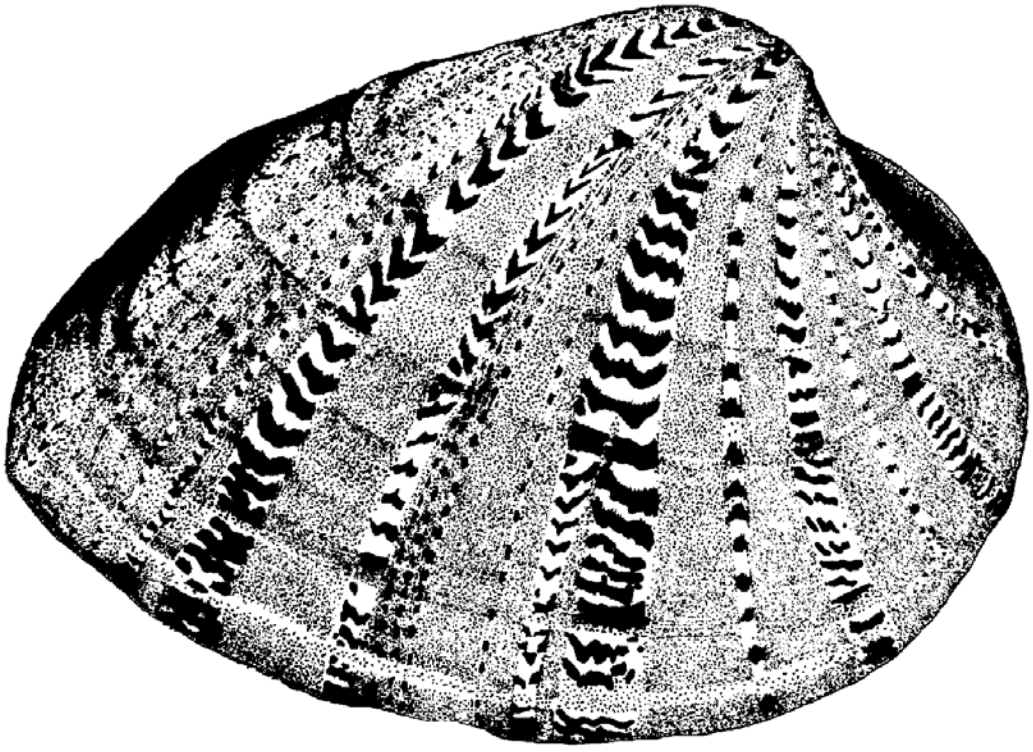
Ellipsaria

The Newsletter of the Freshwater Mollusk Conservation Society

Volume 8 – Number 3 **December 2006**



In this issue:

Freshwater Mollusk Conservation Society Officers

President
Robert M. Anderson
U.S. Fish and Wildlife Service
312 South Allen Street, Suite 322
State College, PA 16801
814-234-4090
Robert_M_Anderson@fws.gov

President Elect
Steve A. Ahlstedt
USGS
1820 Midpark Drive
Knoxville, TN 37828
865-545-4140 x 17 Fax: 4496
ahlstedt@usgs.gov

Secretary
Patricia Morrison
USFWS, Ohio River Islands NWR
P.O. Box 1811
Parkersburg, WV 26102
304-422-0752
patricia_morrison@fws.gov

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

Past President
G. Thomas Watters
Museum of Biological Diversity
The Ohio State University
1315 Kinnear Road
Columbus, OH 43212
614-292-6170
Watters.1@osu.edu

Ellipsaria Editor

Christine Mayer
Illinois Natural History Survey
1816 S Oak Street, Champaign, IL 61820
camayer@inhs.uiuc.edu

Submissions for the April 2007 issue of Ellipsaria may be sent to the editor at any time but are due by **March 22, 2007**. Anyone may submit an article but you must be a member of FMCS to receive Ellipsaria. Please limit submissions to about one page. Categories for contributions include news, new publications, meeting announcements, current issues affecting mollusks, job postings, contributed articles (including ongoing research projects), abstracts, and society committee reports. Electronic submissions are preferred; contact the editor with any questions. Note that submissions are not peer reviewed, but are checked for content and general editing.

Thanks to Jeremy Tiemann for help assembling and mailing this newsletter.

Please send change of address information to the Secretary, Patty Morrison.

Ellipsaria

NEWSLETTER OF THE FRESHWATER MOLLUSK CONSERVATION SOCIETY

Volume 8, No. 3 http://ellipse.inhs.uiuc.edu/FMCS/ December 2006

FMCS 2007 SYMPOSIUM & WORKSHOP

MARCH 11 – 15, 2007

THE PEABODY LITTLE ROCK

LITTLE ROCK, ARKANSAS

Join us for the 5th Biennial Symposium of the Freshwater Mollusk Conservation Society, to be held at The Peabody Little Rock hotel in Little Rock, Arkansas from March 13-15, 2007. A one-day FMCS sponsored workshop on Habitat Restoration will be conducted prior to the symposium on Monday, March 12. The symposium theme is ***Directions in Mollusc Conservation: Molecules to Ecosystems.***

Registration received prior to **February 1, 2007** is $225 for regular or supporting members and $175 for student members; $255 for non-members and $190 for student non-members. Substantial increases will be required for all registrants after February 1. Please download, fill out, and electronically submit the forms for registration and accommodations via the FMCS web site **at http://ellipse.inhs.uiuc.edu/FMCS/symposium/** If you have difficulty, contact Alan Christian: 870-972-3296; achristian@astate.edu

The Peabody Little Rock room rate is $119 per night for single or double occupancy and $129 for triple and quadruple occupancy. Rooms must be booked by **February 9, 2007** to guarantee this rate. Call 501-906-4000 for room reservations and use the meeting code **FMCS2007** – FMCS meeting room rental costs are based upon the number of hotel rooms booked by attendees, so we encourage you to stay at the host hotel. The hotel has a complementary airport shuttle. Hotel valet parking is $13.50/day for registered guests; $10/day for day use. Self-parking is available for $7.50/day at the city-operated parking garage located at the corner of 2nd and Main Street, about two blocks from the hotel.

Board Meeting Minutes

FMCS Board Meeting
November 15 - 16, 2006
Crittenden, KY

A quorum is present for the official meeting of the Board of Directors of FMCS. Committee Chairs will be voted on by individual committees at the 2007 symposium.

Secretary's Report – Motion by Heidi, second by Steve to accept minutes as published in the April 2006 issue of *Ellipsaria*. All in favor. The Society currently has 291 active members, 162 inactive. Need ways to improve timeliness of renewals. Heidi, Patty and Chris will work on renewal forms, note in Ellipsaria, revise registration forms for symposia and workshops, and allow multiple year membership option.

Treasurer's Report – Total society assets $66,376.78. We lost money on symposium last year, and a bit on the workshop this year. May be more income yet to come in for it. Consider raising registration fees for events. Perhaps sponsors are giving less over the past few years. We can all help seek sponsor money. Looking into part-time bookkeeper for help with Treasurer duties, especially in spring. Election of Treasurer coming up next year.

Committee Reports

Awards – Advertising on website for student award applications, some professional award nominations received. Would like to bestow at least one of each type. Their committee can also handle special "thank yous" or other types of appreciation.

Propagation, Restoration and Introductions – Motion received from the committee to amend by-laws to create new full committee for Genetics. There appear to be enough people to support 2 committees and there are dedicated people willing to lead the committee. Hope that cross committee cooperation continues. Might suggest a broader scope to include taxonomic issues. Motion received from committee, all in favor. Will come before the full membership in March for vote.

Workshop and Symposium 2007 – First day (Monday) is a workshop which focuses on habitat restoration, with invited speakers. Physical features, water quality, flows, fish communities. Target audience is FMCS members, but state and other resource people would benefit. Might also target FWS Partners folks and water regulators (Corps, TVA, BLM, etc.). People can come to the workshop alone or both.

Written report from Al Christian, he has a great committee in place and things are coming together well. Board meets on Sunday. Committee meetings proposed to take place over 2 days. Need to advertise at registration to get people to the committee meetings. Get new list of committee members to chairs and put in Ellipsaria for folks to see and review. Board suggests another time for committee meetings besides lunch time. Possible need to provide specific time for access to experts for students seeking information and get feedback.

Information Exchange – *Walkerana*. Kevin and Dan Graaf went to meet with Dr. Burch about transfer of journal. Still need to discuss whether the transfer includes back issues or not, and the cost of those. Need something in writing to solidify the transfer of ownership of the journal and appurtenances. Dr. Burch also wants to retain ownership of the North American snail issues. May need to retain lawyer to resolve copyright issues and transfer documents. Kevin will get cost estimates of back issues and outline key issues to be resolved. Kevin, Bob, Tom, and Steve will work with Dr. Burch and make him an offer based on estimates above and move ahead. For the first issue to be published by FMCS, Kevin will handle mostly himself. Eventually we will have an editorial board. Tom Watters is currently co-editor of the journal.

Jim Williams proposes that FMCS consider developing and posting on our website a digital library of hard to find mussel literature that is not protected by copyright. Board strongly endorses this idea.

Environmental Quality and Affairs – Committee developing position and background and commercial sand and gravel dredging in response to Corps EIS in Pittsburgh District. FMCS is on record opposing any additional dredging. White paper in development, beginning with summary of state-by-state conditions as well as different Corps district approaches. Other issues will be scoped at the upcoming committee meeting. Also sent a letter to TVA on divestment of TVA lands.

Mussel Status and Distribution – Getting the atlas moving again, using NatureServe organization, which exists in all 50 states. All specimens will be identified/verified by regional experts. Sample page was provided in a handout, one page per species. One person does the geo-referencing work for consistency. Can be a pdf file on the web, members can print and punch their own copies. Many species accounts already done. Funding being sought from states and other sources. Also proposed a synonymy and original figures which can be downloadable and searchable as a companion to the atlas. Williams et al. 1993 being updated now, if people have updates to offer, get them to Jim Williams. Letter of support from FMCS would be welcomed.

Gastropod Status and Distribution – via Art Bogan. Paul is working on status paper for AFS. Draft should be available by March symposium.

Guidelines and Techniques – Book on Freshwater Bivalve Ecotoxicology is being released Friday. Board had approved funds to assist in publishing it ($5000). But the price is $150 each copy. Options – buy some and offer to members, or negotiate a reduced price for members. John will get back to

us on options after talking with publisher. Possible workshop idea with SETAC.

