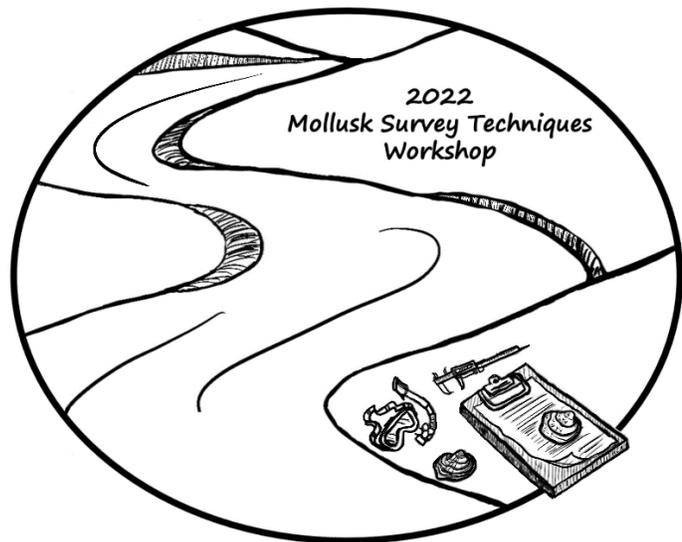




Newsletter of the Freshwater Mollusk Conservation Society
 Vol. 24 – No. 3 ISSN 2689-2936 September 2022

Cover Story 1
 Society News 3
 Announcements . . 13
 Upcoming Meetings 15
 Contributed Article 16
 FMCS Officers . . . 18
 Committees 19
 Parting Shots . . . 20



The Survey Guidelines and Techniques Workshop was Wet but Worthwhile

The FMCS Mollusk Survey Guidelines and Techniques Workshop was held August 8-11, 2022, at Henry Horton State Park on the Duck River in Tennessee. More than 115 people attended from across the United States. The beauty of the park and the flexibility of the park’s staff to accommodate our rather damp and very enthusiastic crowd made for a great few days.

Despite our best attempts to manage the weather, we had a rather wet week that made field sampling difficult. Tuesday, the first day of the Workshop,

started with a plenary talk by Dave Smith to lay out his thoughts on survey design. After his talk, participants spent two days on a path of either hands-on-time and lectures on basic field work and survey techniques, or a series of symposium-style presentations drawing together methodologies for gathering high-quality data to evaluate presence and distribution but also to further evaluation of community resilience, genetics, movement and their response to habitats. Tuesday night was poster night with time after dinner to visit and chat about posters. Wednesday night's dinner ended the Workshop with hours of chat outside, and the occasional net collection by members who couldn't resist the local amphibian life.



The Thursday field trip to the Duck River was intended to cap off the great week, but Wednesday's torrential raised the water level in the river over two feet and it wasn't possible to safely search for mussels. Some participants headed home early, while a small group visited the Tennessee Wildlife Resources Agency Cumberland River Aquatic Center to learn about their techniques for rearing the rare Cumberland mussel fauna. Many thanks to Jason Wisniewski and Hua Dan for making that unscheduled visit possible.



The program for this Workshop, including abstracts of the advanced topics talks, is available on the FMCS website at <https://molluskconservation.org/EVENTS/2022WORKSHOP/12th%20Biennial%20Workshop%20Program%20FINAL.pdf> . Thanks to all of the presenters (Teresa Newton and Heidi Dunn, Wendell Haag, Dave Berg, Amanda Rosenberger, Caitlin Carey, Pete Hazelton, Emilie Blevins, Katie Bockrath, Garrett Hopper, Astrid Schwalb, Jason Wisniewski, Kayla Key, Danielle Kreeger, and Brandon Sansom) for taking the time to put together such relevant and informative talks. Thanks, also, to Mark Hove and David Foltz for taking pictures during the Workshop.

Thanks to all of the participants for taking the time to attend. Workshop organizers Ryan Schwegman, Lisie Kitchel and Megan Bradley, our Workshop Planning Committee of Heidi Dunn, Dave Smith and Dave Foltz, did a great job and kept everything running smoothly. We especially appreciate Heidi Dunn, Janet Clayton, Phil Mathias, Megan Bradley, Joe Snavely, Clarissa Lawlis, and Mark Hove for volunteering their time to help teach sessions. This Workshop would not have been possible without support from nine sponsors. We received sponsorships from EnviroScience, the Virginia Department of Wildlife Resources, Edge Engineering and Science, Mainstream, Daguna Consulting and EcoAnalysts Inc. Their support is greatly appreciated!

Near the end of the Workshop, the attendees discussed whether the FMCS Guidelines and Techniques Subcommittee should work toward recommending standardized mussel sampling protocols – the important considerations, the purpose, and the structure and format. The intent would be to provide guidance on survey data collection or sampling protocols to support and improve freshwater mussel conservation. The guidance would be contingent on broad goals or objectives that are standard to mussel conservation work and influential site conditions, such as stream/river size (for example, whether motivated by research or permitting project determines level of effort and data collection requirements). The recommendations would consider not only what is needed to achieve immediate goals but also how data might be used to understand ecological relationships and dynamics over watersheds, basins, and decades.

Society News

A Better Review of the Joint Aquatic Sciences Meeting May 14-20, 2022

Daelyn Woolnough,
Central Michigan University



As mentioned in my brief report in the June issue of *Ellipsaria*, the May 2022 Joint Aquatic Sciences Meeting (JASM) in Grand Rapids, Michigan, was a huge success. We now know that there were 3,431 attendees, 103 attendees (3% total) of whom were from developing countries. This was likely one of the first face-to-face meetings that many have attended in a couple of years; 77% of attendees attended in person but due to the unknowns of the COVID pandemic, the conference had a large virtual component and 23% of attendees “came” virtually. Like many FMCS symposia, students made up a large group of attendees (30%). FMCS well represented at JASM, with 78 attendees recognizing FMCS as one of their membership societies!



