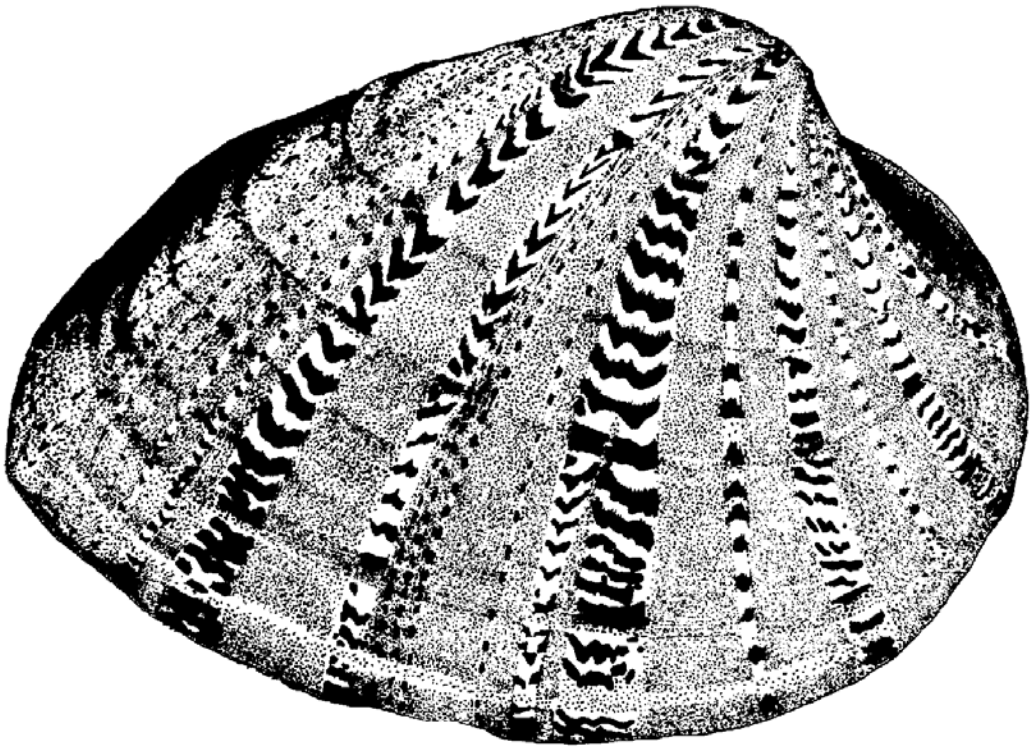
Ellipsaria

The Newsletter of the Freshwater Mollusk Conservation Society

Volume 4 – Number 3 **December 2002**



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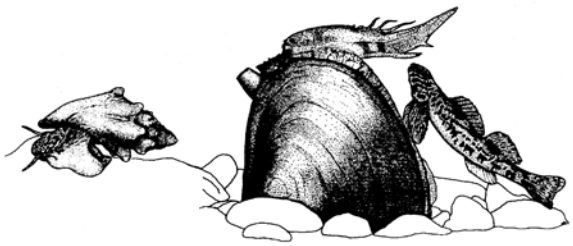

http://ellipse.inhs.uiuc.edu/FMCS/

FMCS 2003 SYMPOSIUM
MARCH 16 – 19, 2003
SHERATON IMPERIAL HOTEL
DURHAM, NORTH CAROLINA

"Connections . . . A Focus on Habitat Conservation"

Please visit http://ellipse.inhs.uiuc.edu/FMCS/Symposium/ or the last issue of *Ellipsaria* for information about abstracts, registration, accommodations, travel, and instructions for presenters.

Please don't forget these deadlines:

- **NOVEMBER 30, 2002** – Abstract due date.
- **DECEMBER 15, 2002** – Last date for early registration.
- **FEBRUARY 28, 2003** – Rooms must be booked at the Sheraton Imperial.

PLEASE do your part and help make this a successful symposium!
Submit abstracts. Register early. Book your room with the Sheraton.

We look forward to seeing you in March!!

REALLY COOL RAFFLE PLANNED FOR SYMPOSIUM!

Hoppy says "Everyone's a Winner"

That's right! We're gonna do it again in Raleigh by bringing you an enjoyable night of painless fundraising to support student travel at the FMCS Auction/Raffle on Tuesday evening. Last meeting we raised over $2600 on a nice variety of items, including at least one $100 baby doll head. Ticket packages of $5-$10-$20 will be available from the society ticket "agents"- look for the apron-clad bodies at scheduled breaks.

ALL SOCIETY MEMBERS are asked to contribute one or more items to the cause. Last year we enjoyed many quality premiums from generous members – we need the same support this year. Think about what type of things you enjoy ....ART, BOOKS, HOBBY EQUIPMENT, DIVE GEAR, MUSIC…. then swallow your pride and ask a local merchant to donate it! Bring it with you and help FMCS bolster its ranks with new blood. Please contact Kurt Welke (kurt.welke@dnr.state.wi.us) to coordinate the donations.

Thanks!

FMCS Reports

FMCS Board Meeting Minutes
November 7-8, 2002
Crittenden, Kentucky

Treasurer's Report:
The Society is in good shape financially, with total assets of $71,888 for 2002; we collected $8,060 in dues, which was higher than last year. Funds are still being collected from sponsors of the 2001 Pittsburgh symposium. The Society's biggest expense is the newsletter. Our workshops continue to be profitable; income from the 2002 propagation workshop was $7,600, and we received $1,000 in donations. Cost of the workshop was $3,873, resulting in $4,726 profit.

Mussel Valuation Project:
The objective of this project is to develop a replacement cost for all freshwater mussel species. The advisory committee is working with Rob Southwick of Southwick Associates to develop a draft document. Two evening sessions were held to obtain expert opinion on the level of difficulty in propagating the various species. Rob hopes to have a clean draft for the March 2003 symposium. The final document will be combined with the AFS fish valuation document as a revision of the AFS Special Publication No. 24.

Committee Reports:
Guidelines and Techniques:
This committee has focused on the mussel valuation project and drafting a manual on techniques for investigating mussel kill events. For example, there will be a section on how to estimate the count of mussels in a kill. A draft of the manual was sent out to a small group of reviewers, and the manual is to be revised by the entire committee. The goal is to have the manuscript out by next May. The FMCS will contribute to the cost of publication, and provide a copy for each member.

Gastropod Status and Distribution:
There were 43 contributed papers in a special gastropod session at the AMS symposium in Charleston, South Carolina this past summer. Rob Dillon intends to publish the papers in the American Malacological Bulletin. A proposed workshop in 2004 would introduce participants to taxonomy and identification of gastropods, survey methods, artificial propagation, and recovery, with the major focus on developing a national strategy for conservation of freshwater gastropods. The committee is also considering establishment of a national reference collection; there are 630 described taxa of freshwater gastropods, and it is believed 44 taxa are extinct. This effort will be done within an existing collection at a museum, likely the Smithsonian, which houses an excellent freshwater gastropod collection.

