



Newsletter of the Freshwater Mollusk Conservation Society
Volume 19 – Number 1 March 2017

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**Lots of People are Coming to Cleveland;
You Can Still Come, Too !**

Many FMCS members and others really seem to be looking forward to attending our 2017 Symposium on March 26-30 in Cleveland, Ohio, USA. As of February 21, over 240 people have registered for this meeting, both Workshops are full, and the Local Committee has had to make arrangements at a second hotel to handle all of the attendees. This should be great meeting !

As you probably remember, the theme of this Symposium is **The Roles of Freshwater Mollusks in a Changing Environment: Ecosystems, Engineering, Valuation, and Practice**. In addition to our usual sets of oral presentations, poster session, and Society and Committee events, the Local Committee has lined up an incredible group of plenary and keynote speakers who

are sure to engage and inform all of us. Also, for the first time ever, we will holding a student/mentor mixer to foster relationships between young biologists and the leaders in the field of freshwater Malacology. This Symposium is being hosted by TRC Environmental Corporation and EnviroScience, Inc.

2017 FMCS Symposium - Schedule Overview

Sunday 3/26	Monday 3/27	Tuesday 3/28	Wednesday 3/29	Thursday 3/30
Registration 12:00 pm - 8:00 pm	Registration 7:00 am - 5:00 pm	Registration 7:00 am - 5:00 pm	Registration 7:00 - 10:00 am	Optional Field Trips 9:00am - 5:00 pm (Box Lunch Provided)
	Continental Breakfast Provided 7:30 - 8:00 am East Foyer	Continental Breakfast Provided 7:30 - 8:00 am East Foyer	Continental Breakfast Provided 7:30 - 8:00 am East Foyer	
	Salons A - D Welcome 8:00 - 8:10 Keynote Speaker Dr. Jeffrey Reutter 8:10-8:30	Salons A - D Announcements 8:15 - 8:30	Concurrent Sessions 8:20 - 10:00 SESSION 19: Threats I SESSION 20: Habitat I (Special) SESSION 21: Conservation IV	
	Plenary: Valuation Mr. Tom Wilmoth 8:30 - 9:00	Plenary: Ecosystems Dr. David Strayer 9:00 - 9:30		
	Plenary: Mollusks as Ecosystem Engineers Dr. Timothy Hoellein 9:00 - 9:30	Plenary: Practice Dr. Greg Cope 9:00 - 9:30		
	Panel Discussion 9:30 - 10:00	Panel Discussion 9:30 - 10:00		
Advanced Unionid Taxonomy Great Lakes Fauna 8:30 am - 4:30 pm Salon C (Lunch Provided)	Morning Break 10:00 - 10:30	Morning Break 10:00 - 10:30	Morning Break 10:00 - 10:30	
	Concurrent Sessions 10:30 - 12:30 SESSION 1: Status, Trends, and Monitoring I SESSION 2: Contaminants & Ecotoxicology I SESSION 3: Conservation I	Concurrent Sessions 10:30 - 12:30 SESSION 10: Life History SESSION 11: Methods SESSION 12: Ecology I	Concurrent Sessions 10:30 - 12:30 SESSION 22: Threats II SESSION 23: Habitat II (Special) SESSION 24: S Status, Trends, and Monitoring IV	
Basic Gastropod Taxonomy and Sampling 8:30 am - 4:30 pm John Carroll University (Lunch Provided)	Lunch On Your Own 12:30 - 2:00 pm	Lunch On Your Own 12:30 - 2:00 pm	FMCS Business Lunch 12:30 - 2:30 pm	
	FMCS Comm. Mtgs 12:30 - 2:00 pm	FMCS Comm. Mtgs 12:30 - 2:00 pm		
	Concurrent Sessions 2:00 - 3:20 SESSION 4: Propagation I SESSION 5: Contaminants & Ecotoxicology II SESSION 6: Conservation II	Concurrent Sessions 2:00 - 3:20 SESSION 13: Status, Trends, and Monitoring III SESSION 14: Ecology II SESSION 15: Environmental DNA	Concurrent Sessions 2:40 - 3:20 SESSION 25: Ecology IV SESSION 26: Genetics and Phylogeny II and Conservation V	
	Afternoon Break 3:20 - 3:40	Afternoon Break 3:20 - 3:40	Afternoon Break 3:20 - 3:40	
FMCS Board Meeting 4:00 - 6:00 pm Erie-Superior	Concurrent Sessions 3:40 - 5:00 SESSION 7: Propagation II SESSION 8: Status, Trends, and Monitoring II SESSION 9: Conservation III	Concurrent Sessions 3:40 - 5:00 SESSION 16: Status, Trends, and Monitoring IV SESSION 17: Ecology III SESSION 18: Genetics and Phylogeny I	Concurrent Sessions 3:40 - 5:00 SESSION 25 cont'd: Ecology IV SESSION 26 cont'd: Genetics and Phylogeny II and Conservation V	
Student/Mentor Mixer First in FMCS History 6:00 - 7:00 pm Huron	Dinner On Your Own or Mixer to Provide Ample Appetizers	Dinner On Your Own or Mixer to Provide Ample Appetizers	Dinner On Your Own 5:00-7:00 pm	
Welcome Reception 7:00 - 10:00 pm Salon E-H	Mixer and Poster Session 6:00 - 9:00 pm Salons E - H (Cash Bar)	Mixer and Auction 6:00 - 9:00 pm Salons E - H (Cash Bar)	Mixer and Music 7:00 - 10:00 pm Salons E - H Abby Normal and the Detroit Lean (Cash Bar)	

For a more details about the Symposium and the schedule, please visit the meeting website:
http://molluskconservation.org/EVENTS/2017Symposium/2017_FMCS-Symposium.html

Invited Speakers

The **Keynote Speaker** at the Symposium will be **Dr. Jeffery Reutter**. He will be giving a talk entitled ***Harmful Algal Blooms and Dead Zones in Lake Erie, the Great Lakes and Around the World: Understanding the Problems and Solutions***. Dr. Reutter began working on Lake Erie in 1971 and directed four programs at The Ohio State University from 1987 to 2015: F.T. Stone Laboratory, Ohio Sea Grant College Program, Center for Lake Erie Area Research, and the Great Lakes Aquatic Ecosystem Research Consortium. He received the Friends of Stone Laboratory Lifetime Achievement Award in 2015, the 2015 Lifetime Achievement Award from the Ohio Environmental Council, and the 2015 Water Conservationist of the Year Award from the League of Ohio Sportsmen. More information is available at <http://ohioseagrant.osu.edu/> and at <http://stonelab.osu.edu>.



The **Plenary Speaker** focusing on **Valuation** will be **Mr. Tom Wilmoth**, Attorney and partner at Blankenau, Wilmoth, Jareckle LLP. Mr. Wilmoth's talk is entitled ***A Review of Freshwater Mollusks and the Endangered Species Act***. He and his partners provide sophisticated solutions to complex legal matters across the country. His practice is devoted to Water, Natural Resources, Energy, Agribusiness, and Environmental Law. Tom has extensive experience with litigation regarding water rights and the Endangered Species Act at the highest levels of the U.S. legal system, including cases related to freshwater mollusk species. Additional information is available at <http://aqualawyers.com/>



The **Plenary Speaker** focusing on **Ecosystems** will be **Dr. David L. Strayer**, Distinguished Senior Scientist, Emeritus, Cary Institute of Ecosystem Studies in New York. Dr. Strayer will be talking about ***What are Freshwater Mussels Worth?*** He recently retired from 30+ years working as a freshwater ecologist at the Cary Institute. His recent research has focused on freshwater ecology, especially on the Hudson River; the distribution and roles of freshwater invertebrates, especially bivalves; the ecology of biological invasions; conservation ecology; and shore zone ecology. More information about Dr. Strayer and his work is available at <http://www.caryinstitute.org/science-program/our-scientists/dr-david-l-strayer>



