty Morrison – now Past President
- Heidi Dunn – Treasurer since FMCS inception, now President Elect
- Greg Zimmerman – Secretary for nine years (since 2007)
- Caryn Vaughn – Past President
- All but one of the Past Presidents of the Society were present and brought to the stage for recognition.



Past, present, and future FMCS Presidents (from right to left): Alan Buchanan (1999), Paul Johnson (2000), Kevin Cummings (2001), Tom Watters (2003-5), Bob Anderson (2005-7), Steve Ahlstedt (2007-9), Greg Cope (2009-11), Caryn Vaughn (2011-13), Patty Morrison (2013-15), Teresa Newton (2015-), and (President-Elect) Heidi Dunn. Dick Neves (2002) was not present for this photograph.

Adjournment, followed by music from *The Diva & The Dude*

2015 FMCS Student Awards

Student Travel Awards

The Awards Committee solicited applications for student travel awards to assist students in attending this symposium. Similar to past years, these travel awards were made in the form of pre-paid rooms at the symposium hotel. A total of 21 students applied for travel awards and, based on the allotted funds for all awards from the Society and the cost of rooms, we were able to make nine student travel awards. Among the awardees, five are working on their M.S. degrees and four are pursuing their PhDs. The following students were selected: Traci Popejoy (University of North Texas), Katherine Bockrath (University of Georgia), Trevor Hewitt (Central Michigan University), Jer Pin Chong (Iowa State University), Leslie Lueckenhoff (University of Missouri-Columbia), Raquel Fagundo (Appalachian State University), Ashley Walters (Miami University), Amy Maynard (Missouri State University), and Lea Schneider (Karlstad University).

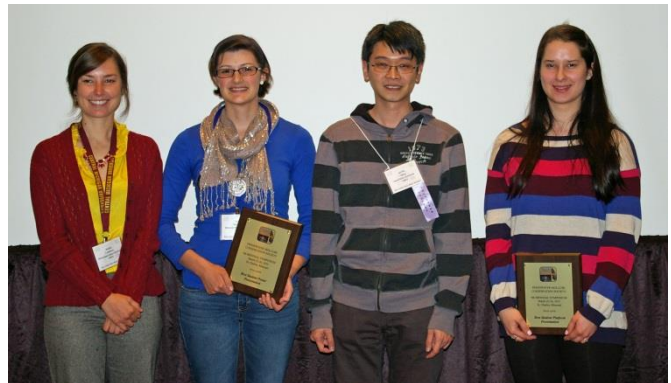


Best Student Platform and Poster Awards

A total of 31 student presentations required judging at the 2015 Symposium (19 platforms and 12 posters). Each student presentation was judged by four separate judges, which meant that 41 FMCS members volunteered to get the job done! The Awards Committee thanks every member who helped us judge student presentations; we could not present these awards without you.

The **Best Student Platform Paper Award** went to Ieva Roznere of The Ohio State University (co-authors G. Thomas Watters, Barbara A. Wolfe and Marymegan Daly) for her talk entitled “Health assessment of relocated freshwater mussel *Amblema plicata* using metabolomics. The honorable mention Platform Award went to Jer Pin Chong of Iowa State University (co-author Kevin Roe) for his talk entitled, “Using genetic structure of a common freshwater mussel species (*Leptodea fragilis*) to examine the impact of host fish dispersal on an endangered mussel species (*Leptodea leptodon*)”.

The **Best Student Poster Award** went to Amy Maynard from Missouri State University (co-authors Chris Barnhart and Laszlo Kovacs) for her poster entitled, “Sperm MT-DNA of *Venustaconcha pleasii*.” The honorable mention Poster Award went to Kandis Cazenave from



Central Michigan University (co-author Dave Zanatta) for her poster entitled, “Environmental drivers of shell shape in a freshwater gastropod from inland lakes and coastal Lake Michigan”.

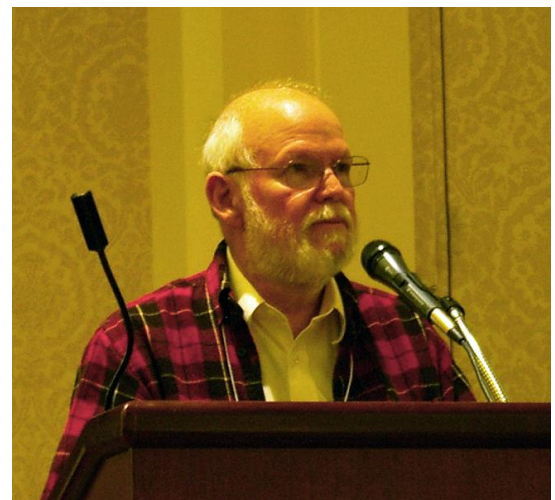
2015 FMCS Professional Awards

The Awards Committee solicited nominations from the membership for professional awards to be presented at the St. Charles Symposium. In 2015, we received one nomination for the **William J Clench Memorial Award**. This award was presented to **Mark Hove**, University of Minnesota, for over 15 years of work on mussel communities in the St. Croix River, Minnesota and Wisconsin. Mark has worked diligently on expanding outreach to the community and educating students, understanding the relationships between mussels and their fish host and in keeping the mussel collection at the Bell Museum of the University of Minnesota up to date.



We received one nomination for the **Meritorious Service Award**. This year's award went to **G. Thomas (Tom) Watters**, Science Director of the Columbus Zoo & Aquarium Freshwater Mussel Research Facility and Curator of the Division of Molluscs, The Ohio State University Museum of Biological Diversity. Tom was recognized for his numerous years of service directed at mollusk conservation. Tom was President of FMCS during 2004-2005, has been co-editor of *Walkerana* since its adoption by the Society, has served on numerous committees, and was the host of the 1999 meeting when the Society was established. Finally, Tom and/or his students have presented contributed papers to FMCS symposia or workshops since 1999.

We also recognized three individuals for their lifetime achievement in working with freshwater mollusks. One of the 2015 **Lifetime Achievement Awards** was presented to **Arthur E. (Art) Bogan**, Research Curator of Aquatic Invertebrates at the North Carolina State Museum of Natural Sciences. Art was recognized for his countless efforts on mollusk conservation, including being a member of FMCS since its inception, serving as co-chair of the mussel status and distribution committee since 2006, being an editor or on the editorial board for 8 journals, and for being a voracious student of historical molluscan literature. During his lifetime, Art has produced 183 peer reviewed publications, 65 technical reports, 135 presentations, and 23 mollusk identification workbooks. His collaborations extend



across multiple disciplines and continents, with colleagues distributed across much of North America, Western Europe, and large portions of Asia.



The second 2015 **Lifetime Achievement Award** was went to **Kevin S. Cummings**, Senior Research Scientist and Curator of Mollusks, Illinois Natural History Survey, for his diverse, important, and sustained contributions to the systematics, ecology, and conservation of freshwater mollusks. Kevin and his staff led efforts to document the distribution and current status of Illinois' freshwater mollusks. He has written or co-written over 72 reports on mollusks in Illinois. Kevin has documented the global distributions and zoogeography of freshwater mollusks, including unionids, snails, and fingernail clams. Kevin has worked on freshwater mollusks in many international locations, including Africa, Angola, the Antilles, Madagascar, and South America. Finally, Kevin has

served on several editorial boards and committees, and has contributed specifically to FMCS by serving as its president in 2001.

