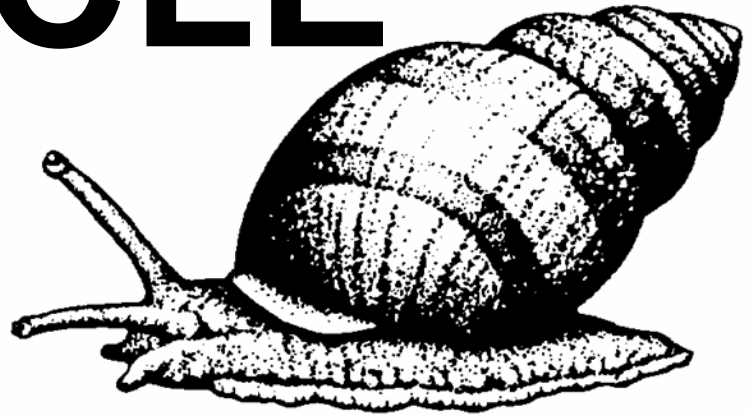


The Newsletter of the IUCN/SSC Mollusc Specialist Group  
Species Survival Commission • IUCN - The World Conservation Union

# TENTACLE



## Editorial

I recently came across an article about the endangered Banff springs snail (*Physella johnsoni*) on the Parks Canada website (see also *Tentacle* 9). I quote: "Nowhere but in Banff National Park have the right chemical, biological and geological forces combined to give rise to this remarkable species. Like other molluscs, it plays a fundamental role in the web of life... Our realization that the Banff springs snail is as worthy of recovery efforts as any other species represents a leap in conservation consciousness. Just as healthy grizzly bear populations reflect the integrity of Rocky Mountain ecosystems, healthy snail populations reflect the integrity of thermal spring ecosystems. It's all a matter of scale."

I was truly heartened to read that this national authority is taking snail conservation seriously. It is a testament to the dedication of those who study these snails and their efforts to promote their conservation. With similar efforts, we can persuade other governments and agencies to make this encouraging "leap in conservation consciousness" and heighten awareness of the conservation needs of the many threatened and endangered molluscs worldwide.

*Tentacle* is part of this effort and I therefore try to distribute it as widely as possible, given limited resources. From this issue onwards it is available on the web at <http://www.hawaii.edu/cert/tentacle.html> and I am announcing this to those on the distribution list for whom I have e-mail addresses. In order to reduce costs, hard copies only go to those for whom I do not have e-mail addresses. Please keep me updated with your current addresses.

As always, I reiterate that the content of *Tentacle* depends largely on what is submitted to me. Molluscs continue to face many conservation threats and I consider *Tentacle* a means to publicise them. Of course, it is also a free, easy way to advertise your own projects! So I encourage anyone with a concern about molluscs to send me an article, however short.

Don't wait until I put out a request for new material (usually via the MOLLUSCA listserver). Send me something now, and it will be included in the next issue (I am trying to publish one issue a year, appearing in January). Line drawings (or in some cases high-contrast photographs with white backgrounds) are particularly welcome.

I make only minor editorial changes to submitted articles and I accept almost everything submitted to me. Statements made in *Tentacle* therefore remain the authors' responsibilities and the balance of each issue reflects whatever I receive.

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MALACOLOGICA, the international society for the study of molluscs, for which the Mollusc Specialist Group is most grateful. To become a member of UNITAS, fill out the application form at the end of this issue of *Tentacle*.

Robert H. Cowie, Editor, contact details in the list of Mollusc Specialist Group members at the end of this issue of *Tentacle*.

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Members of the Mollusc Specialist Group

Shannon diversity, overall abundance, or abundance of the 10 most commonly encountered species. The results are in a manuscript submitted to the *Journal of Conchology* to be considered for the Mollusc Conservation Issue resulting from the Mollusc Conservation Symposium at the 2001 World Congress of Malacology in Vienna. This result, taken at face value along with results from Europe and Australia reported in my previous article, indicates that snails do not respond to habitat fragmentation. However, these results are surprising because they are counter to predictions of island biogeography theory and indicate that land snails behave differently from many other groups of organisms.

My three favorite alternate explanations for why I did not see a correlation are (1) maybe land snails respond to fragmentation of smaller habitats at the scale of square meters instead of hectares, (2) maybe what a land snail perceives as habitat does not coincide with the forest patches that I measured, or (3) if I dramatically under-sampled land snail diversity in each patch, the under-sampling might mask an actual relationship.