The **Plenary Speaker** focusing on **Mollusks as Ecosystem Engineers** will be **Dr. Timothy Hoellein**, Aquatic Ecologist, Loyola University of Chicago. His talk is entitled: ***Ecosystem Engineers: Role of Bivalves in Nutrient Transformations and Retention***. Dr. Hoellein's research interests are ecosystem processes and biogeochemistry; the use of metrics of ecosystem function and seasonal dynamics for evaluation of human impacts and restoration in aquatic ecosystems. Currently, he is conducting research projects related to the influence of restoration on nitrogen cycling in eutrophic coastal habitats in New York City, measuring the role of bivalves on nitrogen transformations, and analyses of biofilm activity on anthropogenic litter and microplastic in aquatic ecosystems. More information is available at <http://www.luc.edu/biology/hoellein.shtml>



The **Plenary Speaker** focusing on **Practice** will be **Dr. Gregory Cope**, William Neal Reynolds Distinguished Professor in the Department of Applied Ecology North Carolina State University (NCSU), and Extension Leader and Coordinator of the NCSU Agromedicine Institute. Greg will be talking about ***Advances in Freshwater Mollusk Research: Perspectives on Practice, Regulation, and Emerging Needs***. Dr. Cope's research interests are in aquatic toxicology, ecology, and physiology, and in the transport, fate, and effects of aquatic pollutants and other human-mediated stressors on freshwater mollusks and fish. His research utilizes sentinel aquatic organisms, biomarkers of exposure, effect, or susceptibility, or alternative toxicological models from which linkages to environmental and human health are evaluated. The following site has more information about Dr. Cope's work: <https://appliedecology.cals.ncsu.edu/faculty/w-gregory-cope/>



Registration

Late registration online ends March 3, 2017 (at http://molluskconservation.org/EVENTS/2017Symposium/2017_FMCSymp_Registration.html). If you miss the online registration cutoff, you can still walk up to register at the Symposium. As indicated above, both the snail and mussel workshops are full. We still have some spots remaining for both the sightseeing tour and the restoration/green infrastructure field trip. Please book as soon as possible so we can plan transportation accordingly.

Lodging

This Symposium will be held at the Cleveland Marriott Downtown at Key Center (<http://www.marriott.com/hotels/travel/clesc-clevelandmarriott-downtown-at-key-center/>). The hotel is located at 1360 West Mall Drive [GPS address] (A.K.A. 127 Public Square), Cleveland, OH 44114. The hotel is within short walking distance of many restaurants and entertainment districts.

Remaining group rate rooms at the Symposium venue are extremely limited. The discounted room rate of \$129/night (1 king or 2 double beds), including complimentary continental breakfasts on Monday and Tuesday may still be available for the nights of March 26 to March 30, 2017. Please check with the Cleveland Marriott Downtown at Key Center for availability by telephone (216-696-9200) or online at http://www.marriott.com/meeting-event-hotels/group-corporate-travel/groupCorp.mi?resLinkData=2017%20FMCS/%20Symposium%20Mar2017%20%5Eclesc%60rmu%60129.00%60USD%60false%602%603/26/17%603/30/17%6003/05/17&app=resvlink&stop_mobi=yes

The Renaissance Cleveland Hotel (24 Public Square, Cleveland, Ohio 44113) has been chosen as the overflow hotel for our meeting and is only a 6 minute walk away from the Cleveland Marriott Downtown at Key Center. The number of rooms available at the Renaissance also is extremely limited, so book early! A discounted room rate of \$134 may still be available by telephone (216-696-5600) or online at: http://www.marriott.com/meeting-event-hotels/group-corporate-travel/groupCorp.mi?resLinkData=FMCS%20Room%20Block%5Eclebr%60umrumra%60134.00%60USD%60false%604%603/25/17%603/30/17%6003/05/2017&app=resvlink&stop_mobi=yes

At either hotel, make sure to mention our Group Name "**FMCS**" when you call. These rates are only available until 5:00pm EST, Sunday, March 5, 2017, **So Reserve Your Rooms Now !**

Travel

The Cleveland Marriott Downtown at Key Center is easily accessible by car from three directions via Interstates 90, 71, and 77; and by air via the Cleveland Hopkins International Airport (CLE), and the Akron-Canton Airport (CAK), located 50 minutes south of Cleveland. A very cheap (~\$1.75) RTA rail option is available from the CLE directly to Public Square next to the hotel (<http://www.riderta.com/airportservice> or <https://goo.gl/maps/332Xs7WaTyQ2>). Several other ground-transportation vendors, taxis, Uber and car rental facilities also are available. If you are driving, please know that parking will be approximately \$20/day at the Cleveland Marriott Downtown at Key Center.

Looking for a Tax Break for 2017? Help Sponsor Our Symposium

We are actively seeking sponsorships for this Symposium. EVERY DOLLAR COUNTS TOWARDS MAKING THIS SYMPOSIUM A SUCCESS! Consider a personal contribution! All sponsor contributions include recognition in the program. The FMCS is a not-for-profit, (501-(c) 3 [TAX DEDUCTIBLE] corporation, dedicated to the advocacy and conservation of freshwater mollusk resources. The Symposium provides a great opportunity to network and build relationships with conservation professionals from state and federal government, industry, and conservation organizations. FMCS has a membership of 500, and 250 members typically attend the biennial symposiums. We are requesting monetary sponsorships to help cover the costs of the symposium facilities. In addition to monetary contributions, FMCS also would accept donations of equipment and other items to support our student travel awards and scholarships.

All Sponsor Contributions Include Recognition in the Symposium Program		
River	≥\$1000	One Complimentary Registration, Logo on Website Registration Page and Symposium Materials
Stream	\$500-\$999	One Registration Reduced by 25%, Logo Displayed at the Welcome Mixer, Logo on Website Registration Page
Eddy	\$100-\$499	Logo on Website Registration Page
Mussel	<\$100	Recognition in the Symposium Program

To make a donation please contact FMCS Treasurer, Emily Robbins at erobbins@ecologicalspecialists.com or use the form on the Symposium page of the website.

Student Presentation Judges Needed

The Awards Committee is still in need of judges for student presentations at the Cleveland Symposium. If you are willing to serve as a judge, please email Emy Monroe, emy_monroe@fws.gov. In your message, let her know which sessions you would prefer to judge and if there are any conflicts to be avoided, particularly involving late arrivals or a conflict of interest with judging your own students. Thank you for considering serving our society in this capacity.



Auction Items Still Needed, Too!

We also need you to donate items for the “World-Famous FMCS Auction” to be held at the Cleveland Symposium. Past items have included field equipment, rare books, T-shirts, art, jewelry, fishing gear, regional foods and beverages, and more. Proceeds go to FMCS student awards. When you come to the meeting, you can deliver your auction items to the registration desk, Greg Zimmerman, Becca Winterringer, or auctioneer Steve Ahlstedt. If you can’t make the meeting in person or would rather ship your donations, please send the items to Attention: Greg Zimmerman, EnviroScience, Inc., 5070 Stow Rd., Stow, Ohio 44224 (Phone 330-688- 0111). Please clearly label shipped items as FMCS AUCTION ITEMS and indicate if a receipt is desired.

**ONE LAST THING! - Send Us Your Photos!!**

This has been a big hit at the last few meetings. We will run a PowerPoint presentation when possible during the mixers, etc., showing FMCS members doing their things. So, send your field photos, lab photos, etc., to show off what you do at work or when just having fun! Send photos to Phil Mathias, PMathias@EnviroScienceInc.com . It would help if you would use “FMCS Photos” as the subject line.



Society News

**Minutes of the Fall 2016 FMCS Board Teleconference Meeting
Thursday, December 8, 2016**

The Board Meeting was called to order by President Teresa Newton. In attendance were: Teresa Newton, Emily Robbins, Janet Clayton, Heidi Dunn, Patty Morrison, Rachel Hoch, Jennifer Archambault, Steve McMurray, Mary McCann, John Harris, John Jenkinson, Dave Berg, Megan Bradley, Braven Beaty, Emy Monroe, Jeremy Tiemann, Tom Watters, Leroy Koch, Rebecca (Becca) Winterringer, Greg Cope and Kevin Cummings. A quorum was declared.

A motion to accept the minutes of the April 19, 2016 Board Meeting as published in the June 2016 *Ellipsaria* was made by President Newton and seconded by Heidi Dunn. All approved.