The third 2015 **Lifetime Achievement Award** was presented to **Paul W. Johnson**, Alabama Aquatic Biodiversity Center, for a series of contributions to freshwater mollusk conservation. Paul's successful efforts to raise, propagate, and release back into the wild different species of endangered freshwater gastropods was the first in the US. Paul also helped establish the Alabama Aquatic Biodiversity Center, where his crew has developed culture techniques for over 38 species of freshwater mollusks. Paul served as President of FMCS in 2000 and has hosted two FMCS biennial symposia. He also served as Chair of the FMCS Gastropod Committee from 2001-2011. Paul was the Chair for the AFS subcommittee for the conservation assessment of freshwater gastropods of the US and Canada which produced the landmark conservation assessment for freshwater gastropods published in Fisheries during 2013.



Two Society Members Also Receive Awards from Others

All FMCS members know that freshwater mollusks are special and that understanding, protecting, and conserving them and their habitats is really important. That's one reason why we recognize our peers when they do outstanding things, sometimes throughout a long career. In recent months, two members of our Society have received awards for their work in conserving freshwater mussels, not from FMCS, but from organizations with broader interests.

In one case, the U.S. Fish and Wildlife Service (FWS) presented **Nathan Eckert** with the **2014 Rachel Carson Award for Scientific Excellence (Individual)**. In their Press Release, the FWS noted that, since Nathan started working as the mussel propagation biologist at the Genoa National Fish Hatchery in 2010, he has helped the station produce over 14.7 million mussels of 17 species, with 4.7 million of those being four federally-listed species. Through his efforts, over 50,000 subadult endangered mussels have been returned to six different essential habitat areas. Recent releases of 2+ year Endangered Higgins Eye Pearlymussel have been increasing due to Nathan using a streamside rearing trailer and other techniques to improve early life history survival and growth rates.

Nathan's recent advances in freshwater mussel culture also include the development of a temperature regulated production system that allows for the mass production and capture of transformed juveniles directly off of fish at set development schedules. His use of alternative rearing systems also has resulted in success with previously uncultured mussels, such as the fawns foot, pistolgrip, and others.

Nathan is contacted on a regular basis to assist in mitigation efforts involving projects that impact freshwater mussel populations throughout the Midwest. He has supplied the USGS Upper Midwest Environmental Science Center laboratory and other laboratories with rare mussel species for experiments testing biocides and pesticides that may affect freshwater mussel survival. Nathan's contribution to freshwater mussel propagation is resulting in an ongoing study to test a new biocide that selectively kills zebra mussels while not affecting freshwater mussel populations, which could provide a new tool to safely combat the invasive zebra mussel in the presence of freshwater mussels. The USGS lab in LaCrosse, Wisconsin, also is looking toward Nathan to determine if water cannons and CO₂ applications can effectively deter Asian Carp migration while not harming native species such as paddlefish and freshwater mussels.

Nathan currently is in charge of propagation and management efforts of multiple recovery programs involving four federally endangered freshwater mussel species in the Upper Mississippi River basin. He also recently prepared two chapters for an upcoming manual of freshwater mussel culture being developed by the National Conservation Training Center (NCTC) and taught a segment of the NCTC freshwater mussel propagation course.



The other award, the **2015 John L. Funk Award of Excellence**, was presented to **Heidi Dunn** by the Missouri Chapter of the American Fisheries Society. This award, the highest presented by the Missouri Chapter, recognizes individuals for their professionalism and long-term contributions to the aquatic resources of Missouri. As those of you who attended the 2015 FMCS Symposium know, the award actually was presented to Heidi by Amanda Rosenberger, President of the Missouri Chapter, during our St. Charles Meeting. The plaque reads:

“For her many years of conscientious work in the field of aquatic biology and her willingness to share her knowledge and experience with others, both at professional meetings and at the boat ramp, the Missouri Chapter of the American Fisheries Society is proud to award the 2015 John L. Funk Award of Excellence to Heidi Dunn.”



Heidi has been in the environmental consulting business for over 30 years, working to collect quality information to assist state and federal regulatory agencies in permitting and licensing decisions. Her career as an environmental consultant led to her founding Ecological Specialists, Inc. in 1990. The company's primary focus is conducting surveys and inventories for licensing and environmental assessment purposes on fisheries and aquatic invertebrate communities, including mussels.

Her work with mussel relocation projects has provided new and better ways of optimizing mussel survival. She has a genuine interest in the welfare of both the individual mussel and the population as a whole, and her efforts have preserved mussel beds (often including state and federally listed species) throughout the Mississippi and Ohio River drainages.

In addition to being well-versed in fish, aquatic oligochaete, and mussel taxonomy, her field experience has served to enhance scientific knowledge by developing protocols for conducting surveys, mussel relocation projects, subsequent long-term monitoring activities, and impact assessments. She has not only disseminated information via the hundreds of environmental analysis and survey reports, but presented papers at a variety of regional and national conferences, including the Missouri Natural Resources Conference. She has also authored or co-authored several peer-reviewed journal articles.

Heidi has been an asset to the study of mussel ecology and knows the value of educating others in this discipline. She has seen the effects of well-meaning, but untrained divers attempting to relocate mussel beds, only to have abysmal survival due to poor understanding of the animals' anatomy or physiological requirements. Many professionals in the aquatic sciences owe their current careers to experience gathered while working with her or contacts made through her. She is patient with young professionals, and her company's work exposes them to a wide variety of working conditions and projects.

Announcements

2016 FMCS Workshop

Population Genetics and Freshwater Mollusk Conservation

National Conservation Training Center, Shepherdstown, West Virginia

February 16 – 19, 2016

The use of genetic information in the conservation and management of organisms is becoming more widespread. The focus of the 2016 FMCS Workshop will be to provide a basic understanding of population genetic tools and their application in the conservation of freshwater mussels. The workshop curriculum will include morning lecture sessions that will provide a basic understanding of population genetic theory, and afternoon sessions built around case studies that will allow attendees opportunities to apply their knowledge using actual data on freshwater mussels. The program will include a poster session and mixer at the end of day one for attendees to present their research. The Workshop will end day two with a series of presentations from experts in conservation genetics. More details about this Workshop, including cost and registration information, will be posted on the FMCS website at <http://molluskconservation.org/Events.html> and in future issues of *Ellipsaria*.



The 2017 Symposium Local Committee is already working hard to make sure FMCS has a **Rockin'** meeting in 2017! Venue, schedule, fieldtrips, workshop(s), and places to see and things to do will be coming soon to *Ellipsaria* and the FMCS website. If you have ideas and/or want to help plan this meeting, contact Rebecca Winterringer, rebecca.winterringer@aecom.com or Greg Zimmerman, gzimmerman@enviroscienceinc.com

Regional Meetings

FMCS Regional Mollusk Meeting Assistance Award Program

As described in the December 2012 issue of *Ellipsaria*, the FMCS has established a Regional Mollusk Meeting Assistance Award Program to facilitate regional mollusk meetings that address local and regional concerns with freshwater mollusk conservation and management. Our interest in assisting with these meetings is to bring people together who work with freshwater mollusks to exchange information on how to conserve and protect this faunal group. These meetings are often attended by a variety of individuals, including agency personnel, academia, private citizens, scientists, and others, some of whom may not be FMCS members. Therefore, a secondary goal of this program is to increase the awareness of, and membership in, FMCS among individuals in these groups. Support is provided via a cash award of \$100 to the regional group to help defray the costs (e.g., meeting room rental, speaker travel, break refreshments, etc.) associated with holding their meeting. It is anticipated that about 15-20 awards will be made in a given calendar year.