Information Exchange:
In anticipation of taking on the journal *Walkerana*, a major undertaking for the Society, the committee will work on formalizing an editorial board. For guidance, the committee will evaluate the editorial makeup of other journals. *Walkerana* can fill a gap for work that currently has no outlet, and the key to success of the journal will be the quality of the peer review. The committee will also draft an editorial policy. Kevin Cummings will post to the listserve and the membership to see what response is generated for an editor and managing editor. The FMCS website is up and being used. Future changes include setting up a link to the federally listed species in each state. The committee will work this winter on developing a map similar to the map on the ORVE website: http://orve.fws.gov/orvecty.html (using state distributions instead of counties).

Mussel Distribution and Status:
The freshwater mussel atlas for North America is the major focus. The committee is discussing ways to pay for the legwork to survey the existing museum collections before including the information in the atlas. Kevin Roe stressed the need to establish a list that members can check to see who is working on specific species accounts. Kevin is also working on accounts for 16 species and has completed 8 accounts. To start an account, there is a format and a digital map available to plot points, with the example on the FMCS web page. There is information in several state atlases that may be used, realizing there will be gaps. By the March 2003 symposium, Kevin will solicit members of the committee to determine who is working on which species, develop a list of individuals and the species accounts they are developing along with the deadlines for draft species accounts in progress, to be posted on the web site. The committee will also update the state contact list for mussels and identify individuals to provide reviews for their states.

Outreach:
The top priority for this committee is to develop a society display to show who we are, the status of the fauna, the national conservation strategy, etc. The display must look professional to encourage people to stop by and take a look. Several committee members have submitted ideas and rough sketches. The committee will develop a draft display with associated costs to present to the Board at the next meeting. Kurt and his committee will aim to have the FMCS display at the AFS 2004 meeting in Madison, Wisconsin. Kurt reminded everyone that the outreach committee is here to serve the needs of other committees.

Water Quality, Habitat, Zebra Mussels:
The document for the Fish and Wildlife Service on preventing the spread of zebra mussels has been completed; copies will be available for attendees at the 2003 symposium. The document summarizes techniques for preventing spread and introduction of zebra mussels through native mussel conservation programs. Authors of the document are Greg Cope, Theresa Newton, and Catherine Gatenby.

Propagation and Restoration:
The committee held a successful and profitable workshop at the FWS National Conservation and Training Center earlier

this year. The workshop was both well attended and well received, and Chris Barnhart may try to get out a written document from the workshop.

Symposium in 2003:
Dates for the symposium are March 16-19, 2003 in Raleigh, North Carolina. A request for sponsors has been sent and commitments from several agencies and groups have been received. Information on potential sponsors should be sent to John Alderman. The notice for registration has been posted to the Unio listserve and on the FMCS website. The focus of the symposium is habitat conservation. Those individuals involved with permit review are encouraged to attend the symposium. A gift from North Carolina will go to 1 submittal within the first 30 abstracts submitted.

Symposium Activities:
Sunday March 16th - Registration and poster set up will run from 1-5 pm, with the poster session from 7-9 pm. The board will meet from 9-5. Monday will be registration and the plenary session, with lunch and contributed papers in the afternoon. The social will be held at the North Carolina Museum from 7-11 pm. Buses will be available to take participants to and from the museum. Tuesday will be contributed sessions; the FMCS business meeting will be held in the evening along with the award presentations, auction, and a mixer. Wednesday will be poster breakdown, a morning technical program, parting remarks and lunch.

The theme for the plenary session is conserving habitat for native mollusks. Most of the plenary speakers are committed. One of the speakers is the director of the census bureau for the Southeast and will give an overview of population growth and projected future growth. Neil Weinstein from Maryland will make a presentation on low impact development, how to manage impacts, and techniques used to concentrate growth to specific areas. Gerry Nichols will give a talk on food resources and food consumed by native freshwater mussels.

Early registration is due by December 15.

Nominations Committee:
Leroy Koch and Sue Bruenderman are soliciting nominations for officers. A draft by-laws amendment to change the president's term to a 2-year term (4 years of service) will be proposed to the membership in *Ellipsaria*, and a vote will occur at the next business meeting in March 2003.

Award Committee:
Awards for best student paper and student travel will be presented at the upcoming symposium. Funding for the travel award is generated from the symposium auction. Thanks to both Greg Cope and Catherine Gatenby for developing the award guidelines and criteria.

Student Recruitment:
Dick Neves drafted a letter to every FMCS member who is a faculty member at a university to encourage student membership. We currently have 27 student members out of a total of 279 members, an improvement from previous years but still a low percentage of the membership.

Environmental Concerns Committee:
John Schmerfeld gave an update on the restoration plan for the Powell River spill in Virginia that will soon appear in the Federal Register. There are three components to the plan: 1) habitat restoration, 2) outreach, and 3) propagation of rare host fish and mussels. When it hits the register, John will contact Chris Barnhart to have it posted on his web page. There will be a 30-day comment period.

FMCS has prepared letters on several issues, including the Allegheny River sand and gravel dredging, black carp, and now the Big Sunflower River dredging issue has returned. There is a need for a committee to respond to these types of issues since many of these projects affect mollusks and often require a quick response. The Board agreed, but it was noted that there is overlap with responsibilities of the water quality/habitat committee. Dick Neves will contact Dick Biggins to see if he would serve as the point person on advocacy issues and work with members of the water quality committee in addressing upcoming issues. We will see how this works over the next 6 months and re-evaluate. Dick Neves has contacted several societies to see how they handle environmental concern issues and only NABS has an established mission statement. They sent a write-up on their committee, and we can use this as a foundation to establish a new committee for FMCS if needed.

American Institute of Biological Sciences Advertisement:
FMCS joined AIBS a few years ago. One of the perks of membership is an opportunity to advertise in their magazine. An advertisement was submitted in September, and it has appeared in the November issue of BioScience. The advertisement says who we are and how to join the Society. BioScience has a wide distribution (over 30,000 members); hopefully we will see an increase in our membership.

2004 Workshop Topics:
Dick Neves sent out a message several weeks ago soliciting potential workshop topics,. He received few responses, including two on a gastropod workshop (hands-on taxonomy, life history, and ecology sessions), a workshop looking at best management practices for protecting and/or restoring habitat in streams and rivers, and a workshop looking at Section 7 consultations with an emphasis on mollusks. One suggestion was to have Dave Smith present an overview of sampling, to go along with the mussel kill assessment document as a special session at a workshop or the symposium. Since habitat is the focus of the 2003 symposium, the Board felt it would be beneficial to the membership to have a gastropod workshop in 2004. The Board suggested incorporating speakers to talk about BMPs and impacts on gastropods and Section 7. The gastropod committee will have a draft agenda of the workshop to present at the March 2003 business meeting in Raleigh.

Liaison with Other Societies:
Two societies, NSA (National Shellfisheries Association) and AMS (American Malacological Society), have expressed

interest in holding a joint meeting with FMCS in the future. The times of their meetings do not coincide with ours, but they have expressed a willingness to adjust their times. The Board will bring this up at the business meeting in March. Send any ideas to Dick Neves on which societies or groups FMCS should contact to make them aware of the existence of the FMCS. The Outreach Committee will contact such organizations about having an FMCS member give a presentation at their meetings.