Treasurer’s Report -- Emily Robbins

Emily stated that symposium registration continues and is up to 20 registrants. Only two sponsors have contributed thus far but are expecting more. Following a successful test run with the Square credit card system in 2015, the old credit card system has been retired. The test run was conducted using Emily’s personal tablet. Since the system is used by others at the registration desk, Emily requested to purchase a tablet for the Society. Although her request

was for a cheaper older generation machine, Dave suggested that it may soon become obsolete and we should consider current model. Teresa made the motion for Emily to purchase a tablet for FMCS not to exceed \$750. Emily seconded the motion and it was approved. Emily further noted that the Square system is capable of using the chip technology of newer credit cards. (The full Treasurer's Report, including her financial statement, is presented on Page 11.)

Secretary's Report -- Janet Clayton

No current membership numbers were provided though that number has remained relatively steady. As Emily reported concerning registrations coming in for the Symposium, it is expected that memberships will go up; however, at the first of the year, there will be a number of memberships lapse for those who do not attend the 2017 Symposium.

Email blasts continue to be sent to the membership when requested. It was decided that the Secretary also should post most blasts to Unio.

The Secretary apologized again for the erroneous email blast that came from the automated system concerning membership renewals. The automated notice to renew membership has since been edited by Sophie Bender (our webmaster) and made into a generic announcement without reference to date or specific symposium.

Old Business

Update on revisions to the American Fisheries Society's (AFS) Investigation and Monetary Values of Fish and Freshwater Mussel Kills publication -- Mary McCann and Rachael Hoch

The most recent edits to Chapter 5 have been submitted to Southwick. There has been discussion among propagation committee members about the best way to capture production efforts across facilities. The group has produced several revisions of the survey. Chapter 6 was not originally attached by the consultant for their review, so they had to backtrack and are reviewing all again. They are currently reviewing the revised survey and are looking for final comments by December 15th. The committee has finalized updating the facilities database contact information as there has been a lot of expansion in facilities from basket propagators to those that have been doing it for years. All affirmed that we were way behind Southwick's planned September draft deadline; however, Heidi and Rachael felt assured that Southwick was ok with the delays since all wanted to take the effort and do it right. Rachael is hopeful to get the survey out to facilities in January during their off season and have back by the symposium.

Heidi added that monies are still coming in for assistance with this project. The request from Southwick was for \$40,000. Genoa National Fish Hatchery has supplied \$10,000, UMRCC - \$10,000, and Patty noted that the Ohio River NRDA just submitted a credit card payment to AFS for \$2,500. Additional funds are expected from Paul Johnson in Alabama, and then FMCS will make up the difference as previously approved.

(Additional information on this topic is presented in the Guidelines and Techniques Committee report, presented on Page 12.)

Student events at future FMCS symposia -- Megan Bradley

Megan noted that the student event for the Cleveland Symposium is still moving forward but she was disappointed with the responses from the announcement in *Ellipsaria*. Teresa assured her that once folks know what is expected of them, they will probably step up. Megan plans to reach out to folks once they get a better feel for the layout. Plans are to do something more casual this symposium and see what participation is like. It will provide information on how to move forward for future efforts. Megan continues looking for suggestions. (Also see the Outreach Committee Report presented on Page 15.)

Theme of 2018 Workshop

Heidi and Teresa brought forward the idea of a Mussel Health and Disease Workshop. Teresa has talked to Diane Waller [USGS-LaCrosse, Wisconsin (WI)] and she would like to have it possibly in conjunction with an aquatic animal health conference (perhaps in Madison or LaCrosse, WI). Megan noted that the topic just came up last week from a regional zoo's veterinarian. Heidi wanted to ensure that the topic was broad enough to get 80-100 folks. Most believed it would, and would be timely due to recent die-offs and the disease concerns/questions in propagation. Rachael noted that the Tennessee group was also very interested. Teresa brought up that there is a disease protocol for fish assessments and maybe one goal would be to come up with a mussel protocol. Suggested maybe get fish and mussel folks together to discuss this. Freshwater mollusk propagation continues to be way behind marine efforts and was suggested that we may want to reach out to some of those researchers. Rachael commented that there was a recent freshwater mussel histology atlas published that could be a good reference. What new knowledge in these other disciplines would be applicable to freshwater mussels? Heidi requested everyone put together some ideas as to what they want out of this workshop. These will be compiled and sent to Diane Waller. Steve McMurray noted that Missouri just hired an aquatic veterinarian and this information would be valuable to direct his research.

(Heidi's proposal for this Workshop is described in more detail in the 2018 Workshop Proposal, presented on Page 13.)

New Business**Travel grants to support international attendees to symposia -- Becca and Teresa**

Recent inquiries from a potential international attendee to the upcoming symposium indicate that international attendees may need incentive (supporting documentation) to get permission to attend. The above individual wanted a letter of invitation to present to his government. All agreed that we want to foster more international participation. Teresa tasked the International Committee to consider it as part of their charge. Braven suggested that the acceptance of an abstract should be acceptable as an invitation. Patty noted that this had been done in the past; once the abstract was submitted and accepted, a letter was then sent to their university stating as such. Concern was raised that we do not want to be put in position of having to vet their intentions. Teresa noted that all award funds are paid directly to the hotel and not the individual. Teresa would like to see a mechanism to support international travel. For the Baltimore meeting (touted as an "international" meeting), we reserved one of the student travel awards for international travel. How do we encourage or support travel of non-students?

Committee Reports**Awards Committee -- Teresa Newton (Full Report on Page 12)**

Teresa reported that they had received their first application for a student travel award. Committee also has received at least one nomination for each category of the professional awards. Request was made to send email blasts soliciting further applicants for student awards, nominations for professional awards and judges. Emy emphasized the need to be notified when last student paper is to be presented at the symposium so the judging can be completed before the business meeting. The judges will need a small room to use for this task.

Gastropod Status and Distribution -- Jeremy Tiemann (Full Report on Page 12)

Jeremy noted that they were hoping to get at least 15 people to sign up for their snail workshop in Cleveland. He also noted that the proposed 2018 disease workshop would most likely be pertinent to snails as they are vectors for nematodes and trematodes, but would check on it.

Guidelines and Techniques -- Mary McCann (Full Report on Page 12)

Mary noted that they are trying to keep protocol list up to date. They currently have a new one from Michigan to add. They have not had a lot of feedback on this effort. Secretary was requested to add to email blast a notice announcing this new posting, request any updates and supply link. Moving forward, they plan to look at evaluating and possibly changing committee goals in line with the new strategy.

Mussel Status and Distribution -- John Harris (Full Report on Page 15)

John reported that the first species account of the Mussel Atlas was posted on the website on December 7 (http://molluskconservation.org/Library/Atlas/Anodonta_template_final.pdf) and a number of other accounts are in various stages of review. Hopefully, more accounts will be posted soon.

Nominations -- Leroy Koch (Full Report on Page 15)

Leroy Koch reported that Todd Morris and Jeremy Tiemann have been nominated for President-Elect, and Janet and Emily agreed to run again for Secretary and Treasurer. Election information was posted in the December issue of *Ellipsaria* and voting is underway now. Janet was directed to send out an email blast in mid January to remind folks to vote.

Outreach -- Megan Bradley (Full Report on Page 15)

The committee continues periodic updates to the website. They have been watching for opportunities being posted to Facebook to add to website. While Jennifer has been trying to keep up with Facebook, Jeremy continues to post as well.

Symposium -- Heidi Dunn and Becca Winterringer

Heidi Dunn brought up plans for future symposia including Austin, Texas in 2019. Charles Randklev will make a presentation in Cleveland on the Texas Symposium. They are still in need of Workshop ideas for 2020. A suggestion was made to approach the Pacific Northwest group to see if they would consider hosting in 2021. It was suggested that the membership be queried in Cleveland as to their willingness to travel that far. Alternative would be to possibly host the 2020 workshop there. John Jenkinson, supported by Dave Berg, suggested that the 2021 symposium should move back east first since 2019 would be in Texas. Heidi and Jennifer noted that the membership may be more willing to travel further for bigger event, such as the Symposium, rather than for a Workshop. It was agreed to put this item on the business meeting agenda to gauge the Society's interest and willingness to travel. Teresa also is to reach out to Matt Patterson at NCTC as they recently hosted a mussel propagation class in Montana. Heidi is also to approach the Pacific Northwest group on their interest in hosting. It was noted that this area is important to the tribes; they just had a mussel position posted, however, it is difficult for them to afford to come East.