It will be interesting to see if accounting for these ideas would reveal an effect of habitat fragmentation on land snails

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## MOLLUSCS ADDED TO CANADA'S LIST OF SPECIES AT RISK

by Robert Forsyth

Three species of molluscs were added to the Canadian list of Species at Risk following scientific assessments completed in November, 2002, by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Added to the endangered category were *Allogona townsendiana* (Lea, 1838) (Oregon Forestsnail) and *Physa* species (Lake Winnipeg Physa snail). *A. townsendiana* is known in Canada from southwestern British Columbia; *Physa* species is unique to Lake Winnipeg, Manitoba. The third species, *Cryptomastix devia* (Gould, 1846) (Puget Oregonian snail) has been determined to be extirpated from Canada. The historical range of *C. devia* in Canada was limited to a small area of southwestern British Columbia. For more information see the COSEWIC web site, [www.cosewic.gc.ca](http://www.cosewic.gc.ca)

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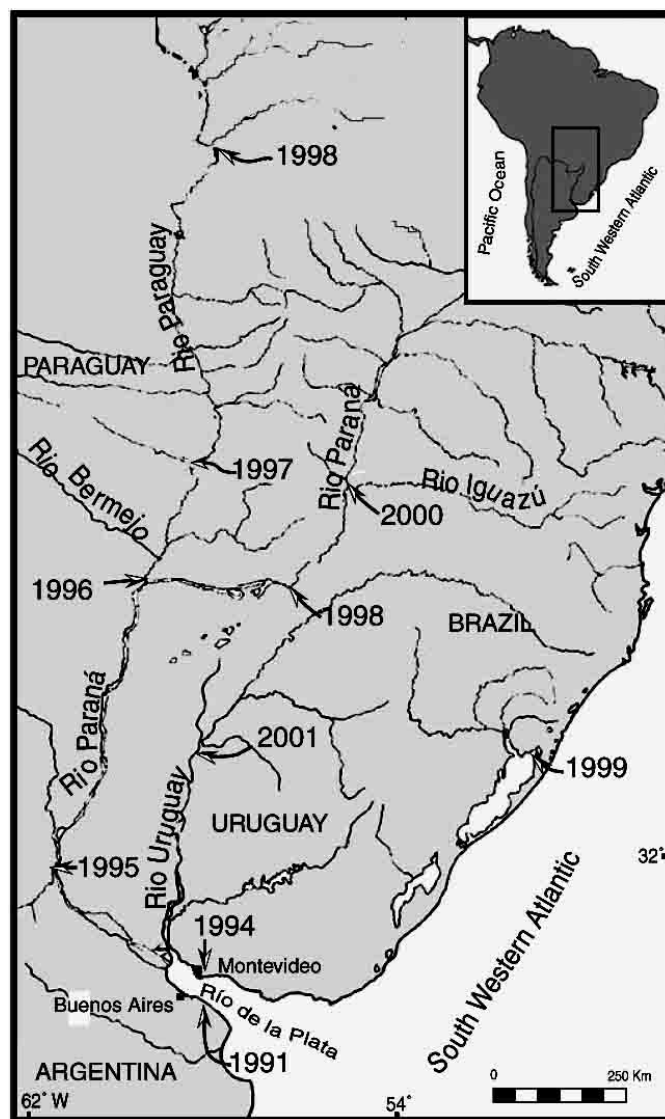
## THE GOLDEN MUSSEL, *LIMNOPERNA FORTUNEI* (DUNKER, 1857) (BIVALVIA: MYTILIDAE), IN THE NEOTROPICAL REGION: A 10 YEAR STORY OF INVASION

by Gustavo Darrigran & Guido Pastorino

Since the 1960s, at least two species of invasive freshwater bivalves from Southeast Asia, have spread through the Río de la Plata System, i.e. *Corbicula fluminea* or 'Asiatic clam' and *Limnoperna fortunei* or 'Golden mussel'. Since that time to now *L. fortunei* has had the highest impact in the human environment, causing, principally, biofouling in the water intakes of industrial, electric power and drinking water plants. These problems are similar to those caused by *Dreissena polymorpha* in the Northern Hemisphere (Darrigran & Ezcurra de Drago, 2000). Fouling problems caused by the golden mussel in South America have been reported along the Río de la Plata, Paraná and Paraguay rivers. The mussels invade as larvae, then settle and mature in water distribution systems in the same way as *D. polymorpha* does (Nalepa & Schloesser, 1993).

The golden mussel was introduced to Hong Kong in 1966 (Morton, 1975, 1996) and Japan in 1991 (Kimura, 1994). Morton (1973) suggested that particular morpho-functional features of this species have allowed its rapid spread, similarly, again, to *D. polymorpha* in the Northern Hemisphere. Darrigran & Pastorino (1995) suggested that the unintentional introduction of this species into South America in 1991 was in the ballast water of ocean-going vessels.

The Plata basin is one of the most important hydrographic systems in South America. It has a drainage area of nearly 3 million km<sup>2</sup> formed by four sub-basins. Its rivers flow through tropical, subtropical and temperate areas including forests, grasslands (the Pampa) and mountains (the Andes). *Limnoperna fortunei* in its spread through South America is invading a wide range of different environments along its route. Between 1991 and 2001 *L. fortunei* invaded four countries (Argentina, Uruguay, Paraguay and Brazil) and four of the largest rivers of the Plata basin (i.e. Río de la Plata estuary, Río Paraná, Río Uruguay and Río Paraguay) (see map). It is calculated that *L. fortunei* traveled along these rivers at a rate of 240 km per year.