JASM occurred in May 2022 during the COVID pandemic, so it should be mentioned how the pandemic was addressed. All attendees were required to show evidence of vaccination prior to receiving their registration package at the registration desk. Masking was required throughout the conference, except during times when you were eating or drinking. Masking was very evident; especially after a handful of COVID positive cases popped up, which was not unexpected with so many attendees. In general, it was an excellent venue and, luckily, excellent weather for outside conversations.

JASM 2022 utilized a hybrid meeting format. The plenary sessions were livestreamed, and all presenters were required to submit recorded versions of their presentation for asynchronous viewing by the attendees. The conference was much larger than many FMCS members are used to [There were over 30 concurrent sessions throughout the week!], so the hybrid format offered the ability to view missed talks. The talks are also available for viewing by registered attendees for six months following the meeting. Questions and comments could be placed on the JASM app to the authors of the talks. Throughout the conference the JASM app didn't work super well for finding talk locations and times, but FMCS members were excellent -- in their normal collegial way -- in helping each another figure out where the next cool mollusk talk was!



There were two poster evenings during the meeting, and the posters were up for most of the week. The posters were set up in the very large DeVos Center (think- large enough for a car show -- it was Michigan, you know), which made spreading out possible and gave attendees the time and space to read posters as well as interact with the

authors in uncrowded conditions.

FMCS had a booth in the vendor area, and it was often the place that FMCS members found one another. Many people signed up for information about FMCS at the booth and there were some great conversations and friendships made.



A promotional announcement for the 2023 FMCS Symposium in Portland was made during one of the JASM Plenary sessions.

There were two plenary speakers each day and the topics were wide-ranging and central for developing good science. At least 1500 attendees were in the audience for the plenary talks, but they were given in a large auditorium with excellent projection facilities. Plenary speakers that FMCS members likely recognized included Dr. Dan Allen (Penn State University) and Dr. Catherine Febria (University of Windsor), both of whom incorporated their work on mollusks in their talks, highlighting research of past and present FMCS members.

It was decided early in the planning that FMCS talks would be distributed throughout the program to help encourage other attendees to learn more about research on freshwater mollusks. This often meant many talks were in different sessions and, regardless of whether this

was positive or negative overall, the mollusk talks were very well attended. In fact, there was a series of mollusk talks on the last afternoon of the conference and they were some of the most highly attended that afternoon. So, many thanks to colleagues and friends who supported one another at JASM.

Diversity, equity, and inclusion (DEI) events, including workshops and social events, happened throughout JASM and were highlighted during the plenary talks. During one of the Plenary sessions, a group of eight women representing African Lake Scientists talked about the importance of their research, and how it aligns with much of what others around the world are doing. There were LGBTQ, BIPOC, and Student meetups early in the week and related workshops throughout the meeting that promoted an inclusive environment for all attendees. The FMCS



DEI Committee presented a poster on their survey results, accomplishments, and ongoing work. Many attendees were interested in what FMCS is doing successfully, and there were many discussions about how DEI initiatives could be incorporated into the aquatic sciences.

The Consortium of Aquatic Science Societies (CASS: <https://aquaticsocieties.org/>) includes the nine aquatic societies that helped coordinate this JASM.

CASS meetings were held throughout the week and Braven Beaty represented FMCS at those meetings. FMCS plays a unique role in CASS as it is one of the smaller societies compared to larger organizations like the American Fisheries Society. Therefore, it was good to have Braven representing FMCS and we are sure he will bring useful and interesting CASS information back to FMCS.

There were many social events at the conference and the DeVos Center venue was adjacent to the Grand River that flows through Grand Rapids and into Lake Michigan. Many of the dinners and social events were outside along the river and the large Thursday night banquet was on bridges that spanned the Grand River. An insect emergence was happening in that week so there were some interesting discussions about what was emerging and what else occurs in the river. That often led to discussion about the unique and rare mollusks found in the Grand River.



Overall, JASM was well attended, and a post-conference survey showed that 88% of attendees would attend another JASM if given the opportunity! The timing of a potential future JASM meeting will be decided by CASS, but it is likely to be at least five years from now. JASM also was a financially successful meeting, therefore a portion of the net income generated will return to FMCS based on the proportion of attendees that identified their membership in our society.



When we realized how well FMCS was represented at this big meeting, we decided to try to round up folks for an FMCS photograph. Some virtual attendees and those who did attend but couldn't make the photo shoot sent in pictures to add to this record. Of the 78 JASM attendees who registered as FMCS members, 42 are represented here. It is possible that others were there but were so busy talking science or watching virtual presentations that they missed the photo shoot.

**Get Ready for Our 2023 Symposium in Portland, Oregon!
Monday-Friday April 10 – 14, 2023**



Yes, you heard it here! We are ready to welcome everyone to the 13th Biennial FMCS Symposium on April 10 -14, 2023, and we are excited to announce it will be live and in person in Portland, Oregon. Unlike past years, the Symposium will be held Monday through Friday to accommodate the Easter holiday weekend.

The Planning Committee is pleased to announce that our conference theme will be: **“From the Mountains to the Sea and Mollusks in Between.”** The goal for this Symposium is to highlight the unique natural history, mollusks, Tribal culture, and compelling river and landscape features in an area of the United States where one of our Symposia has not previously been held. This event will be the first opportunity in four years for FMCS members to gather at a symposium in person. We will bring together



researchers, resource managers, consultants, and enthusiasts in a forum that will allow for collaboration opportunities and easy information exchange. If you are unable to attend in-person, we will be supporting virtual access and interactions for some of the symposium components.

Hotel

The Symposium will take place at the DoubleTree hotel in Portland, Oregon. The hotel room rates will be based on the prevailing federal per diem rate for the area (not yet fixed for 2023). The hotel is easily accessible via the MAX light rail system directly from the Portland airport (PDX), so it is not necessary to rent a vehicle. The room block for the Symposium includes standard single queen, single king, or double queen guestrooms, and you can request a microwave and fridge in the room for no additional charge.