Surveyors and Mussel Projects:
An issue facing the states is a list of qualified freshwater mussel surveyors that meet a set of criteria, similar to the criteria established by AFS for fishery biologists. The FMCS could develop the guidelines or criteria that states can use to judge the credentials of the permit applicants. The Guidelines and Techniques Committee was charged with contacting state agencies to see how they deal with the issue of qualifying applicants, and the committee can work from there to develop a set of criteria for review. The Outreach Committee will query the states for an updated contact list for state permit applications, and send the information to Kevin to post on the website.

Other Items:
Russell the Mussel - This grammar school book was completed this month, funded by the U.S. Fish and Wildlife Service. Dick Neves will send copies to the Board and have a number of copies obligated to the Outreach Committee.

NSA - The April 2003 National Shellfisheries Association meeting is in New Orleans. Dick Neves was approached by that society to put together a session on freshwater pearl culture. Dick has organized 7 speakers for the session.

Logo - Our current logo is too complex to reproduce and is not really a logo. A request for new ideas had previously appeared in *Ellipsaria*, but we received only 2 responses. The logo should be a graphic representation of freshwater mollusks. Put your creative hats on and submit your ideas to Paul Johnson (pdj@sari.org).

The next board meeting is scheduled for Sunday, March 16, 2003 in Raleigh, North Carolina from 9 a.m. to 5 p.m.
Submitted by Rita Villella, Secretary

FMCS 2003 Officer Nominations

The FMCS is seeking nominees for the positions of president-elect and secretary. The new president-elect will take office in March of 2003, become president in 2004, and then serve as past-president in 2005 for a total of three years of service. The secretary position will take office in March 2003 and serve for two years. **The deadline for nominations is January 10th, 2003.** Leroy Koch and Sue Bruenderman are the nominating committee, and will be selecting 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
3761 Georgetown Road
Frankfort, KY 40601
502.698.0468
leroy_koch@fws.gov

Future Workshops

We are looking for future workshop topics! Please send your ideas to Dick Neves at mussel@vt.edu

Proposed Change to the FMCS By-laws

Background: We initially set up the society such that the President was elected in year 1 as president-elect, served a 1-year term, then served as past-president for 1 year. After 3 years with this in place, the society officers and executive committee have determined that a 2-year term as president would better serve the society.

Action: We would like to change the term from 1 year to 2 years, such that the new President and Secretary start on the same day. The following amendment to the by-laws is needed for this action.

Current by-law:
Article VI-Officers; 6.1 Number and elections; D.
The President shall serve a one-year term in this office; however this term will be preceded by a one-year term as President-Elect, and followed by a one-year term as Past-President to assist with Society functions as needed. An Active Member shall be elected to this sequence of offices at the beginning of the President-Elect year, and, automatically advance to President and Past-President without the necessity of a vote at either change of office.

Proposed change:
The President shall serve a **two-year** term in office; however this term will be preceded by a one-year term as President-Elect, and followed by a one-year term as Past-President to assist with Society functions as needed. An Active Member shall be elected to this sequence of offices at the beginning of the President-Elect year, and, automatically advance to President and Past-President without the necessity of a vote at either change of office.

To make this change, the membership has to be notified, and the issue discussed at the next meeting. If approved a resolution will be drafted and placed in the by-laws. So please think about this and bring your thoughts and comments to North Carolina.
Submitted by Heidi Dunn

Planning for *Walkerana*

Before FMCS acquires the journal *Walkerana*, we need to select an editor, a managing editor, and an editorial board. We talked about this subject at the board meeting and I have had informal talks with some members familiar with editing, etc. Now I would like to solicit ideas from the entire membership. I have made inquiries about the procedures that need to be followed to have *Walkerana* cited in Current Contents and the Science Citation Index and I believe that we should pursue that in the future. Please contact me if you have ideas about the structure of the editorial board or experience working (editing, layout, etc.) on a journal:

Kevin Cummings
Illinois Natural History Survey
607 E Peabody Dr., NRB 172
Champaign, IL 61820
ksc@inhs.uiuc.edu

Committee Reports

Freshwater Gastropod Committee Report

The Charleston meeting yielded important progress on at least three fronts. First, a total of 43 excellent presentations were offered on freshwater snails during the first week of August. Abstracts are now available as a PDF download from the AMS website. See the index and link at: http://www.cofc.edu/~dillonr/17Oct02.html Many of these papers will be published in a late 2003 issue of the *American Malacological Bulletin* dedicated to freshwater gastropod biology. I have been asked to serve as guest editor.

Second, the Freshwater Gastropods of North America Project met on Monday evening, August 4. There seems to be a general consensus that our effort would benefit from decentralization. Minutes of that meeting are available at: http://www.cofc.edu/~dillonr/4Aug02.html

Third, the Charleston meeting fostered a series of discussions between our committee and NatureServe which we hope will culminate in funding. Proposals both for museum surveys and for new field work have been discussed. We understand that similar discussions have taken place between NatureServe and the Mussel Status & Distribution Committee. Our two committees should coordinate efforts.

The committee is willing to organize an FMCS workshop in the spring of 2004 focusing on the collection, identification, and conservation of freshwater snails. In addition to introducing participants to the taxonomy and identification of the major groups, we might also invite presentations from noted researchers on ecology, physiology, systematics, and perhaps artificial propagation and recovery of freshwater gastropods. It may be feasible to accumulate a national reference collection for this meeting. Such a gathering might constitute an excellent forum to solicit comments on a National Strategy for Freshwater Gastropod Conservation. We would apply for support from FWS flex funds.
Submitted by R.T. Dillon

Guidelines & Techniques Committee Report Commercial

The committee met with Robb Southwick from Southwick and Associates the evenings of November 6-7, 2002 in Dry Ridge, Kentucky to develop a legally-defensible list of replacement values for mussels which are to be included in the American Fisheries Society fish replacement costs tables. A draft review of this project should be completed by Robb in December and sent out to committee members for review. Dr. John Van Hassel also provided a draft of a field manual for the investigation of freshwater mollusk kills.
Submitted by Steve Ahlstedt

Water Quality, Habitat, and Zebra Mussel Committee Report

Efforts of this committee have focused on completing a report for the U.S. Fish and Wildlife Service that summarizes techniques for preventing the incidental introduction of zebra mussels during native mussel conservation activities. The report, entitled "Evaluation of techniques to prevent introduction of zebra mussels *(Dreissena polymorpha*) during native mussel (Unionoidea) conservation activities", was authored by Committee members Greg Cope (North Carolina State University), Teresa Newton (U.S. Geological Survey), and Catherine Gatenby (Academy of Natural Sciences). The final report, which was peer-reviewed by six FMCS members, was completed and delivered to the U.S. Fish and Wildlife Service in September 2002. A copy of this report will be distributed free to all FMCS members attending the 2003 Symposium in North Carolina.
Submitted by Greg Cope, Co-chair

FMCS Committee Changes

All FMCS committees will meet in Raleigh during the symposium. New chairpersons will be selected this year. The standing committees are listed on the inside back cover of the newsletter – plan to get involved!