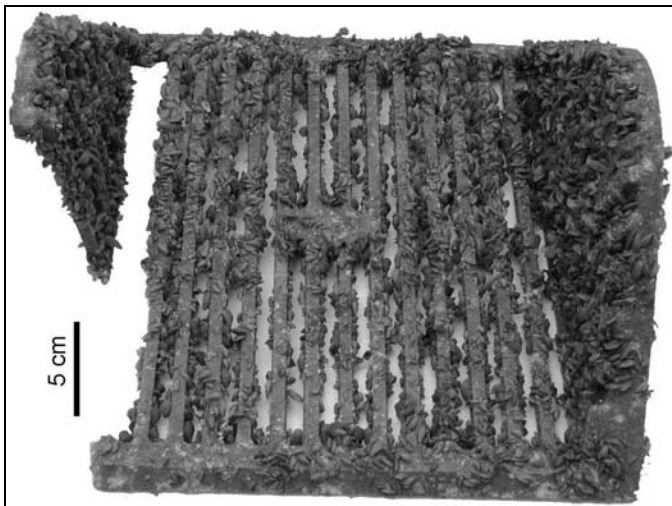
The invasion of South America by *Limnoperna fortunei*.

The impact caused by *L. fortunei* is not just economic (Darrigran, 2000). Darrigran *et al.* (1998a) showed that, since the introduction of *L. fortunei* at Bagliardi Beach, two gastropods commonly found have been displaced. One of them, *Chilina fluminea* (Maton, 1809), is no longer found, while the other, *Gundlachia concentrica* (d'Orbigny,

1835), is becoming rare. In contrast, several benthic species, uncommon or absent before the invasion of *L. fortunei* into this microenvironment, are now present, including a number of annelids: Oligochaeta (8 species), Aphanoneura (1 species) and Hirudinea (8 species). In addition, several species of crustaceans and insects never previously recorded in the invaded areas are now present (Darrigran *et al.*, 1998a).

The Plata basin covers five countries, four of which are members of the southern common market, called MERCOSUR. This fact, plus the apparently slow action of local authorities, could be a factor in the spread of the economical and environmental problems caused by the golden mussel. Until now, macrofouling was primarily a problem in the marine environments but since the invasion of *L. fortunei* most of the same problems affect freshwater systems.

As far as we know, control of ballast water is the best way to avoid the transport of the non-native or probably invading species. Ricciardi (1998) has suggested the need for greater effort to control *L. fortunei* because of the danger of its spread throughout South America. Although *L. fortunei* is as yet not in North American and European rivers, it is probably only a matter of time before it appears there because it can now reach both areas from two different regions: Asia and South America.



Macrofouling sampler with *Limnoperna fortunei* attached

Since the introduction of the golden mussel into the Plata basin in 1991, several lines of research have begun: population dynamics of *L. fortunei* and its impact on native species (Darrigran *et al.*, 1998a), its distribution and impact (Darrigran, 2000; Darrigran *et al.*, 2000; Darrigran & Ezcurra de Drago, 2000), its reproductive biology (Darrigran *et al.*, 1998b; Darrigran *et al.*, 1999) and predation upon it (Penchaszadeh *et al.*, 2000). Other studies are in progress, e.g. growth rates and larval development, as well as testing for resistance to exposure to air and to poisoning. This work aims to supply the necessary information for control of *L. fortunei* and prevention of its further introduction and spread.

Funding for this project was provided by Facultad Ciencias Naturales y Museo (UNLP), Fundación Antorchas (N°13887-23) and Agencia Nacional Promoción Científica y Tecnológica (PICT01-03453).

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## MOLLUSC CONSERVATION BEGINS IN CHINA

by Min Wu, Yueying Liu & Fengshan Xu

Mollusc conservation in China began in 2000, with a workshop held during July and August in Dujiangyan, a town in the mid-west of China. At that workshop, Professor Sung Wang, the director of the Biodiversity Working Group / China Council for International Cooperation on Environment and Development (BWG/CCICED), a Chinese NGO aiming at biodiversity conservation and facilitating the Red Listing Project of China (RLPC), introduced to the specialists involved in the work the purpose of the threatened species' rank assessment, and the reason for using the IUCN Red List Categories and Criteria (version 3.1) for the assessment. The aim is to produce a list of currently threatened species in China, using the new IUCN Red List Criteria, in order to provide a scientific basis for legislation, conservation planning, and initiation of projects by government and related institutions. The list will cover both plants and animals, including molluscs (terrestrial, freshwater and marine), mammals, birds, amphibians, reptiles, fishes, insects and other invertebrates. However, in China, except for those specialists working on mammals and birds, until now there were no specialists in the biodiversity of the other major groups. Initially, the difficulty faced by those selected to cover these groups was unfamiliarity with the IUCN Red List Criteria. The greatest initial difficulty for BWG/CCICED was to make the specialists familiar with the criteria and to maintain the