



Newsletter of the Freshwater Mollusk Conservation Society

Volume 20 – Number 3 September 2018

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It's Time to Start Your Planning for the 2019 Symposium in San Antonio, Texas!

The 11th Biennial FMCS Symposium will be held on April 14 -18, 2019, at the Hyatt Regency San Antonio Riverwalk, in downtown San Antonio, Texas. The theme for this meeting is **Life on the Edge: reconciling human needs and freshwater mollusk conservation**. The goal for this Symposium is to focus on the ways in which humans and freshwater systems can coexist to ensure the long-term persistence of freshwater mollusks. The Symposium will bring together regulators, researchers, consultants, and enthusiasts in a forum that will allow for collaboration opportunities and information exchange. Several internationally-recognized speakers have been invited and we will host a workshop that will cover conservation genetics and species status assessments.

For those of you unfamiliar with Texas, -- which we hope to change -- the City of San Antonio serves as the seat of Bexar (pronounced Bear) County and was founded during the Spanish Colonial Era, making it the state's oldest municipality (founded in 1718, 300 years ago this year). The City contains notable attractions such as five 18th-century missions, including the Alamo, and the San Antonio Missions National Historical Park, the River Walk, Tower of Americas, and Sea World. The U.S. Armed Forces have numerous facilities in and around San Antonio and it's also home to the five-time National Basketball Association champion San Antonio Spurs.



Schedule

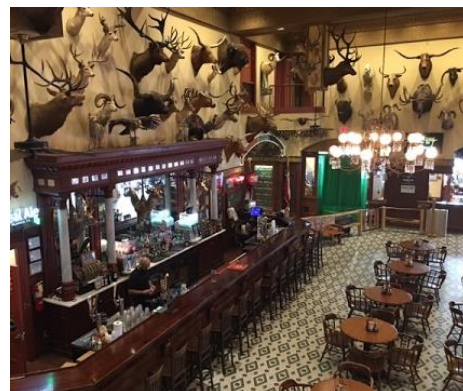
When planning your trip to San Antonio, keep in mind that we will follow a similar schedule as during past symposia. A Workshop, the Board Meeting, the Student/Mentor Mixer, and an opening reception will occur on Sunday, April 14; the three full days of platform presentations will happen Monday through Wednesday; the poster session will be Monday evening; our infamous Steve Ahlstedt will be at the helm for the auction on Tuesday evening; music and mixer will occur on Wednesday evening; and a couple of field trips will take place on Thursday, April 18.

Location and Travel

The Hyatt Regency San Antonio Riverwalk is conveniently located in downtown San Antonio on the Riverwalk. The hotel is a five-minute walk away from the Alamo and a number of restaurants and bars, including the Buckhorn Saloon (<http://www.buckhornmuseum.com>).

San Antonio International airport can be reached in 20 minutes by car from the hotel. While there are no shuttles from the airport, taxi and "Uber" services are available.

Hotel rooms will be **\$126/night for a king** and **\$151/night for a double**. Standard internet is included. Reservations can also be made online or by calling (210) 222-1234. Be sure to say, **"I want the 2019 FMCS/Symposium April 2019 rate."** Last day to book rooms at this rate is **March 18, 2019**. Currently, overnight valet parking is \$43 with "in and out" privileges, and overnight self-parking is available for \$31 plus tax.



Registration

Registration for the San Antonio Symposium will open on **November 1, 2018**, and must be done using the form provided on the event page of the FMCS website: https://molluskconservation.org/EVENTS/2019SYMPOSIUM/2019_FMCS-Symposium_INTRO.html . FMCS members also will get an email reminder with more details about registration.

Registration rates are as follows:

Early (before January 25, 2019)

- Regular member – \$450
- Student member – \$325
- Non-member – \$550
- Student non-member – \$375

Late (after January 24, 2019)

- Regular member – \$500
- Student member – \$350
- Non-member – \$600
- Student member – \$400

Workshop

On Sunday, April 14, we will host a Workshop that will be split into two half-day sessions; the first half will cover Conservation Genetics, and the second half will cover Species Status Assessments.

Analysis of genetic data has become an integral tool for assessing the conservation status of species, and understanding genetic variation informs the three Rs (representation, resiliency, and redundancy) that are the centerpiece of the revised U.S. Fish and Wildlife Service (FWS) Species Status Assessment. In addition to providing information on the amount and distribution of genetic variation in natural populations, genetic data can help to guide propagation and management of captive populations, construct pedigrees, detect and predict the effects of population fragmentation, and identify hybrid individuals. A degree in genetics is not required to take advantage of the information genetic data can provide; anyone with a basic understanding of genetics, ecology, and conservation biology can understand how genetic information can be useful in their conservation endeavors. This part of the Workshop will provide attendees with an appreciation for the value of genetic information for informing conservation and management actions. For more information about this topic, contact Kevin Roe (kjroe@iastate.edu).

The Species Status Assessment (SSA) Framework is an analytical approach developed by the FWS to conduct biological assessments to inform all Endangered Species Act (ESA) decisions. This part of the Workshop will introduce participants to the purpose of SSA, familiarize them with the SSA Framework, and show the application of the SSA to freshwater mussels using case studies from across the country. Given the substantial number of mussels that have either recently been evaluated for ESA listing using SSAs or are currently undergoing analysis, it is important for biologists working with freshwater mussels, whether from management agencies, research institutions, or consultants, to understand the basic SSA approach and how the FWS applies it for ESA decisions. The SSA Framework will also be integral for future decisions on mussels already listed under the ESA, such as 5-year status reviews and recovery planning. For background on the SSA Framework see the recent publication here: <http://www.fwspubs.org/doi/pdf/10.3996/052017-JFWM-041> . Authors from this paper will be leading the SSA part of the Workshop. For more information contact Susan Oetker (susan_oetker@fws.gov).

More details about the Workshop will be presented on the event website: https://molluskconservation.org/EVENTS/2019SYMPOSIUM/2019_FMCS-Symposium_INTRO.html. Registration information for the Workshop will be included on the Registration page of the website once it is open. The **Registration rate** for the Workshop will be **\$125 for regular members and non-members** and **\$75 for students**.

Field Trips

On Thursday, April 18, Symposium attendees will have the option of attending one of two field trips. These trips will highlight different aspects of this beautiful and interesting part of Texas.

Central Texas Hill Country Tour



San Antonio is just southeast of the Texas Hill Country, one of the most beautiful regions in Texas. The Hill Country is famous for its wildflower-lined roadways and beautiful small towns. Start the day by climbing Enchanted Rock, a dome of pink granite rising 425ft above ground and one of the largest batholiths in the United States, offering a great view of the surrounding rolling hills. Then stroll along Main Street in Fredericksburg and enjoy your lunch in a beer garden. Visit the nearby LBJ Ranch at the Pedernales River, where Lyndon B Johnson, the 36th President of the

United States, lived and died. End the day listening to live-music in legendary Luckenbach, which was made famous in a country song by Waylon Jennings. More information about these sights is available at the following websites:

<https://tpwd.texas.gov/state-parks/enchanted-rock> ,

<https://www.nps.gov/lyjo/planyourvisit/visitlbjbranch.htm>

<http://www.luckenbachtexas.com/home.htm>

Registration for this trip is **\$125 per person**.

