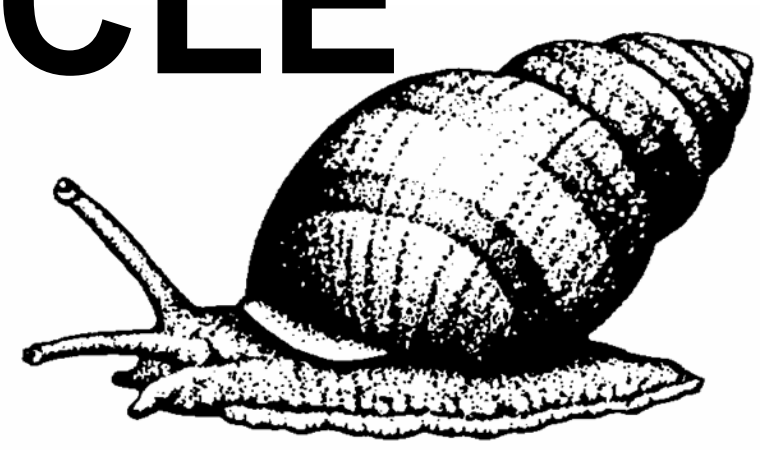
The Newsletter of the IUCN/SSC Mollusc Specialist Group
Species Survival Commission ● IUCN - The World Conservation Union

TENTACLE



UNITAS MALACOLOGICA

Editorial

This issue marks a small change in the layout of *Tentacle*. *Tentacle* began in 1989 as the newsletter of the Mollusc Specialist Group of the Species Survival Commission of IUCN, and it still is this Group's newsletter. However, it now reaches a far wider audience than just the members of the Mollusc Specialist Group, and this can only be considered a good thing. However, because of this, I feel that it is the news articles about molluscs and their conservation, contributed from far and wide by this expanded readership, that should be most prominent in the newsletter. So these articles will now appear at the start of the newsletter. The sections dealing with IUCN and SSC news, and other items of information (meetings, internet resources), that formerly occupied the first few pages are now moved to the last pages of the newsletter, not because they are unimportant, but because they are probably of less immediate interest to this new wider readership of *Tentacle*. Making *Tentacle* a more attractive read, even in a small way, can only help its purpose, which is to inform as widely as possible about mollusc conservation.

One highlight since the last issue of *Tentacle* is the publication in the April 2004 issue of *BioScience* of an article authored by Charles Lydeard and a number of IUCN Mollusc Specialist Group members entitled "The global decline of nonmarine mollusks". It is available on line either directly on the *BioScience* website (http://www.aibs.org/bioscience/) or via a link on the website of the American Malacological Society (http://erato.acnatsci.org/ams/). I encourage everyone to take a look at it. In addition, the proceedings of two notable symposia are now published: *Molluscan Biodiversity and Conservation*, from the World Congress of Malacology in Vienna in 2001, and *The Biology and Conservation of Freshwater Gastropods*, from the American Malacological Society's annual meeting in Charleston in 2002; details are given in the list of recent publications on p. 23.

All issues of *Tentacle* are available on the web at http://www.hawaii.edu/cowielab. Note that this is a new web address. However, because of very limited resources, hard copies are now only sent to those people on the distribution list for whom I do not have e-mail addresses. I announce the publication of each new issue to all who are on the e-mail distribution list, so please keep me updated with your current e-mail addresses so that you do not drop off the list. I also announce the availability of each issue, as it appears, on the MOLLUSCA listserver (for details, see page 27).

As always, I reiterate that the content of *Tentacle* depends

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Chilean mussel, *Diplodon chilensis*, these are the only two freshwater mussels living in Patagonia east of the Andes. Regrettably, the Negro river basin is the most heavily impacted in Argentinian Patagonia by human activities, such as the construction of many dams and reservoirs, the introduction of exotic species, the use of agrochemicals and the discharge of untreated municipal wastewater.