Outreach – Tom Jones of Marshall University is interested in being co-chair of committee. Marshall U has a lot of students working on information technology. They would like to work on putting together coordinated DVD and interactive website on mussel education. Grant pre-proposal to the Wildlife Conservation Fund (supports state wildlife action plans) due this week. Possible multi-state application. Need to get more information to the Board before voting to endorse and possibly provide cost share funding by FMCS.

Nominations Committee – Heidi Dunn continuing to serve as Treasurer. We asked for nominations for Treasurer in the April issue of Ellipsaria. For December issue, vote on Treasurer and ask for nominations for President-elect and Secretary to take over in 2007. Get official duties to Chris for the newsletter. Leroy, Secretary and Past-President should work on this committee. Standardize the times when the calls and ballots are published in the future – call for nominees April, balloting in December. Need more effort towards nominating people.

Old Business

FMCS chapters – Nothing to report. Rich Henry is working on it.

Revision to National Strategy – Rachel Muir actively working on it, Board will receive a draft soon. Proposing to present at the Business Meeting and allow time for comment over the next 12 months.

Role of Past President / Motion to add Past President to voting Board – Motion by Rita to amend by-laws to increase Board of Directors to include past-President as voting member of the Board. Second by Janet, all in favor. Proposed amendment will be submitted to the full membership for vote at the March 2007 business meeting.

Cooperative Research Units – Draft of letter endorsing need for malacology expertise in the units is in the President's hands.

New Business

Future Symposia and Workshops –

Workshop 2008 – Suggestion to meet with another organization and attach our workshop. Possibly with AMS, or Society for Conservation Biology. Need theme and local host, focus on outreach to their membership. Chattanooga, TN in July 13 – 18, 2008. TN Aquarium and U. T. Chattanooga could help. Possible focus on mollusk taxonomy, implementing SW plans, translocation of mussels for recovery, state and federal permitting. Backup location, possibly with AMS in Carbondale, IL. Other ideas: investigating mussel kills; water quality standards protective of mussels; propagation and restoration; ecotoxicology. Follow up by conference call in the near future.

Symposium 2009 –
Catherine Gatenby proposing to host a joint International, tribal and FMCS symposium in Baltimore, MD. AZA is potential sponsor and host for opening event at the National Aquarium. Highlight Margaretiferids in a special session, and get tribes and Europeans to attend. FWS Region 5 will help sponsor as well. May be possible in 2011 as well or a 2008 workshop.

Leroy and Monte proposing to host at the International Convention Center in Louisville, KY. World Aquaculture Society would handle all the arrangements. Multiple state and federal sponsors on board already. Motion by Heidi to hold 2009 symposium in Louisville, KY, second by Barb. All in favor. Core group is Monte, Catherine, and Leroy.

Updated 1/4/2007:
Subsequent to the board meeting, a second request was made to consider having the 2009 symposium in Baltimore rather than Louisville. This was put to the board for a vote and it has passed. The sponsors of the Louisville meeting have agreed to postpone that meeting location until 2011.

Fish Habitat Partnership for Mussels – Possible Ohio River Basin Mussel Habitat Initiative being developed on an ecosystem scale, possible endorsement by FMCS.

Spring 2006 workshop in Columbus, OH was very well attended, 110 people. Proceedings will be printed and distributed.

Next spring meeting Sunday March 11, 2007 in Little Rock, AR; fall meeting of the Board November 8 – 9, 2007, Morgantown, WV.

Conference call coming up to discuss 2008 Workshop.

Motion to adjourn by Heidi, second by Steve. All in favor.

FMCS Mollusk Stocking Database

As described in the last issue of *Ellipsaria* we have been working with Kevin Cummings, Jess Jones and Chris Mayer to create a Mollusk Stocking Database to record efforts of freshwater mollusk propagation and release throughout the world. Our intention is to make this information, except for specific stocking locations, available to the Society and the public. Access to specific stocking locality data and stocking reports would only be granted to those who receive a password from the Propagation and Restoration Committee or by communicating with the contact person for the specific mollusk stocking effort. The database will be hosted through the through Illinois Natural History Survey server. Please consider sending an electronic copy of any reports or information you have describing freshwater mollusk stocking you have been associated with. Send your reports

or any questions you have regarding this effort to Mark (mark_hove@umn.edu) or Julie (Julie_Devers@fws.gov).

Thank you for your assistance,

Mark Hove and Julie Devers
Mollusk Stocking Database Co-chairs

Membership Brochures

We still have a decent supply of FMCS membership brochures available for distribution at professional meetings, envelope stuffing parties, and other events where we want to get the FMCS word out.

Please contact Bob Szafoni if you would like a dozen or a dozen hundred or any amount in between.

robert.szafoni@illinois.gov
217.345.2420

FMCS Officer Nominations
President-Elect and Secretary

The FMCS is seeking nominees for two offices: president-elect and secretary. Nominees must be current FMCS members in good standing. Both positions will be voted on before the Little Rock meeting. You will receive a ballot in early 2007. The new **president-elect** will take office in March of 2007, become president in 2009, and then serve as past-president until 2012 for a total of **six** years of service. The **secretary** will take office in March 2007 and serve for **two** years.

The deadline for nominations is February 2, 2007. The nominations committee will select the two candidates for each office who receive the most nominations and who are willing to run for that office. Position statements from the candidates will be mailed out with the ballots after nominations close. Send nominations to:

Leroy Koch
U.S. Fish and Wildlife Service
J.C. Watts Federal Building, Room 266
330 West Broadway
Frankfort, Kentucky 40601

Leroy_Koch@fws.gov

FMCS Treasurer Election

The new treasurer will serve for 2 years beginning in March 2007. Nominations are closed and one person has been nominated to serve – the incumbant, Heidi Dunn.

A ballot has been included with this newsletter. Please take a few minutes to read the position statement from the candidate and return your marked ballot to Leroy Koch by **February 2, 2007**.

~ Don't forget to renew your membership! ~

Announcements

Freshwater Mussel Session at SIL2007

SIL is the *International Association for Theoretical and Applied Limnology* and its meetings are truly diverse and international in representation. We would like to encourage you to attend the SIL meeting next summer, August 12-18, in Montréal, where we are co-chairing a session on *Freshwater mussels - distribution, function in the ecosystem, and conservation* (session #20). We hope a broad range of researchers and managers from around the world will come to exchange ideas.

Description of the Session:
Freshwater mussels can be very abundant in lakes and rivers, and because of their large sizes relative to other benthic organisms, they can have an important impact on these ecosystems. Yet the basic biology and ecology of most species is poorly known. Much interest has recently focused on the diversity and conservation of mussels faced in many areas with habitat destruction and invading species. This session is dedicated to fundamental and applied research on freshwater mussels.

Deadline for submission of abstracts is **February 15, 2007**. You will find more information on the meeting at: http://www.sil2007.org/

We hope to meet you in Montréal,

Hélène Cyr, University of Toronto, helene@zoo.utoronto.ca
John Downing, Iowa State University, downing@iastate.edu
Frances Pick, University of Ottawa, frpick@science.uottawa.ca

Annual Pacific Northwest Freshwater Mussel Research Symposium

April 17, 2007
Water Resources Center, Vancouver, Washington

The Pacific Northwest Freshwater Mussel Workgroup is hosting its 4th annual research symposium. The workgroup is dedicated to conservation of existing Pacific Northwest drainage mussel populations and promoting restoration, protection of mussel populations, and identification of further research that assists in management decisions to achieve these goals.

Several themes for this year's symposium will be hosted. The symposium organizers are soliciting potential participants for their interest in presenting on the following themes:

1. Habitat Knowledge/Issues
2. Relocation and re-introduction of populations
3. Bear Creek, WA Research (die-off, suburban impacts, genetic characteristics)
4. Regulatory issues involving: protection, restoration, and conservation.

Please contact us with your desire to participate by presenting a research paper, concept paper, or a poster. We would like to hear from you by February 15, 2007 with your commitment to a presentation at this symposium.

Contact: Molly Hallock
WA Department of Fish and Wildlife
hallomh@dfw.wa.gov
(360) 902-2818

Minnesota Department of Natural Resources, Stream Habitat Program: Mussel Research Internship - 2007

The Minnesota Department of Natural Resources will be filling up to 4 student intern positions to assist with mussel surveys, monitoring, and endangered species propagation and reintroduction. The positions will be based in St. Paul, Minnesota, but will travel statewide. Start date is expected to begin May 21 and continue to at least August 29; $10.00/hr (40 hrs/wk). Duties include:

-Diving in large rivers such as the Mississippi and St. Croix
-Sample mussels in streams, rivers and lakes while snorkeling or diving
-Quantitatively sample mussel beds to establish long-term monitoring stations
-Assist with endangered mussel propagation activities
-Monitor reintroduced endangered mussels
-Use topographic and county maps to record location of sampling sites
-Record data on field sheets so that it is legible, accurate, and complete
-Prepare and label voucher specimens
-Maintain and organize field and SCUBA equipment
-Operate state vehicles, possibly including boats

For a copy of the job announcement, contact Bernard Sietman: 651-259-5139, bernard.sietman@dnr.state.mn.us

Publications

Jones, J. W., E. M. Hallerman, and R. J. Neves. 2006. Genetic management guidelines for captive propagation of freshwater mussels (Unionoidea). Journal of Shellfish Research 25(2): 527-535.

Jones, J. W., R. J. Neves, S. A. Ahlstedt, and E. M. Hallerman. 2006. A holistic approach to taxonomic evaluation of two closely related endangered species, the oyster mussel *Epioblasma capsaeformis* and tan riffleshell *Epioblasma florentina walkeri* (Bivalvia:Unionidae). Journal of Molluscan Studies 72: 267-283.

Mummert, A., T. J. Newcomb, R. J. Neves, and B. Parker. 2006. Evaluation of a recirculating pond system for rearing juveniles freshwater mussels at White Sulphur Springs National Fish Hatchery, West Virginia, U.S.A. American Malacological Bulletin 21 (1/2): 1-10.

Valenti, T. W., D. S. Cherry, R. J. Neves, J. W. Jones, R. Mair, and C. M. Kane. 2006. Chlorine toxicity to early life stages of freshwater mussels (Bivalvia:Unionidae). Environmental Toxicology and Chemistry 25(9): 183-189.