Mussel Sampling Trip

Come and find hidden gems in the most flash-flood prone area in the United States -- Central Texas. Our gems include several endemic species in the Guadalupe River basin, you don't want to miss. Lunch will be BBQ in Lockhart, the BBQ capital of Texas:

<http://www.lockhartchamber.com/pages/BBQCapitalofTexas>

Registration for this trip is **\$100 per person**



For more information concerning the field trips, please visit the symposium website (https://molluskconservation.org/EVENTS/2019SYMPOSIUM/2019_FMCS-Symposium_INTRO.html) or contact Astrid Schwalb (schwalb@txstate.edu). **Space is limited to 25 people per trip, so register as soon as possible.**

Student/Mentor Mixer

Did you make it to the Student/Mentor Mixer in Cleveland? Are you willing to invest time talking to students and young professionals just joining FMCS and beginning their pursuit of their shell-based careers?

We are organizing another mixer at the 2019 Symposium on Sunday, April 14. The goal of this mixer is to make it easier for students and young professionals to meet established professionals, have one-on-one conversations with them, and learn about where they can contribute to FMCS and remain engaged with our Society over their careers. More details about the student mixer will be presented on the event website: https://molluskconservation.org/EVENTS/2019SYMPOSIUM/2019_FMCS-Symposium_INTRO.html. Also, feel free to contact Megan Bradley at megan_bradley@fws.gov for more information about this mixer.

Sponsorships

You want to make FMCS great again ☺ and make sure we don't bankrupt FMCS, then show us the money! Sponsorships for this Symposium will be used to cover some of the expenses associated with holding this event. Specific sponsorship levels and their associated benefits are listed below but, unfortunately, the rates have been increased due to rising hotel fees. We understand that grants and budgets aren't what they use to be, but we need all the support you can provide, and we sincerely appreciate any and all donations.

All Sponsor Contributions Include Recognition in the Symposium Program		
Basin	≥\$10,000	Three Complimentary Registrations, Logo on Website Registration Page, Recognition in the Symposium Program and at the Banquet Dinner. Choice of up to three free t-shirts, hats or FMCS fleeces.
River	\$9,999-\$5,000	Two Complimentary Registrations, Logo on Website Registration Page, Recognition in the Symposium Program
Stream	\$2,500-\$4,999	One Complimentary Registration, Logo on Website Registration Page and in the Symposium Program
Eddy	\$1,000-\$2,499	Logo on Website Registration Page and in the Symposium Program
Mussel	\$<999	Recognition in the Symposium Program

To make a sponsorship donation please contact FMCS Treasurer, Emily Grossman at egrossman@ecoanalysts.com or fill out the form available on the Symposium page of the website. For more information about sponsorships for this Symposium, contact Matt Johnson (matt.johnson@enviromscienceinc.com).

For more information:

For further general information about the Symposium, please contact any one of the three Symposium co-chairs:

Charles Randklev, (crandklev@ag.tamu.edu)

Clint Robertson, (Clint.Robertson@tpwd.texas.gov

Susan Oetker, (susan_oetker@fws.gov)



See you in San Antonio!

Call for Abstracts
2019 Biennial FMCS Symposium
San Antonio, Texas, USA April 14 – 18, 2019

The abstract submission deadline for the 2019 Symposium will be **Friday January 4th, 2019**. The symposium format will include both oral and poster presentations. Oral presentations will be limited to 20 minutes (including the question and answer period). Poster size will be limited to 4 by 4 feet.

Abstracts for both the posters and the oral presentations are limited to 300 words. Abstract title should appear in all caps and be followed by the author(s) name(s), affiliation(s) and e-mail address(es). Abstracts should be written in Word utilizing Arial 11-point font. The text of the abstract should include clearly stated objectives, a brief description of methods, general results, and the basic conclusion(s). An example abstract has been posted on the 2019 Meeting page: https://molluskconservation.org/EVENTS/2019SYMPOSIUM/2019_FMCS-Symposium_INTRO.html .

At the bottom of the abstract, please indicate your preference of oral or poster presentation, and if you would be willing to switch formats. If you are a student, please indicate if you want your presentation judged (if you have more than one, please enter only one for judging).

Submit your abstract using the following abstract entry form:

<https://irnrfm.tamu.edu/fmi/webd/FreshwaterMolluskConservation>

Society News

The First FMCS International Meeting in Europe Occurs This Month

As any reader of this newsletter knows by now, the first Freshwater Mollusk Conservation Society International meeting outside of the United States will occur on September 16-20, 2018, at the Teatro Maggiore in Verbania, Italy. The program for that meeting includes 60 platform papers and 26 posters being offered by presenters, quite literally, from all around the world. By the time you read this, the program for this meeting probably will be posted on the event page of the FMCS website:

https://molluskconservation.org/EVENTS/2018-INTNL/2018_FMCS-INTNLMeet.html). If you are not able to attend this meeting, plans are being made to publish many of the contributions in a Special Issue of an international journal. More about that publication and a review of the meeting will be included in the next (December 2018) issue of *Ellipsaria*.



FMCS OFFICER NOMINATIONS FOR 2019

We are still seeking nominees for **President-Elect**, **Secretary**, and **Treasurer** of our Society. Each position is for a period of two years. These positions will take office during the FMCS Symposium in San Antonio, Texas, in April 2019.

Any member may nominate any other member. Nominees must be current FMCS members in good standing and who agree to be nominated. Please consider yourself or another worthy member for these positions. This is a great opportunity to serve in the FMCS.

The Nominations Committee will select the two candidates willing to run for each office who receive the most nominations for that office. We anticipate that position statements from the candidates will be posted in the December issue of *Ellipsaria*, and on the FMCS website in January 2019; and that voting will also be done on the FMCS website.

Send your nominations to: Leroy Koch, either by e-mail at Leroy.Koch@fws.gov or by surface mail at U.S. Fish and Wildlife Service, J.C. Watts Federal Building, Room 265, 330 West Broadway, Frankfort, Kentucky 40601. If you have any questions, feel free to contact Leroy by email or call him at 502-695-0468 ext. 106. **The deadline for nominations is October 5, 2018.**



Diversity and Inclusiveness Ad hoc Committee Wants You, Too**Tamara Smith**, Ad-hoc Committee Chair

The new Diversity and Inclusiveness ad hoc committee was formed to highlight what FMCS already does to welcome a wide variety of people and ideas in our efforts to conserve and protect freshwater mollusks. Our committee also will recommend actions that could help our Society develop a more welcoming environment. We want to encourage participation by all individuals, regardless of age, culture, ethnicity, gender identity or expression, national origin, physical or mental difference, politics, race, religion, sex, sexual orientation, socio-economic status, or subculture. Our committee will look at ways for FMCS to promote diversity in everything we do, including fostering diversity in recruitment, membership, leadership, committees, outreach, and public engagement.

As a way of getting started, we would like to feature **you** on the FMCS website. We would like to show more of our faces on our website; not just pictures of mussels and snails! We want to post photographs and quotes to showcase some of our members and their reasons for belonging to FMCS to demonstrate our welcoming culture and encourage others to join. Please send a high-resolution photograph of yourself and brief a brief sentence or two describing *why you joined and/or continue to be a member of FMCS* to Tam Smith (at tamara.smith@fws.gov) by **October 15, 2018**.

If you have any questions about this invitation, or if you are interested in joining the ad hoc committee, please contact Tam Smith at tamara.smith@fws.gov.

Attention Regional Groups!

The FMCS Board recently voted to establish an ad hoc committee to develop a framework for recognizing watershed or regional Chapters. We are thinking that Chapter status would be sought most often by existing watershed or regional mussel and snail discussion groups that want a formal affiliation with FMCS.