Ellipsaria Submissions - April Issue

Submissions for the April 2003 issue of *Ellipsaria* can be sent in at any time but are due by **March 21, 2003**. Anyone may submit an article but you must be a member of FMCS to receive *Ellipsaria*. Categories for contributions include news (meetings, current issues affecting mollusks, and the like), new publications, job postings, contributed articles (including ongoing research projects), abstracts, society committee reports, etc. Electronic submissions are preferred; please send them to cmayer@inhs.uiuc.edu

News

Unionids at the Milwaukee Public Museum

Joan P. Jass, Assistant Curator
Zoology Section, Milwaukee Public Museum
800 W Wells, Milwaukee WI 53233
jass@mpm.edu, 414-278-2761

The basic computer inventory of accessioned mollusks at the Milwaukee Public Museum (MPM) was updated in Spring 2002. Members of the family Unionidae comprise 3017 lots and 7388 specimens of the inventoried total. By far the greatest number of these in terms of both lots and specimens are from North American localities east of the Mississippi River. Of the 30 U.S. states and Canadian provinces represented in the MPM unionid collection, the top five are Wisconsin, Tennessee, North Carolina, Alabama, and Michigan. 149 unionid species (as listed by Turgeon et al., 1998) are represented, including 12 whose status is given as Extinct. Much of the early (though in the majority of cases not specifically dated) material was acquired by MPM in 1888 from the estate of Charles M. Wheatley. In addition to the North American lots, the collection includes 30 foreign unionid species from the following countries: Brazil, Canada, China, Cuba, England, France, Germany, Guatemala, India, Iraq, Japan, Malaysia, Nicaragua, Norway, Panama, South Africa, Sumatra, and Syria. Inquires about the collection and/or requests for loans are welcomed.

World Congress of Malacology

PERTH, WESTERN AUSTRALIA
11-16 July 2004
For further information, please visit Unitas Malacologica at
http://www.inter.nl.net/users/Meijer.T/UM/um.html
...and the Malacological Society of Australasia
http://www.amonline.net.au/malsoc

Moratorium on Commercial Mussel Harvest in Kansas

The Kansas Wildlife and Parks Commission has approved a 10-year moratorium on commercial mussel harvesting, effective Jan. 1, 2003 through Dec. 31, 2012. The action was taken at a public hearing in Manhattan Oct. 24, 2002. Kansas Department of Wildlife and Parks staff had expressed concerns over declining mussel numbers in the state. Of the 40 species of mussels found in Kansas streams and reservoirs, 22 are included on the state list of endangered, threatened, and species-in-need-of-conservation.

Publications

Blalock-Herod, H.N., J.J. Herod, and J.D. Williams. 2002. Evaluation of conservation status, distribution, and reproductive characteristics of an endemic Gulf Coast freshwater mussel, *Lampsilis australis* (Bivalvia: Unionidae). Biodiversity and Conservation 11(10) 1877-1887.

Job Announcements

Environmental Specialist/Biologist

Huff & Huff, Inc., located in LaGrange, Illinois, has an opening for an environmental specialist/biologist. M.S. in Biology required (Environmental Studies or Natural Resources may be considered pursuant to qualifications). The position is open from entry level up to senior staff position. Desired course-work/experience includes some combination of the following: Illinois fish, mussel, plant, tree identification; macroinvertebrate identification, and water quality issues/evaluation. Field experience a plus.

Maureen T. Wunderlich
Huff & Huff, Inc.
512 West Burlington, Suite 100
LaGrange, IL 60525
Phone: 708/588-7957
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Contributed Articles

Freshwater Mussel Conservation in the Northeastern Gulf Ecoregion

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Freshwater Mussel Conservation in the Northeastern Gulf (NEG) Ecoregion is getting a kickoff from the U.S. Fish and Wildlife Service, Panama City Fisheries Resources and Ecological Services Office, in Panama City, Florida. In 2002, a strategy, based on the National Strategy and locally/regionally specific issues, was outlined to promote mussel conservation focusing on habitat restoration, monitoring, and life history and ecology.

The NEG strategy was implemented in two basins by initiating surveys for monitoring purposes. Ochlockonee

River basin, of Florida and Georgia, was sampled between July and August. Seventeen sites that historically (pre-2000) supported listed species were examined. Shinyrayed pocketbooks (Endangered), oval pigtoes (Endangered), and purple bankclimbers (Threatened) were located at a total of four sites. Unfortunately, no Ochlockonee moccasinshells were found; however, efforts will continue next summer. In Econfina Creek basin, five sites were sampled and two yielded Gulf moccasinshells (Endangered) and oval pigtoes. Once the surveys are complete, long-term population monitoring sites will be established. Assistance for the survey work was provided by USFWS at Warm Springs National Fish Hatchery, Warm Springs, GA, USFWS at Jackson Guard, Eglin Air Force Base, Niceville, FL, and Apalachee Ecological Conservancy, Inc., Panacea, FL.

In cooperation with USFWS Ecological Services in Athens and Ft. Benning, Georgia, and Columbus State University, Columbus, Georgia, a GIS database was established to track mussel sampling sites in NEG rivers. The database is to serve as a clearinghouse for all historical and current records of ANY sites sampled specifically for mussels (regardless of species collected) to 1) provide one system to combine records from various reports and published literature; 2) keep track of ongoing survey sites; 3) determine where data gaps exist for species in these rivers; and 4) aid in decision-making processes concerning habitat restoration, long-term monitoring site selection, and permitting/consultation issues. The database is housed and quality assurance/quality control (QA/QC) procedures are conducted at USFWS Panama City. The QA/QC has begun for historical and current records from the Ochlockonee River and Econfina Creek basins. Other records have been archived until they can be processed. Anyone wishing to submit NEG collection records can do so by email.

A database of people conducting research within NEG has also been established. The purpose of this database is to 1) maintain contact information for people currently conducting and interested in conducting research (of any kind regarding mussels) in NEG rivers; and 2) track current projects so research efforts are not duplicated. Anyone wishing to be in this database can email his or her name, address, phone number, current project title (funds and funding source are optional), cooperators/partners, and comments. The database is available to those who have submitted their information.

In cooperation with Florida Fish and Wildlife Conservation Commission and U.S. Geological Survey, a pamphlet is being developed to assist the general public in understanding State and Federal regulations regarding freshwater mussels in Florida. The pamphlet contains detailed original watercolor artwork, general state distribution maps, a general discussion on why freshwater mussels are important, and explanations regarding Florida's regulations concerning take and zebra mussels. Artwork will feature internal and external views of native and/or invasive species from all five families that occur in Florida's freshwaters. Additionally, all eight species given federal protection will be highlighted to help the public protect these species.