Becca reported that they would soon be posting updated information about the Cleveland Symposium on the website. She further noted that hotel room rates would be at conference prices three days before and after the symposium. (Her full Report starts on Page 13)

Propagation, Restoration, and Introduction Committee -- Rachael Hoch

The full report from this committee is presented on Page 16. All additional discussions were with regards to the monetary values document provided above (on Page 7).

Information Exchange -- Greg Cope and Tom Watters

The FMBC editors are currently drafting a section for the Procedures Manual pertaining to the journal, its structure, and procedures for editors. This information will be submitted soon.

The editors also are currently working on a transition plan and will be appointing (or suggesting) their own replacements. As a beginning, Tom will be stepping down as an editor in 2017.

Ad Hoc Committees

Ecosystem Services: Teresa noted that Dan Spooner said he was just too busy to take this on. Caryn Vaughn and Danielle Kreeger are the other two members.

International: Kevin Cummings and Teresa Newton (Full Report is on Page 16)

Kevin did not have much to report and is looking for direction and goals for this committee. Teresa indicated she had tasked the group with addressing mechanism to support international travel and will resend the items she had previously charged the group to address. Kevin said the group would try and have something together to present at the next board meeting in March.

One goal is to support networking and increase international collaboration. Kevin noted that they were trying to organize small groups internationally, within prospective countries, which would then work with the larger FMCS. Greg Cope suggested group consider working with international audience and possibly have a special issue of FMBC on European fauna. The first FMCS International Symposium is being planned for Northern Italy in 2018.

Professional Certification – Becca Winterringer (Full Report on Page 17)

Becca noted that they have an aggressive timeline and hope to have something to present in Cleveland. Greg Cope had provided them some information from SETAC who just went through the same process. He said it was important to get a feel from the membership as to what they felt about the certification process and how many people would participate in it. Bill Posey is liaison with AFS. Becca is to put out a survey monkey or provide questionnaire at symposium.

Other Items

Diversity Studies

Jeremy Tiemann made the Board aware of ongoing studies (or possible studies) by the American Fisheries Society (AFS) and others on gender and diversity in its members. AFS is currently involved with the newly developing Diversity Joint Venture that was initiated by USFWS/DOI and thought that would be good if FMCS and other Consortium of Aquatic Science Societies (CASS) groups could collaborate. Jeremy believed it would be good for FMCS to collaborate as there appears to be a gender bias between societies, with FMCS having a greater proportion of females. He will keep us informed. Teresa discussed trying to have more collaboration in students, scholarships, and diversity with AFS. Jeremy had also previously started some discussion on FMCS possibly joining CASS. Jeremy reached out to CASS as to how we can be involved. He has drafted a letter and will continue to research and report back.

National Strategy Implementation

Megan wanted to know what the plans were for moving forward following the publishing of the National Strategy. Teresa noted that she and Heidi had been talking about it and had hoped to get folks together last fall. She noted that the existing committees were formed based on the previous strategy and believes that committees should be aligned with the goals in the new strategy. She still hopes to get a group together to discuss. Heidi suggested meeting in Cleveland. It was noted that a few tasks have dropped out from the previous strategy and new things have been identified that do not have a committee assigned. Megan noted that the new strategy could really change her committee. Teresa encouraged committees to set goals and have them align with the new strategy. Committees should be looking at how their efforts will advance the strategy. Heidi will send out copies of the Strategy to committee chairs to draft talking points which should then be brought to rest of committee at symposium. Following the

symposium, the committees should come back with a synopsis of what their direction should be. We need to look at the bylaws and how the committee structure is established in there and whether changes need to be made. John Jenkinson suggested that maybe the Past President could be in charge of assessing this. Teresa and Heidi both indicated they wanted to work on it. The committee chairs should email their membership to bring their goals for the year to board meeting, and another group will meet later to implement. Patty suggested working with some members ahead of committee meeting so meeting goals could be finalized in Cleveland.

Committee Notices -- Teresa encouraged all committees to request an email blast when major milestones have been reached or they have added new sections to the website. It was also suggested to have a recurring section in *Ellipsaria* pointing out website updates.

Procedures Manual -- Patty advised the group that one of the duties of the Past President is to maintain an up-to-date Policies and Procedures Manual and that she would soon be soliciting changes from all.

March Meeting Agendas -- Teresa will be sending out the agenda for the Cleveland board and business meetings based on this call and other items. Let her know by the end of January of any other items to be addressed.

Motion to adjourn was made by John Jenkinson and seconded by Patty. Meeting adjourned.

Reports Submitted to Support the Fall 2016 Board Meeting Teleconference

Treasurer's Report (as of 11/30/16) – Emily Robbins

2017 Symposium income

We currently have 15 people registered for the Cleveland symposium, and have received two sponsorships (Columbus Zoo and HDR).

Income so far:

• Registrations	\$4,125.00
• Sponsorships	1,101.00
• Unionid workshop	360.00
• Gastropod workshop	180.00
• Field trips	375.00
• <u>T-shirts, etc.</u>	<u>138.00</u>
Total symposium income to date	\$6,279.00

Other income and expenses, 4/5/16 – 11/30/16

Income

• Memberships	\$3,200.00
• Interest	63.79
• 2016 workshop sponsorships	
• <u>(deposited after last treasurer's report)</u>	<u>3,000.00</u>
Total	\$6,263.79

Expenses

• Allen Press/FMBC costs	\$1,992.05
• Webpage	2,380.00
• Regional meetings (Ohio River Valley)	100.00
• Old credit card machine fees	29.95
• PayPal fees	197.71
• Square (new CC system) fees	2.95
• Bank fees (membership fees on credit cards)	71.00
• Tax prep	35.00
• <u>And some last 2016 workshop expenses</u>	<u>170.00</u>
Total	\$4,978.66

Current bank balance

• Checking	\$ 13,688.84
• Savings	124,967.15
• PayPal	
<u>(has since been transferred to bank)</u>	<u>8,250.85</u>
Total	\$146,906.84

Other Items

I have closed out our account with Bank of America (old credit card processing system) since our new system, Square, has been working well. Square runs on a mobile device (phone/tablet/etc.); I have just been running it on my personal iPad for the time being. With the symposium approaching, I would like to suggest/request that we purchase an iPad for FMCS use. Cost of an older-generation model (will work fine for our purposes) is around \$300.

Awards Committee – Teresa Newton

Announcements for the FMCS student travel awards, a call for judges for student presentations, and a call for professional award nominations were emailed to the FMCS membership in November and posted in the December issue of *Ellipsaria*. Teresa is coordinating student travel grants, Emy is coordinating judging student presentations, and Greg is handling the professional awards. We will all continue to work with the symposium coordinators to take care of each type of award.

There are several volunteers stepping forward to judge student presentations, and multiple professional nominations have been made thus far.

Gastropod Status and Distribution Committee – Jeremy Tiemann

Our committee will lead a one day introduction to aquatic gastropods workshop at the upcoming FMCS meeting in Cleveland (if 15 people register for it). This workshop will provide a background on the ecology of aquatic gastropods, sampling techniques, and taxonomic skills for commonly encountered species. Please check out the FMCS website for more details, including registration information.

Guidelines and Techniques Committee – Mary McCannCompilation of Published Mussel Survey Protocols and Guidelines:

An email was sent out to the committee membership summarizing recent meeting discussions and soliciting input on proposed website information on mussel survey protocols. All the compiled documents and introductory text was added to the website in May of this year, and a notice of the new addition to the committee website page was included in June issue of *Ellipsaria* (thanks Sophie!) The intent is to update this page as new information becomes available.

Photo Guidelines:

No progress to report on this task.