The complete program description and application form may be obtained from the Awards Committee website at http://www.molluskconservation.org/Mservices_awards.html. One copy of the completed application must be received by the Chair of the Awards Committee at least two months prior to the Regional Mollusk Meeting to allow for application and payment processing.

New Publication

The third edition of ***Freshwater Mussels of the Upper Mississippi River*** was recently published. Republication of this booklet was funded in part by the FMCS, the UMRCC, and other agencies. You can download a PDF of this booklet from the FMCS website at <https://www.dropbox.com/s/5h900e13hmq1uoq/Mussels%20Guide%202015.pdf?dl=0> but be ready for it to take a while to download. [You do not have to have a Dropbox account to download this pamphlet; just wait for the add to close.]

Job Announcement

Freshwater Malacologist Bedford, New Hampshire

Normandeau Associates, Inc., one of the nation's largest science-based environmental consulting firms, is seeking a Freshwater Malacologist. This position requires a Master's degree in Malacology, Invertebrate Zoology, Biology, Environmental Science, or a closely related field; experience with Atlantic slope freshwater mussel fauna identification and survey techniques, especially in the northeastern United States, is essential, knowledge of mussel fauna from other geographical regions, sampling gear, and boat operation are highly preferred; demonstrable experience with fisheries and other aquatic species will also be considered favorable; periodic travel, evening, and weekend work required; ability to work as part of a team and independently required; random drug testing and formal background check will be required. Candidates must be able to work in the United States without company sponsorship.

As an employee-owned company, Normandeau Associates, Inc. offers a competitive salary and excellent benefits. If you are interested in joining an exciting firm, please submit a cover letter, resume and 3 references to HR@normandeau.com with the subject: **2015MS**.

Equal Opportunity Employer – Minorities/Females/VET/Disabled.



Upcoming Meetings

August 2 – 6, 2015 – International Congress for Conservation Biology, Montpelier, France
<http://www.conbio.org/conferences/about-scb-meetings/past-iccbs>

August 28 – 31, 2015 – American Malacological Society 81st Annual Meeting, University of Michigan Biological Station, Pellston, Michigan
<http://www.malacological.org/meetings/2015/AMS%202015%20Michigan%20ad.pdf>

October 4 – 8, 2015 – Second International Meeting on Biology and Conservation of Freshwater Bivalves, Buffalo, New York, USA <http://greatlakescenter.buffalostate.edu/>

November 24 – 26, 2015 – 2nd International Seminar; Rearing of unionoid mussels, Centre Culturel Château de Clervaux (Castle Clervaux) L-9712, Clervaux, Luxembourg <http://www.unio.lu>

February 16 – 19, 2016 – FMCS Workshop: Population Genetics and Freshwater Mollusk Conservation, National Conservation Training Center, Shepherdstown, West Virginia
<http://molluskconservation.org/Events.html>

February 22 – 26, 2016 – National Shellfisheries Association 108th Annual Meeting, Las Vegas, Nevada, USA Theme: “All in for Aquaculture” <http://www.shellfish.org/annual-meeting> .

May 21 – 26, 2016 – Society for Freshwater Science Annual Meeting, Sacramento Convention Center, Sacramento, California Theme: “Running on Empty.” <http://sfsannualmeeting.org/SFS2016.cfm>

March 26 – 30, 2017 – FMCS 10th Biennial Symposium, Cleveland, Ohio venue and theme yet to be determined

Contributed Articles

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

Natural Glochidia Hosts of Willow River Fishes

Mark Hove¹, John Douglas¹, Elizabeth Rasmussen¹, Anders Ames², Laura Drohman², Andrew Edgcumbe³, Kelsey Fiedler², Jordan Knutson², Shelby Marr³, Violet Ohnstad², Christopher Parker², Emily Riewestahl², Bernard Sietman³, Anna Scheunemann², Nathan Swenson², Alyssa Taylor², and Matt Berg²

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High school and university students, and Matt Berg drive fishes towards the seine.

Identifying juvenile freshwater mussels from fishes infested in nature is the most robust measure of a host association. The objective of this study was to identify juvenile mussels recovered from naturally infested fishes in hopes of determining the natural hosts for *Lasmigona compressa* (I. Lea, 1829).

We used standard methods to recover juvenile mussels (Hove *et al.*, 2012). Fishes were collected from the Willow River, a St. Croix River tributary, during fall 2014. Previous mussel surveys showed only two Anodontine species, *L. compressa* and *A. ferussacianus*, living at the study site (Hwy. 63 bridge crossing over the Willow River, St. Croix County, Wisconsin), with two additional Anodontines, *Pyganodon grandis* and *Strophitus undulatus*, occurring at other river locations (Mathiak 1979, Berg *et al.*, 2004).

Willow River fishes released juvenile mussels and glochidia. Young mussels were separated into groups using glochidial shell outline, and were identified using discriminant analysis (DA) of their shell height, length, and hinge length (JMP v.11) (Table 1). Single glochidia identified as *L. compressa* were collected from Johnny darters and mottled sculpins. Single juveniles identified as *A. ferussacianus* were released by creek chubs and brook sticklebacks (Figure 1).

We collected five other glochidia from brook sticklebacks, and one from creek chubs. These glochidia had a different shell outline and their shell height was greater than those of *L. compressa* or *A. ferussacianus* (Table 2). These unknown glochidia were similar in size and shape to *Alasmidonta*

marginata and *Lasmigona costata*, and although these species were not observed during the most recent survey of the Willow River (Berg *et al.*, 2004), they do occur in several other St. Croix River tributaries.

The unknown glochidia are similar in size to *A. marginata* but discriminant analysis could not predict the identity of the species with a probability $\geq 85\%$. Glochidia from reference mussels used in our statistical analysis were from Minnesota and Wisconsin. Additional sampling and measurement of glochidia from known Willow River mussel species would probably be needed to definitively identify these unknown glochidia.

Table 1. Shell dimensions and standard deviations (sd) of glochidia from Willow River Anodontines. Shell dimensions with different superscripts are significantly different ($P < 0.05$).

Species	Height \pm 1sd (μ)	Length \pm 1 sd (μ)	Hinge length \pm 1 sd (μ)	Picture (Not to scale)
<i>Anodontoides ferussacianus</i>	320 \pm 23 ^b	324 \pm 22 ^b	247 \pm 22 ^b	
<i>Pyganodon grandis</i>	369 \pm 14 ^a	365 \pm 13 ^a	274 \pm 13 ^a	
<i>Lasmigona compressa</i>	279 \pm 6 ^b	328 \pm 13 ^b	237 \pm 11 ^b	
<i>Strophitus undulatus</i>	300 \pm 10 ^a	366 \pm 16 ^a	271 \pm 18 ^a	
Unknown Anodontine	360 \pm 9	337 \pm 7	239 \pm 6	
<i>Lasmigona costata</i>	392 \pm 25 ^a	362 \pm 19 ^a	249 \pm 16 ^a	
<i>Alasmidonta marginata</i>	366 \pm 26 ^b	331 \pm 18 ^b	223 \pm 15 ^b	

Figure 1. Electron micrographs of study mussel species:

- 1a -- *L. compressa* glochidium (reference),
- 1b -- *L. compressa* glochidium from Johnny darter,
- 1c -- *L. compressa* glochidium from mottled sculpin (specimen tilted),
- 2a -- *A. ferussacianus* glochidium (reference),
- 2b -- juvenile *A. ferussacianus* from brook stickleback,
- 2c -- juvenile *A. ferussacianus* from creek chub,
- 3a -- unknown glochidium from brook stickleback, and
- 3b -- unknown glochidium from creek chub.