Mussel Surveys

Steve Ahlstedt
U. S. Geological Survey, Knoxville, TN 37921
ahlstedt@usgs.gov

Harpeth River, TN

The Harpeth River above and below Nashville was sampled the week of July 22, 2002 at 6 sites by Don Hubbs and David Simms (Tennessee Wildlife Resources Agency) and Jeff Powell (USGS). The river was evaluated for future mussel restoration efforts. Basically, the river is largely destroyed near Nashville by urbanization, pollution, and streambed destabilization. Mussels do occur in the Harpeth and previous sampling by Don Hubbs in the extreme lower river reported 13 species live and another 9 species as relict. No federally listed species were found during the present sampling. The Harpeth does not appear to be a candidate for mussel restoration efforts.

East Fork Stones River, TN

The East Fork Stones River was sampled the week of July 22, 2002 at two sites with Don Hubbs. The East Fork Stones has problems that are similar to the Harpeth River. The streambed is completely destabilized and scoured in places down to bedrock. Only 8 mussel species were found live including an additional 4 relict species. No federally listed species were found during the present sampling. The East Fork Stones does not appear to be a candidate for mussel restoration efforts.

Duck River, TN

The freshwater mollusk survey of the Duck River, including a few collecting sites on the Buffalo River, is completedand information is currently being tabulated. Three federally listed species were documented during the present survey: *Epioblasma capsaeformis*, *Lemiox rimosus*, and *Quadrula intermedia*. This is a three-year Nature Conservancy project that is being done jointly with Dr. Paul Johnson, Tennessee Aquatic Research Unit, Cohutta, Georgia.

Caney Fork, TN

Smith Fork, a large tributary stream to the Caney Fork, was sampled in September 2002. No historical information exists on what mussels occurred in the river. Only 5 mussel species were found live and included relict specimens of 2 species. Portions of the streambed in Smith Fork are destabilized. Relict shells were relatively abundant at the lowest site closest to the Caney Fork. Sampling sites in the upper part of the river look favorable for mussels but only a few individual relict specimens were found or none at all. Continued sampling of Smith Fork is needed to determine whether the river is a candidate for mussel restoration. No federally listed species were found during the present sampling.

Big South Fork Cumberland River, TN and KY

The freshwater mussel survey of the Big South Fork has been completed. Approximately 8,000 live mussels representing 26 species were documented from the river and tributary streams. Five federally listed mussel species were found

during the survey: *Alasmidonta atropurpurea, Epioblasma brevidens, E. walkeri, Pegias fabula,* and *Villosa trabalis*. One additional federally listed species, *Pleurobema clava*, was not confirmed. Many of the mussel species are reproducing and recruiting in the river based on size-class distributions. The Big South Fork contains the largest extant populations of *E. brevidens*, *E. walkeri*, and *P. fabula* in the Cumberland River system. Efforts are underway to expand the present fauna and restore extirpated mussel species back into the Big South Fork via culturing, propagation and adult translocations. The mussel survey was a three-year project funded by the National Park Service.

Exotic Freshwater Bivalves Found in the Nolichucky River, East Tennessee

Arthur E. Bogan[1], Steven A. Ahlstedt[2], and Paul W. Parmalee[3]
[1]North Carolina State Museum of Natural Sciences, Research Laboratory, 4301 Reedy Creek Road, Raleigh, NC 27607
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On 16 July 2002, S. Ahlstedt, J. Herrig, and E. Scott collected a series of freshwater bivalves from the backside of a small island in the Nolichucky River below Highway 107 bridge, Unicoi County, Tennessee. The unionids were found in a shallow area where people had piled up rocks to form a shallow, 20 foot-long pool. The animals were either dead or dying. These animals were immediately recognized as not part of the native unionoid fauna of the Nolichucky River, but their identification was not made in the field. Shells of all of these specimens were collected and deposited with the Mollusk Collection at McClung Museum, University of Tennessee, Knoxville. Part of the sample was forwarded to the North Carolina State Museum. The shells represented five species and a total of 42 specimens. *Elliptio complanata* group (NCSM 27274, 1 specimen): this specimen was thick shelled and quite inflated - maximum shell length 102 mm. *Lampsilis radiata* (MCCM 3689, 7 specimens; NCSM 27277, 3 specimens): these shells are thick, greatly inflated, and all possessed a salmon nacre - maximum shell length of females was 99 mm and males, 114 mm. *Ligumia nasuta* (MCCM 3687, 23 specimens; NCSM 27276, 4 specimens): these specimens are very inflated and large - maximum shell length 130 mm. *Pyganodon cataracta* (MCCM 3688, 2 specimens; NCSM 27275, 1 specimen): the shells of these specimens are quite thick - maximum shell length 113 mm. *Elliptio* sp. (MCCM 3690, 1 specimen): this is one of the lanceolate group of *Elliptio* - maximum shell length 104 mm.

These specimens represent species not native to the Tennessee River Basin, but taxa that are found in the Atlantic Slope drainages from the Savannah River north to about Maryland. The *Elliptio complanata* shell form appears to be similar to ones seen from southern Virginia to South Carolina. Both male and female shells of *Lampsilis radiata* are very inflated, possess a rough periostracum, and have a distinctive nacre color. The *Elliptio* sp. shell resembles specimens from North and South Carolina. We are suggesting that this sample of unionids was collected from one of the rivers in the Carolinas and transported back to the Nolichucky River in Tennessee. The reason the specimens were transported/transplanted into the Nolichucky River remains a mystery. However, this behavior may explain some disjunct and obvious introductions such as the occurrence of *Villosa iris*, an Interior Basin species, in the lower Juniata River and Conodoquinet Creek, both tributaries to the Susquehanna River in Pennsylvania.

It is not uncommon while doing field survey work to find valves of blue mussel shells (*Mytilus*), quahog shells (*Mercenaria mercenaria*) and even oyster shells (*Ostrea* sp.), in creeks and rivers where they were discarded after the meat was consumed during an outing. However, the discovery of live or recently deceased specimens of unionids moved from one major river drainage to another is much less common. Shelton and Gettleman (ND) reported a similar occurrence in the Conecuh River, Alabama where shells of several species were recovered, but were not native to the river system in which they were found. Historically, S.S. Haldeman (1842, 1846) reported moving specimens from the Ohio River to the Susquehanna River to see if they would survive. This is the most recent example in Tennessee of persons depositing live mussels in a habitat and region outside of their native range.

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Sinanodonta woodiana also in Serbia

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During the ongoing search for records of the invasive Chinese Pond mussel, *Sinanodonta woodiana* (Lea, 1834), Fam. Unionidae, in Europe, it is sometimes rather difficult to locate the published records. First records of this huge mussel appear all too often in journals with a rather local distribution or in unpublished reports prepared for (inter)national organizations. Some of the latter appear now-and-then on the internet.

Quite by chance I came across a report of to the latter category, which dealt with the impact of wartime related pollution on the aquatic fauna of the Iron Gate, a famous part of the Danube River in Serbia near the border of Romania.

This report had been prepared by members of the Balkan Task Force on behalf of the United Nations Environment Programme (UNEP), Division of Early Warning and Assessment (DEWA), based in Geneva.