We are currently in the process of identifying: 1) groups that might want to pursue being FMCS Chapters, and 2) individuals who would be willing to serve on the ad hoc committee to form the framework for chapter recognition. If you are currently coordinating the activities of a regional or watershed mollusk group, please contact Heidi Dunn at Hdunn@ecoanalysts.com. She would like to compile a list of those groups along with their contact information. The first step in the process will be to poll these groups to see how much interest there is in forming chapters.

If there is enough interest, the ad hoc committee will continue to develop a framework for accepting chapters. Present committee members Greg Cope, Celeste Mazzacano, and Art Bogan have compiled some information from other Societies that could be used as a starting point. We need some additional folks to review what has been collected and help develop a structure that would work for FMCS. If this process goes forward, the committee would develop a minimum Chapter structure that would be included in our by-laws, and some guidelines that groups would use to form their FMCS Chapters. International chapters could be formed the same way (example FMCS Europe, FMCS Asia, etc.).

Call for Professional Award Nominations

Do you know someone who has made worthwhile contributions to mussel conservation or to the Society either through donating their professional time and expertise or through their scientific endeavors? Consider nominating them for one of the three FMCS Professional Awards:

- **The Meritorious Service Award**—given to an individual for singular accomplishments or long-term contributions to the Society. The recipient of this award must be a past or present FMCS member who has performed long-term, exceptionally high-quality service to the Society.
- **The William J. Clench Memorial Award**—given to an individual for singular accomplishments or long-term contributions that have advanced the natural history and understanding of freshwater mollusks at an academic or non-academic level. The recipient of this award must have had (1) activity in one or more aspects of freshwater mollusks for a substantial period of time, with a recommended minimum guideline of 20 years, and (2) made substantial contributions to the field of freshwater malacology.
- **Lifetime Achievement Award**—given to an individual for singular accomplishments or long-term contributions that have advanced the conservation and science of freshwater mollusks at a national or international level. The recipient of this award must have had (1) activity in one or more aspects of freshwater mollusk research and/or conservation for a substantial period of time, with a recommended minimum guideline of 20 years, and (2) made substantial contributions to the scientific understanding of freshwater mollusks and/or their conservation.

Nominations and their supporting documents are due by **December 31, 2018**. Details on how to make these nominations are posted on the Awards Committee page: http://molluskconservation.org/Mservices_awards.html. For more information or answers to questions about this nomination process, contact Teresa Newton, tnewton@usgs.gov, 608-781-6217; Emy Monroe, emy_monroe@fws.gov, 608-783-8402; or Susan Oetker, Susan_Oetker@fws.gov, 404-679-7050.

Change in Dues Schedule

Several FMCS members expressed a desire to have a Lifetime Membership dues option and to give a discount to retired members. During its Meeting in March 2018, the Board voted in favor of the following changes in our dues schedule

Old schedule:

- Student \$40/2 years
- Regular \$80/2 years
- Contributing \$200/2 years

New schedule:

- Student/Retiree \$40/2 years
(retiree is anyone who has retired from a career position)
- Regular \$80/2 years
- Contributing \$200/2 years
- Lifetime \$800 (one-time payment)

The new dues schedule will be implemented for 2019 dues (active as of November 1, 2018, and available with registration for the 2019 Symposium).

Free Money for FMCS !

If you buy things from the online retailer Amazon, you can support FMCS by shopping through the AmazonSmile program. When you shop at <https://smile.amazon.com> and select the Freshwater Mollusk Conservation Society as your charity of choice, the AmazonSmile Foundation will donate 0.5% of the purchase price of eligible items to FMCS. Millions of products on Amazon are eligible for these donations, they are marked “Eligible for AmazonSmile donation” on their product detail page. If you already have an Amazon account, you can shop on AmazonSmile using your existing account information.

Amazon pays all expenses of the Foundation – the operating expenses are not deducted from the donation amounts generated by purchases – so there is no cost to FMCS or members to participate. Potential uses for the funds generated through AmazonSmile will be discussed during the next FMCS Board meeting.



Society Business Items

During our Symposium in San Antonio, FMCS will be following a newly-established Code of Conduct and you and other FMCS members will be asked to vote on two items that will affect our Society in several ways. The following three articles describe these proposals and ask for your comments and suggestions about each of them. Please read these proposals and provide your comments by the requested dates.

Proposed Amendments to the FMCS By-Laws **Heidi Dunn, Teresa Newton, and Jeremy Tiemann**

The last amendments to the FMCS By-Laws were accepted by the membership at the FMCS symposium in Guntersville, Alabama and were finalized on April 14, 2011. FMCS was initially formed around committees that were established to address the needs of the original National Strategy and those committees were listed in the By-Laws. The National Strategy was revised in 2016 and will continue to be revised in the future. Additionally, FMCS has grown and requires committees that address the day-to-day society functions, and several presently-operating ad hoc committees should become standing committees. We need our By-Laws to be more flexible, allowing committees to be modified to meet the functional and technical needs of FMCS. While reviewing the By-Laws, we also discovered other clauses that need amending to reflect how FMCS currently functions. Proposed amendments are provided below. The present FMCS By-Laws can be found on our website under Society/About Us/By-Laws.

Please review these suggested amendments to the By-Laws and send comments to Heidi Dunn at Hdunn@ecoanalysts.com by **October 15, 2018**. A final version of the proposed amendments to the By-Laws will be submitted to the Board before the November 2018 Board meeting. If supported by the Board, the proposed amendments will be published in the December 2018 issue of *Ellipsaria* and will be brought before the Membership for adoption during our Business Meeting at the 2019 Symposium in San Antonio, Texas.

In the following proposed amendments, wording involved in changes is presented in red. The green text is an explanation of the wording changes and will not be included in the final form of the By-Laws.

Proposed Changes to the FMCS By-Laws

Article II- Offices

[Section 2.3 needs to be modified to provide flexibility]

Current wording

2.3 The registered agent of the Society shall be Heidi L. Dunn, whose address is 1417 Hoff Industrial Drive, O'Fallon, Missouri 63366.

Proposed wording

2.3 The registered agent of the Society shall be appointed by the Executive Committee and shall maintain a permanent Society address in the state of incorporation. The registered agent will assist the Secretary and Treasurer in maintaining the Society as an incorporated, non-profit organization.

Article III – Membership

[Section 3.2 needs to be updated to include a retiree class. An additional section 3.12 Code of Conduct and 3.13 Suspension or Removal also is proposed to be added.]

Current wording

3.2 Qualification. The Society may have more than one class of members and shall consist of: **Active, Emeritus**, Student, and Contributing members.

A. Active Members:Qualifications

Must:

- a) share the stated purpose of the Society
- b) pay member dues

Benefits

May:

- a) vote in Society affairs
- b) hold office and/or serve on the Board of Directors
- c) participate in Society functions, programs, and activities

B. Emeritus Members:Qualifications

Must:

- a) have been an Active Member and be selected in recognition of their contribution to freshwater molluscan conservation and to the Society
- b) share the stated purpose of the Society
- c) be an active member for 3 years [effective after 12/31/01]
- d) be elected by the Board of Directors of the Society after being nominated by an Active Member
- e) be recognized for service to the Society and freshwater malacology

Benefits

May:

- a) vote in Society affairs
- b) hold office and/or serve on the Board of Directors

Proposed wording

3.2 Qualification. The Society may have more than one class of members and shall consist of: **Lifetime, Regular**, Student, **Retired**, and Contributing members.