Program Highlights

We anticipate two plenary presentations, our typical wide range of traditional platform talks, a poster session, and an exciting underwater filmography and photography workshop. There will also be a special session where members of the Pacific Northwest Native Freshwater Mussel Workgroup will share their work and goals with the broader FMCS audience. In the coming months, more details will be provided on the Symposium page on the FMCS website (<https://molluskconservation.org/index.html>).

Schedule

The Symposium schedule will be similar to previous years except that we will begin on Monday (instead of Sunday) and have field trips on Friday (instead of Thursday).

2023 Symposium Schedule at-a-Glance				
Monday 4/10	Tuesday 4/11	Wednesday 4/12	Thursday 4/13	Friday 4/14
Workshop	Plenaries and Concurrent Talks	Concurrent Talks	Concurrent Talks	Field Trips
	Lunch and Committee Meetings	Lunch and Committee Meetings	All Member Business Meeting and Lunch	
FMCS Board Meeting	Concurrent Talks	Concurrent Talks	Concurrent Talks	
Student-Mentor Mixer	Poster Session and Mixer	Dinner	Dinner on Your Own	
Welcome Reception	Possible Movie	Auction		

Abstract Submission

Start getting those abstracts polished! The abstract submission deadline for the 2023 FMCS Symposium will be **Friday, January 27, 2023**. The First Call for Abstracts is posted below (on Page 10). It also will be the subject of an email blast that will be sent out soon.

Registration

Registration for the 2023 Symposium will open October 15, 2022. We are happy to be able to offer the same registration rates as we were planning for two years ago, pre-COVID. While most things cost more these days, attending the FMCS Symposium doesn't have to!

Attendee Status	Early Registration (10/15/22 - 1/27/23)	Late Registration (after 1/27/23)	Virtual
Member	\$415.00	\$465.00	\$275.00
Non-member	\$500.00	\$550.00	\$355.00
Student/Retiree Member	\$275.00	\$325.00	\$185.00
Student/Retiree Non-member	\$315.00	\$365.00	\$225.00

Monday Workshop - Underwater Photography and Filmography



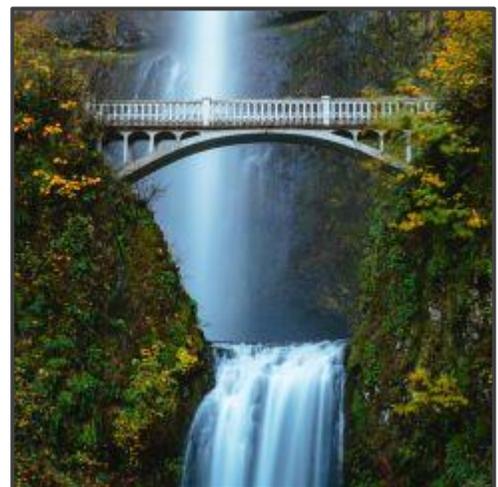
A picture is worth a thousand words, especially in today's visually driven world of social media. Are you interested in improving your underwater filmography or photography skills to better capture and communicate the importance of freshwater mussels and snails? Join us for a workshop led by experts in the fields of nature photography and filmography, as well as science communication. You'll receive information and training regarding equipment and technique and learn more about using digital media for conservation.

Three Friday Field Trips to Choose From

Trip 1: Waterfalls, Sturgeons, and Dams

This field trip will take participants along the Columbia River corridor in Oregon, stopping at Multnomah Falls (<https://www.travelportland.com/region/multnomah-falls/>), then traversing on to Bonneville Dam (<https://www.travelportland.com/region/bonneville-dam/>).

Attendees can take a tour of the dam, see the fish ladder, visit Herman the Sturgeon (<https://myodfw.com/articles/herman-sturgeon>), and take a short self-guided hike to nearby Wahleclella Falls. The trip is less than an hour's drive from the hotel and will allow time for participants to enjoy some of the highlights of the Oregon side of the Columbia River.



Trip 2: Conservation and Restoration Successes of the lower Columbia in Washington



This field trip will take participants along the Columbia River corridor in Washington, first heading to Steigerwald Lake National Wildlife Refuge (<https://www.fws.gov/refuge/steigerwald-lake>), following a 2-year closure and \$31 million floodplain habitat restoration project. The site is home to native freshwater mussels, salmon and steelhead, and a variety of bird life. Following a tour hosted by USFWS staff, the field trip will continue on to Cape Horn for stunning views of the Columbia Gorge (hike optional, with stops at the overlook: <https://gorgefriends.org/hike-the-gorge/cape-orn.html>). The trip

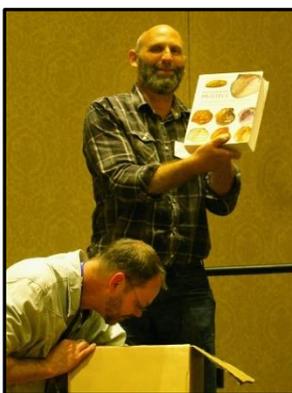
also is less than an hour's drive from the hotel and will allow time for participants to enjoy some of the highlights of the Washington side of the Columbia River.

Trip 3: Astoria and the Oregon Coast

A trip to Oregon is never complete without a visit to the Pacific coast. This field trip will take participants to Fort Stevens State Park on the Oregon coast (<https://stateparks.oregon.gov/index.cfm?do=park.profile&parkId=129>), followed by an afternoon in Astoria (<https://traveloregon.com/places-to-go/cities/astoria/>). Attractions include a historic shipwreck, the Astoria Column (<https://astoriacolumn.org/>), and the Columbia River Maritime Museum (cost is \$16, to be paid by attendee; <https://www.crm.org/>). The trip is approximately 2 hours from the hotel, with about a half our additional driving from the coast to Astoria.



Auction



Did we mention the “World-Famous” FMCS auction? Don’t forget to start collecting items now and bring them to the Symposium. Past items have included rare and unusual things of interest, field equipment, rare books, T-shirts/clothing, art, photos, jewelry, fishing gear, foods, beverages, and more (including river booty). Proceeds go to support the FMCS student and young professional awards. Since many people will be flying you can pack small items in your suitcase. Item too big to pack in your suitcase? Can't attend? You can still donate. Stay tuned for more details!