Scale bar is 200 microns.

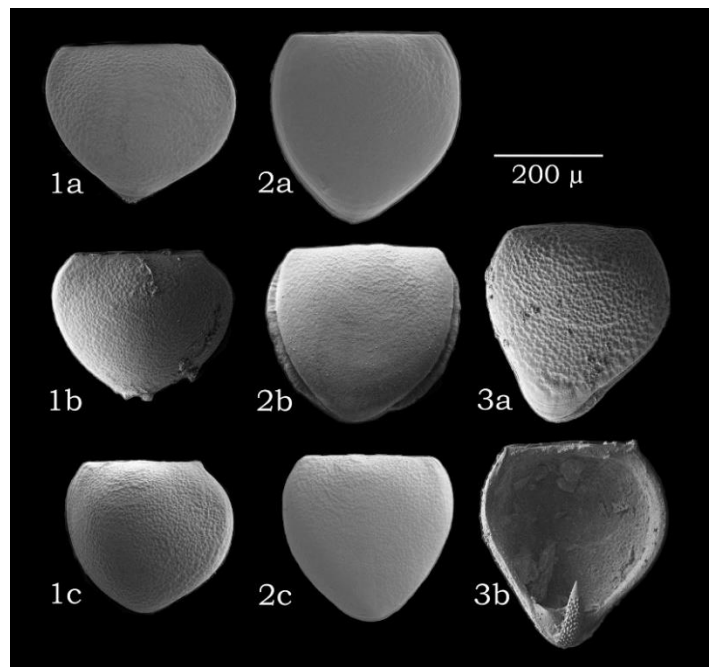


Table 2. Mussels recovered from naturally infested fishes in Willow River, Wisconsin.

Recovered from	Height \pm 1 sd (μ)*	Length \pm 1 sd (μ)*	Hinge length \pm 1 sd (μ)*	Predicted mussel species (DA prediction probability)
Juvenile from brook stickleback	298	298	244	<i>A. ferussacianus</i> (99.9%)
Juvenile from creek chub	299	312	243	<i>A. ferussacianus</i> (99.9%)
Glochidium from Johnny darter	276	293	200	<i>L. compressa</i> (99.9%)
Glochidium from mottled sculpin	280	307	205	<i>L. compressa</i> (99.9%)
Five glochidia from brook stickleback	358 \pm 8	337 \pm 7	240 \pm 6	Unknown Anodontine
Glochidium from creek chub	371	339	235	Unknown Anodontine

* Glochidial shell dimensions

Our findings are consistent with previous host research. We observed *L. compressa* glochidia naturally infest Johnny darter and mottled sculpin. *Lasnigona compressa* have been reported naturally infesting a variety of fishes, including: creek chub, common shiner, fathead minnow, brook stickleback, and rock bass (Kakonge 1972). Recent host suitability trials conducted in our laboratories showed that *L. compressa* will metamorphose on mottled sculpins and Johnny darters.

We collected juvenile *Anodontoides ferussacianus* from brook sticklebacks and creek chubs. *Anodontoides ferussacianus* have been reported to naturally infest several fishes, including: sea lamprey, northern redbelly dace, common shiner, brassy minnow, hornyhead chub, blacknose shiner, fathead minnow, bluntnose minnow, blacknose dace, creek chub, white sucker, brook stickleback, and Iowa darter (Wilson and Ronald 1967, Kakonge 1972). This mussel will metamorphose on cyprinids (fathead minnow and spotfin shiner) and brook stickleback in the laboratory (Hove *et al.*, 1995, Eckert and Buening 2013).

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A Brief Note on the *Corbicula* Species Living in Tiga Lake, Kano State, Nigeria

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During the feasibility study for the extension of the Kano River Irrigation Project (KRIP) conducted by Tahal Consultants in Kano State, northern Nigeria, in July 1992, we had the opportunity to sample freshwater molluscs of the Tiga Lake. Since the water of the lake is populated with schistosomiasis infected snails belonging to the genera *Bulinus* and *Biomphalaria*, we collected mainly the molluscs which were washed ashore in countless numbers. The material was collected by Dr. Bukar A. Abdullahi (Bayero University, Kano), Dr. Reuven Ortal (Israel Nature Reserves Authority, Jerusalem) and Henk K. Mienis (Hebrew University of Jerusalem).

Corbicula samples had been collected at the following stations in Lake Tiga:

- 1: Lake Tiga, in drift west of the Tiga Rapids Dam, leg. R. Ortal, 14.07.1992 (HUJ 2324/m & SMNH MO 79916/3);
- 2: Lake Tiga, in drift west of the Tiga Rapids Dam, leg. R. Ortal & B.A. Abdullahi, 19.07.1992 (HUJ 2337/m);
- 3: Lake Tiga, in drift east of the Tiga Rapids Dam, leg. H.K. Mienis, R. Ortal & B.A. Abdullahi, 21.07.1992 (HUJ 2322/m);
- 4: Lake Tiga, in drift S.E. of Rurum, leg. H.K. Mienis, R. Ortal & B.A. Abdullahi, 26.07.1992 (HUJ 2340/m & SMNH MO 79917/6).

The same *Corbicula* species was also collected at the following localities outside the Tiga Lake:

- 5: brick-lined section of unlined main canal, just south of the Tiga Rapids Dam, north of the Rano take off, leg. H.K. Mienis & B.A. Abdullahi, 21.07.1992 (HUJ 2355/1);
- 6: field canal near rice-field of Kode-farm, leg. H.K. Mienis, 21.07.1992 (HUJ 2357/1);
- 7: Kosawa Night Storage Reservoir, leg. H.K. Mienis & R. Ortal, 25.07.1992 (HUJ 2374/1);
- 8: distribution canal near Yadakwari, leg. H.K. Mienis & R. Ortal, 25.07.1992 (HUJ 2385/1);
- 9: Agollas Night Storage Reservoir, leg. H.K. Mienis, 25.07.1992 (no specimens were preserved for permanent storage);
- 10: distribution canal near the Agollas Night Storage Reservoir, leg. H.K. Mienis, 25.07.1992 (no specimens were preserved for permanent storage).

In the drift line of Tiga Lake, it was the dominant species and thousands of *Corbicula* shells were laying around, most of them with the valves still connected. In the additional localities (5-10), which are all receiving water from the Tiga Lake, living specimens were found in the mud, often in stands of *Phragmites australis*.

Note on the identity of the *Corbicula* samples

All the specimens collected by us in the waters connected to the Kano River Irrigation Project in northern Nigeria, were very small (Figure 1). The largest specimens had a width of 12 mm. Some were slightly wider than high, others were slightly higher than wide; however, all the valves were of a strikingly yellowish colour. In all these features, they agreed in full details with the *Corbicula* material described by von Martens (1903: 9) as *Corbicula tsadiana* and by Germain (1905: 488) as *Corbicula lacoini* both from Lake Chad. The two names were given (respectively) to specimens which were slightly longer than high (*tsadiana*), or a little higher than long (*lacoini*). I agree with Mandahl-Barth (1988: 114) in considering them as belonging to one and the same variable species.