Mussel Kill Evaluation:

This task is shared with the Propagation committee. The task is to update the AFS Fish and Mussel Kill evaluation book. Southwick Associates has the contract to update the book but is looking to FMCS to provide information on current propagation costs and facilities and on the Field Procedures chapter. The committee worked early on to develop an ad-hoc committee of various experts on propagation and field survey protocols. An ad-hoc committee was formed and numerous email exchanges and a few conference calls were conducted. However, the chapters needed extensive updating and people with specific expertise on conducting these types of field evaluations so the heavy load of updating really fell to a smaller group working closely with Southwick. I believe Janet and Heidi have the most up to date information on the current status of the field procedures chapter, and Rachel and Jeremy on the propagation and costs chapters.

2017 Symposium Update (as of November 28, 2016) – Becca WinterringerPresent Status:

- Registration has opened ~ 8 members and 5 non-members registered
- Issues with international registrants not being able to register due to an entry field has been resolved.
- Sponsorships are coming in – attempting to get company/entity logos for those levels on the website
- Abstracts slowly trickling in – Dave Zanatta has been collaborating with Paul Johnson and Steve McMurray to get program templates.
- Schedule is (relatively) finalized.
- Fieldtrips, Workshops, and Plenary Speakers are confirmed.
- Special Session (Habitat) speakers confirmed (HD)
- Poster Panels confirmed.
- Event Insurance confirmed.
- Next Planning Call: December 7, 2016

Action Items:

- Student Mentor Mixer – Logistics
- Symposium Schedule –Plenary speaker time slots to map out the sessions accordingly
- Sponsorships - Looking for someone take the lead on monitoring who has contributed, get logos, track money, etc. and provide to Greg and Becca.

- Identify volunteer needs – Would like someone to take this on and manage who can/will be assisting at registration desk make a time slot schedule for tasks and volunteers, identify other areas where help is needed.
- music arrangements – Greg Zimmerman

2018 Workshop Proposal -- Freshwater Mussel Health and Disease – Heidi Dunn

About 25 years have passed since the workshop on freshwater mussel die-offs was held in response to events in the Upper Mississippi, Tennessee, and Ohio rivers. Why convene a workshop on mussel disease again? What has changed since 1996?

Freshwater Mussel disease is a growing concern because:

- Intensive culture programs for unionids are spread throughout portions of the United States and Europe. As with fish and marine bivalve culture, confinement of dense populations of individuals can lead to disease outbreaks for which we have very few tools to diagnose, prevent, or treat in freshwater mussels.
- Mussels are stocked from hatcheries to natural waters, relocated within and between basins, and transplanted into waterbodies for research studies. There is the potential for transmission of microorganisms among mussels during these activities. There is no standard procedure to disease-certify freshwater mussels, similar to that in place for fish.
- Invasive molluscs, such as dreissenid mussels and *Corbicula*, have continued to expand their range. Invasive species are potential sources of new pathogens, but may also indirectly reduce tolerance of native mussels to facultative pathogens by altering food and water quality.
- Continued degradation of water quality from non-source and point source inputs have led to algal blooms and changes in food supply and food quality, which exacerbate the occurrence of disease disorders in freshwater mussels.
- Knowledge of mussel disease and diagnostic tools have improved.
- Recognition of the importance of disease in the decline of freshwater mussels prompted reviews and work by people such as C. Starliper, J. Grizzle, Jay Levine.
- Histological atlas of freshwater mussels was published by A. McElvain and S. Bullard.
- New technology is available for identification of bacteria and viruses.

The target audience for the proposed Workshop would include individuals working in:

- Mussel propagation (state and federal),
- Mussel conservation and relocation (private, university, state, federal),
- Water quality monitoring and ecosystem health (local, university, state, federal),
- Aquatic animal health (university, state and federal animal health laboratories), and
- Research (state, university, federal),

Potential Workshop Topics:

1. State of the knowledge of freshwater mussel disease
 - Known pathogens and etiology
 - Diagnostic procedures
 - New technologies
 - Knowledge gaps
 2. Mussel die-offs and kills – Case studies since 2000
 - Panel discussion: Review existing protocols for response to mussel die-off
-

3. Considerations for disease development and transmission during propagation, stocking, and relocation activities.
 - Current practices – hatchery to field, interbasin, and intrabasin relocation
 - Risk assessment and reduction of disease transmission
4. Environmental stressors and development of disease
 - Water quality and algal blooms
 - Aquatic invasive species occurrence
 - Toxicants
 - Water temperature
5. Tolerance of diseased mussels to environmental stress.

Potential Field Trip/Hands on Experiences:

- Tour aquatic animal health laboratory,
- necropsy and sampling procedures for diagnostic tests.

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

1. J. D. Williams et al. Conservation assessment of freshwater mussels of US, Canada and Mexico. This revision of Williams et al. (1993) was submitted to Freshwater Mollusk Biology and Conservation in August 2015, and following substantive comments from the editor and reviewers in December 2015, it was decided that the manuscript should be divided in two, with the first revised manuscript to cover taxonomy and nomenclatural issues, an update of Turgeon et al. 1998. After the taxonomy paper is published, or is in press, a companion version addressing conservation status will be submitted to Freshwater Mollusk Biology and Conservation.
2. Development of Mussel ID App - Susan Oetker. We tested the app at Texas mussel identification workshops hosted by Charles Randklev in August and October 2015. The app did not perform to our expectations or satisfaction, and we performed an extensive QA/QC and revision to the characters database during Winter 2015 and Spring 2016. Revisions to the app character matrix are complete, and the development team is now reviewing and testing the app as we continue to improve and augment the photo archive and illustrations. The team continues to search for and solicit high quality photos to complete the North American set. Additional funding has been received through ESA Section 6 to the state of Texas. When contracts are finalized, the App Developer will be ready to release a new build for peer review and testing.
3. Atlas of Freshwater Mussels of North America. Currently, 159 of the approximately 362 taxa to be addressed in the Atlas have volunteer authors for species accounts. As of November 29, 2016, we have received 22 first draft accounts. External review and subsequent revisions are complete for one species, and the account has been posted to the website (at: http://molluskconservation.org/Library/Atlas/Anodonta_template_final.pdf). We are proceeding with preliminary and external reviews of the remaining draft species accounts and will post those as they are completed.

Nominations Committee – Leroy Koch

Here are the nominees for our next round of elected officers:

- for President-Elect: Todd Morris and Jeremy Tiemann
- for Secretary: Janet Clayton
- for Treasurer: Emily Robbins

Position statements from each of these members and information about how to participate in the election was posted in the December issue of *Ellipsaria*. Voting will end on January 31, 2017, and the winners will be announced at our Business Meeting during the 2017 Symposium in Cleveland.

Outreach Committee – Megan Bradley

Professional/Student Mixer: Since the spring conference call, committee co-chairs Jennifer and Megan have been in touch a few times about shoring up plans for a student/professional mixer during the Cleveland Symposium. There were previously some valid concerns raised regarding schedule time and space constraints, and some brainstorming had us leaning toward scheduling an informal meet-up near the conference location at a local pub/eatery. Planning a firm date/time for the event hasn't been possible without a better sketch of the full symposium schedule, though we hope that we can firm that up during the fall conference call. After consulting the 2015 symposium 'schedule at a glance' and if the schedule for Cleveland is similar, possible day/times may be Monday (or Wed...or whatever other day is not the banquet day) after platforms and ahead of a poster session (e.g., 5:30-6:30 happy hour).

A few professionals responded to our request for participation in the mixer posted in the September issue of *Ellipsaria* but additional attendance will be needed to provide enough support. Once more details are ironed out with the Symposium committee Megan and Jennifer will reach out to other members.

Website: Things have continued much the same with periodic requests for information. New this year, an Opportunities tab was added to the website and several people have sent information about job openings to be posted.

Propagation, Restoration, and Introduction Committee – Rachael HochFMCS Mollusk Propagation and Restoration Facilities Database

The committee is 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. Any facilities actively propagating freshwater mollusks are encouraged to contact Rachael Hoch to add their contact information to the facilities database.