Need more information?

More information about the Portland Symposium will be posted soon under the Events tab on the FMCS website (<https://molluskconservation.org/index.html>). If you have specific or urgent questions, please contact Emilie Blevins (Emilie.Blevins@xerces.org) or Megan Bradley (megan_bradley@fws.gov).



**First Call for Abstracts for the
FMCS 2023 Symposium
April 10-14, 2023
in Portland, Oregon, USA**



The 13th Biennial symposium of the Freshwater Mollusk Conservation Society will be held from April 10-14, 2023, at the DoubleTree hotel in Portland, Oregon. The theme for the symposium is: ***From the Mountains to the Sea and Mollusks in Between.*** The Local Committee encourages members and guests to give talks and offer posters pertinent to the theme; however, other talks and posters concerning freshwater snails, freshwater mussels, and their habitats will be welcome. Traditional topics from past presentations have included: Life History and Ecology, Status and Distribution of Mollusks, Surveys and Monitoring, Propagation, Ecosystems and Community Ecology, Genetics and Phylogeny, Ecosystem Services, Habitat and Mollusk Community Restoration, Contaminants and Ecotoxicology, Outreach, Climate Change, Invasive Mollusks, and Mollusk Kills.

Instructions for Authors

Abstracts for both talks and posters will be due by 11:59 pm Eastern U.S. on **Friday, January 27, 2023**. We may be able to accommodate pre-recorded presentations for some individuals who find they cannot attend in person. Stay tuned for more details later.

All abstracts should be submitted as an email attachment in Microsoft Word® or Rich Text format to Patricia Morrison at pearlymussel@gmail.com. **The file name should be the presenter's last name and initials** (e.g., **dubosetp.doc**). Acknowledgment of abstract receipt, if requested, will be provided by e-mail.

Abstract format

The abstract should be typed in **Calibri 12-pt font**, and contain the title in **BOLD, CAPITAL** letters, followed by the author(s), and address(es). Underscore the presenter's name. Skip one line and begin the text including a clear summary of presentation including objectives, results, and conclusions. Please keep abstracts to 300 words or less (see example below). Also, be sure to include the requested information at the bottom of your abstract.

DROUGHT-INDUCED MASS MORTALITY OF FRESHWATER MUSSELS ALTERS ECOSYSTEM FUNCTION: A MESOCOSM EXPERIMENT. Traci P Dubose¹, Carla L Atkinson², Caryn C Vaughn¹ & Stephen W Golladay³. ¹University of Oklahoma, Norman, OK; ²University of Alabama, Tuscaloosa, AL; ³Jones Center at Ichauway, Newton, GA.

Droughts are becoming more frequent and intense globally. As sedentary organisms, native freshwater mussels are vulnerable to the high water temperatures and shrinking aquatic habitat caused by extreme events. While drought-driven die offs have been documented in the southern Great Plains, the ecosystem impacts of these droughts have not been completely quantified. To better quantify impacts of mussel mass mortality events on ecological function, we conducted a mesocosm experiment

that simulated a mussel die-off. We created three scenarios in eighteen 946L mesocosms: nine control mesocosms without freshwater mussels, four mesocosms with a live mussel community, and five mesocosms with a mussel community that experienced a die-off. We measured water column nutrients, primary production, and the macroinvertebrate community before (3 samples over 20 days) and after (4 samples over 39 days) the mussel mortality event. We also measured mussel decomposition following the die-off. In the week after the die-off, ammonium increased by 94% in the mortality mesocosms and was significantly higher than the control mesocosms, but not the live mesocosms. Soluble reactive phosphorus increased in mortality mesocosms but was not significantly different than the control or live mesocosms. The rapid nutrient release following mussel mortality likely stimulates both the autotrophic and heterotrophic components of river food webs. Benthic gross primary production was greater in mortality and live mesocosms than in control mesocosms. Decomposition of organic matter increased immediately following mussel death in mortality mesocosms and was statistically different than live mesocosms. We combined our mesocosm experiment results with field observations and the literature to build a conceptual model of how unionid mass mortality events likely impact ecosystem function across short and long time scales. This conceptual model should aid development of conservation and management strategies that sustain stream structure and function in the face of drought-driven mussel losses.

Presentation format:

select one: **Oral Platform** (15 minutes plus 5 minutes for questions) or **Poster**?

Student: Yes/No *?

Willingness to switch formats (platform to poster or vice versa): Yes/No

Interested in submitting as a pre-recorded talk : Yes/No

*Note: All students submitting abstracts, provided they meet eligibility requirements, will be judged for the best student platform or poster presentation, unless otherwise indicated.

FINAL CALL

FMCS Officer Nominations for 2023

Every other year, our Society elects members to serve in three Executive Committee positions: President-elect (who, after two years, goes on to serve as President for two years, then Past-President for two years), Treasurer (for a 2-year term), and Secretary (also for a 2-year term). This is an invitation for nominees to fill all three positions. Any member may volunteer themselves or nominate another member, but the nominee must be a current FMCS member in good standing and agree to be nominated. Please consider yourself or another worthy member for these positions.

These positions will be filled during an election to be held later this year and the new officers will assume their duties during the 2023 FMCS Symposium in Portland, Oregon. If you want to nominate someone or have questions about this process, send an email to the Election Committee Chairman, Wesley Daniel, at wdaniel@usgs.gov.