Members of the Balkan Task Force in cooperation with scientists of local scientific institutes in Serbia carried out fieldwork in the Iron Gate Reservoir at river km 1077.6 (as measured from the exit of the Danube in the Black Sea) on 26th August 1999. They sampled a transect across the Danube from Stara Palanka (= Bacska Palanka) on the left bank to Ram on the right bank. At both sites, specimens of *Sinanodonta woodiana* were collected alive in shallow water. No specimens of the Chinese Pond mussel were collected in the deeper parts of the Iron Gate Reservoir in the Danube. The sampled area forms part of the Djerdap (= Iron Gate) National Park.

The presence of these mussels in the Serbian part of the Danube underlines the assumption that *Sinanodonta woodiana* can be expected in shallow waters and old branches along the whole length of its 2860 km long course throughout Europe: from its sources in the Black Forest Mountains, Germany in the west up to its estuary in the Black Sea, Romania in the east. It has been recorded from the Danube or its tributaries in Austria, the Czech Republic, Slovakia, Hungary, Romania, and Ukraine, but specific Danubian records from Germany, Croatia, and Bulgaria are still lacking. Moldavia is just outside the reach of the Danube. However, the River Prut, which forms the border between Moldavia and Romania, enters the Danube at the point where the latter becomes the border between Romania and Ukraine. Therefore, the Chinese Pond Mussel may be expected to also occur in Moldavia.

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Anodonta suborbiculata (Say, 1831) added to the freshwater bivalve fauna of Pennsylvania

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Morrison et al. (1993) reported six species, five alive, from the Ohio River just upstream of our study site: *Lampsilis siliquoidea, Lasmigona costata, Leptodea fragilis, Pyganodon grandis, Quadrula quadrula,* and *Utterbackia imbecillis*. This was the first report of living *Leptodea* and *Quadrula* from the Ohio River in Pennsylvania for over 50 years.

We collected a series of juvenile and small specimens from fine sediment in the Ohio River at the head end of Georgetown Island (ORM 37.4), Beaver County, Pennsylvania. Previously, very small individuals of seven species of unionids had been collected in approximately the same area. The species observed were *Lasmigona complanata*, *Leptodea fragilis, Obliquaria reflexa, Potamilus alatus, Pyganodon grandis, Quadrula quadrula,* and *Utterbackia imbecillis*. We spent about four hours and found small and juvenile specimens of five species of unionids and two species of *Pleurocera*. This is the first recent report of *Pleurocera canaliculatum* and *Pleurocera acuta* from the Ohio River in Pennsylvania. They were living on the surface of the mud substrate. We collected a single specimen of *Anodonta suborbiculata* (NCSM 27251); the shell length was 81 mm. This is the first reported record of the Flat Floater from the waters of the State of Pennsylvania. Ortmann did not report this species from Pennsylvania. It is apparently expanding its range into the upper Ohio in Pennsylvania. Only three specimens of *Obliquaria reflexa* were collected; the smallest was about 18 mm in length. Specimens of *Quadrula quadrula* were quite common and ranged from about 19 mm up to full-sized adults. The most abundant species was *Utterbackia imbecillis*, ranging in size from 15 to 41 mm, with the most abundant size class being 15-21 mm in shell length. A single fresh-dead shell of *Pyganodon grandis* was collected. *Potamilus alatus* varied in size from 38 mm to adult specimens. During the second trip we did not collect any specimens of *Leptodea fragilis*. Juvenile specimens were not living down in the anaerobic mud but were in the very fine silt layer that was covered by a thin layer of algae. Adult specimens of *Potamilus*, *Quadrula*, and *Anodonta* were found with very little of the shell exposed. The most common juvenile specimens were of *Utterbackia*, which were in the fine silt and floated off when an attempt was made to collect them. There were no attempts to quantify the abundance and only generalized comments were collected on the location of the animals. The specimens were collected in 3 to 20 feet of water, at the head end of the back channel at Georgetown Island. The animals were found in the silt, not in the long row of gravel found near the edge of the main channel.

The collection of juveniles documents the active reproduction of these species in the Ohio River in Pennsylvania. This represents the first occurrence of *Anodonta suborbiculata* in the Ohio River in Pennsylvania and the first occurrence of *Obliquaria reflexa* in Pennsylvania in about 100 years. With the addition of these recent invasions, the modern unionid fauna which has reinvaded the upper Ohio River in Pennsylvania in the last 10 years now stands at 11 species.

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Wisconsin Unionid Zoogeography

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The major drainage system in which a freshwater species occurs is one of the most significant zoogeographic influences on that species. However, some widespread species have ranges spanning more than one system. In Wisconsin for example, a number of unionids are present in both the Great Lakes-St. Lawrence and Mississippi River drainages. Two such unionids are *Pyganodon grandis* and *Strophitus undulatus*. The finer scale analysis of molluscan variability within such widespread species in the state has interested zoologists since Baker (1928), who emphasized stream size as a factor governing unionid intraspecific variation.

Jass and Glenn (1999) analyzed morphometric variation present in *Pyganodon grandis*, finding significant differences among shells from rivers in three Wisconsin ecoregions: northeastern, southwestern, and an intermediate tension zone. Curtis (1971) divided the state into these regions by mapping the ranges for 182 species reaching their northern or southern limits in Wisconsin, defining the middle region covered by the 182 range limit lines as a tension zone where geology, climate, and environmental factors combined to exert a defining selective pressure on both plants and animals.

Our initial finding of a correlation between these ecoregions and morphometric variation in *Pyganodon grandis* spurred interest in further testing with other unionids. With the Milwaukee Public Museum Mathiak Collection (Mathiak 1979) the specimen source, *Strophitus undulatus* collected from rivers across the state from 1973-1977 were analyzed based on the following shell traits: width, height, length, and anterior-to-beak length of the right valve (measured to the nearest tenth of a millimeter with a dial caliper); N=66. Table 1 gives means, standard deviations, and ranges for these measurements for *S. undulatus* from the three Curtis (1971) ecoregions: northeastern (28 sites), tension zone (5 sites), southwestern (4 sites). Although ranges of the measurements overlapped, means were largest in southwestern shells, intermediate in tension zone shells, and smallest in northeastern shells. All scores, calculated from Kruskal-Wallis testing of these differences, exceeded the chi-square approximation values, at levels well below the 0.05 chosen for statistical significance (Table 2). SAS Software (Version 6.12) was used for statistical calculations.

Woodward (1875) presented an early worldwide system of provinces defining mollusk distributions that also included zoogeographic regions for freshwater and land mollusks. Based originally on botanical data, these were correlated to various factors such as climate (location of critical isothermic barriers) and past geological history. The advantage of the Curtis (1971) ecoregions for use in analysis of zoogeographic variation in Wisconsin mollusks is that they similarly incorporate into a single system the complexity of factors which have influenced the distributions of the "test" species (the 182 mentioned above) and use that data to predict a pattern for others. The preliminary results reported here support the possibility of this being a useful tool for analysis of Wisconsin unionid variation, both interspecifically and intraspecifically in species distributed across the state.

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Table 1. Means, standard deviations, and ranges for measurements of *Strophitus undulatus* from 3 Wisconsin ecoregions.