Farris, J.L., and J.H. Van Hassel. 2006. Freshwater Bivalve Ecotoxicology. CRC Press, Boca Raton, Florida. 408pp. ISBN: 142004284X
http://www.crcpress.com/

Contributed Articles

The following articles were contributed by FMCS members and others in the malacological community. The contributions are incorporated into the newsletter with minimal editing and the opinions expressed therein are those of the authors.

New Host Fish Identifications for the Pyramid Pigtoe, *Pleurobema rubrum*

J. Jacob Culp, Adam C. Shepard, and Monte A. McGregor
Kentucky Department of Fish and Wildlife Resources
Center for Mollusk Conservation, Frankfort, KY

The pyramid pigtoe, *Pleurobema rubrum* (Rafinesque 1820), is a freshwater mussel that occurs sporadically in large rivers in the Ohio and Mississippi River systems and has been extirpated from a large proportion of its historical range. It has a G2 global ranking and is considered imperiled or critically imperiled in states where extant populations can still be found. Kentucky appears to have the best extant populations of this species, located in several sections throughout the Green River system.

Over a two year period (2003-2005), 14 *P. rubrum* individuals were collected during both quantitative and qualitative mussel sampling on the Green River, Kentucky. All individuals collected were placed into a gravity fed, flow-through raceway system to facilitate reproduction at the Center for Mollusk Conservation in Frankfort, Kentucky. On June 15 of 2006, a single female pyramid pigtoe was observed releasing conglutinates. Approximately 50 white conglutinates (15-20 mm long and about 5 mm wide) were released during a 10 minute interval. Conglutinates contained few glochidia and consisted mostly of unfertilized eggs. Water temperature at the time of conglutinate release was 22.5^{o}C.

Nine previously collected fish species were exposed to *P. rubrum* glochidia. Fish were anesthetized with MS-222 (150 mg/l) and glochidia were pippetted directly onto the gill filaments of one branchial cavity of each fish. Fish were held in multi-tank recirculating systems (AHAB Aquatic Habitats, Inc., Apopka Florida). Each tank received a continuous supply of water, and the overflow drained through a filter cup with a 150 µm screen to prevent loss of juveniles. After 12-15 days at temperatures of 21-23°C, transformation of glochidia to juveniles occurred on 4 fish species from the family Cyprinidae: *Cyprinella spiloptera*, *Erimystax dissimilis*, *Lythrurus fasciolaris*, and *Notropis photogenis* (Table 1). This coincides with other species in the genus *Pleurobema*, many of which use at least one cyprinid species as a host (Haag and Warren 1997, Haag and Warren 2003, Hove and Neves 1994, Layzer et. al 2003, Weaver et. al 1991). All 4 fish species identified as hosts are common in the current range of *P. rubrum*, and all but *L. fasciolaris* are generally associated with the large river habitat of the pyramid pigtoe. All 4 fish species are potentially natural hosts and *C. spiloptera* appears to be a very suitable host fish for propagation purposes, but more research, including laboratory testing of other potential fish hosts as well as examining natural infestations, is necessary.

Table 1. Results of *Pleurobema rubrum* host fish trials. Numbers in parentheses represent number of fish surviving entire study.

Species	No. of fish infested	No. of juveniles recovered	Days to transform
Cyprinidae			
Cyprinella spiloptera	3 (3)	79	12–15
Erimystax dissimilis	3 (3)	23	13–15
Hybopsis amblops	3 (3)	–	–
Lythrurus fasciolaris	4 (3)	20	12–13
Notropis photogenis	3 (1)	4	13–15
Phenacobius uranops	1 (1)	–	–
Percidae			
Etheostoma bellum	1 (1)	–	–
Etheostoma maculatum	1 (0)	–	–
Etheostoma rafinesquei	1 (1)	–	–

Literature Cited

Haag, W.R., and M.L. Warren. 1997. Host fishes and reproductive biology of 6 freshwater mussel species from the Mobile Basin, USA. Journal of the North American Benthological Society 16(3): 576-585

Haag, W.R., and M.L. Warren. 2003. Host fishes and infection strategies of freshwater mussels in large Mobile Basin streams, USA. Journal of the North American Benthological Society 22: 78-91.

Hove, M.C., and R.J. Neves. 1994. Life history of the endangered James spinymussel, *Pleurobema collina* (Conrad, 1837) (Mollusca: Unionidae). American Malacological Bulletin 11(1):29-40

Layzer, J.B., B. Adair, S. Saha, and L.M. Woods. 2003. Glochidial hosts and other aspects of the life history of the Cumberland pigtoe (*Pleurobema gibberum*). Southeastern Naturalist 2(1):73-84.

Weaver, L.R., G.B. Pardue, and R.J. Neves. 1991. Reproductive biology and fish hosts of the Tennessee clubshell *Pleurobema oviforme* (Mollusca: Unionidae) in Virginia. American Midland Naturalist 126(1):82-89.

Quadrula metanevra glochidia metamorphose on select minnow species

Andrea Crownhart[1], Bernard Sietman[1], Mark Hove[2], and Nissa Rudh[2]

[1]Minnesota Department of Natural Resources, 500 Lafayette Road, St. Paul, MN 55155; and

[2]University of Minnesota, 1980 Folwell Avenue, St. Paul, MN 55108.

andrea.crownhart@uwrf.edu

A total of forty-six fish species in ten families were tested for host suitability. All trials were conducted at 22˚ C.

Suitable hosts:

Spotfin shiner *(Cyprinella spiloptera)*
Days to transformation: 16

Bluntnose minnow *(Pimephales notatus)**
Days to transformation: 22

Eastern blacknose dace *(Rhinichthys atratulus)*
Days to transformation: 17

Creek chub *(Semotilus atromaculatus)*
Days to transformation: 20

*Only one juvenile was recovered from one individual. Additional trials will be conducted.

Prior to this study, the reported hosts for *Quadrula metanevra* were green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*) (Surber 1913), and sauger (*Sanders canadense*) (Howard 1914). We ran two complete trials on both bluegill and green sunfish with no observed glochidia transformation. Glochidia were sloughed within three days. Surber's (1913) results were based on natural infestations, with no observed juvenile transformation. We were not able to obtain any sauger during our study. However, supplemental testing will be done next summer, which will include sauger as well as more minnow species.

Literature Cited

Howard, A.D. 1914. Experiments in propagation of fresh-water mussels of the *Quadrula* group. Report of the U.S. Commissioner of Fisheries for 1913. Appendix 4: 1-52 + 6 plates. 52 pp. (Issued separately as U.S. Bureau of Fisheries Document Number 801.)

Surber, T. 1913. Notes on the natural hosts of fresh-water mussels. Bulletin of the Bureau of Fisheries 32: 101-116.

A New Way To Collect Adult Small Mussels

Robert A. Hrabik[1], David P. Herzog[1], Tom Proch[2]
[1] Missouri Department of Conservation, Open Rivers and Wetlands Field Station, 3815 E. Jackson Blvd., Jackson, MO 63755.
[2] PA Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh PA 15222.

In September 2005, the Pennsylvania Department of Environmental Protection (PADEP) collaborated with the Missouri Department of Conservation (MDC) on a study of benthic fishes in the upper navigable Allegheny River using the Missouri trawl (Herzog et. al., 2005). The trawl and techniques used by MDC staff exhibited astounding efficacy in sampling benthic fishes in Pennsylvania waters. Ancillary to benthic fish collection, we found that the trawl provided an excellent way to collect *Villosa fabalis*. We collected literally hundreds of these mussels in the trawl. The areas sampled included sites where divers had spent many hours yet collected few specimens. Apparently the trawl, which is designed to drag on the river bottom, disturbed enough of the upper substrate to dislodge *V. fabalis* and suspend them for collection in the trawl. Very few large mussels were collected, indicating that suspension may be a critical aspect of collecting mussels with a trawl. We trawled in water ranging from 1.5 - 8m deep and were successful in collecting *V. fabalis* in all depths. Hopefully, this serendipitous finding will help with the evaluation of the status of this federal candidate species and others.

Reference:

Herzog, D.P., V.A. Barko, J.S. Scheibe, R.A. Hrabik, and D.E. Ostendorf. 2005. Efficacy of a benthic trawl for sampling small-bodied fishes in large river systems. North American Journal of Fisheries Management, 25:594-603.

More Freshwater Limpets on the Isle of Terschelling, the Netherlands

Henk K. Mienis
Mollusc Collection, National Collections of Natural History
Department of Zoology, Tel Aviv University
IL-69978 Tel Aviv, Israel
mienis@netzer.org.il

A week-long visit to the Isle of Terschelling has become a recurring event during my annual stays in my native the Netherlands. Such events take place in the autumn, i.e. at the end of September or the beginning of October. Usually the weather is still fair during that period and more importantly, the land- and freshwater molluscs are still active.

During these visits I always sample the Doodemanskisten, a small lake in the dunes near West-Terschelling, the main village on the island. Data concerning its mollusc fauna exist since 1922 (Boer, 1923), while finds made occasionally during the following 50 years have been summarized by Visser (1973). Twelve species have been recorded during that period; however, never more than six at a time. Moreover, there was never a year that the same combination of species had been found. In other words, you never can tell what you will find during the next visit to the Doodemanskisten.

Two years ago I reported about the presence of *Ferrissia clessiniana* (Jickeli, 1882) in that lake (Mienis, 2004b). This tiny freshwater limpet had been encountered on the leaves of Water lilies *Nymphaea* species, which were free floating in a corner of the lake together with two other exotic aquatic plants: the Water hyacinth *Eichhornia crassipes* and Water lettuce *Pistia stratiotes*. Without doubt all these non-local plants had been thrown into the lake by the owner of a garden pond living in the neighbourhood.

On 3 October 2005 none of these exotic plants were still present. Instead, a fair number of Water soldiers *Stratiotes aloides*, also known as Water houseleek, Water aloe, and Crab's claw to name a few of its common names, were floating around in the same corner. Although Water soldiers do occur in the Netherlands, they are not known from Terschelling. Like all the plants mentioned above, it is for sale in so-called garden centres, where it is advocated as a good hideout for small fish in garden ponds. The only snail species encountered on the leaves of the Water soldier was *Haitia acuta* (Draparnaud, 1805), a highly invasive species in the Netherlands, which had been previously encountered in the lake in the autumn of 2003 (Mienis, 2004a). Other species collected on the same spot within or below the native aquatic vegetation were *Valvata cristata* Mueller, 1774 and *Gyraulus albus* (Mueller, 1774).