Daget (1998:171) considered these dwarfish *Corbicula* specimens from Lake Chad as belonging to the *Corbicula fluminalis consobrina* (Cailliaud, 1827) complex, while Mandahl-Barth (1988:114) had a few years earlier written that "It appears so different from the typical *fluminalis* that it would be natural to consider it a distinct species, if it were not for the fact that it is connected through gradual transitions

.... with more normal *consobrina*-like forms." And continues: "Despite this, however, I find *tsadiana* so divergent that I must consider it as a local race of *fluminalis*."

In my opinion, only a thorough revision of all *Corbicula* material found in Africa together with *Corbicula fluminalis* from its type locality (the Euphrates), based on modern DNA-research, may shed some light on this long-standing problem of how many species can be recognized as living in Africa and what is their relation with *Corbicula fluminalis* from Mesopotamia. In the meantime, I consider the specimens here described from Lake Tiga and the Kano River Irrigation Project in northern Nigeria as conspecific with the dwarf, yellowish *Corbicula* from Lake Chad and use for both of them the oldest name *Corbicula tsadiana* von Martens, 1903.

From the conservational point of view, it may be noted that the situation of *Corbicula tsadiana* has become rather vulnerable in Lake Chad due to the slow but steadily drying up of the lake since 1963. In Lake Tiga it seems still to be a rather common species.

Acknowledgements

I like to thank Dr. Bukar A. Abdullahi of the Bayero University in Kano, Nigeria and Dr. Reuven Ortal, formerly of the Israel Nature Reserves Authority (now Israel Nature and Parks Authority) Jerusalem, Israel, for their friendship and assistance during the fieldwork in Nigeria. Likewise I like to thank my colleague and friend Oz Rittner of the Steinhardt Museum of Natural History, Tel Aviv University, Tel Aviv, Israel, for the excellent photograph of the discussed *Corbicula* species.

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Figure 1: *Corbicula tsadiana* von Matens, 1903 from Tiga Lake, Kano State, Nigeria (height x width: 9.6 x 10.5 mm). Photograph: Oz Rittner.



Additional Information Concerning the Conquest of Europe by the Invasive Chinese Pond Mussel *Sinanodonta woodiana*, 38. News from Belgium, Czech Republic, Germany, Hungary Italy, and General Information

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Papers dealing with the presence of the invasive Chinese Pond mussel *Sinanodonta woodiana* (Lea, 1834) in Europe continue to appear. Here is some overlooked and some new information from Belgium, the Czech Republic, Germany, Hungary, and Italy.

Belgium

The Royal Belgian Society for Conchology has a workgroup on the field of land and freshwater molluscs by the name "*Succinea*". On 20 September 2014, it organized a fieldtrip to the Nature Reserve "De IJsebroeken" near Overijse in Flemish Brabant. When the participants arrived at the site, they immediately noticed numerous empty shells of *Sinanodonta woodiana* within a beaver-dam. A survey of the bottom fauna for the presence of large freshwater mussels revealed numerous living specimens of the Chinese Pond mussel. One of the first specimens found had a width of about 22 cm. Besides the Chinese pond mussel, local Duck mussels *Anodonta anatina* (Linnaeus, 1758) also were present in the IJsebroeken.

On 12 March 2015, a photograph was placed by Pieter Moysons on the internet site waarnemingen.be (8125638) which showed numerous small pond mussels that he had photographed at the same site in IJsebroeken. He had identified the shells as juvenile Duck mussels; however, I agree with Tom van den Neucker that they are the young of the Chinese Pond mussel because of the characteristic round shape of the shells.

Czech Republic

A study of the relationship between the European bitterling, *Rhodeus amarus*, and freshwater mussels carried out in the Czech Republic (Reichard *et al.*, 2012) has shown that the European bitterling parasitizes all sympatric European mussels but are unable to use the invasive Chinese Pond mussel. The glochidia of *Sinanodonta woodiana*, however, successfully develop on *Rhodeus amarus* while the larvae of European mussels are rejected by the European bitterling.

Germany

Katrin Schniebs (2015) published a poster on the website of "Weichtiere Sachsen" on how to recognize the Chinese Pond mussel. In addition, she provided also some information about the ecology and distribution of this invasive species in Germany.

Hungary

Bárdos *et al.* (2014) published extensive data on the ecology of the invasive Chinese Pond mussel in Lake Balaton, in which they compare the results with the native Duck mussel *Anodonta anatina*. Unfortunately, the entire article is written in Hungarian.

Italy

According to a study by Mosello & Larni (2011), the temperature of the upper water column (0-30 m) in Lake Maggiore has increased by 1.4°C during the last 45 years. This has enabled several alien species, among them the bivalves *Dreissena polymorpha*, *Corbicula fluminea* and *Sinanodonta woodiana*, to establish viable populations in the lake.

General information

Ricciardi (2015) has published an article on the "Ecology of invasive alien invertebrates," in which *Sinanodonta woodiana* is briefly mentioned as a notable exception on the rule that unionid freshwater mussels are generally poor colonizers.

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<https://www.weichtiere-sachsen.de/Pages/TaxonomyBrowser.aspx?id=338058>

The Little Limnic/ Freshwater Snail *Physa marmorata* Guilding, 1828: A “Cosmopolitan Mollusk” Threatened with Extinction in Brazil ???

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Continuing the brief analysis of mollusks included in the controversial recent “Official List of Brazilian Fauna Threatened Extinction” (Agudo-Padrón 2015), we have the following in headlines with respect to the little air-breathing limnic/ freshwater species *Physa marmorata* Guilding, 1828 (Figure 1), a question that requires particular and urgent attention:



Figure 1.- Specimens of the freshwater/ limnic snail *Physa marmorata* Guilding, 1828 found in Brazil Photographs by Walther Ishikawa, Planeta Invertebrados Brasil, São Paulo State/ SP <http://www.planetainvertebrados.com.br/index.asp?pagina=inicial>

Basically, this is not a specific endemic Brazilian species ... is a "cosmopolitan" form, which already leaves "questionable" the situation of its consideration and inclusion (... justified only by "regional punctual data"!).

Found in a variety of habitats, including ponds (natural and man-made), streams, rivers, dams, drainage ditches, marshes, temporary water bodies, and roadside pools (IUCN 2014), still easily found in aquariums.

As recognized in the Official List (for access, see Agudo-Padrón 2015: 30) "... its type locality is the "Saint Vincent Island" in the Caribbean (Paraense, 1986), with multiple records in Central America and South America (... in Brazil was found in the States of RO, TO, MA, RN, BA, MT, GO, MG, RJ, SP, PR and SC!) ...", when, in fact, it is demonstrably present in the southernmost Brazilian State of Rio Grande do Sul/ RS (by example), where it comes to represent a potential "agricultural pest" in rice fields (Agudo-Padrón *et al.* 2009, 2010). Abundant general other biogeographical information extra still is available in the technical literature (IUCN 2014).

Conclusively, this particular and "controversial" situation (among others of lower scope), needs to be revised and "corrected". The content of the "Official Malacological List" clearly demonstrates that the urgent and necessary knowledge about the situation of our conservation unfortunately still persists unchanged today ... worryingly "stagnant and deficient".