	Northeast	Tension Zone	Southwest
Width (mm)	19.7+3.89	25.9+7.39	30.2+8.18
Width range	13.1-30.0	15.9-36.0	18.6-40.9
Height (mm)	29.0+4.44	35.9+6.23	39.3+6.77
Height range	22.5-41.7	25.8-44.0	28.8-47.2
Length (mm)	52.6+8.74	71.1+16.25	75.4+13.02
Length range	39.1-78.2	48.5-90.9	54.1-88.3
Anterior (mm)	14.7+2.97	19.0+5.35	20.1+4.78
Anterior range	9.1-22.1	12.0-25.1	13.5-25.7

Table 2. Kruskal-Wallis Test (Chi-Square Approximation) results comparing differences between *Strophitus undulatus* from three Wisconsin ecoregions.

Trait	Region	Mean Score	Chi-Square	P value
Width	Southwest	54.167	13.253	0.0013
	Tension	45.389		
	Northeast	28.971		
Height	Southwest	55.583	17.246	0.0001
	Tension	48.500		
	Northeast	28.555		
Length	Southwest	55.333	19.924	0.0001
	Tension	51.222		
	Northeast	27.804		
Anterior	Southwest	50.250	11.652	0.0030
	Tension	46.333		
	Northeast	29.265		

Channel Catfish is a Suitable Host Species for Mapleleaf Glochidia

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Juvenile propagation is a conservation tool that may be used to enhance or reestablish federally endangered winged mapleleaf (*Quadrula fragosa*) populations. Intensive culture of juvenile mussels demands knowledge of their food and habitat requirements. Obtaining winged mapleleaf glochidia is presently difficult so we studied a closely related species, mapleleaf (*Quadrula quadrula*).

To conduct propagation studies we had to identify a fish species that would facilitate metamorphosis of mapleleaf glochidia. Howard and Anson (1922) showed that flathead catfish (*Pylodictus olivaris*) are infested with mapleleaf glochidia under natural conditions. The purpose of this study was to determine if channel catfish (*Ictalurus punctatus*) would facilitate metamorphosis of mapleleaf glochidia.

Mapleleaf conglutinates

Channel catfish were identified as suitable hosts for mapleleaf glochidia using standard testing procedures (Neves *et al*. 1985). We collected glochidia during early May 2002 from a single mapleleaf living in the upper Mississippi River at Minneapolis (Hidden Falls), Minnesota. Channel catfish were reared and donated by the Minnesota Department of Natural Resources (MN DNR). We infested 6 channel catfish by placing them in a heavily aerated water bath with mapleleaf glochidia. Infested fish were held in flow-through aquaria equipped with a false bottom to prevent catfish from eating excysted juvenile mussels. To simulate the rise in spring river water temperature we increased aquarium water temperature as mean weekly river temperature rose from 13-20 °C. A total of 563 juvenile mapleleaf excysted from the fish between 51-68 days after glochidial infestation.

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Types of Ampullariidae in the National Mollusc Collection of the Hebrew University of Jerusalem

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In recent years the Apple snails, or Ampullariidae, form regular news items. These large freshwater prosobranchs are not only kept in tropical aquaria all over the world (Perera & Walls, 1996), but are also grown on a commercial scale as a food item in Taiwan, Thailand, and elsewhere in S.E.-Asia. Unfortunately, escaped or intentionally released specimens are known to cause havoc in rice fields and taro patches (Baldia & Pantastico, 1991; Cowie, 1993; Halwart, 1994).

Since the identities of the numerous species described in the 19th and 20th Century are still in a state of confusion, Dr. Robert H. Cowie is revising the genus *Pomacea*, which is restricted in its natural distribution to the Americas. A study of the original type material is of utmost importance in order to solve the numerous problems in the taxonomy and the nomenclature.

The National Mollusc Collection of the Hebrew University of Jerusalem (HUJ) contains six samples of type material belonging to the Ampullariidae. They once formed part of the collection of the late Arthur Blok (1882-1974), Rottingdean, England. These samples are listed here in alphabetical order according to the name in the original description. In addition to the exact reference, the type locality and collection number is given. This list is published in compliance with Recommendation 72D of the International Commission on Zoological Nomenclature.

List of types

01 *Ampullaria avellana* Sowerby, 1909: 360, textfigure.
Type locality: Venezuela, Lagunella.
Paratype: HUJ 21519/1 (= Blok 10294)

02 *Ampullaria decussata* Moricand, 1836: 445, plt. 2, figs. 26-27.
Type locality: Brazil, Bahia Province, Lake Baril.
Syntypes: HUJ 21518/2 (= Blok 10971).

03 *Lanistes (Meladomus) connollyi* Pain, 1954: 2, figs. 1-2.
Type locality: Southern Rhodesia, Victoria Falls.
Paratype: HUJ 21520/1 (= Blok 7310).

04 *Pomacea camena* Pain, 1949: 258, plt. 13, figs.5-6.
Type locality: Venezuela, in a shallow stream near Lagunella, at 800 metres.
Paratype: HUJ 21516/1 (= Blok 8575).

05 *Pomacea (Limnopomus) meridaensis* Pain, 1950: 109.
Type locality: Venezuela, Merida.
Paratype: HUJ 21517/1 (= Blok 9740).

06 *Pomacea zeteki* Morrison, 1946: 8, plt. 1, fig. 3.
Type locality: Republic of Panama, shallow margin of the Chagres River near Gatuncilla, leg. J.P.E. Morrison, October 6, 1944.
Paratype: HUJ 21515/1 (= Blok 10085).

I would like to thank Dr. Robert H. Cowie (Hawaii) for sending me a copy of Moricand's paper.

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Various Observations Concerning *Ferrissia clessiniana* in North-Holland, North of the North Sea Channel, The Netherlands

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Ferrissia clessiniana (Jickeli, 1882), Fam. Planorbidae, is a small freshwater limpet originally described from the Nile delta near Alexandria. Hubendick (1970 & 1972) has published a good redescription. About half a century ago, *Ferrissia clessiniana* started to expand its range northwards into the Levant (Mienis, 1976) and Europe. In the latter area it had been known as *Ferrissia wautieri* (Mirolli, 1960), but now that name is considered to be a junior synonym of *Ferrissia clessiniana* (Falkner & von Proschwitz, 1998; Falkner et al., 2002).

The first records from the Netherlands were published in 1977 (Van der Velde & Roelofs, 1977). The most recently published map dealing with the distribution of *Ferrissia* in the Netherlands (Gittenberger et al., 1998) shows numerous records; however, only one locality is indicated on the map in the province of North-Holland north of the North Sea Channel. In the past, large parts of that area were characterized by a brackish water flora and fauna. However, since the enclosure of the marine Zuiderzee in 1932, resulting in the development of a huge freshwater inland lake (the Ijsselmeer), the salinity of the water in the northern part of the province of North Holland has dropped considerably, enabling typical freshwater molluscs to settle in that area.

Since I have spent the first 28 years of my life in that part of North Holland, regular family visits to the Netherlands have always been combined with malacologically orientated fieldwork. This has brought to light not only a number of new records of *Ferrisia clessiniana*, but also some information concerning its habitat and competition with the native freshwater limpet *Acroloxus lacustris* (Linnaeus, 1758).