A. Lifetime Members:Qualifications:

Must:

- a) share the stated purpose of the Society
- b) have paid the life-time membership fee

Benefits:

May:

- a) vote in Society affairs
- b) hold office and/or serve on the Board of Directors
- c) participate in Society functions, programs, and activities

B. Regular Members:Qualifications

Must:

- a) share the stated purpose of the Society
- b) pay member dues

Benefits:

May:

- a) vote in Society affairs
- b) hold office and/or serve on the Board of Directors
- c) participate in Society functions, programs, and activities

C. Student Members:Qualifications

Must:

- a) share the stated purpose of the Society
- b) be a student showing promise of becoming qualified for Regular Member status at a later date

c) participate in Society functions, programs, and activities

C. Student Members:

Qualifications

Must:

- a) share the stated purpose of the Society
- b) be a student showing promise of becoming qualified for Active Member status at a later date
- c) pay Student member dues

Benefits

May:

- a) vote in society affairs
- b) apply for Active Member status
- c) participate in Society functions, programs, and activities

D. Contributing Members:

Qualifications

Must:

- a) share the stated purpose of the Society
- b) provide support to the Society

Benefits

May:

- a) be acknowledged by the Society for support in newsletters, annual programs, and activities
- b) participate in Society functions, programs, and activities

c) pay Student member dues

Benefits

May:

- a) vote in society affairs
- b) apply for Active Member status
- c) participate in Society functions, programs, and activities

D. Retired Members:

Qualifications

Must:

- a) share the stated purpose of the Society
- b) be retired from a career position and a Regular or Contributing Society member in the past
- c) pay Retired member dues

Benefits

May:

- a) vote in Society affairs
- b) hold office and/or serve on the Board of Directors
- c) participate in Society functions, programs, and activities

E. Contributing Members:

Qualifications

Must:

- a) share the stated purpose of the Society
- b) provide support to the Society

Benefits

May:

- a) be acknowledged by the Society for support in newsletters, annual programs, and activities
- b) vote in Society affairs
- c) hold office and/or serve on the Board of Directors
- d) participate in Society functions, programs, and activities

Current wording

E. Membership to all of the above membership classes, **except Emeritus**, requires the payment of dues or support as determined by the Society. **Active, Emeritus**, and Student Members constitute the voting membership of the Society and **Active and Emeritus Members** may hold office.

F. The Board of Directors shall determine the manner of fixing a date as the record date for determining the members eligible to have notice of a members' meeting. The record date may not be more than one hundred (100) days before the meeting or action requiring a determination of who are the Active Members.

3.12 Currently no text

3.13 Currently no text

Proposed wording

F. Membership to **all** membership classes requires the payment of dues or support as determined by the Society. **Lifetime, Regular, Retired, Contributing** and Student Members constitute the voting membership of the Society and **Lifetime, Regular, Retired, and Contributing Members** may hold office.

G. The Board of Directors shall determine the manner of fixing a date as the record date for determining the members eligible to have notice of a members' meeting. The record date may not be more than one hundred (100) days before the meeting or action requiring a determination of who are the Active Members.

3.12 Code of Conduct. **Society members and attendees of Society-sponsored symposia, workshops, meetings, or other Society activities (events) are expected to adhere to the Society Code of Conduct. The Society is committed to providing a safe, productive, and welcoming environment for all participants and staff. All participants including, but not limited to, members, guests, attendees, speakers, volunteers, exhibitors, and service providers are expected to abide by this Code of Conduct.**

3.13 Suspension or Removal. **A Member may be suspended or removed with or without cause by vote of two-thirds of the Board of Directors. A Member may be suspended or removed with cause only after reasonable notice and opportunity to be heard. Failure to adhere to the Code of Conduct is cause for suspension or removal at the discretion of the Executive Committee.**

[The Code of Conduct is currently being developed based on Codes recently developed by Society of Freshwater Science and Partners in Amphibian and Reptile Conservation. Once developed, it will be submitted to the Board for comments. The Code will appear on the symposium registration page. Event participants will need to check a box indicating they will adhere to this Code when registering for the Symposium.]

Article V Board of Directors

Section 5.2

[Section 5.2 currently defines the Board of Directors as the Executive Committee and Committee Chairs. As the National Strategy changes and FMCS grows, we need to rethink how to restructure the Board to better represent the membership and undertake the day to day functions of FMCS.]

Current wording

5.2 Qualifications and Number of Directors. The number of Directors may be increased or decreased, but to no fewer than three, from time to time by amendment to the Articles or By-laws. A Director must be a member in good standing.

The Board of Directors shall consist of the President as the presiding officer, the President-Elect, Past President, Secretary, Treasurer, and **Chairs of Standing Committees** as defined in the By-Laws. **Chairs of Standing Committees** are to be selected by members of that committee at the biennial symposium held in odd numbered years. A committee **may have co-chairs** but only one vote on the Board of Directors. A person may be Chair of only one Standing Committee at any given time.

Proposed wording

5.2 Qualifications and Number of Directors. The number of Directors may be increased or decreased, but to no fewer than three, from time to time by amendment to the Articles or By-laws. A Director must be a member in good standing.

The Board of Directors shall consist of the President as the presiding officer, the President-Elect, Past President, Secretary, Treasurer, and **Chairs of Functional and Technical Committees** defined in the By-Laws. **Committee chairs** are to be selected by members of that committee at the biennial symposium held in odd numbered years and **shall hold no more than three consecutive terms**. A committee may have **subcommittees and subcommittee chairs**, but that committee has only one vote on the Board of Directors. A person may be Chair of only one Committee at any given time.

Section 5.15 Duties of the Board of Directors

[Section 5.15 needs to be reworded to reflect the changes in membership categories]

Current wording

5.15 Duties of the Board of Directors. The duties of the Board of Directors shall be:
A. To manage the business, functions, programs, and activities of the Society.

Proposed wording

5.15 Duties of the Board of Directors. The duties of the Board of Directors shall be:
A. To manage the business, functions, programs, and activities of the Society.

- B. To establish dues and support levels for **Active Members**, Student Members, and Contributing Members.
- C. To establish policy and promote the objectives of the Society.

- B. To establish dues and support levels for **Lifetime Members, Regular Members**, Student Members, **Retired Members**, and Contributing Members.
- C. To establish policy and promote the objectives of the Society.

Section 5.18 Committees

[The committee structure needs to change to be more flexible.]

Current wording

5.18 Committees. **The Standing Committees shall be:**

- Awards
- Symposium
- Status/Distribution of Mussels
- Status/Distribution of Gastropods
- Outreach
- Information Exchange
- Environmental Quality and Affairs
- Propagation/Restoration and Introduction
- Nominations
- Genetics
- Guidelines & Techniques

Proposed wording

5.18 Committees. **Committees shall be of three types; Functional, Technical, and Ad hoc.**

Functional Committees will take care of the day-to-day functions of the Society. Functional committees shall include, but are not limited to:

- Outreach (e.g., website, social media, event tools)
- Awards
- Nominations
- Symposia and Workshops
- Publications (Ellipsaria, FMBC)
- Diversity and Inclusiveness
- National Strategy

Technical Committees will be established to meet the goals and objectives of the National Strategy. Broad committees will be formed that consist of subcommittees that function to address specific projects outlined in the current National Strategy. The National Strategy Committee will recommend changes to these committees based on their five-year evaluation. These recommendations will be voted on by the Board of Directors and communicated to the membership before the symposium following the review.