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The Limnic/ Freshwater Mollusks Found on Santa Catarina Island, Florianópolis/ SC, Central Southern Brazil Region

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According to the available regional literature, the Santa Catarina's State/ SC, geographic central portion of the southern Brazil region, consists of a total of 72 limnic/ freshwater mollusk species (42 Gastropoda and 30 Bivalvia), including two amphibious representatives of the genera *Omalonyx* d'Orbigny, 1837 (semi-slug Succineidae) and *Assimineia* Fleming, 1828 (operculated snail Assimineidae) (Agudo-Padrón 2014 a-b). Of these, 24 species (six Bivalvia and 18 Gastropoda – one amphibian, with two exotic and invasive – one Bivalvia and one Gastropoda – and six under immediate threat of extinction

– five Bivalvia and one Gastropoda) occur in the “Great Florianópolis” region (Agudo-Padrón 2014 a: 21). Sixteen gastropods are found on Santa Catarina Island territory (Agudo-Padrón 2008) (Figure 1), located in the biogeographic malacological coastal region of the State (Agudo-Padrón 2014 a: 20-21; 2014 b: 9- Figure 2). Limnic/ freshwater bivalves are not known on the island except for the “punctual record” of the introduced mussel/ naiad *Leila blainvilleana* (Lea, 1834) (Mycetopodidae) (Agudo 2007).

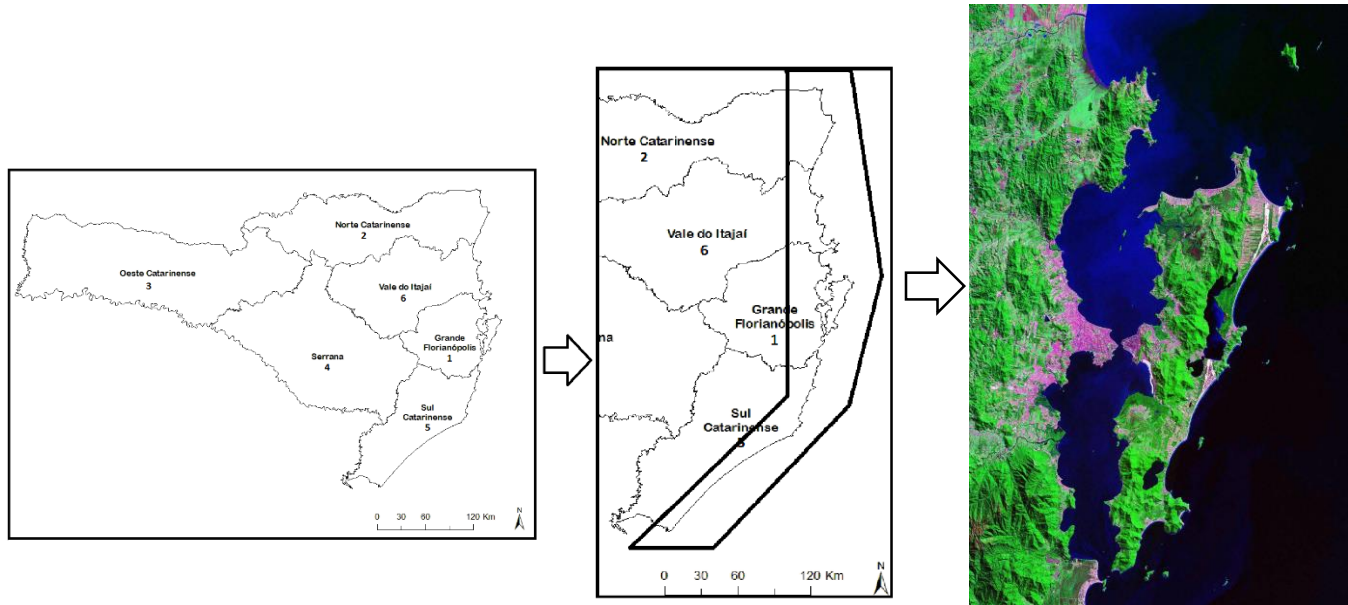


Figure 1.- Santa Catarina Island, in the Great Florianópolis coastal region, the largest insular portion of the Santa Catarina State/ SC.

The general hydrographic environment of the island is conveniently described in the literature (Agudo 2007:10), having among its prominent macrobiotic elements diverse freshwater crustaceans, among them brachyuran land crabs *Trichodactylus fluviatilis* Latreille, 1828 (Trichodactylidae), characteristic limnic prawns *Macrobrachium olfersi* (Wiegmann, 1836) (Palaemonidae), and curious anomuran freshwater crabs *Aegla* cf. *parva* Bond-Buckup & Buckup, 1994 (Aeglidae), in addition to small catfishes *Rhamdia branneri voulezi* Haseman, 1911 (Pimelodidae), occurring both in the bodies of semi-stagnant water found in the plains of sandbanks as descending the slopes of the hills (little streams/ creeks).

Limnic/ Freshwater Mollusks Found on Santa Catarina Island

CLASS GASTROPODA

Caenogastropoda

Family Ampullariidae Gray, 1824

Genus *Pomacea* Perry, 1811

Pomacea bridgesii (Reeve, 1856)

Pomacea canaliculata (Lamarck, 1819)

Family Hydrobiidae Troschel, 1857

Genus *Littoridina* Souleyet, 1852

Littoridina australis (d'Orbigny, 1835)

Littoridina piscium (d'Orbigny, 1835)

Littoridina charruana (d'Orbigny, 1840)

Family Assimineidae H. Adams & A. Adams, 1856

Genus *Assiminea* Fleming, 1828

Assiminea sp (in determination process)

- Pulmonata
- Family Succineidae Beck, 1837
 - Genus *Omalonyx* d'Orbigny, 18413
 - Omalonyx convexus* (Heynemann 1868)
- Family Physidae Fitzinger, 1833
 - Genus *Physa* Draparnaud, 1801 (Figure 2)
 - Physa acuta* Draparnaud, 1805
 - Physa* (= *Stenophysa*) *marmorata* Guilding, 1828
- Family Lymnaeidae Rafinesque, 1815
 - Genus *Lymnaea* Lamarck, 1799
 - Lymnaea* (= *Pseudosuccinea*) *columella* Say, 1817 (Figure 2)
 - Lymnaea viatrix* d'Orbigny, 1835