This year I visited the Doodemanskisten on 4 October 2006. No exotic plants were floating around this time. Within a few minutes I managed to locate large numbers of *Valvata cristata*, *Bithynia tentaculata* (Linnaeus, 1758), *Haitia acuta,* and *Physa fontinalis* (Linnaeus, 1758). Along the banks a dense stand of *Phragmites* was growing. In order to have a look at the mollusc species associated with these reeds I pulled a few plants out of the water. To my surprise I found two species of freshwater limpets clinging to the submerged parts of the reeds: *Ferrissia clessiniana* and *Acroloxus lacustris* (Linnaeus, 1758). The latter is a common, autochthonous species in the Netherlands, but had not been reported before from Terschelling.

I do not rule out the possibility that *Acroloxus* had already been introduced in 2004 together with *Ferrissia* when someone dropped his surplus water-plants from his garden in

the lake. Both limpet species are often encountered on the same leaves, this in spite of the strong competition for food and space (Mienis, 2005).

Noteworthy is the fact that these limpets, *Acroloxus* and *Ferrissia*, have been found recently for the first time in a similar lake: the Torenvijver, on the nearby island of Vlieland (de Winter & van Leeuwen, 2004). Therefore aerial distribution from one island to the other by means of water fowl or aquatic insects can not be ruled out.

References

Boer, D. 1923. Vacantiebiologie, IV. Terschelling. De Levende Natuur, 28: 105-109.

Mienis, H.K. 2004a. Eindelijk een bevestiging van het voorkomen van de Puntige blaashoren (*Haitia acuta*) op Terschelling. Spirula 340: 97-98.

Mienis, H.K. 2004b. An odd find of *Ferrissia clessiniana* on the isle of Terschelling, the Netherlands. Ellipsaria 6(3): 12.

Mienis, H.K. 2005. Additional observations concerning *Ferrissia clessiniana* in North-Holland, north of the North Sea Channel, the Netherlands. Ellipsaria 7(3): 7-8.

Visser, G. 1973. Chemische samenstelling, flora en fauna van binnendijks water op Terschelling, speciaal met betrekking tot duinplassen. 103 pp, numerous, maps, graphics and tables. Biologisch Station, Oosterend.

Winter, A.J. de & Leeuwen, S.J. van. 2004. Veranderingen in de niet-marine molluskenfauna van Vlieland. Spirula 338: 50-57.

Additional Information Concerning the Conquest of Europe by the Invasive Chinese Pond Mussel *Sinanodonta woodiana*. 14. News from Italy, Romania and Serbia

Henk K. Mienis

National Mollusc Collection, Dept. Evolution, Systematics & Ecology, Hebrew University of Jerusalem, IL-91904 Jerusalem, Israel, and

Mollusc Collection, National Collections of Natural History, Dept. Zoology, Tel Aviv Univ., IL-69978 Tel Aviv, Israel

mienis@netzer.org.il

Several important papers have been recently published concerning the ongoing expansion of *Sinanodonta woodiana* (Lea, 1834) in parts of Romania and Serbia. This invasive species has been reported from a new locality in Italy, while in Romania a report has been published concerning isolation of genomic DNA from this mussel.

Italy

Finds of two specimens of the Chinese pond mussel on the beach of Palo Laziale (Roma) were reported by Albano (2006: 22, Fig. 3). Both specimens were still juveniles and were found near the mouth of a small freshwater stream.

Romania

Sîrbu & Benedek (2006) published a study dealing with the aquatic molluscs and vegetation of ten localities in the Cefa-area. In that area of Romania the first European specimens of *Sinanodonta woodiana* had been collected by B. Kiss in 1979. Chinese pond mussels were found in 50% of the localities. It was the dominant species among the benthic community of the two fishponds included in their survey.

Sîrbu (2006) and Sîrbu et al (2006) published excellent reviews of respectively the distribution and ecology of the freshwater molluscs of the inner Carpathian Basin and the distribution of Unionidae in Transylvania and neighbouring regions. In the Carpathian region it occurred in 12 out of a total of 18 surveyed hydrographic basins. The Chinese pond mussel occurred commonly in the rivers Criş, Tisa, Danube and their tributaries in Transylvania and adjacent regions. It was also frequently found in fishponds in the Mureş River Basin. The paper by Sîrbu et al (2006) also contains a reference to another interesting article by Sárkány-Kiss et al (2000), which I failed to locate so far.

Popa et al (2006) give a description of the procedure used for isolating genomic DNA from specimens of *Sinanodonta woodiana* that had been preserved for two years in alcohol. The samples showed a variable degree of genomic DNA fragmentation and the authors reached the conclusion that this degraded DNA is not suitable for genomic library construction, but it should not represent any problem for PCR-based DNA analysis.

Serbia

The Chinese pond mussel is reported from 44 localities in Serbia by Paunovic et al (2006). The records were made between 1998 and 2006. They include 33 finds in the Danube, seven in the Tisza River, two in the Sava River and one each in the Begej River and Velika Morava River. All of these localities are situated in the northern part of Serbia.

References

Albano, P.G. 2006. Ritrovamenti presso la spiaggia di Palo Laziale (Roma). Notiziario S.I.M., 24(1-4): 21-22.

Paunovic, M., Csányi, B., Simic, V., Stojanovic, B., & Cakic, P. 2006. Distribution of *Anodonta (Sinanodonta) woodiana* (Lea, 1834) in inland waters of Serbia. Aquatic Invasions, 1(3): 154-160.

Popa, L.O., Popa, O.P. & Pisică, E.I. 2006. Isolation of genomic DNA from museum alcohol preserved specimens. Brukenthal Acta Musei, 1(3): 181-185.

Sárkány-Kiss, A., Sîrbu, I. Hulea, O. 2000. Expansionof the adventive species *Anodonta woodiana* (Lea 1834) in Central and Eastern Europe. Acta Oecologica, 7(1-2): 49-57.

Sîrbu, I. 2006. Aspects concerning the distribution and ecology of the freshwater molluscs from the Romanian Inner Carpathian Basin. Heldia, 6(3-4): 115-134.

Sîrbu, I. & Benedek, A.M. 2006. Freshwater mollusca fauna, hydrocormoflora and hygrocormoflora from Cefa area (Bihor County Romania). Brukenthal Acta Musei, 1(3): 79-88.

Sîrbu, I., Sárkány-Kiss, A., Sîrbu, M., & Benedek, A.M. 2006. The Unionidae from Transylvania and neighbouring regions (Romania). Heldia, 6(3-4): 151-160.

Preliminary Notes on the Freshwater and Terrestrial Gastropod Mollusks of the Paraná State, Southern Brazil

A. Ignacio Agudo
Projeto Naiade (Naiade Project)
Avulsos Malacológicos – AM
Caixa Postal (P. O. Box) 010, 88010-970 Centro,
Florianópolis, Santa Catarina – SC, Brasil
iagudo@lycos.com – http://www.malacologia.com.br

Parallel to the continental malacological inventory of the Santa Catarina - SC State (carried on since 1996 in an autonomous way), and based on the knowledge that the continental malacological fauna of this portion of southern Brazilian is poorly documented [the Paraná´s freshwater bivalves were summarized by Agudo (2005b, 2006)*, along with some other reports cited by Oliveira et al (1981, p. 435), from one not-identified native Unionoid (*Diplodon* sp, PR - Brasil, UFJF Cat. no. 4009), and most recently Takeda (2005), from the exotic invaders *Corbicula fluminea* (Müller, 1774), *Limnoperna fortunei* (Dunker, 1857), and the little native limnic clam *Pisidium* sp**], with support in available published reports***, information obtained from regional researchers, studies of reference material, and personal observations in the field, a preliminary list of freshwater and terrestrial gastropod mollusks of the Paraná - PR State is compiled and presented. The list includes 84 species and subspecies (76 natives and 8 exotic invaders) distributed in 9 PROSOBRANCHIA (7 freshwater & 2 terrestrial) and 75 PULMONATA (18 freshwater & 57 terrestrial). Of these, 42 present simultaneous occurrences confirmed in the Santa Catarina's state territory (Agudo 2004, 2005 a, 2006), including 4 Prosobranchia (1 exotic invader) and 36 Pulmonate (7 exotic invaders).

*Recently, it was verified by us (July, 2006) the occurrence of most one native species for the State: MYCETOPODIDAE *Haasica balzani* (von Ihering, 1893), on the hydrographical basin of the "Iguaçú River and Waterfalls", in the "Iguaçú National Park" region.

**Ituarte (2000, pp. 52-fig. 1, 55-56) describes the little species *Pisidium pipoense* Ituarte, 2000 for locality of the Paraná River Basin.

***Refs.: Pilsbry 1895-6, Morretes 1949, 1953, 1954a, 1954b; Paraense 1975; Thomé 1975, 1976; Boffi 1979; Tillier 1981; Parkinson et al 1987, Abbott 1989; Graeff-Teixeira et al 1993; Thomé 1993; Luz et al 1994; Barbosa 1995; Lanzer 1996; Teles 1996; Luz et al 1998; Passos et al 1998; Oliveira & Almeida 1999; Almeida & Bessa 2001; Almeida 2003; Bueno-Silva et al 2003; Cowie & Thiengo 2003; Fernandez et al 2003; Kosloski et al 2003; Simião et al 2003; Thiengo 2003; Simião & Fischer 2004; Bueno-Silva & Fischer 2005; Carvalho et al 2005; Latoski & Fischer 2006; Thomé et al 2006; Simone 2006.