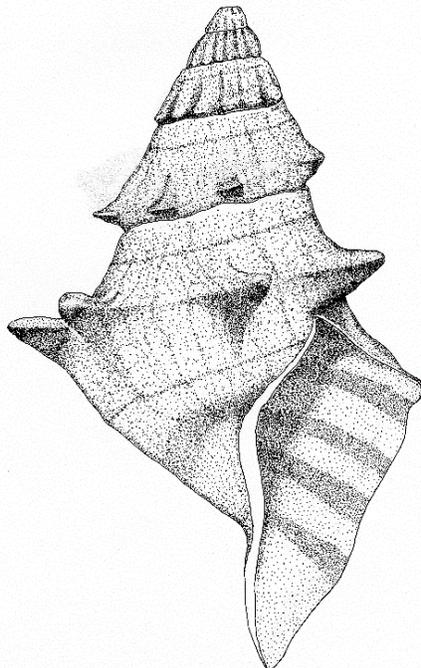


Update on the Professional Mollusk Certification Program

Yes, the Professional Mollusk Certification Program is still underway. The Professional Development Committee met in late May to discuss comments received from the FMCS Board and other society committees. A final iteration of the certification program is in preparation. We have refined several scoring criteria, worked to target inclusivity in all scoring factors, and asked several volunteers to run through the process to better align the certification tiers. The Certification Guidelines and Procedures will describe several categories of scoring criteria, such as:

- Professional Qualifying Experience,
- Professional Performance,
- Continuing Education,
- Involvement in the Malacological Community, and
- Demonstrated Professional Performance.

It's been a long process, but we are very VERY close! Look for a final Professional Mollusk Certification to roll out very soon! If you have any questions, feel free to contact Becca Winterringer at beccawint6@gmail.com .



Announcements

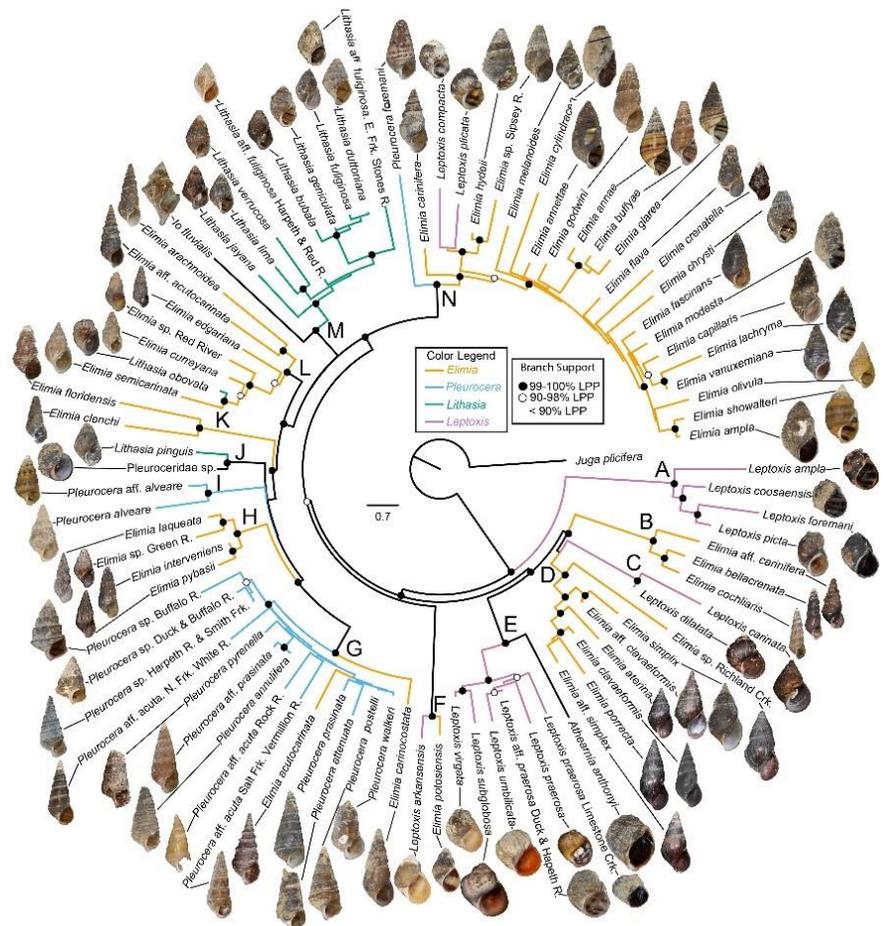
New Publication on Phylogenomics of Pleuroceridae

Members of the gastropod family Pleuroceridae are dominant in streams and rivers of the midwestern and, particularly, the southeastern parts of the United States. With a 79% imperilment rate, including 33 species that are considered to be extinct, the family is a conservation priority. A new study published in *Bulletin of the Society of Systematic Biologists* reports on the first nuclear-based molecular phylogeny of the Pleuroceridae. A robust phylogenetic framework of pleurocerids has been elusive but an anchored hybrid enrichment nuclear probe set with over 600 loci provided a breakthrough in understanding pleurocerid evolution. Many FMCS members may recognize that this approach was used for the freshwater mussel Unioverse probe set (Pfeiffer et al. 2019; DOI: 10.1016/j.ympcv.2019.02.016). This modern phylogenomic inference approach revealed extensive polyphyly of most currently-recognized pleurocerid genera and the likely presence of many unrecognized species. The results of this study will serve as a foundation for future research on pleurocerid ecology, evolution, systematics, and taxonomy.

The *Bulletin of the Society of Systematic Biologists* is an open-access publication of the Society of Systematic Biologists. The paper can be found here: <https://doi.org/10.18061/bssb.v1i2.8419>.

Full citation: Whelan, N.V., P.D. Johnson, J.T. Garner, N.L. Garrison, E.E. Strong. (2022) Prodigious polyphyly in Pleuroceridae (Gastropoda: Cerithioidea). *Bulletin of the Society of Systematic Biologists*. 1:8419. DOI: 10.18061/bssb.v1i2.8419.

Pleurocerid species tree (Figure 4) from Whelan et al. 2022. Major clades are indicated with uppercase letters (see publication for more details). Figured specimens are of sequenced vouchers but are not presented at a consistent scale. Branch support is measured by local posterior probability (LPP). Branch lengths and scale bar are in coalescent units. Branch colors correspond to current genus placement.