Mussel Kill Evaluation

Some of our members have joined an ad-hoc committee assisting the Techniques and Guidelines Committee to provide information on mussel value estimates for the American Fisheries Society's Investigation and Monetary Values of Fish and Freshwater Mussel Kills publication. Members are currently reviewing and compiling comments on the 2002 facility

propagation cost survey and the cost and economic valuation chapter of the original document. Compilation of comments are expected to be completed by the end of the year.

International Ad hoc Committee -- Arthur E. Bogan, Kevin S. Cummings, Manuel Lopes-Lima

1. World Congress of Malacology 2016. 18-24 July 2016, Penang, Malaysia:
Four FMCS members participated and presented five papers at the meeting including over 20 international colleagues. These four also chaired four sessions.
2. Organization of the first FMCS international freshwater bivalve meeting:
Nicoletta Riccardi, Italy with assistance from Maneul Lopes-Lima is planning the next international bivalve meeting to be held in 2018 in northern Italy.
3. International publications from FMCS members, examples of collaboration:
Lopes-Lima, M., E. Froufe, V.T. Do, M. Ghamizi, K.E. Mock, U. Kebapci, O. Klishko, S. Kovitvadhi, U. Kovitvadhi, O.S. Paul, J.M. Pfeiffer III, M. Raley, N. Riccardi, H. Sereflisan, R. Sousa, A. Teirxeira, S. Varandas, XP Wu, D.T. Zanatta, A. Zieritz and A.E. Bogan. 2016. Phylogeny of most species rich freshwater bivalve family (Bivalvia: Unionida: Unionidae): defining modern subfamilies and tribes. *Molecular Phylogeny and Evolution* [2017] 106:174-191. Available on line September 2016 at <http://dx.doi.org/10.1016/j.ympev.2016.08.021>
Zieritz, A. M. Lopes-Lima, A.E. Bogan, R. Sousa, S. Walton, K.A.A. Rahim, J.-J Wilson, P.Y. Ng, E. Froufe, S. Mc Gowan. 2016. Factors driving changes in freshwater mussel (Bivalvia, Unionida) diversity and distribution in Peninsular Malaysia. *Science of the Total Environment* 571:1069-1078. available on line 26 July 2016. at <http://dx.doi.org/10.1016/j.scitotenv.2016.07.098>

Professional Development Ad-hoc Committee – Becca Winterringer

On November 14, 2016, the core development team had a kickoff call to discuss the path for FMCS Professional Development. Below are the minutes from that call.

Meeting Minutes

Attendees:: Becca Winterringer, Amanda Rosenberger, Casey Swecker, Matt Patterson, Todd Morris, Bill Posey

Becca provided an introduction and background as to how the Professional Development program evolved.

- Core development team to draft documents; disseminate to committee members for input.
 - * Open floor for round table discussion about the goals of the program.
- Discussed roll of the Committee in the Program
 - * To develop and administer a Professional Development program for the Society.
 - * Integrate existing programs (e.g.: AFS, TWS) so as not to re-invent the wheel.
 - * Set up a google docs for information exchange (Matt).
 - * Discussed the criteria; considering AFS Certified professionals already have a level of certification that may not warrant as much review.

- * Establish a review panel.
- * Charge a Fee – need to find out how to do that; discussed supporting student award of some type.
- * Determine maintenance costs.
- * Renewal processes.
- * Action Items:
 - Draft criteria (Bill to review AFS and generate draft by mid to late January)
 - Draft Purpose and Objective (Becca by Dec 31)
 - Define Implementation (Pending)
 - Establish a Review Panel (Pending)
 - Submit to FMCS Board for review in February and targeting announcement of the Program to the membership by March 2017
 - * Accept first applications by mid to late Summer 2017

Next Call: Becca to send a doodle poll in Early December

Announcement

Macroinvertebrate Ecology and Identification Course

This Spring the U.S. Fish and Wildlife Service (FWS) National Conservation Training Center, 698 Conservation Way, Shepherdstown, West Virginia, 25443-4024, will be offering a 4-day course on macroinvertebrate ecology and identification. This course has the following objectives:

- Describe common life history strategies of macroinvertebrate taxa;
- Describe habits and trophic group types;
- Describe macroinvertebrate patterns of abundance based on physical and chemical habitat templates;
- Discuss effect of impairment on assemblage composition;
- Correctly use a variety of sampling gears;
- Use proper collecting, labeling, and preservation techniques; and
- Correctly identify unknown specimens by following methods demonstrated in the course.

This course is targeted toward anyone needing background in macroinvertebrate ecology and identification, for example, biologists interest in using or understanding macroinvertebrates as a component of aquatic monitoring programs.

The course will be held on May 10-14, 2017. The registration fee for non-FWS personnel is \$1,195.00. More information about this course and how to register for it is available at <https://nctc.fws.gov/nctcweb/catalog/CourseDetail.aspx?CourseCodeLong=FWS-CSP2221> or from the course instructor, Matthew Patterson, matthew_patterson@fws.gov.

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.

Upcoming Meetings

March 26 – 30, 2017 – FMCS 10th Biennial Symposium, Cleveland Downtown Marriott at Key Center, Cleveland, Ohio Theme: ***Ecosystems, Engineering, Valuation, and Practice – The Roles of Freshwater Mollusks in a Changing Environment.***

http://molluskconservation.org/EVENTS/2017Symposium/2017_FMCS-Symposium_INTRO.html

March 26 - 30, 2017 – National Shellfisheries Association 109th Annual Meeting, Knoxville, Tennessee, USA Theme: [not posted] <https://shellfish.memberclicks.net/annual-meeting>

June 4 – 9, 2017 – Society for Freshwater Science Annual Meeting, Raleigh, North Carolina, USA Theme: *Designing our Freshwater Futures* <http://sfsannualmeeting.org/>

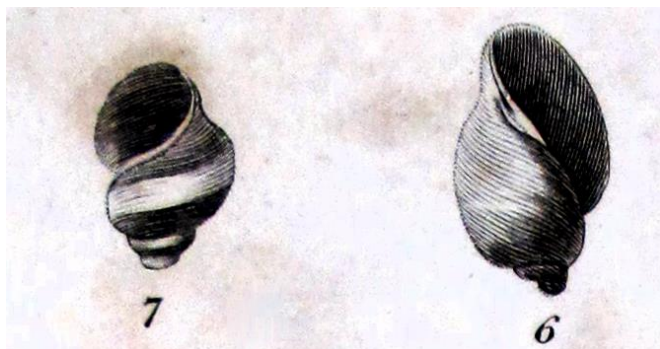
July 16-21, 2017 – American Malacological Society 83rd Annual Meeting University of Delaware, Newark, Delaware, USA Theme: *Mollusk research in a digital world: creating, integrating and mining large datasets* <http://www.malacological.org>

August 20 – 24, 2017 – American Fisheries Society 147th Annual Meeting, Tampa Convention Center, Tampa, Florida, USA Theme: *Fisheries Ecosystems: Uplands to Oceans* <http://fisheries.org/events-page/future-afs-meetings/>

Spring (?) 2018 – FMCS Workshop, Topic and location yet to be determined.

Summer (?) 2018 -- First FMCS International Freshwater Bivalve Meeting, Northern Italy (?), Details and precise location yet to be determined.

July (?) 2018 – Society for Conservation Biology North American Sectional Meeting, Toronto, Ontario, Canada. Dates, and Theme not yet posted <http://scbnorthamerica.org/naccb2016/>



(See Page 27 for the source of this image)

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.

Freshwater Mollusk Occurrence in the Tacuaruçu Stream Microbasin, Highlands of Santa Catarina State/ SC, Central Southern Brazil

A. Ignacio Agudo-Adrón, Project “Avulsos Malacológicos - AM”, P.O. Box 010, 88010-970 Centro, Florianópolis, Santa Catarina/ SC, Brazil – ignacioagudo@gmail.com;
<http://noticias-malacologicas-am.webnode.pt/>

Continuing our malacological research in the Highlands Region of Santa Catarina State/ SC of Urubici Municipal District (Agudo-Adrón 2016d), we took this opportunity to sample the Tacuaruçu River microbasin (Figure 1), a typical larger stream that runs between the Municipal Districts of Monte Carlo – 27°13'22"S & 50°58'48"W – and Fraiburgo – 27°01'34"S & 50°55'17"W (Figure 2). This stream is part of the fluvial network that forms the important macrobasin of the Uruguay River, geographically located in the northeast section of the Highlands, border with the Western Malacological Region of the State (Agudo-Adrón 2014a:9 Figure 2). That region is the domain of the Mixed Ombrophilous or Araucária Forest and includes altitudes that range between 942 (Monte Carlo) and 1048 meters (Tacuaruçu/ Fraiburgo) above sea level. As in the Urubici region (Agudo-Adrón 2016d), strong frosts and snows are common in this microbasin during the austral winter period.