Systematic Species List :

Class GASTROPODA

Subclass Prosobranchia

Family AMPULLARIIDAE (6)*

-*Asolene spixii* (d'Orbigny, 1838)
-*Pomacea canaliculata* (Lamarck, 1819)
-*Pomacea insularum* (d'Orbigny, 1835) (*)
-*Pomacea scalaris* (d'Orbigny, 1835)
-*Pomacea sordida* (Swainson, 1823) (*)
-*Pomella americanista* (Ihering, 1919)

*Obs.: Oliveira et al (1981, p. 79) cited *Ampullarius* (=*Pomacea*) sp. from "Sete Quedas – PR – Brasil"

Family THIARIDAE (1)

-*Melanoides tuberculatus* (Müller, 1774) (*)

Family CYCLOPHORIDAE (2)

-*Adelopoma brasiliense* Morretes, 1954
-*Neocyclotus prominulus* (d'Orbigny, 1840)

Subclass Pulmonata

Family ACHATINIDAE (1)

-*Achatina* (*Lisoachatina*) *fulica* (Bowdich, 1822) (*)

Family ANCYLIDAE (1)

-*Laevapex* sp

Family BULIMULIDAE (14)*

-*Bulimulus dukinfieldi* Melvill, 1900
-*Bulimulus eudioptus* Ihering, 1897
-*Drymaeus* (*Mormus*) *acervatus* Pilsbry, 1895 (*)
-*Drymaeus* (*Mormus*) *acervatus acervatus* (Pfeiffer, 1857)
-*Drymaeus* (*Mormus*) *acervatus paucipunctus* Pilsbry, 1898
-*Drymaeus imperfectus* (Guppy, 1866)
-*Drymaeus interpunctus* E. von Martens, 1886
-*Drymaeus* (*Mormus*) *oreades* (d'Orbigny, 1835)
-*Drymaeus* (*Mormus*) *papyraceus papyraceus* (Mawe, 1823)
-*Drymaeus* (*Mormus*) *papyraceus papyrifactus* Pilsbry, 1898
- *Leiostracus perlucidus* (Spix, 1827)**
- *Mesembrinus interpunctus* (Martens, 1887)** (*)
-*Simpulopsis sulculosa* Férussac, 1819 (*)
-*Thaumastus achilles* (Pfeiffer, 1848)

*Obs.: One other species, *Drymaeus sentalus* Oliveira, Silveira e Sá & Bessa, 1992, referred in the specialized literature for the State (Oliveira & Almeida 1999, p. 38), is today considered a "Nomem nudum" -in litteris (Luiz Ricardo Lopes de Simone, Ph.D., Museu de Zoologia da Universidade de São Paulo -USP, SP, 18/02/2006, Pers. com.; Simone 2006, p. 143)

**In the ecological forest trail of the "Iguaçú Waterfall National Park", Brazilian territory (July 2006, Pers. obs.).

Family CHILINIDAE (1)

-*Chilina fluminea* (d'Orbigny, 1835) * (*)

*In "spring" of the ecological forest trail of the "Iguaçú Waterfall National Park", Brazilian territory (July 2006, Pers. obs.)

Family ELLOBIIDAE (1)
-*Melampus coffeus* (Linné, 1758)* (*)

*Obs.:Estuarine land snail species, inhabitant in mangrove areas

Family HELICIDAE (1)
-*Cornu* (= *Helix*) *aspersa* Müller, 1774 (*)
Family LIMACIDAE (3)
-*Deroceras laeve* (Müller, 1774) (*)
-*Limacus* (= *Limax*) *flavus* (Linné, 1758) (*)
-*Limax maximus* Linné, 1758 (*)
Family LYMNAEIDAE (1)
-*Pseudosuccicnea* (= *Lymnaea*) *columella* Say, 1817 (*)
Family MEGALOBULIMIDAE (12)
-*Megalobulimus* (*Phaiopharus*) *foreli* (Bequaert, 1948)
-*Megalobulimus* (*P.*) *gummatus* (Hidalgo, 1870) (*)
-*Megalobulimus* (*P.*) *vestitus* (Pilsbry, 1926)
-*Megalobulimus* (*P.*) *grandis* (von Martens, 1798)
-*Megalobulimus* (*Megalobulimus*) *arapotiensis* Morretes, 1952
-*Megalobulimus* (*M.*) *nodai* Morretes, 1952
-*Megalobulimus* (*M.*) *paranaguensis* (Pilsbry & Iheing, 1990)
-*Megalobulimus* (*M.*) *rolandianus* Morretes, 1952
-*Megalobulimus* (*M.*) *sanctipauli* (Ihering & Gilsby, 1900)
-*Megalobulimus parafragilior* (Leme & Indrusiak, 1990)
-*Megalobulimus* (= *Psiloicus*) *oblongus* Müller, 1775* (*)
-*Megalobulimus* (= *P.*) *oblongus elongates* (Bequaert, 1948) (*)

*Obs.: Cited from the "Parana region" by Pilsbry (1895-6, p. 30)

Family ODONTOSTOMIDAE (4)
-*Cyclodontina* (= *Odontostomus*) *fusiformis* (Menke, 1828)
-*Cyclodontina* (= *Odontostomus*) *punctatissima* (Lesson, 1830) (*)
-*Macrodontes degeneratus* Pilsbry, 1899
-*Macrodontes paulistus* Pilsbry & Ihering, 1898
Family PHYSIDAE (4)
-*Physa acuta* (= *cubensis*) Draparnaud, 1805 (*)
-*Physa papaveroi* Leme, 1966
-*Stenophysa* (= *Aplexa*) *marmorata* Guilding, 1828 (*)
-*Stenophysa* (= *Aplexa*) *rivalis* (Maton & Rackett, 1807) (*)
Family PLANORBIDAE (9)
-*Antillorbis nordestensis* (Lucena, 1954) (*)
-*Biomphalaria glabrata* (Say, 1818) (*)
-*Biomphalaria occidentalis* Paraense, 1981 (*)
-*Biomphalaria oligoza* Paraense, 1975 (*)
-*Biomphalaria peregrina* (d'Orbigny, 1835) (*)
-*Biomphalaria straminea* (Dunker, 1848) (*)
-*Biomphalaria tenagophyla* (d'Orbigny, 1835) (*)
-*Drepanotrema cimex* (Moricand, 1839) (*)
-*Drepanotrema depressissimus* (Moricand, 1839)
Family SAGDIDAE (1)
-*Thysanophora caeca* (Guppy, 1868)
Family STROPHOCHEILIDAE (7)
-*Mirinaba* (= *Strophocheilus*) *curytibana* Morretes, 1952
-*Strophocheilus* (= *Mirinaba*) *erythrosoma* Pilsbry, 1895 (*)
-*Strophocheilus* (*Mirinaba*) *antoninensis* Morretes, 1952
-*Strophocheilus* (*Mirinaba*) *cadeadensis* Morretes, 1952
-*Strophocheilus* (*M.*) *poreunir phyrostoma* Clench & Archer, 1930
-*Strophocheilus* (*Metara*) *jassaudi* (Morretes, 1937)
-*Strophocheilus* (*Strophocheilus*) *calus* Pilsbry, 1901
Family SUBULINIDAE (4)
-*Lamelaxis micra* d'Orbigny, 1835 (*)
-*Leptinaria unilamellata* (d'Orbigny, 1835) (*)
-*Opeas goodalli* (Miller, 1822)
-*Subulina octona* (Bruguiêre, 1792) (*)
Family SUCCINEIDAE (2)
-*Omalonyx unguis* (Férussac in d'Orbigny, 1837) (*)
-*Succinea meridionalis* d'Orbigny, 1846 (*)
Family SYSTROPHIIDAE (1)
-*Happia* (*Happia*) *vitrina* (Wagner, 1827)
Family VALLONIIDAE (1)
-*Pupisoma minus* Pilsbry, 1920
Family VERONICELLIDAE (6)*
-*Belocaulus angustipes* (Heynemann, 1885) (*)
-*Phyllocaulis boraceiensis* Thomé, 1972 (*)
-*Phyllocaulis tuberculosus* (Martens, 1868) (*)
-*Phyllocaulis variegatus* (Semper, 1885) (*)
-*Sarasinula marginata* (Semper, 1885) Thomé, 1973
-*Sarasinula plebeia* (Fischer, 1868) Thomé 1971 (*)

*Obs.: A other species "doubtful" of native slug Veronicellidae, *Vaginulus paranensis* Burmeister, 1861, it is referred in the specialized literature for the State (Thomé 1993, p. 75)

Family XANTHONYCHIDAE (1)
-*Bradybaena similaris* (Férussac, 1821) (*)
Family ZONITIDAE (1)
-*Habroconus* (*Pseudoguppya*) *semenlini* (Moricand, 1845)

(*) = Species occurs in Santa Catarina State.

References

Abbott, R.T. 1989. Compendium of landshells. Melbourne, Florida - USA: American Malacologists 240 p.

Agudo, A.I. 2004. Preliminary general inventory of continental mollusks (Gastropoda & Bivalvia) from Santa Catarina State, Southern Brazil. FMCS Newsletter *Ellipsaria* 6(3): 14-16.

Agudo, A.I. 2005 a. New records to add to inventory of continental mollusks (Gastropoda & Bivalvia) from Santa Catarina State, Southern Brazil. FMCS Newsletter *Ellipsaria* 7(3): 8-9.

Agudo, A.I. 2005 b. Preliminary notes on the freshwater mussels/naiades of the Paraná State, Southern Brazil. FMCS Newsletter *Ellipsaria* 7(3): 9-11.

Agudo, A.I. 2006. Additional new records of continental mollusks (Bivalvia & Gastropoda) from Paraná and Santa Catarina States, Southern Brazil region. FMCS Newsletter *Ellipsaria* 8(1): 10-11.

Almeida, M.N. 2003. O gastrópode *Bradybaena similaris* (Pulmonata, Xanthonychidae) como modelo experimental para estudos em laboratório I: Introdução e aspectos gerais. Informativo SBMa, Rio de Janeiro 34(143): 9-11.

Almeida, M.N., & E.C. de Almeida Bessa. 2001. Estudo do crescimento e da reprodução de *Leptinaria unilamellata* (d'Orbigny) (Mollusca, Subulinidae) em laboratório. Rev. Bras. Zool. 18(4): 1107-1113.

Barbosa, F.S. 1995. Tópicos em malacologia médica. Rio de Janeiro, RJ: FIOCRUZ 314 p.

Boffi, A.V. 1979. Moluscos brasileiros de interesse médico e econômico. São Paulo, SP: FAPESP / HUCITEC, 182 p.

Bueno-Silva, M., & M.L. Fischer. 2005. Dinâmica populacional de *Drepanotrema cimex* (Moricand, 1839) (Mollusca: Basommatophora: Planorbidae) no Parque Barigüi, Curitiba, Paraná, Brasil. Biotemas 18(2): 129-141.