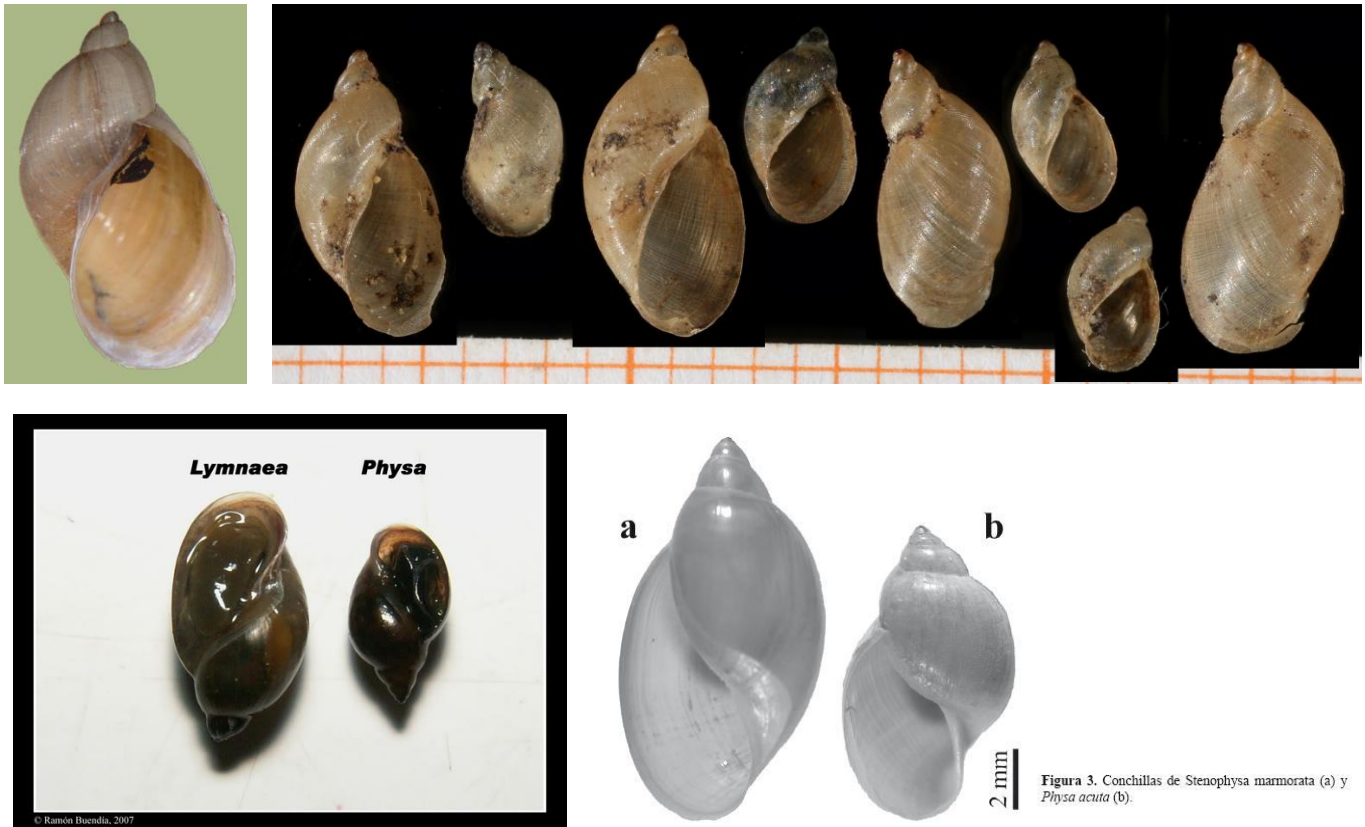


Figure 2.- Comparison between limnic snails *Lymnaea columella* Say, 1817 (upper photos), *Physa marmorata* Guilding, 1828, and *Physa acuta* Draparnaud, 1805 (lower photos). Sources: Núñez (2011: 104-Figure 3); AnimalBase < <http://www.animalbase.uni-goettingen.de/zooweb/servlet/AnimalBase/home/speciestaxon?id=15116> >

- Family Planorbidae Rafinesque, 1815
 - Genus *Biomphalaria* Preston, 1910
 - Biomphalaria occidentalis* Paraense, 1981
 - Biomphalaria oligoza* Paraense, 1981
 - Biomphalaria straminea* (Dunker, 1848)
 - Biomphalaria tenagophila tenagophila* (d'Orbigny, 1835)
 - Genus *Drepanotrema* Crosse & Fischer, 1880
 - Drepanotrema cimex* (Moricand, 1838)

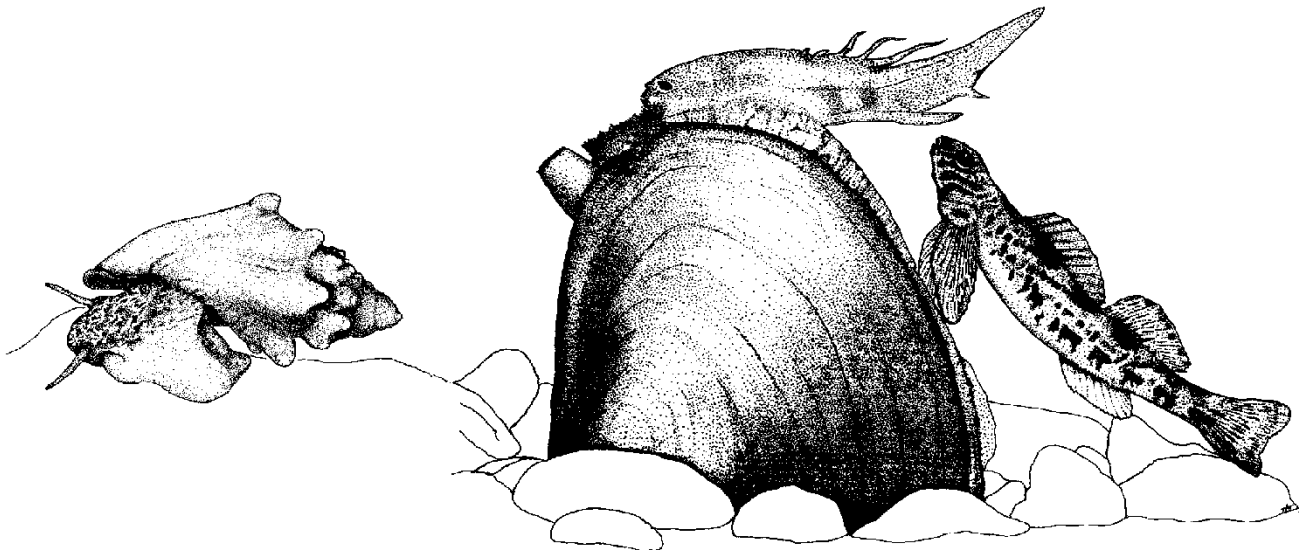
CLASS BIVALVIA

Unionoida

Family Mycetopodidae Gray, 1840

Genus *Leila* Gray, 1840*Leila blainvilleana* (Lea, 1834)**References:**

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2014 Freshwater Mollusk Bibliography

Kevin S. Cummings

The following are papers on freshwater mollusks that have been published up to and including 2014 that have not appeared in previous FMCS bibliographies. These citations are split into five groups for the convenience of researchers: Unionoida, Sphaeriidae, Corbiculidae, Dreissenidae & other freshwater bivalves, and Gastropoda. Papers that include taxa from more than one of the above categories are included under each group. A web searchable database of over 24,000 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: kscummin@illinois.edu.