In view of this situation we have recently initiated studies to gain insight into the conservation status of both mussels in the Negro river basin, aiming at the detection of viable populations to further study reproductive habits and fish host identity, especially concerning the Patagonian mussel.

An extensive survey was performed during a period of relatively low waters (January 2004), with the aim of finding extant populations and determining the present distribution of *A. puelchanus* and *D. chilensis*. Twenty-one sites were visited, as determined by the possibility of access, evenly covering the entire section of the basin that was supposed to be inhabited by the Patagonian mussel according to Bonetto (1973) and Castellanos & Landoni (1990). We carefully inspected each site by wading hundreds of meters along one of the shores, searching for living macrobivalves or their empty valves among the submerged vegetation, among stones, in the sediments or along the strand.

Our efforts to find viable populations of the Patagonian mussel failed completely. Only one living individual of this species was retrieved, at the uppermost site in the Negro river. Only empty valves were found at the other seven sites in that river, including San Javier, the type locality of this species, and two other sites from where museum collections exist. Most of the valves were broken or heavily eroded post-mortem although many were still joined or had remains of the external ligament. A few valves were found at a single site in the lower course of both the Neuquén and Limay rivers.

Living specimens of the Chilean mussel were found at several sites (none in the Neuquén river) though we never found the high densities reported in rivers and lakes of Chile (Parada & Peredo, 1994). The Asiatic clam, *Corbicula fluminea*, was found at all sites along the Negro river, where it was always the most abundant macrobivalve, but nowhere in the Limay and Neuquén rivers. This clam has been linked to the decline of several species of bivalves elsewhere (Bogan, 1993).

The abundance of empty valves of *A. puelchanus* suggests the presence of extant or recently vanished populations in the Negro river, but the few remains found in the lower part of the Limay and Neuquén rivers indicate that the populations reported there have disappeared long ago. All the valves measured more than 5 cm long, indicating a higher fragility of juvenile valves or a prolonged absence of recruitment. Contrarily, living juvenile specimens of the Chilean mussel were found, though only in the lower Limay river, a section not colonized yet by the Asiatic clam.

Archeological evidence of the use of mussels going back thousands of years has been reported in southern Chile (Parada & Peredo, 1994) and in the Negro river. Doering (1881) recorded the mass consumption of the more abundant *D. chilensis* by members of military expeditions. During our survey we gathered some information about the past consumption of native mussels from local people, all of whom were unaware of the presence of two species in the Negro river. Neither of the mussels seems to be abundant enough nowadays to permit such activities.

The Asiatic clam has already colonized the full extent of the Negro river and the presence of the common carp, *Cyprinus carpio*, has now been confirmed along most of its course. Although because of their recent introduction and spread they are surely not responsible for the decline of the native mussels, they probably would hamper any future repopulation or reintroduction attempts.

In addition to the threats already mentioned, perhaps the most important menace to the Patagonian mussel is the almost complete ignorance of its fundamental ecology and the fact that most people living along the river are not even aware of its existence. Although our results are far from auspicious, we are planning to continue our efforts in order to locate remaining populations. We have also already released some notes to academic and popular media to highlight the problems facing mussel conservation and the introduction of non-indigenous aquatic species.

Bonetto, A. 1973. Náyades de la Patagonia. *Revista de la Asociación de Ciencias Naturales del Litoral* 4: 177-185.

Bogan, A.E. 1993. Freshwater bivalve extinctions (Mollusca: Unionoida): a search for causes. *American Zoologist* 33: 599-609.

Castellanos, Z. & Landoni, N. 1990. Mycetopodidae. In: *Fauna de agua dulce de la República Argentina. XVI (1): Moluscos Pelecípodos* (Castellanos, Z., ed.), p. 1-114. Buenos Aires.

Doering, A. 1881. Moluscos. In: *Informe oficial de la Expedición al Río Negro bajo las órdenes del General D. Julio A. Roca*, p. 61-75. Imprenta de Ostwald & Martinez, Buenos Aires.