New distributional records

The following records of *Ferrissia clessiniana* were registered in the province of North Holland, north of the North Sea Channel. The records are enumerated from north to south:

01-Wieringen, Hippolytushoef, "de Weel", in pond, on the submerged part of *Sparganium erectum*, 8th October 1991;
02-Alkmaar, Noord-Hollands Kanaal, on submerged part of *Iris pseudoacorus*, 14th October 1991;
03-Edam, Burgemeester Versteeghsingel, on *Nuphar luteum*, 13th September 1991; also 13th October 1998;
04-Z.O. Beemster, in garden center "Koelemeijer", on *Nymphaea alba*, 6th May 1994;

05-Purmerend, ditch along Oudelandsdijkje, on *Nuphar luteum*, 28th September 1991;
06-Purmerend, ditch along Flevostraat near Kadijkerkoog, on *Nuphar* luteum, 14th September 1991;
07-Purmerend, ditch along Nieuwe Gouw near Kadijkerkoog, on *Nuphar luteum*, 28 September 1998.
08-Monnickendam, Oude Zijds Burgwal, on *Nuphar luteum*, 19th September 1991;
09-Monnickendam, Vesting, on *Nuphar luteum*, 19th September 1991; also 22nd September 1998;
10-Ilperveld, on submerged parts of *Typha* species, 25th September 2001;
11-Oostzaan, in broad waterway at the corner De Haal-Oostzanerrijweg, on *Nymphaea* spec. (rosy flowers), 30th September 2002.

According to these records, *Ferrissia clessiniana* may be expected to occur in suitable habitats throughout the province of North Holland, north of the North Sea Channel.

Substrates used by *Ferrissia clessiniana*

This freshwater limpet has been encountered in the study area exclusively on the submerged parts of *Iris pseudoacorus*, *Typha*, and *Sparganium erectum*, and on the leaves of *Nuphar luteum*, *Nymphaea alba*, and *Nymphaea* spec. (a rosy cultivated form). It may occur in very large numbers, especially on the leaves of the Water lilies (*Nuphar* and *Nymphaea*). At the locality in Edam (Stat. 03) it was encountered at a rate of 20-50 specimens per leaf in 1991; however, seven years later this number had been reduced to a mean average of 0.3 specimens per leaf. Similar changes in the density of the snails have also been noticed elsewhere and are indicative for an introduced species. A new invader often builds up enormous populations (in Edam the population was estimated to contain over 2,000,000 specimens!), but after a few years a balance usually develops between the native species and the invader.

Ferrissia clessiniana probably reaches new localities by the transfer of Waterlilies, both *Nymphaea* and the more hardy *Nuphar*, from one place to another: nowhere *Nymphaea alba* is a native species in the northern part of North Holland. Moreover, Water lilies, especially the more colorful cultivars, are usually imported from abroad and they turn out to be often infected with non-native snails. Noteworthy was therefore the find of this limpet on *Nymphaea* in a commercial garden center (Stat. 04).

Competition with *Acroloxus lacustris*

The native freshwater limpet *Acroloxus lacustris* occupies the same habitat and same substrates as *Ferrissia*. When the latter invades a new area and start to build up a very dense population, then almost simultaneously *Acroloxus* nearly disappears. When 20-50 specimens of *Ferrissia* were encountered per leaf at Stat. 3 (Edam), only one specimen of *Acroloxus* was encountered on thirty leaves, i.e. 0.03 specimens per leaf. Seven years later the population size of *Ferrissia* had dropped to 0.3 specimens per leaf, while that of *Acroloxus* had increased to 1.9 per leaf. The same situation occurred in Monnickendam (Stat. 09): *Ferrissia* reached a density of 15.6 per leaf in 1991, which dropped to 1.7 in 1998, while *Acroloxus* occurred at a rate of 0.5 per leaf in 1991, but increased to 2.4 in 1998. I hope to follow the interactions between these two limpets in the coming years.

The fieldwork in 1991 was carried out with the help of a grant from the "Beijerinck-Popping Fund" for freshwater research in the Netherlands. Representative samples of the discussed material have been lodged permanently in the mollusc collection of the Zoological Museum in Amsterdam, The Netherlands.

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Reminders

Send your nominations for President-elect and Secretary to Leroy by January 10, 2003

Send your 2003 dues to Heidi (see insert)

Early Registrations ends December 15, 2002

Don't forget to book your room at the Sheraton by February 28, 2003 – why not do it today? Call 800-325-3535

Two words: Raffle Items!!!

Helpful Hints from Hoppy:

When you water-scope, you hope. When you dig, you are rewarded!

Submitted by Steve Ahlstedt

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

Freshwater Mollusk Conservation Society
Standing Committees and Chairs

If you are interested in assisting or learning more about any of the FMCS Standing Committees, please contact the appropriate chair at the address listed below.

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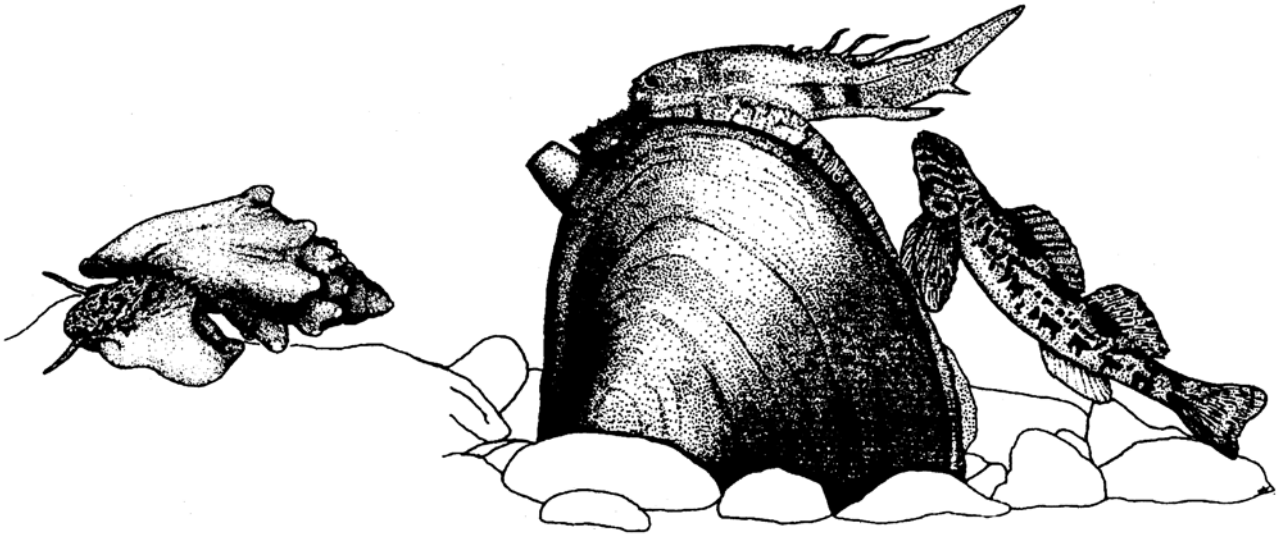
Freshwater Mollusk Conservation Society



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