Figure 1. A typical view of the Tacuaruçu River, the larger stream of Fraiburgo and Monte Carlo Municipal Districts in Santa Catarina State/ SC, Brazil.

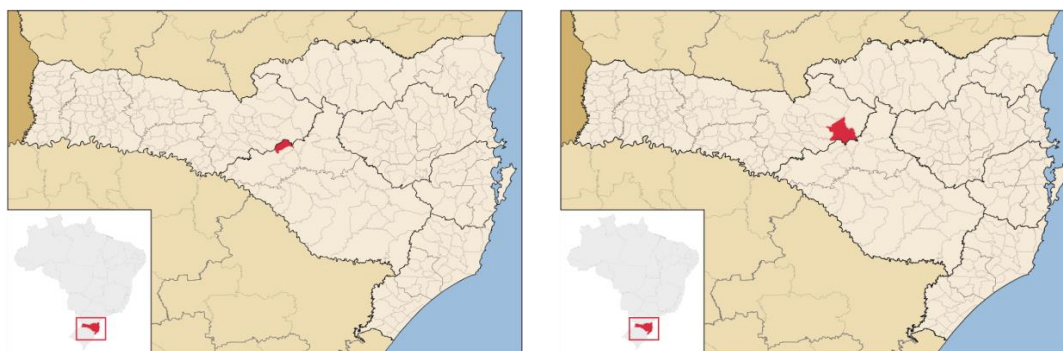


Figure 2. Locations of the Monte Carlo (left) and Fraiburgo (right) Municipal Districts (Maps - red color) in the geographical territory of Santa Catarina State/ SC, Brazil.

Our data on the little-known regional fauna of continental mollusks in the general Highlands territory includes a total of 29 previously registered forms – seven native bivalves and 22 gastropods (9 limnic/ freshwater – one exotic, 8 natives – and 13 land/ terrestrial – 7 natives, 6 exotics) occurring in this part of Santa Catarina State/ SC (Agudo-Padrón 2008, 2012, 2014a-b, 2015, 2016a-d).

Of the previously documented total, seven native freshwater/ limnic species were confirmed by us in the field on this collection trip (Figure 3). That total includes three gastropod species [Caenogastropoda Hydrobiidae *Potamolithus catharinae* Pilsbry, 1911, Pulmonata Chiliniidae *Chilina fluminea* (Maton, 1809), Planorbidae *Biomphalaria straminea* (Dunker, 1848)], and four bivalve species [Unionoida Hyriidae *Rhipidodonta charruana* (d'Orbigny, 1835) = *Diplodon aethiops* (Lea, 1860), *Diplodon ellipticus* (Wagner, 1827), *Diplodon rhuacoicus* (d'Orbigny, 1835), and Veneroida Sphaeriidae *Pisidium observationis* (Pilsbry, 1911)].



Figure 3. Some limnic mollusk species of the Tacuaruçu stream microbasin: *Potamolithus catharinae* Pilsbry, 1911 (upper left and middle), *Chilina fluminea* (Maton, 1809) (upper right), *Biomphalaria straminea* (Dunker, 1848) (lower left), *Rhipidodonta charruana* (d'Orbigny, 1835) = *Diplodon aethiops* (Lea, 1860) (lower middle), and *Diplodon rhuacoicus* (d'Orbigny, 1835) (lower right).

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Additional Record of the Invasive Non-native Asian Clam *Corbicula largillierii* (Philippi, 1844) in the Irani River Microbasin, Western Region of Santa Catarina State/ SC, Southern Brazil

A. Ignacio Agudo-Padrón, Project “Avulsos Malacológicos - AM”, P.O. Box 010, 88010-970 Centro, Florianópolis, Santa Catarina/ SC, Brazil – ignacioagudo@gmail.com goodcatt30@gmail.com
<http://noticias-malacologicas-am.webnode.pt/>

The Irani River is located within the upper middle reaches of the Uruguay River Basin. It is born in the Serra da Trincadeira mountain range in the State of Santa Catarina/ SC, Municipality of Água Doce, at an altitude of approximately 1250 m, extending to its mouth in the Uruguay River with a distance of approximately 206 km. The basin has a drainage area of 1750 km² and runs through a deep embedded valley with steep slopes and an amplitude of relief of the order of 400 meters. The valley excavated by the Irani River has a "V" profile, shallower near its source, deepening towards the Uruguay River, alternating areas of backwaters and rapids (Figure 1). In general, the region is an Ecotone area, with Deciduous Seasonal Forests downstream and Araucária Forests upstream along the river. Additional environmental description and location of the Irani River watershed is available in the regional technical literature (such as Techio Beé 2008:9-13).

Figure 1.- Typical view of the Irani River in the Western region of Santa Catarina State/ SC, Central Southern Brazil.



With the exception of the cities of Chapecó and Xanxerê, all the municipalities in the Irani River basin have the production of pigs and poultry as their main economic activity. Breeders indiscriminately throw waste in the rivers and streams, contributing to the environmental degradation (Agudo-Padrón 2016a:31). In addition, at least three small hydroelectric power plants are installed in the Irani microbasin, mainly upstream, with altitude in the locality ranging between 545 and 384 meters, involving the Municipalities of Faxinal dos Guedes and Xanxerê (upstream), Xavantina and Arvoredo (downstream) (Techio Beé 2008:9,10-Figure 1).

A recent addition has been made to the malacological research reports from the West region of Santa Catarina State/ SC (Agudo-Padrón 2016). recently, Maike Elize Techio Beé, a local professional biologist, requested the possible identification of a lot of small limnic bivalve mollusks that were found in the Irani River near a small hydroelectric power plant in the Municipal District of Arvoredo, (Figure 2) – 27°03'40.34"S / 52°28'11.49"W. The bivalves were illustrated in several field photos (Figure 3)



Figure 2.- Municipal District of Arvoredo (map - red color) and a view of the local small hydroelectric power plant on the Irani River.



Figure 3.- Invasive Asian clams *Corbicula largillierti* (Philippi, 1844) found in the cited locality of the Irani River microbasin. Photographs by Biologist Maike Elize Techio Beé.

The species involved was confirmed by us as the exotic invasive Asian mussel Corbiculidae/ Cyrenidae *Corbicula largillierii* (Philippi, 1844), confirming once again our forecast for its continued spread in the region (Agudo-Padrón 2016a:31, 2016b). With the aggressive presence of invasive alien forms, and the galloping destruction of habitats by human intervention, today the Upper Uruguay River Basin and its rich endemic malacological fauna are seriously threatened, transiting along an increasingly dark path and with no return !

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(See Page 27 for the source of this image)

FMCS Officers

President

Teresa Newton

U.S. Geological Survey
Upper Midwest Environ. Science Center
2630 Fanta Reed Road
LaCrosse, WI 54603
608-781-6217
tnewton@usgs.gov

President Elect

Heidi L. Dunn

Ecological Specialists Inc.
1417 Hoff Industrial Park
O'Fallon, MO 63366
636-281-1982; Fax: -0973
Hdunn@ecologicalspecialists.com

Secretary

Janet Clayton

West Virginia Division of Natural Resources
PO Box 67
Elkins, WV 26241
304-637-0245
Janet.l.clayton@wv.gov

Treasurer

Emily Robbins [formerly Grossman]

Ecological Specialists Inc.
1417 Hoff Industrial Park
O'Fallon, MO 63366
636-281-1982
erobbins@ecologicalspecialists.com
Note her new e-mail address, too

Past President

Patricia Morrison

U.S. Fish and Wildlife Service
Ohio River Islands NWR
3982 Waverly Road
Williamstown, WV 26187
304-375-2923 x 124
patricia_morrison@fws.gov

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, meeting notices, pertinent announcements, informal articles about ongoing research, and comments on current issues affecting freshwater mollusks. Anyone may submit material for inclusion in *Ellipsaria* and all issues are accessible to anyone on the FMCS website (<http://molluskconservation.org>).