Parada, E. & Peredo, S. 1994. An ecological evolutive approach of Chilean hyriids life history (Mollusca, Bivalvia). *Boletín de la Sociedad de Biología de Concepción, Chile* 65: 71-80.

Pablo R. Martín & Pablo A. Seewald, Laboratorio de Zoología de Invertebrados I, Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur, San Juan 670, 8000 Bahía Blanca, Argentina. pmartin@criba.edu.ar

CONSERVATION OF LAND SNAILS IN THE MOUNTAIN GRASSLANDS OF THE ARGENTINIAN PAMPAS

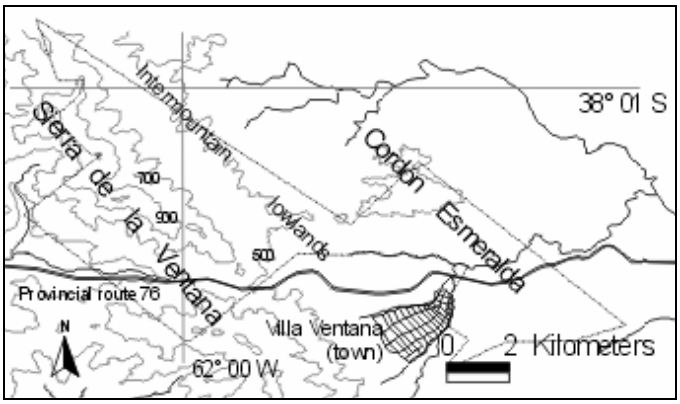
By Valdemar Delhey, Silvana Burela, Julia Pizá, Natalia Ghezzi & Néstor J. Cazzaniga

The Ventana Mountains are not only a remarkable physical feature within a mostly plains region, but also a 'biodiversity island' in the Pampas, the region most modified by agricultural activities in Argentina. These mountains harbor both endemic land snails and species of the surrounding plains. Thus, this is the most important area for land snail conservation in the Pampas, a region with a rather poor overall diversity of terrestrial snails. The state park 'Parque Provincial Ernesto Tornquist' (PPET) is the only reserve protecting these unique grasslands. Major threats to the native biota of the park are biological invasions by feral horses and exotic pines, which could also be affecting land snail

Top - *Austroborus lutescens dorbignyi*; middle - *Discoleus aguirrei*; bottom *Plagiodontes patagonicus*.

populations.

We have recently finished a land snail and earthworm conservation project in this reserve, funded by the BP Conservation Programme 2002 (British Petroleum, BirdLife International and Fauna & Flora International). One of our



The survey area in the Argentinian Pampas

specific goals was to investigate the effect of environmental conditions and the possible impact of horses on the distribution and abundance of four autochthonous macrosnail species: *Austroborus lutescens dorbignyi* (Doering, 1876), *Discoleus aguirrei* (Doering, 1884), *Plagiodontes patagonicus* (d'Orbigny, 1835) and the strictly endemic *Ventania avellanedae* (Doering, 1881). Sampling was carried out at two geographical scales. Environmental conditions recorded included topography, habitat structure, vegetation physiognomy, climatic and edaphic factors, floristic composition and horse impact.

Snail species commonly co-occurred and generally edxhibited similar qualitative responses to environmental variables. At a microgeographical scale, habitat structure variables were the most informative. For example, the four snail species mentioned above clearly preferred habitats with a more or less equal cover of rocks and vegetation. Particularly, rocks seemed to be an important habitat requirement for snails. We found snails partially buried in the soil under stones, attached to rocks and in narrow rock fissures. However, there were some resting site differences among snail species.