[Broad committees that would be formed from existing committees to meet the new National Strategy include:

- Environmental Quality and Advocacy (including a representative on Consortium of Aquatic Science Societies)
- Propagation and Restoration (subcommittee suggestions: Propagation, Restoring Populations, Habitat Restoration)
- Ecology and Ecosystem Services (subcommittee suggestions: Guidelines and Techniques, Genetics, Ecology, Ecosystem Services, Mollusk Valuation)
- Mollusk Status and Distribution (subcommittees suggestions: Mussel and Gastropod Atlas, Mussel and Gastropod Names, Mussel App)

The President will form *ad hoc Committees* to explore specific issues or answer specific questions. These committees will be dissolved when their task is complete. They will be evaluated by the Executive Committee at least every five years and either dissolved (if task is complete) or made into a Functional or Technical subcommittee.

[For example, the ad hoc Chapter Committee was formed to determine how other societies have formed chapters. Under the revised By-Laws we could then form a Functional Chapter Committee to oversee the development of Chapter guidelines and get the process rolling. Similarly, the ad hoc Professional Development Committee was formed to determine if the membership is interested in a Certification program and what that might look like. If the membership decides to go forward with Certification, that committee would become a Functional Committee to develop the process.]

Now that you have invested so much time reviewing these proposed changes, make sure to send your comments about them to Heidi Dunn at Hdunn@ecoanalysts.com by **October 15, 2018**. As indicated above, a final version of the proposed amendments will be submitted to the Board before the November 2018 Board meeting. If supported by the Board, the proposed amendments will be published in the December 2018 issue of *Ellipsaria* and will be brought before the Membership for adoption during our Business Meeting at the 2019 Symposium in San Antonio, Texas.

FMCS to Adopt a Code of Conduct

Heidi Dunn, Teresa Newton, and Jeremy Tiemann

The following draft of a possible Code of Conduct for FMCS was developed based on similar Codes of other societies. This draft is being posted in *Ellipsaria* so that all members have an opportunity to review and comment on it. Please provide your comments to Heidi Dunn (at hdunn@ecoanalysts.com) by **October 1, 2018**. All comments will be considered, and the Code will be revised as needed prior to being brought to a vote of the FMCS Board of Directors. The final version of this Code of Conduct will appear in the FMCS By-Laws and on the registration form for the San Antonio Symposium and subsequent Society events. We look forward to your comments and suggestions.

The Freshwater Mollusk Conservation Society's Code of Conduct

The Freshwater Mollusk Conservation Society (FMCS) is an international scientific organization whose purpose is to conserve and advocate for freshwater mollusks. FMCS members and attendees of FMCS-sponsored symposia, workshops, meetings, or other FMCS activities (events) are expected to adhere to the FMCS Code of Conduct. FMCS is committed to providing a safe, productive, and welcoming environment for all participants and staff. All participants including, but not limited to, members, guests, attendees, speakers, volunteers, exhibitors, service providers, and others are expected to abide by this Code of Conduct. This Code of Conduct applies to both in-person and electronic (text, email, social media) communications.

Expected Behavior:

- Communicate openly with respect and consideration for others, valuing a diversity of views and opinions.
- Avoid personal attacks directed toward other attendees, participants, suppliers, and vendors.
- Be mindful of your surroundings and of your fellow participants. Alert an FMCS board member if you notice a dangerous situation or someone in distress.
- Respect the rules and policies of the event venue, hotels, FMCS contracted facility, or any other venue.
- Request permission from speakers before recording or taking photographs during their presentation. Turn off any ringers or other disrupting devices during oral and poster sessions.
- All members should feel empowered to speak up or intervene if they observe discriminatory behavior directed at others.

Unacceptable Behavior:

It is important that our events be a place where no attendee or staff is ever belittled, harassed, or made to feel unsafe. The following behavior will not be tolerated:

- Harassment, intimidation, or discrimination in any form.
- Physical, written, or verbal abuse of any attendee, speaker, volunteer, exhibitor, service provider, or other event guest.

Examples of unacceptable behavior include, but are not limited to, unwelcomed physical contact; verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, or national origin; inappropriate use of nudity and/or sexual images in public spaces or in presentations; and threatening or stalking any attendee, speaker, volunteer, exhibitor, service provider, or other event guest.

Reporting Unacceptable Behavior & Consequences

Anyone filing a complaint concerning a violation of suspected violation of the Code of Conduct must be acting in good faith and have reasonable grounds for believing the information disclosed indicated a violation of the Code of Conduct. Any allegations made with a malicious intent will be viewed as a Code of Conduct violation.

All members, event attendees, and event staff are expected to abide by the FMCS's Code of Conduct. Anyone experiencing or witnessing behavior that constitutes an immediate or serious threat to public safety should contact 911 and locate a house phone and ask for security. Anyone requested to stop unacceptable behavior is expected to comply

immediately. If you are the subject of unacceptable behavior or have witnessed any such behavior, please immediately notify an FMCS board member or our event services representative.

Notification can also occur by emailing your concern to the FMCS president or our event services representative. After receiving a report of inappropriate behavior, the FMCS president and our event services representative will assess the report and work with the complainant to determine the most appropriate response.

FMCS is committed to protecting the privacy of all individuals involved in the incident to the greatest extent possible. When necessary, the FMCS leadership will be notified that a complaint has been received and will discuss appropriate actions. The FMCS leadership reserves the right to take any lawful action we deem necessary in response to a violation of this code of conduct. This includes, but is not limited to, the immediate removal from the event without warning or refund. The FMCS leadership may also elect to suspend the member from future events. Repeat violations will result in loss of membership.

Failure to adhere to the Code of Conduct is cause for suspension or removal at the discretion of the Executive Committee. A Member may be suspended or removed from FMCS with or without cause by vote of two-thirds of the Board of Directors only after reasonable notice and opportunity to be heard.

Ensuring Inclusion & Diversity in the Future

The FMCS leadership and the FMCS Inclusiveness and Diversity Committee also encourage anyone to contact FMCS officers or members of the FMCS Inclusiveness and Diversity Committee regarding ways in which the Society can improve inclusion and diversity and encourage a stimulating and supporting atmosphere.

Please take time to provide your comments on this proposed Code of Conduct to Heidi Dunn (at hdunn@ecoanalysts.com) by **October 1, 2018**.

Are You, and is FMCS, Ready for a Professional Mollusk Certification Program?

In 2016, the FMCS Board established the Professional Development Ad hoc Committee to explore the possibility of developing a certification program for freshwater mollusk professionals. The intent of such a program would be to provide an education-based professional certification that could benefit our members and support the Society's education strategy. Since then, the Committee has: 1) polled the membership about interest in such a certification (see *Ellipsaria* Volume 20, No. 1, March 2018), 2) spoken to other organizations that offer similar certifications, and 3) identified some possible certification rating criteria. Recently, the FMCS Executive Committee has reviewed the following overview of the possible Certification Program and has encouraged the Committee to post it in *Ellipsaria* for all members to review. During our Business Meeting at the 2019 Symposium in San Antonio, the FMCS Membership will be asked to vote on whether to establish a Professional Mollusk Certification Program. If that motion is approved, the proposed Certification Review Panel will finalize the procedures and evaluation criteria, then start issuing certifications.

Overview of the Proposed Certification Program

OBJECTIVE: The objective of the FMCS Mollusk Professional Certification Program would be to provide minimum standards of experience and education for mussel and snail professionals. **This would not be a taxonomic certification**, but an endorsement for applicants having met minimum standards of education and experience in freshwater malacology.