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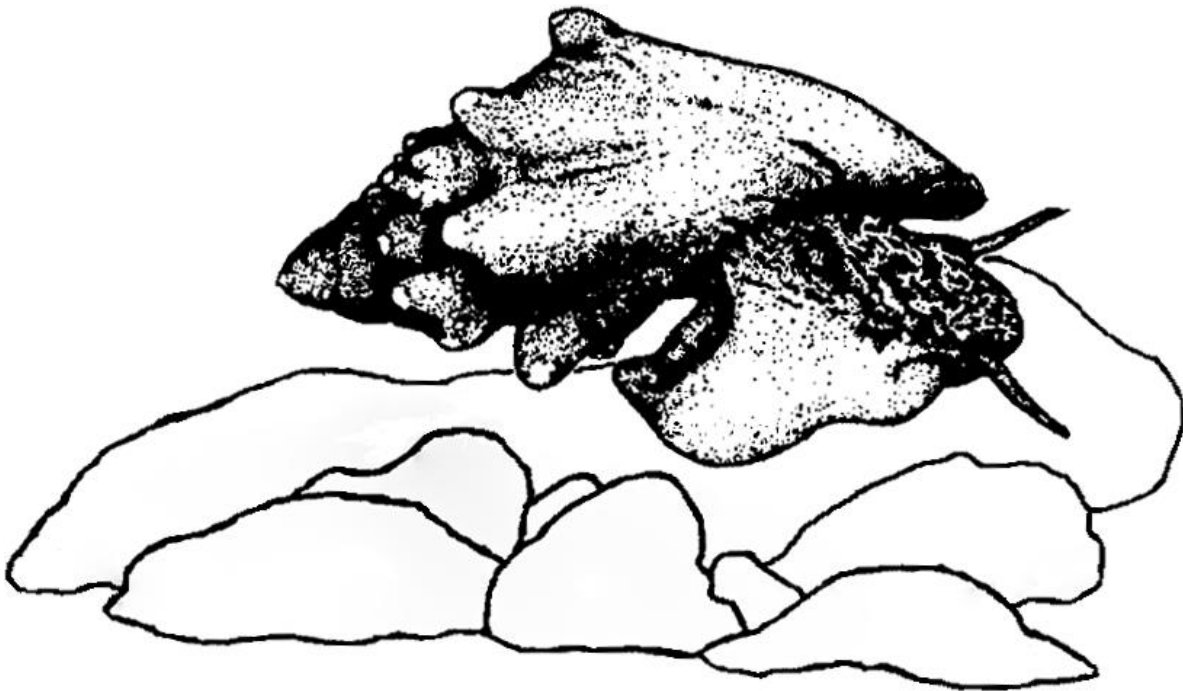
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Ellipsaria is posted on the FMCS web site quarterly: around the first of March, June, September, and December. This newsletter routinely includes Society news, abstracts, job postings, meeting notices, publication announcements, informal articles about ongoing research, and comments on current issues affecting freshwater mollusks. Anyone may submit material for inclusion in *Ellipsaria*; however, only current dues-paying members of FMCS can access the two most recent issues. Older issues are accessible to anyone. Information for possible inclusion in *Ellipsaria* should be submitted via e-mail to the editor, John Jenkinson, at jjjenkinson@hotmail.com.

Contributions may be submitted at any time but are due by the 15th of the month before each issue is posted. MSWord is optimal for text documents but the editor may be able to convert other formats. Graphics should be in a form that can be manipulated using PhotoShop. Please limit the length of informal articles to about one page of text. Note that submissions are not peer reviewed but are checked for clarity and appropriateness for this freshwater mollusk newsletter. Feel free to contact the editor with questions about possible submissions or transmission concerns.

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If you are interested in participating in committee activities, please contact one of the appropriate chairs.

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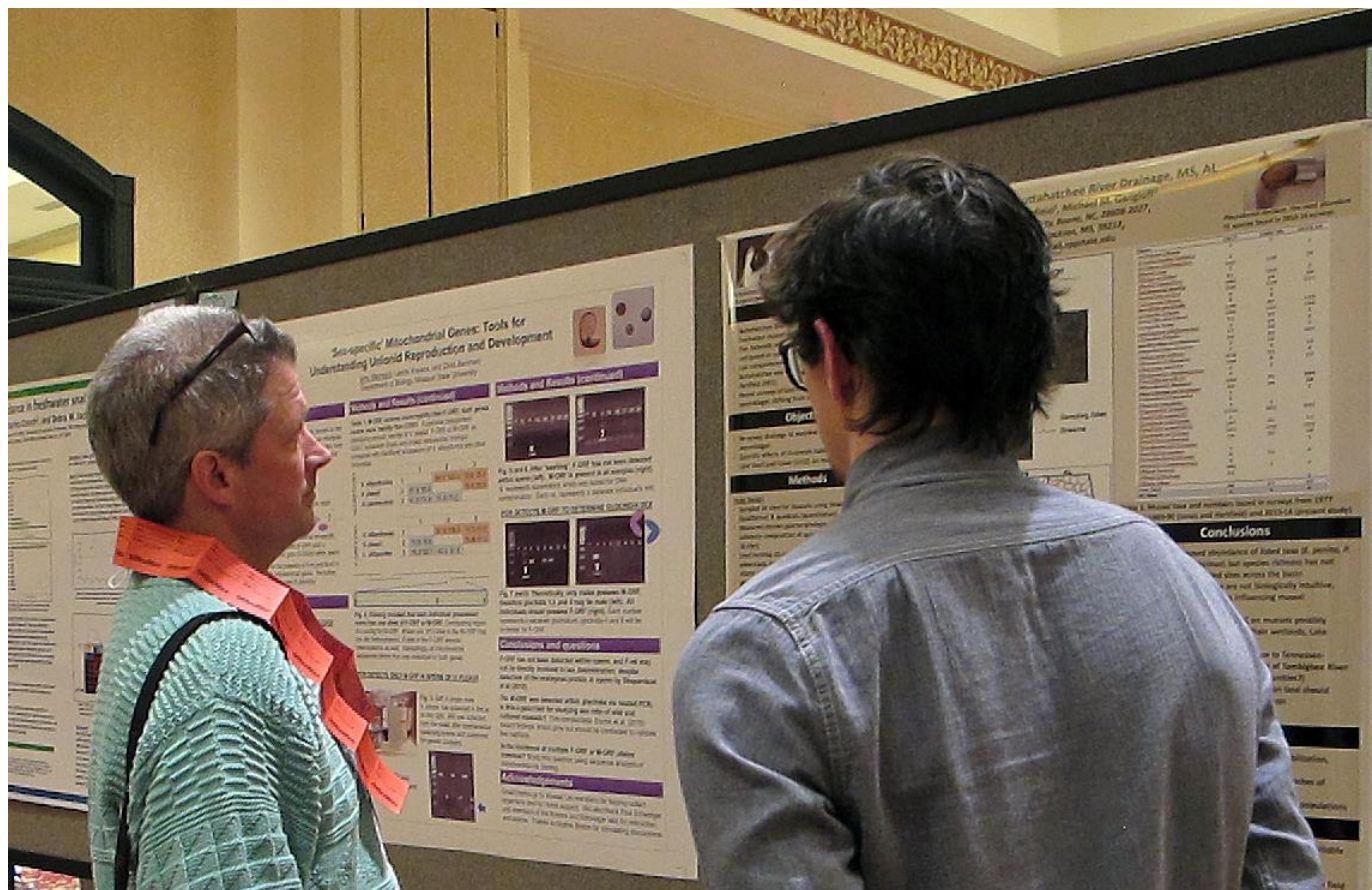
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Parting Shot



During the Poster Session at the St. Charles Symposium, Mark Hove (here on left with Daniel Mason from Appalachian State University) made a point of talking to many of the students presenting the results of their work. At the end of those discussions, Mark gave each student a raffle ticket they could use during the auction later in the week. He was heard to say “I know it’s not much but I just wanted to thank you for your interest in freshwater mollusks.” His focus on encouraging students is just one of the reasons why Mark Hove richly deserved the William J. Clench Memorial Award presented to him during this Meeting. Photograph by Janet Clayton, West Virginia DNR.



If you would like to contribute a freshwater mollusk-related image for use as a **Parting Shot** in *Ellipsaria*, e-mail the picture, informative caption, and photo credit to jjjenkinson@hotmail.com.