Information for possible inclusion in *Ellipsaria* should be submitted via e-mail to the editor, John Jenkinson, at jjjenkinson@hotmail.com. Those 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.

FMCS Standing Committees and Their Chairs/Co-chairs

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

Awards

W. Gregory Cope
North Carolina State University
greg_cope@ncsu.edu

Teresa Newton
Upper Midwest Environ. Science Center
tnewton@usgs.gov

Emy Monroe
Midwest Fisheries Center
emy_monroe@fws.gov

Environmental Quality & Affairs

Steve McMurray
Missouri Dept. of Conservation
stephen.mcmurray@mdc.mo.gov

Braven Beaty
The Nature Conservancy
bbeaty@tnc.org

Gastropod Status and Distribution

Nathan Whelan
Auburn University
nwhelan@auburn.edu

Jeremy Tiemann
Illinois Natural History Survey
jtiemann@illinois.edu

Genetics

David J. Berg
Miami University
bergdj@miamioh.edu

Curt Elderkin
The College of New Jersey
elderkin@tcnj.edu

Guidelines and Techniques

Mary McCann
HDR, Inc.
mary.mccann@hdrinc.com

Ryan Schwegman
EnviroScience, Inc.
RSchwegman@EnviroScienceInc.com

Information Exchange

Newsletter

-- John Jenkinson
Clinton, Tennessee
jjjenkinson@hotmail.com

Information Exchange (continued)

Journal

-- G. Thomas Watters
OSU Museum of Biological Diversity
Watters.1@osu.edu

-- W. Gregory Cope
North Carolina State University
greg_cope@ncsu.edu

-- Wendell R. Haag
U.S. Forest Service
whaag@fs.fed.us

Mussel Status and Distribution

Arthur E. Bogan
N.C. State Museum of Natural Sciences
arthur.bogan@ncdenr.gov

John L. Harris
Arkansas State University
omibob1@gmail.com

Nominations

Leroy Koch
U.S. Fish and Wildlife Service
leroy_koch@fws.gov

Outreach

Megan Bradley
U.S. Fish and Wildlife Service
Megan_Bradley@fws.gov

Jennifer Archambault
North Carolina State University
jmarcham@ncsu.edu

Propagation, Restoration, & Introduction

Dan Hua
Tennessee Wildlife Resources Agency
Dan.Hua@tn.gov

Rachael Hoch
North Carolina Wildlife Resources
Commission
rachael.hoch@ncwildlife.org

Symposium

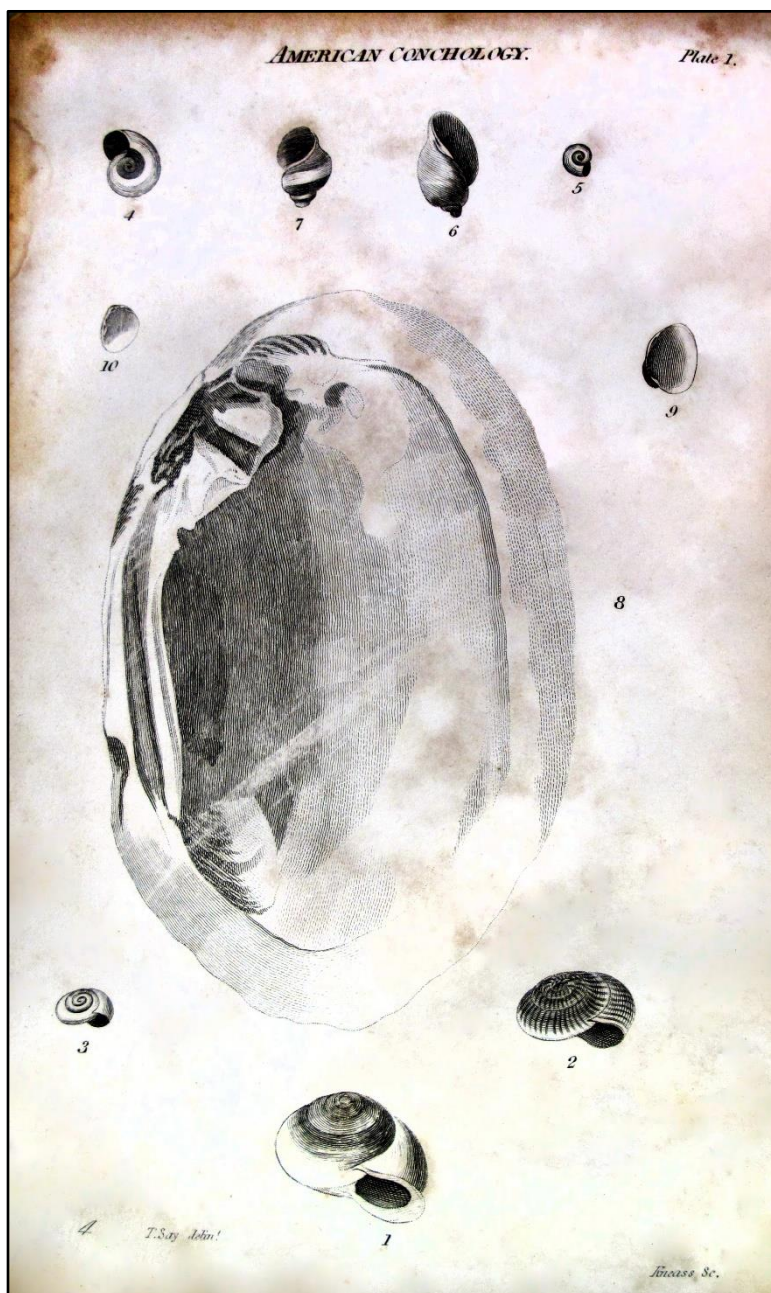
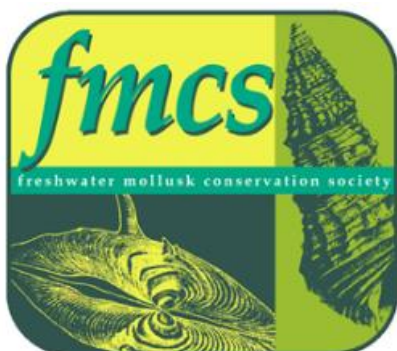
Heidi L. Dunn
Ecological Specialists Inc.
Hdunn@ecologicalspecialists.com

Parting Shot

In 1817-- two hundred years ago this year -- Thomas Say published the first American paper on North American land and freshwater mollusks as part of the *American Edition of the British Encyclopedia or Dictionary of Arts and Sciences*. Say's Conchology article consisted of fifteen unnumbered pages of introductory information and concise descriptions mostly of species not yet described by others. The article was accompanied by four uncolored plates.

This copy of Plate I from Say's article includes illustrations of ten species: four land snails, three aquatic snails, a freshwater mussel, and two fingernail clams. Say's names and their present identifications are as follows:

1. *Helix albolabris* [*Neohelix albolabris* (Say, 1817)],
2. *Helix alternata* [*Anguispira alternata* (Say, 1817)],
3. *Helix glaphyra* [*Oxychilus callarius* (Muller, 1774)],
4. *Planorbis bicarinatus* [*Helisoma anceps* (Menke, 1830) ?],
5. *Planorbis parvus* [*Gyraulus parvus* (Say, 1817)],
6. *Lymnaea heterostropha* [*Physella acuta* (Draparnaud, 1805)],
7. *Lymnaea subcarinata* [*Lioplax subcarinata* (Say, 1817)],
8. *Unio crassus* [*Actinonaias ligamentina* (Lamarck, 1819)],
[Say's *crassus* is not available as the senior name for this species because Retzius had used *Unio crassus* previously for a species in Europe.]
9. *Cyclas similis* [*Sphaerium simile* (Say, 1817)], and
10. *Cyclas dubia* [*Pisidium dubium* (Say, 1817)].



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.