GOALS: To provide recognition of achievement for mollusk professionals and present minimum standards for key skills and competencies for mollusk conservation professionals. The program specifically addresses the National Strategy for the Conservation of Freshwater Mollusks Issue 8: *"Educate and train the conservation community and future generations about the importance of mollusks to ensure conservation efforts continue, Strategy 1 - Develop and recommend a list of key skills and competencies for mollusk conservation biologists and the supporting disciplines such as communication."*

PROGRAM OVERVIEW:

- Program would consist of different levels of certification, depending on education and experience.
- Members may be able to use certifications with similar organizations (i.e., AFS Fisheries Professional) in lieu of and/or in support of the mollusk certification requirements.
- Fee structure would depend on the level of certification. All fees would be allocated to professional development and continuing education opportunities within FMCS, and to student membership support.
- Applicants would be required to sign and adhere to the FMCS Code of Conduct (in development).
- Applicants must be an FMCS member to apply.
- A Certification Review Panel would be appointed by the FMCS Board []. The review panel would be comprised of representatives from academia, private sector, and government agencies.

Proposed Certification Tiers:

- Mollusk Professional in-Training (MPI)
- Associate Mollusk Professional (AMP)
- Certified Mollusk Professional (CMP)

Proposed Evaluation Categories:

- Education focused on mollusk, fisheries, biology, other relevant coursework
- Knowledge of systematics, taxonomy, genetics of mollusks
- Demonstrated performance in research, management, or conservation of freshwater mollusks
- Demonstrated skill and competency in field methods
- Current understanding of mollusk research and status of mollusks

If you have questions or comments about this proposed certification program or details of this overview, please feel free to contact the ad hoc committee co-chairs Rebecca Winterringer (rwinterringer@trcsolutions.com) or Amanda Rosenberger (rosenbergera@missouri.edu). They would appreciate receiving feedback in time to evaluate any possible changes before the topic is discussed at our Business Meeting at the 2019 Symposium in San Antonio.

Announcement

Survey for Owners of Private Natural History Collections in Europe

Dear private collection owner,

When it comes to privately- owned natural history collections, these are often ‘hidden’ and may harbor highly valuable specimens for a specific taxon or (local) geographic range. On a European scale, these private collections combined are expected to form a significant part of the natural history collections as a whole. Therefore, it is important to include private collections in Europe’s digitisation efforts of natural history collections, which is currently being explored within the ICEDIG project, a design study for the DiSSCo research infrastructure (icedig.eu and dissco.eu).

With this questionnaire, we hope to get an idea of the volume, scope and level of digitisation of private collections within Europe. In addition, we would like to know what kind of resources private collection owners need for digitisation and dissemination of their private collections. The outcomes of the questionnaire will be used to write guidelines for the digitisation of private collections, to perform a couple of pilot digitisation pilots of private collections, and to present information about private collections to policy and decision makers. If we can show that there are many interesting private collections in Europe, we can make a strong case to focus on these natural history collections as well. It is therefore of great importance that this questionnaire is completed by as many private collection owners as possible.

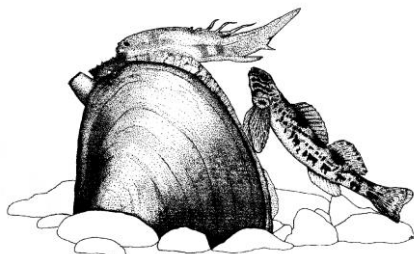
The questionnaire consists of 20 questions and requires less than 10 minutes to complete. We ask you to fill out the questionnaire before the **17th of September 2018**. Please use the following link to complete the questionnaire: <https://www.surveymonkey.com/r/77MQCLR>

Thank you in advance.

Luc Willemse (Head of Entomological and Geological Collections) and Emily van Egmond, Naturalis Biodiversity Center, Leiden, the Netherlands

GDPR statement

By completing the questionnaire, and in compliance with the new EU regulations on GDPR (General Data Protection Regulation), you give your consent to store your data for the purpose of this survey. We will not share the data with any third party and you can opt out at any time with an email to emily.vanegmond@naturalis.nl. You can participate anonymously, except for when you are interested to receive a summary of the results of the questionnaire, for which we will need your name and email address for distribution purposes.



Upcoming Meetings

September 2 – 6, 2018 – 8th International Symposium on Aquatic Animal Health, Charlottetown, Prince Edward Island, Canada Theme: *Biotechnology in the Advancement of Aquatic Animal Health*
<https://isaah2018.com/>

September 16 – 20, 2018 – First FMCS International Freshwater Mollusk Meeting, Theater Maggiore Verbania, Italy, Theme: *Bridging the gap between freshwater mollusk research and conservation in the Old and New Worlds* https://molluskconservation.org/EVENTS/2018-INTNL/2018_FMCS-INTNLMeet.html

October 21 – 24, 2018 – Southeastern Association of Fish and Wildlife Agencies 72nd Annual Conference, Renaissance Riverview Plaza Hotel, Mobile, Alabama, USA.
<http://www.seafwa.org/conference/overview/>

November 27 – 29, 2018 – International Seminar: Monitoring and Restoration of Freshwater (mussel) Habitats, Clervaux, Luxembourg. <http://www.unio.lu/aktuelles/news/international-seminar-monitoring-and-restoration-o/>

March 7 – 11, 2019 – National Shellfisheries Association and World Aquaculture Society joint meeting, New Orleans Marriott, New Orleans, Louisiana, USA. Theme: *Aquaculture – The Big Easy Choice!*
<https://www.was.org/meetings/pdf/AQ2019RegBro.pdf>

April 14 – 18, 2019 – FMCS 11th Biennial Symposium, Hyatt Regency, San Antonio, Texas, USA. Theme: *Life on the Edge: Reconciling River Management*. Other details not yet announced.

May, 19 – 23, 2019 – Society for Freshwater Science Annual Meeting, Salt Palace, Salt Lake City, Utah, USA Theme: *Translational Ecology in Freshwater Science* <http://sfsannualmeeting.org/>

June ? – ?, 2019 – American Malacological Society 85th Annual Meeting [Date, Site, and theme not yet posted] <http://www.malacological.org>

September 29 – October 3, 2019 – Joint Meeting of the American Fisheries Society and the Wildlife Society, Reno-Sparks Convention Center, Reno, Nevada, USA Theme: (not yet announced)
<http://afstws2019.org/>

July ? – ?, 2020 – Society for Conservation Biology North American Sectional Meeting, [Date, Site, and theme not yet posted] <http://conbio.org/groups/sections/north-america/meetings/>

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.

The Freshwater and Amphibious Gastropod Mollusks of Santa Catarina State/ SC, Central Southern Brazil: Current State of Our Knowledge After 22 Years of Research

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This is the second summary of our review of freshwater mollusks known from Santa Catarina State/ SC, Central Southern Brazil (see Agudo-Padrón 2018a), product of 22 years of systematic field research, examination of specimens deposited in museum collections, and parallel reference studies. We now know that the limnic/freshwater and amphibious gastropod mollusk fauna occurring in the geographical territory of Santa Catarina State is 42 confirmed species, including 37 native (15 Caenogastropoda and 22 Pulmonata – one amphibious) and five non-native/ exotic forms (3 Caenogastropoda – one amphibious and 2 Pulmonata) (Table 1).

Table 1. Systematic relationships of the 42 freshwater and amphibious gastropod mollusk species known to occur in the State of Santa Catarina/ SC, Central Southern Brazil, and the Malacological Regions in which each has been found (pertinent map is Figure 1).