U.S. Fish and Wildlife Service National Conservation Training Center Training Announcement

Scientific River Diving Safety *SAF4300*

Course Description

This course will address safety procedures, hazards, risks, benefits, and equipment associated with Scientific River Diving. Throughout the course, divers will practice and show mastery in the following skills: diving with a full-face mask, communicating verbally with full-face mask divers from the surface and collecting data, communicating using tactile and line signals, diving on a tether, tending divers on a tether, diving with a hookah, briefing a river dive, and creating a river dive plan. Students that demonstrate mastery will receive certifications in Scientific River Diving and Full-Face Mask through PADI. Please note: Due to the unique hazards involved with river diving, all participants are required to complete the Rescue Diver certification and First Aid/CPR and O2 delivery prior to the course. Dry suit certification also is required if participants plan to use a dry suit during the course.



Course Objectives

Upon completion of this course, participants will be able to:

- Describe and execute the planning and organization of a river dive.
- List the equipment needed for conducting river dives.
- Describe and execute the techniques and procedures for conducting river dives.
- Explain the hazards of river diving and how they may be avoided or overcome.
- Describe and execute river diving safety procedures.
- Demonstrate mastery of all open-water skills.

Dates: October 3 - 7, 2022

Location: National Conservation Training Center, Shepherdstown, West Virginia

Who Should Attend: Scientific SCUBA divers who work in riverine environments with low visibility and current.

Tuition: Tuition for FWS, NPS and USGS employees is prepaid. For participants from other DOI agencies, there is a tuition charge of \$1,195.00.

To Register: To register for the course, go to DOI Talent.

Contact Information: For content questions: matthew_patterson@fws.gov

Reasonable Accommodations: The U.S. Fish and Wildlife Service is committed to providing access to this training for all participants. Please direct all requests for sign language interpreting services, closed captioning, or other accommodation needs to the course contact.

Upcoming Meetings

October 23 – 26, 2022 – Southeastern Association of Fish and Wildlife Agencies 76th Annual Conference, Charleston, West Virginia, USA. <http://www.seafwa.org/conference/overview/>

March 26 - 30, 2023 – National Shellfisheries Association 115th Annual Meeting, Baltimore Marriott Inner Harbor at Camden Yards, Baltimore, Maryland, USA [Annual Meeting \(shellfish.org\)](http://shellfish.org)

April 10 – 14, 2023 – FMCS Biennial Symposium, Double Tree Hotel, Portland Oregon, USA. Theme: *Mountains to Sea and Mollusks Between*. [See articles starting on Page 6]

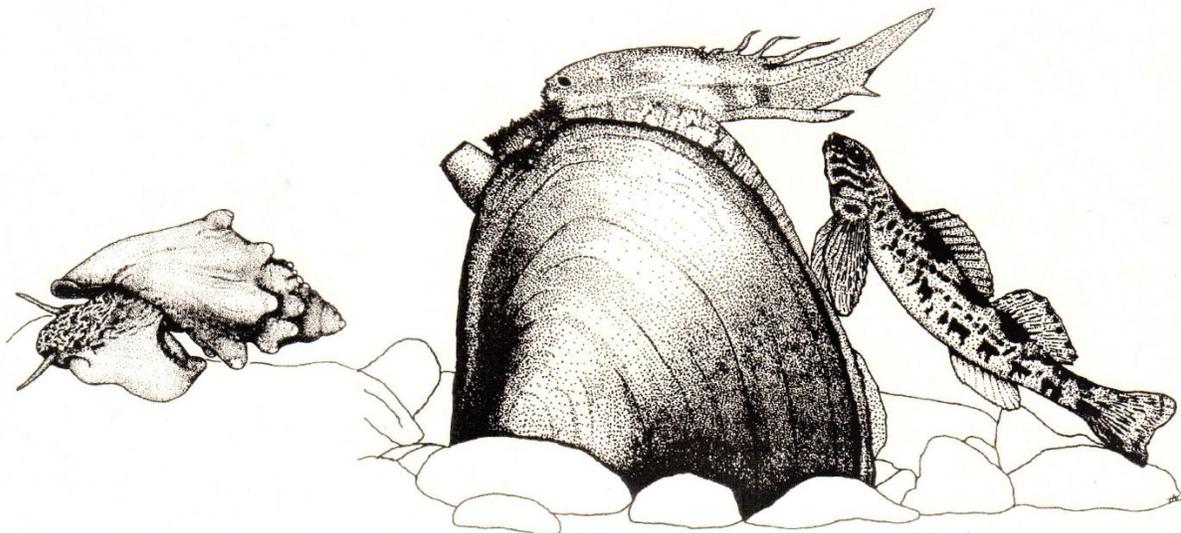
June 3 – 7, 2023 – Society for Freshwater Science Annual Meeting, Brisbane Convention and Exhibition Centre, Brisbane, Australia <https://www.freshwaterdownunder2023.org/>

August (?), 2023 – American Malacological Society Annual Meeting [Location and theme not yet posted] <https://ams.wildapricot.org/>

August (?), 2023 – American Fisheries Society 153rd Annual Meeting, [Location and theme not yet posted] <https://afsannualmeeting.fisheries.org/>

July (?) 2024 – Society for Conservation Biology North American Sectional Meeting, [Location and theme not yet posted] <https://scbnorthamerica.org/>

May (?) 2025 – FMCS Biennial Symposium, somewhere in Michigan, USA. [dates, location, theme, and other details yet to be determined]



Contributed Article

The following article was contributed by FMCS members and others interested in freshwater mollusks. Contributions like this are incorporated into Ellipsaria without peer review and with little editing. The opinions expressed are those of the authors.