Bueno-Silva, M., M.L. Fischer, M.A. Kosloski & M.S. Simião. 2003. Levantamento e sazonalidade da malacofauna límnica associada ás macrófitas aquáticas no Parque Barigüi, Curitiba, Paraná, Brasil. Rio de Janeiro, RJ: Resumos XVIII Encontro Brasileiro de Malacologia, Julho 21 a 25 de 2003, p. 256.

Carvalho, O.S., L.K.J. Passos, C.L.F.G. Mendonça, P.C.M. Cardoso & R.L. Caldeira. 2005. Moluscos de importância médica no Brasil. Belo Horizonte, MG: FIOCRUZ/Centro de Pesq. René Rachou, 52 p.

Cowie, R.H., & S.C. Thiengo. 2003. The apple snails of the Americas (Mollusca:Gastropoda:Ampullariidae: *Asolene*, *Felipponea*, *Marisa*, *Pomacea*, *Pomella*): a nomenclatural and type catalog. Malacologia 45(1): 41-100.

Fernandez, M.A., S.C. Thiengo, & L.R.L. Simone. 2003. Distribution of the introduced freshwater snail *Melanoides tuberculatus* (Gastropoda:Thiariidae) in Brazil. The Nautilus 117(3): 78-82.

Graeff-Teixeira, C., S.C. Thiengo, J.W. Thomé, A.B. Medeiros, L. Camillo-Coura & A.A. Agostini. 1993. On the diversity of mollusc intermediate host of *Angiostrongylus costaricensis* Morera & Céspedes, 1971 in Southern Brazil. Mem. Inst. Oswaldo Cruz, Rio de Janeiro, 88(3): 487-489.

Ituarte, C.F. 2000. *Pisidium taraguyense* and *Pisidium pipoense*, new species from Northeastern Argentina (Bivalvia: Sphaeriidae). The Veliger 43(1): 51-57.

Kosloski, M.A., M.L. Fischer & M.S. Simião. 2003. Ocorrência de *Achatina fulica* Bowdich, 1822 (Mollusca; Stylommatophora; Achatinidae) no litoral do Estado do Paraná. Rio de Janeiro, RJ: Resumos XVIII Encontro Brasileiro de Malacologia, Julho 21 a 25 de 2003, p. 244.

Lanzer, R. 1996. Ancylidae (Gastropoda: Basommatophora) na América do Sul: sistemática e distribuição. Rev. Bras. Zool. 13(1): 175-210.

Latoski, N.M., & M.L. Fischer. 2006. Análise preliminar da dieta de Megalobulimus sp (Mollusca; Megalobulimidae) em ambiente natural e cativeiro. Londrina, PR: Resumos XXVI Congresso Brasileiro de Zoologia, Fevereiro 12 a 17 de 2006, no. 319.

Luz, E., A.M. Vieira & T.C.P. Cezar. 1994. Aspectos biológicos de *Lymnaea columella*, Say, 1817, *Physa cubensis* Pfeiffer, 1839 e *Physa marmorata* Guilding, 1828 (Mollusca-Pulmonata) no Primeiro Planalto e Litoral Paranaense. Arq. Biol. Tec. Paraná 37(3): 667-671.

Luz, E., S.M. Silva, A.P. Carvalho & N. Castro. 1998. Atualização da sistemática e distribuição geográfica dos planorbídeos (Gastropoda, Pulmonata) no Estado do Paraná (Brasil). Acta Biol. Paranaense, 27(1-4): 39-55.

Morretes, Frederico Lange de. 1949. Ensaio de catálogo dos moluscos do Brasil. Arq. Mus. Paranaense, Curitiba, 7: 5-216.

Morretes, F.L. 1953. Addenda e corrigenda ao ensaio de catálogo dos moluscos do Brasil. Arq. Mus. Paranaense, Curitiba, 10: 37-76.

Morretes, F.L. 1954 a. Dos novos moluscos do Brasil. Arq. Mus. Paranaense, Curitiba, 10: 331-337.Morretes, Frederico Lange de. 1954 b. Sobre *Megalobulimus paranaguensis* Pilsbry & Ihering. Arq. Mus. Paranaense, Curitiba, 10: 343-344.

Oliveira, M. Pinto de, & M.N. de Almeida. 1999. Conchas dos caramujos terrestres do Brasil / Land shells from Brazil. Juiz de Fora, MG: Editar Editora Associada, 61 p. + bibliographical record.

Oliveira, M. Pinto de, G. de Jesus R. Rezende & G.A. de Castro. 1981. Catálogo dos moluscos da Universidade Federal de Juiz de Fora. Juiz de Fora, MG: UFJF, 520 p.

Paraense, W.L. 1975. Estado Atual da Sistemática dos Planorbídeos Brasileiros (Mollusca, Gastropoda). Arq. Mus. Nac., Rio de Janeiro, 55: 105-128.

Parkinson, B., J. Hemmen & K. Groh. 1987. Tropical Landshells of the World. Wiesbaden: Verlag Christa Hemmen, 279 p.

Passos, A.D.C., A.C. Silveira, J.P. Madruga, J.T. França da Silva, M.A.S. Porto, M. Aparecida H. T. de Oliveira, Maristela dos Reis Luz Alves, P.C. da Silva, R.S. do Amaral & U. Guida. 1998. Controle da Esquistossomose: diretrizes técnicas. Brasília, DF: Fund. Nac. da Saúde/Ministério da Saúde, 70 p.

Pilsbry, H.A. 1895-6. Manual of Conchology. Philadelphia, USA: Academy of Natural Sciences of Philadelphia 10: 264 p.

Simião, M.S., & M.L. Fischer. 2004. Distribuição e estimativa populacional de *Achatina fulica* Bowdich, 1822 no Município de Pontal do Paraná, Brasil. Brasília, DF: Resumos XXV Congresso Brasileiro de Zoologia, Fevereiro 8 a 13 de 2004, p. 289 – no. 1172.

Simião, M,S., M.A. Kosloski & M.L. Fischer. 2003. Malacofauna ocorrente no mesmo ambiente de *Achatina fulica* Bowdich, 1822 (Mollusca; Achatinidae) no litoral do Estado do Paraná. Rio de Janeiro, RJ: Resumos XVIII Encontro Brasileiro de Malacologia, Julho 21 a 25 de 2003, p. 243.

Simone, Luiz Ricardo L. 2006. Land and freshwater molluscs of Brazil. São Paulo, SP: FAPESP, 390 p.

Takeda, A.M. 2005. Moluscos invasores na bacia do Paraná: com ênfase ao Estado do Paraná. Rio de Janeiro, RJ: Resumos XIX Encontro Brasileiro de Malacologia, Julho 25 a 29 de 2005, p. 190.

Teles, H.M.S. 1996. Distribuição de *Biomphalaria straminea* ao sul da região neotropical, Brasil. Rev. Saúde Pública 30(4): 341-349.

Thiengo, S.C. 2003. Distribuição atual do molusco introduzido *Melanoides tuberculatus* (Müller, 1774) (Gastropoda; Thiariidae) no Brasil. Rio de Janeiro, RJ: Resumos XVIII Encontro Brasileiro de Malacologia, Julho 21 a 25 de 2003, pp. 24-26.

Thomé, J.W. 1975. Os gêneros da família Veronicellidae nas Américas (Mollusca; Gastropoda). Iheringia, Sér. Zool., Porto Alegre, (48): 3-56.
Thomé, J.W. 1976. Revisão do gênero *Phyllocaulis* COLOSI, 1922 (Mollusca; Veronicellidae). Iheringia, Sér. Zool., Porto Alegre, (49): 67-90.
Thomé, J.W. 1993. Estado atual da sistemática dos Veronicellidae (Mollusca; Gastropoda) americanos, com comentários sobre sua importância econômica, ambiental e na saúde. Biociências, Porto Alegre, 1(1): 61-75.
Thomé, J.W., S.R. Gomes & J.B. Picanço. 2006. Os caracóis e as lesmas dos nossos bosques e jardins. Pelotas, RS: Editora USEB, 123 p.
Tillier, S. 1981. South American and Juan Fernandez succineid slugs (Pulmonata). J. Moll. Stud., 47: 125-146.

Additional records of land and freshwater mollusks (Gastropoda & Bivalvia) from Paraná State, Southern Brazil region

A. Ignacio Agudo
Projeto Naiade (Naiade Project)
Avulsos Malacológicos – AM
Caixa Postal (P. O. Box) 010, 88010-970 Centro,
Florianópolis, Santa Catarina – SC, Brasil
iagudo@lycos.com – http://www.malacologia.com.br

Thirteen new records of native land and freshwater mollusks (12 GASTROPODA – 1 Prosobranchia & 11 Pulmonata, and 1 BIVALVIA – Unionoida) have been recorded from Paraná State in southern Brazil. Most were recently published in an illustrated catalogue of Brazilian continental mollusks fauna (Simone 2006) including Gastropods PROSOBRANCHIA (p. 65), Gastropods PULMONATA (pp. 126, 130, 146, 152, 165, 186, 208), and Bivalves UNIONOIDA (p. 259). This elevates the number of known species to 115 (Agudo 2005, 2006 a-b): 95 GASTROPODA – 10 Prosobranchia & 85 Pulmonata, and 20 BIVALVIA – 15 Unionoida, 4 Veneroida & 1 Mytiloida. Of these, 3 present simultaneous occurrence confirmed in the Santa Catarina's state territory. Another of the total 97 species of gastropods previously mentioned by us for the State (10 Prosobranchia & 87 Pulmonata) are "confirmed" in the recent literature examined (Colley & Santos 2006; Simone 2006, pp. 42, 61, 108, 135, 141, 143, 145, 152, 161, 163, 169, 180, 203-204, 207, 209, 211, 216, 219, 221).