Species	Malacological Regions					
	1	2	3	4	5	6
Caenogastropoda						
Family Ampullariidae Gray 1824						
<i>Asolene (Pomella) megastoma</i> (Sowerby, 1825)			X			
<i>Felipponea iheringi</i> (Pilsbry, 1933)			X			
<i>Pomacea bridgesii</i> (Reeve, 1856)	X	X			X	X
<i>Pomacea canaliculata</i> (Lamarck, 1819)	X				X	X
<i>Pomacea lineata</i> (Spix, 1827)				X	X	X
<i>Pomacea paludosa</i> (Say, 1829)						X
<i>Pomacea sordida</i> (Swainson, 1822)	X	X			X	X
Family Hydrobiidae Stimpson, 1865						
<i>Littoridina australis</i> (d'Orbigny, 1835)	X					
<i>Littoridina piscium</i> (d'Orbigny, 1835)	X	X			X	X
<i>Littoridina charruana</i> (d'Orbigny, 1840)	X		X	X		
<i>Littoridina davisi</i> (Silva & Thomé, 1985)					X	
Family Tateidae Thiele, 1925						
<i>Potamolithus catharinae</i> (Pilsbry, 1911)		X	X	X		X
<i>Potamolithus kusteri</i> (Ihering, 1893) #			X	X		
<i>Potamolithus lapidum</i> (d'Orbigny, 1835)			X			
<i>Potamolithus philippianus</i> Pilsbry, 1911		X	X			X

Table 1. (Continued)

Species	Malacological Regions					
	1	2	3	4	5	6
Family Assimineidae H. Adams & A. Adams, 1856						
<i>Assimineia</i> sp *	X	X				X
Family Thiaridae Gill, 1871 (1823)						
<i>Aylacostoma</i> sp #						X
<i>Melanoides tuberculata</i> (Müller, 1774)	X	X				X
Pulmonata						
Family Succineidae Beck, 1837						
<i>Omalonyx convexus</i> (Heynemann, 1868) *	X				X	X
Family Ancyliidae (Menke, 1830)						
<i>Burnupia ingae</i> (Lanzer, 1991)					X	
<i>Hebetancylus moricandi</i> (d'Orbigny, 1837)	X			X	X	X
<i>Ferrissia gentilis</i> (Lanzer, 1991)					X	
<i>Uncancylus concentricus</i> (d'Orbigny, 1835)			X			
Family Chilinidae Dall, 1870						
<i>Chilina fluminea</i> (Maton, 1809)			X	X		
<i>Chilina globosa</i> (Frauenfeld, 1881)				X		X
<i>Chilina parva</i> (Martens, 1868)			X		X	
Family Physidae Fitzinger, 1833						
<i>Physa acuta</i> (Draparnaud, 1805)	X				X	X
<i>Aplexa marmorata</i> (Guilding, 1828)	X		X		X	
Family Lymnaeidae Rafinesque, 1815						
<i>Lymnaea columella</i> (Say, 1817)	X	X	X	X	X	X
<i>Lymnaea rupestris</i> (Paraense, 1982) #			X			
<i>Lymnaea viatrix</i> (d'Orbigny, 1835)	X					X
Family Planorbidae Rafinesque, 1815						
<i>Biomphalaria glabrata</i> (Say, 1818)	X				X	X
<i>Biomphalaria occidentalis</i> (Paraense, 1981)	X	X				
<i>Biomphalaria oligoza</i> (Paraense, 1981)	X					
<i>Biomphalaria peregrina</i> (d'Orbigny, 1835)			X			X
<i>Biomphalaria schrammi</i> (Crosse, 1864)						
<i>Biomphalaria straminea</i> (Dunker, 1848)	X		X	X		
<i>Biomphalaria tenagophila</i> (d'Orbigny, 1835)	X	X	X		X	X
<i>Acorbis petricola</i> Odhner, 1937			X			
<i>Drepanotrema cimex</i> (Moricand, 1838)	X				X	
<i>Drepanotrema heloicum</i> (d'Orbigny, 1835)						X
<i>Drepanotrema pfeifferi</i> (Strobel, 1874)			X			X

– Endemic species to the State (3)

* – Amphibious species (2)

The first comprehensive report of this group for the State corresponds to start of the years 2000 (Agudo 2004; Agudo-Padrón 2008). More recently (Agudo-Padrón 2016a, 2018b), this regional biodiversity is preliminary categorized, being one of the most relevant species the controversial native Ampullaridae *Pomacea sordida* (Swainson, 1823) (Agudo-Padrón 2016b) (Figure 2).

Only two amphibious (swampy/of flooded areas) forms are known so far in this geographic territory: the operculate non-native/exotic snail “*Assimineia* sp” and the neotropical native pulmonate semi-slug *Omalonyx convexus* (Heynemann, 1868).

Spatially distributed in the six malacological regions in which the geography of the State was by us divided since the year 2014 (Agudo-Padrón 2014:9, 2018b:58) (Figure 1), the majority of the species registered (22) once again occur in the streams and flooded/swampy spaces of the great Itajaí River

watershed (Malacological Region 6), the largest Atlantic drainage-basin of the State ~ see Agudo-Padrón 2011b:5-7, 2011c:33-Figure 1) (Figures. 2 and 3), followed closely (with 20 species) by Malacological Region 1, the Great Florianópolis area., also in the Atlantic Slope in the State (Agudo-Padrón 2008:150, 2011a:40-41, 2014:21).

Only two of these species – one non-native/exotic form, the cosmopolitan limnic snail *Lymnaea columella* (Say, 1817) and the neotropical native species Planorbidae *Biomphalaria tenagophila* (d'Orbigny, 1835) – are known to occur simultaneously in each of the six malacological regions. Three other native snails – Tateidae *Potamolithus kusteri* (Ihering, 1893), Thiariidae *Aylacostoma* sp (Figure 3), and Lymnaeidae *Lymnaea rupestris* (Paraense, 1982) – are endemic forms of this little geographical southern territory (Agudo-Padrón 2012:40).

Figure 1. Malacological regions of Santa Catarina State: (1) Greater Florianópolis, coastal and mountain region; (2) Northern Region; (3) Western Region – Upper Uruguay River Basin; (4) Highlands Region; (5) Southern Region; (6) Itajaí River Basin Valley Region.

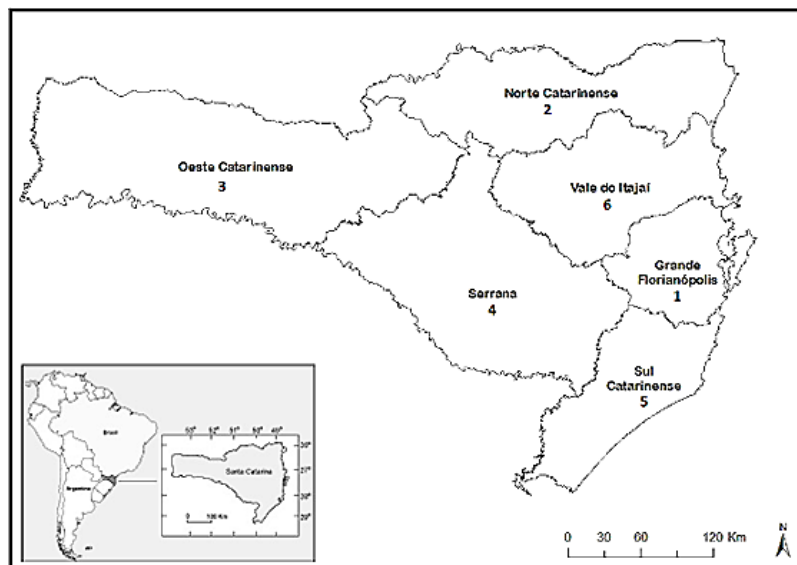


Figure 2. General aspects of the subtropical fluvial environment in the Itajaí Açu River basin, Malacological Region 6, Santa Catarina State, Central Southern Brazil.