Rescuing Regional Freshwater Mussel Collections: Digitizing Mussels at the University of Oklahoma

[Not Peer-reviewed]

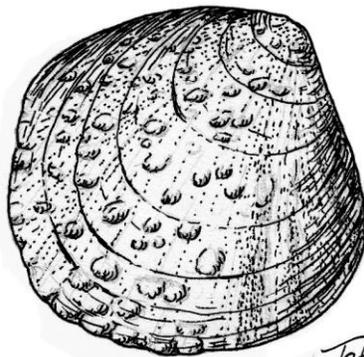
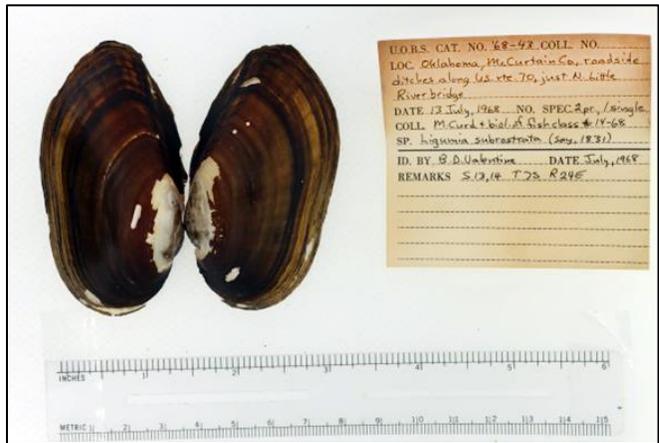
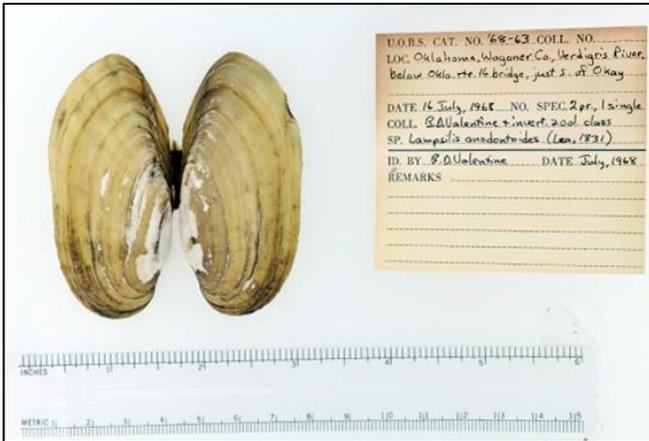
Alex Franzen and **Caryn Vaughn**, Oklahoma Biological Survey,
111 E. Chesapeake Street, Norman, Oklahoma 73019
corresponding author – ajfranzen@ou.edu

Natural history collections are important sources of biogeographical records that allow researchers to study the diversity, distribution, and evolution of organisms. At the same time, these repositories are incredibly valuable teaching resources that need to be both maintained and accessible to researchers (Bradley et al. 2014). As species declines become increasingly common, as is the case with freshwater mussels, historical records help inform our ability to develop conservation and recovery strategies. Fortunately, technological advances have facilitated increasing availability of specimen data and provided new means of preserving specimens, especially for endangered and extinct species, in the event physical specimens are lost or destroyed. Capitalizing on these advances, we are in the process of curating and digitizing two small freshwater mussel collections at the University of Oklahoma.

In 2021, Dr. Caryn Vaughn received a National Science Foundation grant to synthesize her research from the past 30 years. Part of this project involves designing an educational website and poster of the mussel fauna of Oklahoma. We are using the mussel collections at the Oklahoma Biological Survey (OBS) and the University of Oklahoma Biological Station (UOBS) to develop these resources. These collections represent material collected from the late 1960s through the early 2000s, and amount to over 4000 specimens (Valentine and Stansbery 1971; Vaughn 2000); however, these collections were disorganized and contained outdated taxonomy. We first organized the collections and, in the process, discovered several records of rare species (see photos below). Next, we started photographing each specimen using standard imaging techniques (Callomon 2019). Digitizing these specimens will allow us to use high resolution images for our current outreach projects and will be useful to other malacologists. Curation and digitization of the collections are still in progress, but we hope to make our catalog and photographs publicly available soon and encourage malacologists to contact us if they have information on Oklahoma freshwater mussels.

References

- Bradley RD, Bradley LC, Garner HJ, Baker RJ. 2014. Assessing the Value of Natural History Collections and Addressing Issues Regarding Long-Term Growth and Care. *BioScience* 64:1150–1158.
- Callomon P. 2019. Standard views for imaging mollusk shells. American Malacological Society: <http://malacological.org/epubs.html>
- Valentine BD, and Stansbery DH. 1971. An introduction to the naiads of the Lake Texoma region, Oklahoma, with notes on the Red River fauna (Mollusca: Unionidae). *Sterkiana* 42:1–40.
- Vaughn CC. 2000. Changes in the mussel fauna of the middle Red River drainage: 1910-present. Pages 225–232 in *Freshwater Mollusk Symposium Proceedings* (R. A. Tankersley, DI Warmolts, GT Watters, BJ Armitage, PD Johnson, and RS Butler, editors). Ohio Biological Survey, Columbus.



Celeste Tapp

Cyprogenia stegaria (Rafinesque, 1820)

FMCS Officers

President

Stephen McMurray

Missouri Department of Conservation
3500 East Gans Road
Columbia, Missouri, USA 65201-8992
stephen.mcmurray@mdc.mo.gov

Secretary

Sarah Veselka

BioSurvey Group
1538 McKinney Cave Road
Reedsville, West Virginia 26547
sarah@biosurveygroup.com

Past President

Jeremy Tiemann

Illinois Natural History Survey
1816 South Oak Street
Champaign, Illinois, USA 61820
jtiemann@illinois.edu

President Elect

Megan Bradley

U.S. Fish and Wildlife Service
322 North East Avenue
Viroqua, Wisconsin, USA 54665
megan_bradley@fws.gov

Treasurer

Alan Christian

Honors Program, Clarkson University
CU Box 57555
8 Clarkson Avenue
Potsdam, New York, USA 13699
adchrist@clarkson.edu

Ellipsaria is posted on the FMCS web site quarterly: around the first of March, June, September, and December of each year. The newsletter routinely includes Society news, meeting notices, pertinent announcements, and informal articles about ongoing research concerning freshwater mollusks and their habitats. Anyone may submit material for inclusion in *Ellipsaria* and all issues are accessible to anyone on the FMCS website (<http://molluskconservation.org>).