Systematic Species List:
Class GASTROPODA
Subclass Prosobranchia
Family AMPULLARIIDAE (1)
- *Asolene platae* (Maton, 1809)
Subclass Pulmonata
Family BULIMULIDAE (4)
- *Naesiotus eudioptus* (Ihering in Pilsbry, 1897) (*)
- *Aposcutalus atanticus* (Dutra & Leme, 1985)
- *Mesembrinus oreades* (d'Orbigny, 1835)
- *Thaumastus dukinfieldi* (Melvill, 1900)
Family MEGALOBULIMIDAE (4)
- *Megalobulimus chionostomus* (Mörch, 1852)
- *Megalobulimus crassus* (Albers, 1850)
- *Megalobulimus oosomus* (Pilsbry, 1895)
- *Megalobulimus torii* Morretes, 1937* (*)
Family ODONTOSTOMIDAE (1)
- *Cyclodontina catharinae* (Pfeiffer, 1856) (*)
Family SUBULINIDAE (2)
- *Leptinaria lamellata* (Potiez & Michaud, 1838) - p. 186
- *Leptinaria parana* (Pilsbry, 1906) – p. 186

Class BIVALVIA
Order UNIONOIDA
Family HYRIIDAE (1)
- *Diplodon fontainianus* (d'Orbigny, 1835)

*Obs.: Not referred by Morretes (1949, p. 142; 1953, p. 66) in its historic works, even so mentioned for the coast area of the State by Colley & Santos (2006).
(*) Species occurs in Santa Catarina State – SC.

References:

Agudo, A. Ignacio. 2005. Preliminary notes on the freshwater mussels/naiades of the Paraná State, Southern Brazil. FMCS Newsletter *Ellipsaria*, 7(3): 9-11.
Agudo, A. Ignacio. 2006 a. Additional new records of continental mollusks (Bivalvia & Gastropoda) from Paraná and Santa Catarina States, Southern Brazil region. FMCS Newsletter *Ellipsaria*, 8(1): 10-11.
Agudo, A. Ignacio. 2006 b. Preliminary notes on the freshwater and terrestrial gastropod mollusks of the Paraná State, Southern Brazil. FMCS Newsletter *Ellipsaria*, 8(3): ... this issue.
Colley, Eduardo & Franklin Noel dos Santos. 2006. "Expedição Lange de Morretes I". Informativo SBMa, Rio de Janeiro, 37(155): 5.
Morretes, Frederico Lange de. 1949. Ensaio de Catálogo dos Moluscos do Brasil. Arq. Mus. Paranaense, Curitiba, 8: 5-216.
Morretes, Frederico Lange de. 1953. Addenda e corrigenda ao ensaio de catálogo dos moluscos do Brasil. Arq. Mus. Paranaense, Curitiba, 10: 37-76.
Simone, Luiz Ricardo L. 2006. Land and freshwater molluscs of Brazil. São Paulo, SP: FAPESP, 390 p.

Development of a mollusc fauna in a storage reservoir for run off rainwater on the isle of Terschelling, the Netherlands, 3

Henk K. Mienis
National Mollusc Collection, Dept. Evolution, Systematics & Ecology, Hebrew Univ. of Jerusalem, IL-91904 Jerusalem, Israel;
Mollusc Collection, National Collections of Natural History, Dept. Zoology, Tel Aviv University, IL-69978 Tel Aviv, Israel
mienis@netzer.org.il

In the autumn of 2006 I continued my survey of the storage reservoir for run off rainwater near Midsland, Terschelling the Netherlands. I visited the place on the 2nd of October 2006. The water stood rather high and covered part of the normally dry banks, probably a result of the heavy rains which characterized nearly the whole month of August.

Because of the high water level, I could not sample some of the spots I had surveyed during previous years. I do not know whether this was the reason why I failed to find three species which I had observed in the past: *Radix* species, *Anisus vorticulus*, and *Musculium lacustre*. Instead, I managed to collect three additional species for the first time: *Valvata cristata*, *Gyraulus crista*, and *Hippeutis complanatus*. All three are rather small gastropods. Since I am using the same kitchen strainer connected to a broomstick year after year, it is not a question of oversight in the past that I could now add these three gastropods to the list.

The following 14 species are now known from the storage reservoir:

Scientific name	09.10.2002	01.10.2003	05.10.2004	03.10.2005	02.10.2006
Bithynia leachii *(Sheppard, 1823)*	-	+	+	+	+
Bithynia tentaculata *(Linnaeus, 1758)*	-	-	-	+	+
Valvata cristata *Mueller 1774*	-	-	-	-	+
Lymnaea stagnalis *(Linnaeus, 1758)*	+	+	+	+	+
Radix balthica *(Linnaeus, 1758)**	-	+	+	+	+
Radix *species*	-	+	+	+	-
Anisus vortex *(Linnaeus, 1758)*	+	+	+	+	+
Anisus vorticulus *(Troschel, 1834)*	-	-	-	+	-
Gyraulus albus *(Mueller, 1774)*	-	+	+	+	+
Gyraulus crista *(Linnaeus, 1758)*	-	-	-	-	+
Hippeutis complanatus *(Linnaeus, 1758)*	-	-	-	-	+
Planorbarius corneus *(Linnaeus, 1758)*	-	-	+	+	+
Planorbis planorbis *(Linnaeus, 1758)*	-	+	+	+	+
Musculium lacustre *(Mueller, 1774)*	-	-	-	+	-

* This species was known as *Radix ovata* (Draparnaud, 1805).

Remarks concerning some of the species

Adult specimens of *Lymnaea stagnalis* at this site reach a height of at least 5 cm, some more than 7 cm.

Radix species appears in my two previous reports (Mienis, 2005a-b) as *Radix labiata* (Rossmaessler, 1835), the correct name for *Radix peregra* of authors not Mueller 1774. However, Bargues et al, 2001 have shown that true *R. labiata* is confined in its distribution to Central-Europe and the Alps. According to their study the West-European *peregra/labiata* should be considered an ecological form of *Radix balthica*. According to Honer (1960) *Radix balthica* (as *R. ovata*) and *Radix* species (as *R. peregra*) are infected by different parasites, which may be an indication that we are dealing here with two different species. As long as this problem is not sufficiently solved, I prefer to use the name *Radix* species.

Two specimens of *Planorbis planorbis* were collected with the keel in the middle of the last whorl, giving them the appearance of *Planorbis carinatus* Mueller, 1774. However, all the previous whorls had the keel at the upper edge of the shell when held with the aperture to the left, therefore these two shells were also classified as *Planorbis planorbis*. Similar shells are occasionally found in populations showing normally formed shells elsewhere in the Netherlands. The cause of this interesting variation is unknown.

What can we expect in the future?

Most of the aquatic gastropods inhabiting the ditches and canals in the nearby polders have now been found in the storage reservoir. Noteworthy absentees are the invasive species *Potamopyrgus antipodarum* (Gray, 1843) and the autochthonous, minute Planorbid *Segmentina nitida* (Mueller, 1774). In addition, we may expect to find one or more species of Pea mussels belonging to the genus *Pisidium* in the reservoir in the future.

The presence of at least two other exotic species, *Haitia acuta* and *Ferrissia clessiniana*, in aquaria, garden ponds, and in the Doodemanskisten, the small lake near West-Terschelling (Mienis, 2004), may form a source for additional colonization of the reservoir.

Noteworthy is the fact that so far we failed to find in the reservoir any amphibious species like *Galba truncatula* (Mueller, 1774), *Oxyloma elegans* (Risso, 1826), and *Succinea putris* (Linnaeus, 1758), which are all rather common species elsewhere on the island. This is reason enough to have another look at the reservoir near Midsland in the coming years.

References

Bargues, M.D., Vigo, M, Horak, P., Dvorak, J, Patzner, R.A., Pointier, J.P., Jackiewicz, M., Meier-Brook, C. & Mas-Coma, S. 2001. European Lymnaeidae (Mollusca: Gastropoda), intermediate hosts of trematodiases, based on nuclear ribosomal DNA ITS-2 sequence. Infection, Genetics and Evolution 1: 85-107.

Honer, M.R. 1960. Parasitological affinities in the *Radix* group. Correspondentieblad van de Nederlandse Malacologische Vereniging 91: 926-928.

Mienis, H.K. 2004. An odd find of *Ferrissia clessiniana* on the Isle of Terschelling, the Netherlands. Ellipsaria 6(3): 12.

Mienis, H.K. 2005a. Development of a mollusk fauna in a storage reservoir for run off rainwater on the Isle of Terschelling, the Netherlands. Ellipsaria 7(1): 11-12.

Mienis, H.K. 2005b. Development of a mollusk fauna in a storage reservoir for run off rainwater on the Isle of Terschelling, the Netherlands, 2. Ellipsaria 7(3): 15-16.

Dates to Remember

Early symposium registration ends February 1, 2007

***Vote and return your ballot for Treasurer by February 2nd* (see insert)**

Send your nominations for President-Elect and/or Secretary to Leroy by February 2 nd

Book your room at the Peabody Little Rock by February 9th
Call 501-906-4000 and use the meeting code FMCS2007

Return your membership renewal form with dues to Heidi (see insert)
~Membership dues are collected annually at the beginning of each year~

Updates and additions to membership list:

(Please send change of address information to the Secretary, Patty Morrison)

Tamara Anderson
University of Colorado Museum
285 Smith Street
Lander, WY 82520
(307) 335-8662
tamara.anderson@ucolorado.edu

James Atkinson
Dept. Zoology
Michigan State University
East Lansing, MI 48824-1115
(517) 353-2269
atkinso9@msu.edu

Lee Barclay
USFWS
446 Neal St.
Cookeville, TN 38501
(931) 528-6481
lee_barclay@fws.gov

Arthur Bogan
NC Museum Natural Sciences
4301 Reedy Creek Road
Research Laboratory
Raleigh, NC 27607
(919) 733-745
arthur.bogan@ncmail.net

Robert Butler
USFWS
160 Zillicoa Street
Asheville, NC 28801
(828) 258-3939
bob_butler@fws.gov

Betty Crump
USDA Forest Service
PO Box 1270
Hot Springs, AR 71902
(501) 321-5236
bcrump@fs.fed.us

Joseph A. Daraio
University of Iowa
IIHR Hydroscience and Engineering
100 C. Maxwell Stanley Hydraulics Lab.
Iowa City, IA 52242- 1585
319-541-4103
joseph-daraio@uiowa.edu

Tom Dickinson
The Catena Group
410-B Millstone Drive
Hillsborough, NC 27278
(919) 732-1300
tdickinson@thecatenagroup.com

Barbara Douglas
USFWS
694 Beverly Pike
Elkins, WV 26241
(304) 636-6586
barbara_douglas@fws.gov

Stan Dvorak
FMNH
3512 Woodside Ave.
Brookfield, IL 60513
(708) 387-0687

Eric Hallerman
Virginia Tech
Dept Fisheries & Wildlife Sciences
Blacksburg, VA 24061
(540) 231-3257
ehallerm@vt.edu