Figure 3. Typical native stream/ river snails of the Itajaí Açu River Basin Valley (Malacological Region 6), Santa Catarina State/ SC, Central Southern Brazil region: upper left - operculate Ampullariidae *Pomacea sordida* (Swainson, 1823), upper right - Thiariidae *Aylacostoma* sp (endemic form in “determination process”), lower left - Tateiidae *Potamolithus catharinae* (Pilsbry, 1911), and lower right - pulmonate Chiliniidae *Chilina globosa* (Frauenfeld, 1881).

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Concerns About the Non-native and Invasive Amphibious and Freshwater Mollusks Present in Santa Catarina State, Central Southern Brazil

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<http://noticias-malacologicas-am.webnode.pt/>

At present, a total of 32 non-native and invasive mollusk taxa are known to occur in Santa Catarina State Brazil (Table 1). This number includes four marine bivalves, one marine gastropod (Agudo-Padrón 2011) and 27 non-marine/continental forms (Agudo-Padrón 2012, Agudo-Padrón 2017a, 2017b:31, Agudo-Padrón and Luz 2017, Agudo-Padrón 2018a:59, 2018b). Eighteen of the non-marine invasive mollusks known from Santa Catarina State are terrestrial gastropods, one is an amphibious snail (*Assiminea*), four are freshwater bivalves (*Corbicula* and *Limnoperna*), and four are aquatic snails (*Pomacea*, *Melanoides*, *Physa*, and *Pseudosuccinea*).

The 32 invasive mollusk taxa now known to occur in Santa Catarina State represent the greatest concentration of foreign mollusk species found in all of Brazil (Table 2), almost 53% of the total recorded for the entire country. This highlights the growing and worrying situation with regard to the protection of native species.

Table 1. Non-native amphibious and freshwater mollusks known to occur in Santa Catarina State, Brazil.

Gastropoda
Assimineidae <i>Assiminea</i> sp
Ampullaridae <i>Pomacea paludosa</i> (Say, 1829) (Figure 1)
Thiaridae <i>Melanoides tuberculata</i> (Müller, 1774)
Physidae <i>Physa acuta</i> Draparnaud, 1805
Lymnaeidae <i>Pseudosuccinea</i> (= <i>Lymnaea</i>) <i>columella</i> (Say, 1817)
Bivalvia
Cyrenidae (= Corbiculidae) <i>Corbicula fluminea</i> (Müller, 1774) <i>Corbicula fluminalis</i> (Müller, 1774) <i>Corbicula largillierti</i> (Philippi, 1844)
Mytilidae <i>Limnoperna fortunei</i> (Dunker, 1857)

Table 2. Comparison of the numbers of non-native mollusks known from all of Brazil and just in Santa Catarina State.

Mollusk Groups	Brazil	Santa Catarina
Freshwater Bivalves	5	4
Freshwater Gastropods	8	4
Amphibious Gastropods	1	1
Terrestrial Gastropods	35	18
Marine Bivalves	9	4
Marine Gastropods	3	1
Totals	61	32

Special emphasis needs to be given to the operculate gastropod *Melanooides tuberculata* (Müller, 1774) and the fouling bivalve *Limnoperna fortunei* (Dunker, 1857). Both species present the greatest invasive aggressive behavior, violently occupying the spaces they colonize and rapidly changing the original environmental conditions to the detriment of native species (Agudo-Padrón 2012: 21).

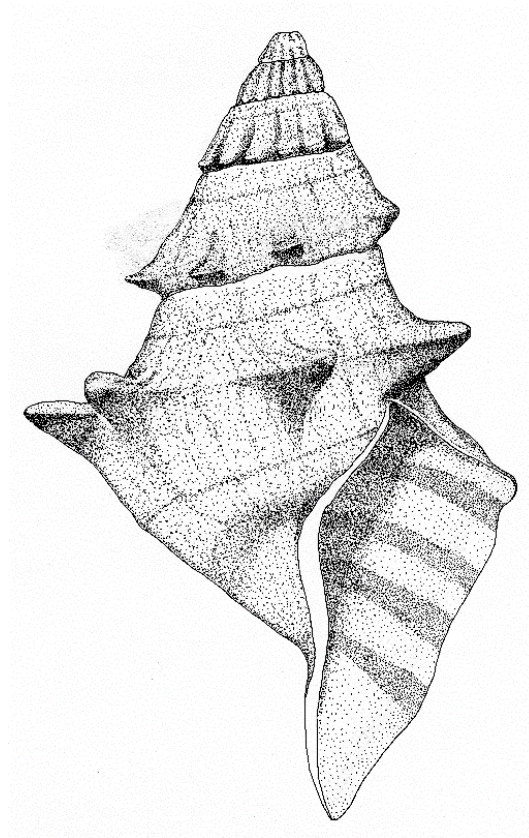
The present distribution patterns of two invasive aquatic snails probably illustrate the different ways that people have spread these species. The little pulmonate gastropod *Pseudosuccinea* (= *Lymnaea*) *columella* (Say, 1817), occurs in each and every one of the six malacological regions established for the Santa Catarina's geographical territory (Agudo-Padrón 2018a:55-Table 1, 60), more than likely associated with agricultural activities. In contrast, the Apple Snail *Pomacea paludosa* (Say, 1892) is known only from a single geographical location (Figure 1), probably the result of a release of aquarium snails.



Figure 1. The only known occurrence of the non-native Apple Snail *Pomacea paludosa* (Say, 1892) in the Camboriú River (map), part of the Itajaí River basin, a strongly human-influenced basin in northeastern Santa Catarina State.

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Ellipsaria is posted on the FMCS web site quarterly: around the first of March, June, September, and December. This newsletter routinely includes Society news, abstracts, 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. Contributions may be submitted at any time but are due by the 15th of the month before each issue is posted. MSWord is optimal for text documents but the editor may be able to convert other formats. Graphics should be in a form that can be manipulated using PhotoShop. Please limit the length of informal articles to about one page of text. Note that submissions are not peer reviewed but are checked for clarity and appropriateness for this freshwater mollusk newsletter. Feel free to contact the editor with questions about possible submissions or transmission concerns.

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Parting Shot



This rather innocent-looking picture of a mussel is, actually, quite important for a number of reasons. First, this little mussel (22 mm Standard Length) is a Pale Lilliput [*Toxolasma cylindrellus* (Lea, 1868)], an extremely rare federal endangered species known to persist naturally only in a short reach of the Paint Rock River in northeastern Alabama. Second, on August 9, 2018, Don Hubbs and a Tennessee Wildlife Resources Agency (TWRA) survey crew found this animal alive, tagged it, and returned it to its collection site in the Duck River in central Tennessee. Third, this 2-year-old mussel was found several hundred meters upstream from an ongoing reintroduction site for this species. Since 2014, cultured Pale Lilliput's have been released at this site by the Alabama Department of Conservation and Natural Resources (ADCNR) Alabama Aquatic Biodiversity Center (3 releases – 1,100 individuals) and TWRA's Cumberland River Aquatic Center (1 release – 160 individuals). Finding this one young mussel indicates this endangered species has reproduced successfully in a portion of its historic range in the Duck River. Similar reintroduction efforts using cultured *Toxolasma cylindrellus* also are underway by ADCNR and TWRA in three other watersheds in Alabama and Tennessee where this species once occurred. Photograph by Dan Hua, TWRA.

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.