Articles contributed to *Ellipsaria* should be preliminary or initial observations of note (e.g., natural history observations, meaningful new distribution records, interesting finds, etc.) concerning freshwater mollusks, their habitats, and/or their conservation. Articles that include quantitative analyses, draw conclusions based on analyses, or propose taxonomic revisions should not be submitted to *Ellipsaria* and, instead, should be submitted to a peer-reviewed journal such as *FMBC*. Please limit the length of contributed articles to about one page of text (i.e., excluding pertinent tables, figures, and references).

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, but the editor may be able to convert other formats. Graphics should be in a form that can be manipulated using PhotoShop. Note that submissions are not peer-reviewed but are edited for clarity and checked for appropriateness for posting in this freshwater mollusk newsletter. Feel free to contact the editor with questions about possible submissions or transmission concerns.

FMCS Committees and Their Chairs/Co-chairs

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

Functional Committees

Awards

Curt Elderkin - elderkin@tcnj.edu
 David Hayes - david.hayes@eku.edu
 Susan Oetker - susan_oetker@fws.gov

Chapters

Emilie Blevins - emilie.blevins@xerces.org
 Manuel Lopes-Lima -
manuelplopeslima@gmail.com

Diversity, Equity and Inclusion

Tamara Smith - tamara_smith@fws.gov

Elections

Wesley Daniel - wdaniel@usgs.gov

Finance

[vacant at present]

National Strategy

[vacant at present]

Outreach

Amy Maynard - amy.maynard@dwr.virginia.gov
 Dan Symonds - daniel.symonds@stantec.com

Professional Development

Rebecca Winterringer - beccawint6@gmail.com
 Amanda Rosenberger -
arosenberger@tnitech.edu

Publications

Robert Bringolf - rbringolf@warnell.uga.edu

Symposia and Workshops

Megan Bradley - megan_bradley@fws.gov

Technical Committees

Conservation and Restoration

Maddie Pletta - madeline.pletta@state.mn.us
 Tyler Hern - tyler_hern@fws.gov
 Jesse Weinzinger -
jesse.weinzinger@wisconsin.gov

Environmental Quality and Advocacy

Braven Beaty - bbeaty@tnc.org
 Mickey Matthews - mickey.matthews@ardot.gov

Field Studies and Ecosystems

Lisie Kitchel - lisie.kitchel@wi.gov
 Carla Atkinson - carlalatkinson@gmail.com

Genetics

Nathan Johnson - floridamussels@gmail.com

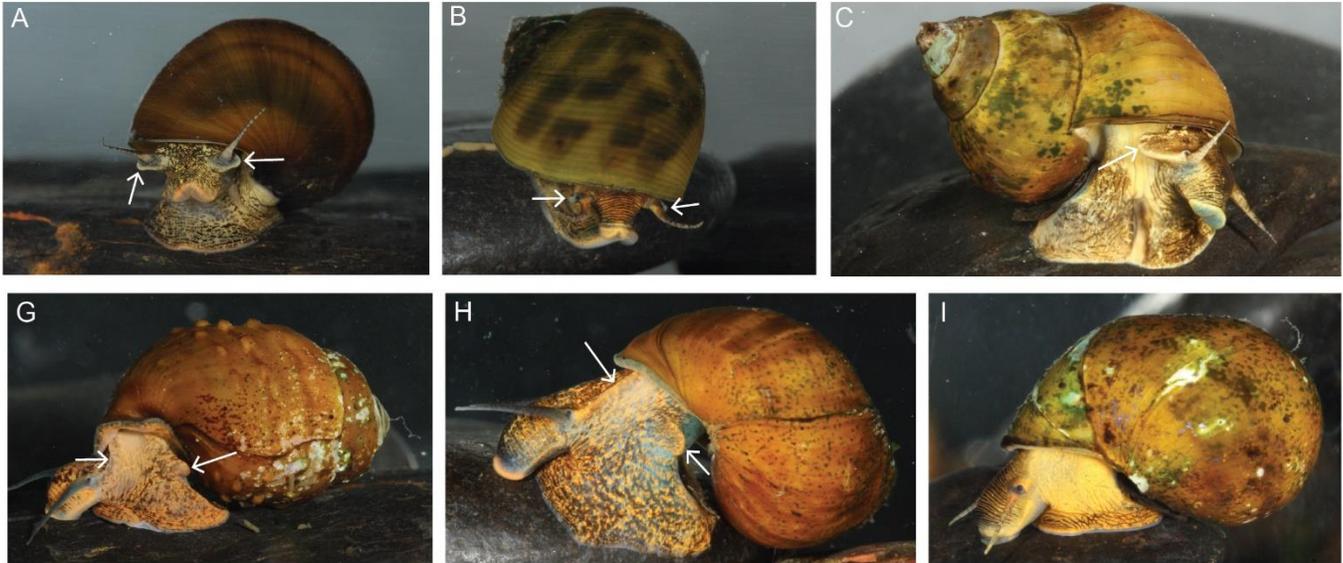
Mollusk Status and Distribution

Jason Wisniewski - jason.wisniewski@tn.gov
 Wesley Daniel - wdaniel@usgs.gov

Ad-Hoc Committees

[None at present]

Parting Shots



The authors of the recent article on a new approach to studying relationships among snails in the Family Pleuroceridae (See Announcement on Page 13), also recognized that their genetic results correlate with attributes of the species either not or rarely used previously to help classify them. These images from Figure 6 of their article show some of the anatomical features of the live animals that appear to help identify the clades to which they belong. Egg laying patterns also seem to correlate with some of the different clades. It will be interesting to see if this is a whole new beginning to sorting out the relationships among these widely-studied but poorly-understood freshwater snails. Photographs by Thomas Tarpley, Alabama Aquatic Biodiversity Center.

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.