David Heath
WI DNR
3550 Mormon Coulee Road
La Crosse, WI 54601
(608) 785-9993
david.heath@dnr.state.wi.us

Tharran Hobson
The Nature Conservancy
11304 N Prarie Rd
Lewistown, IL 61542
Thobson@tnc.org
309-547-2730

Dave Hopper
U.S. Fish & Wildlife Service
1387 S Vinnell Way, Rm 368
Boise, ID 83706
208-685-6957

Roberta E. Hylton
U.S. Fish and Wildlife Service
330 Cummings St.
Abingdon, VA 24210
276-623-1233
roberta_hylton@fws.gov

Leroy Koch *New Address*
U.S. Fish and Wildlife Service
J.C. Watts Federal Building - Room 266
330 West Broadway
Frankfort, Kentucky 40601
502.695.0468 ext. 106
leroy_koch@fws.gov

Kevin Markham
Environmental Services, Inc.
524 South New Hope Road
Raleigh, NC 27610
(919) 212-1760
kmarkham@esinc.cc

Jason Mays
NC State University
1324 Takeaway Place
Morrisville, NC 27560
919-270-9213
jasonmays@mac.com

Richard Neves
USGS
Dept Fish & Wildlife
Virginia Tech
Blacksburg, VA 24061-0321
(540) 231-5927
mussel@vt.edu

Tamara Pandolfo
NC State University
Dept. of Environmental & Molecular
Toxicology, Box 7633
Raleigh, NC 27695-7633
919-515-5296
tjpandol@ncsu.edu

Bill Pearson
USFW
1208 B Main Street
Daphne, AL 36526
(251) 441-5181
bill_pearson@fws.gov

Cianna Pender
Rhodes College
2000 North Parkway
Memphis, TN 38112
901-830-1945
penci@rhodes.edu

Malcolm Pierson
Pierson Environmental Consulting
204 Stetson Lane
Alabaster, AL 35007-4708
250-790-7557
sgpjmp@bellsouth.net

Eric Rahm
Tennessee Tech University
1772 Gainesboro Grade
Cookeville, TN 38501
573-694-6966
ejrahm21@TNTech.edu

Kathleen Reagan
Univ of Oklahoma
111 E. Chesapeake Street
Norman, OK 73019
(405) 325-2753
kathleen.l.reagan@ou.edu

Marsha May Reimer
Texas Parks & Wildlife Dept.
9602 Cheryl Lynn Drive
Austin, TX 78747
(512) 965-6714
marsha.reimer@tpwd.state.tx.us

Kevin Roe
Iowa State University
Natural Resource Ecology and Management
339 Science II
Ames, IA 50011-3221
(515) 294-8332
kjroe@iastate.edu

Robert Schanzle
IL DNR
One Natural Resources Way
Springfield, IL 62702-1271
(217) 785-4863
bschanzle@dnrmail.state.il.us

Kathryn Schneider
Stuyvesant Envir. Consulting
16 Frisbee Lane
Stuyvesant, NY 12173
(518) 799-3457
fallline@berk.com

William L. Sheffall
Rhodes College
2000 North Parkway, Rhodes Box 2353
Memphis, TN 38112
229-224-8769
shewl@rhodes.edu

David R. Smith
USGS
11649 Leetown Rd
Kearneysville, WV 25430
(304) 724-4467
drsmith@usgs.gov

Matthew Smith
Environmental Services, Inc.
524 South New Hope Road
Raleigh, NC 27610
(919) 212-1760
msmith@esinc.com

Geoffrey Smith
Marshall University
411 Cabell Court
Huntington, WV 25703
570-660-4884
smith1090@marshall.edu

James Spence
U. S. Army Corps of Engineers
135 Oney Ave
Huntington, WV 25705
(304) 523-2060
james.b.spence@lrh01.usace.army.mil

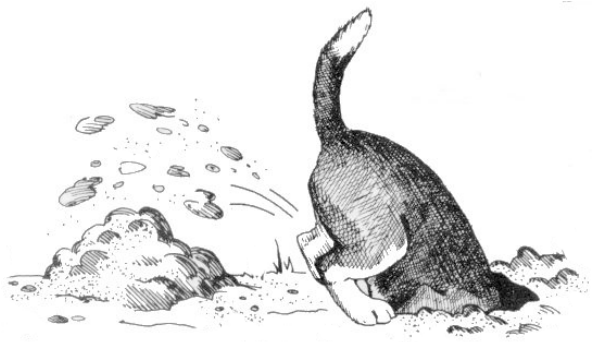
Timothy Stewart
Iowa State Univ
339 Science II
Ames, IA 50011
(515) 294-1644
twstewar@iastate.edu

Ralph Taylor
Marshall Univ
2 Francis Circle
Huntington, WV 25504
(304) 696-2338
ralph.taylor@marshall.edu

Barry Wicklow
Saint Anselm College
100 Saint Anselm Drive
Manchester, NH 03102-1310
(603) 641-7160
bwicklow@anselm.edu

Greg Zimmerman *New Address*
EnviroScience, Inc.
6751 A-1 Taylor Road
Blacklick, OH 43004
(614) 866-8540
gzimmerman@enviroscienceinc.com

Helpful Hints from Hoppy:



Hoppy Says — The definition for a stream that's biologically destroyed...El Foldo!

Submitted by Steve Ahlstedt

Freshwater Mollusk Conservation Society
Standing Committees and Chairs

If you are interested in joining a committee, please contact one of the appropriate chairs.

Awards
W. Gregory Cope
North Carolina State
Dept. Environ. & Molecular Toxicology
Box 7633
Raleigh, NC 27695-7633
919-515-5296; greg_cope@ncsu.edu

Catherine Gatenby
White Sulphur Springs National Fish Hatchery
400 E. Main Street
White Sulphur Springs, WV 24986
303-536-1361; Catherine_Gatenby@fws.gov

Environmental Quality and Affairs
Richard Biggins
55 Pyfrom Drive
Swannanoa, NC 28778
828-299-9128; rgbiggins@aol.com

Ryan Evans
Western Pennsylvania Conservancy
209 Fourth Avenue
Pittsburgh, PA 15222
412-288-2777; REvans@paconserve.org

Gastropod Status and Distribution
Paul D. Johnson
Alabama Aquatic Biodiversity Center
Route 3, Box 86
Marion, AL 36756
334-683-5000; paul.johnson@dcnr.alabama.gov

Guidelines and Techniques
John Van Hassel
American Electric Power
1 Riverside Plaza
Columbus, OH 43216
614-223-1249; jhvanhassel@aep.com

Information Exchange
Kevin Cummings
Illinois Natural History Survey
1816 S Oak Street [new street address]
Champaign, IL 61820
217-333-1623; ksc@inhs.uiuc.edu

Mussel Status and Distribution
Arthur E. Bogan
North Carolina State Museum of Natural Sciences
Research Laboratory
4301 Reedy Creek Road
Raleigh, NC 27607
919-733-7450 ext 753; arthur.bogan@ncmail.net

James D. Williams
U.S. Geological Survey
7920 NW 71st Street
Gainesville, FL 32653
352-264-3475; JDWilliams@usgs.gov

Outreach
Matthew Patterson
USFWS White Sulphur Springs National Fish Hatchery
400 E. Main Street
White Sulphur Springs, WV 24986
304-536-1361; matthew_patterson@fws.gov

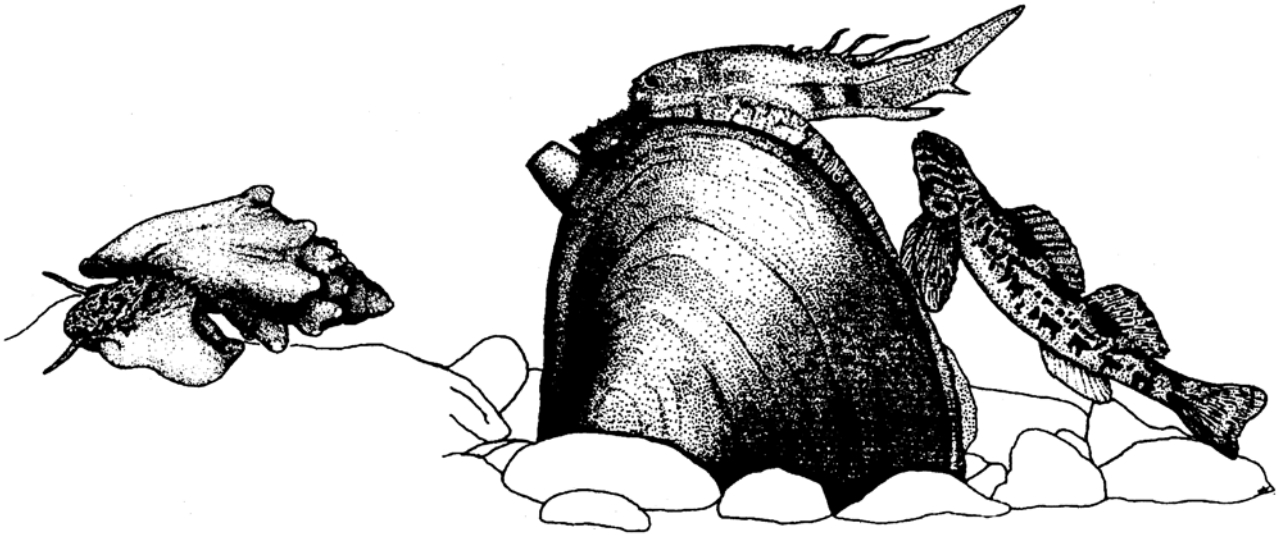
Propagation, Restoration, and Introduction
Jess Jones
Virginia Tech
606 Broce Drive
Blacksburg, VA 24060
540-231-5927; vtaquaculture@hotmail.com

Genetics Subcommittee
David J. Berg
Miami University
546 Mosler
Oxford, OH 45069
513-785-3246; bergdj@MUOhio.edu

Symposium Committee – Arkansas 2007
Alan D. Christian
Arkansas State University
Department of Biological Sciences
P.O. Box 599
State University, AR 72467
achristian@astate.edu

Join the UNIO Listserver
http://my.fit.edu/~rtankers/unio.htm

Freshwater Mollusk Conservation Society



…dedicated to the advocacy and conservation science of freshwater molluscan resources