Frequency of snail occurrence and abundance across different environments was uneven. There are three main environments in PPET: (1) the Sierra de la Ventana mountain range with the highest altitudes and the greatest diversity of environments (summits, gorges, steep hillsides); (2) the Cordón Esmeralda mountain range, a group of low elevation hills of gentle slope; and (3) the intermountain lowlands, a transition area between the mountain ranges. Horses are present in Sierra de la Ventana and especially in the intermountain lowlands, but a wire fence prevents horses entering Cordón Esmeralda. Snail frequency and abundance was high in Cordón Esmeralda and lowest in the intermountain lowlands. The summits of Sierra de la Ventana had the highest population densities of *P. patagonicus* and *D. aguirrei.* Some responses to ecological variables, including horse impact, might explain this particular distribution pattern.

At the summits of Sierra de la Ventana, the highest densities of *D. aguirrei* and *P. patagonicus* were associated with the endemic dwarf shrub *Grindelia ventanensis*. This cushion-shaped and compact shrub could offer both shelter and food in the harsh environmental conditions of the summits. It is noticeable that even in the absence of rocks this shrub sustains dense snail populations.

Some reasons for the widespread occurrence of land snails in Cordón Esmeralda might be the presence of a homogeneously mixed cover of roughly equal proportions of rock and vegetation, as well as the particular structure of the rocks, typical of this area. These rock outcrops consist of parallel rock layers that offer numerous shelters, such as fissures and the microhabitats created by detached rock layers on the ground.

The intermountain lowlands exhibited marked environmental similarities with Cordón Esmeralda, including climatic and soil conditions. Furthermore, the structure and geological origin of rocky outcrops in these regions are similar. However, snails are usually absent from rocky habitats in the lowlands, probably for two reasons. First, rock outcrops showed a scattered pattern of occurrence. Second, lowlands sustain high horse populations, which might have a direct impact on snails. Some evidence for this impact follows from the fact that the presence of horses in lowlands is one of the clearest habitat differences with Cordón Esmeralda, where snails are frequent and abundant. Moreover, areas of Sierra de la Ventana with high horse impact also had low frequency of snail presence.

Horses could affect snails directly by trampling or indirectly by habitat modification via soil compaction or reduction of height of natural grasslands. Some snail species might be more affected by horses than others. While *A. l. dorbignyi* and *P. patagonicus* were totally absent from areas with high horse impact, some of these areas were inhabited by *D. aguirrei* or *V. avellanedae.* Individuals of the last two species were found in rock fissures, a resting site that is possibly safer from horse impact than those used by *A. l. dorbignyi* and *P. patagonicus*, species more associated with the ground.

Other ecological conditions, climate, topography, as well as calcium content, pH and other soil chemical properties were not important in explaining land snail distribution patterns, although some species tended to prefer a coarse soil texture.

These results support the hypothesis that horses have a negative effect on land snails. As the feral horse population continues to grow, the impact on land snails will probably increase. Therefore, we suggest designing a management plan to control feral horse populations, which are not part of the natural fauna of the reserve. In addition, it is also highly desirable that horses are permanently excluded from Cordón Esmeralda. The other main threat to the local flora and fauna, including land snails, is the spread of exotic pines. We have not found any snail population under long established pine forests. A number of methods of pine control are presently practiced in the park.

Valdemar Delhey, Silvana Burela, Julia Pizá, Natalia Ghezzi & Néstor J. Cazzaniga, Laboratorio de Zoología de Invertebrados I, Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur. San Juan 670, 8000 Bahía Blanca, Argentina. valdo@criba.edu.ar

THREATENED MOLLUSCS OF POLAND

By Katarzyna Zajac

The new edition of the *Red List of Threatened Species of Animals in Poland* includes 129 mollusc species of a total of over 270 mollusc species known in Poland. The richest malacofauna is found in southern Poland. This results both from the Pleistocene history of this part of Poland as well as the ecological diversity of the uplands and mountains in this part of the country. Over 230 species of snails are known from Poland (173 terrestrial, about 50 freshwater, 8-9 marine). Unfortunately, over 30 % of them are threatened with extinction and included in the *Red List*. Out of 39 species of bivalves found in freshwater and in brackish water of the Baltic Sea, 20 species have been included in the *Red List* (Table 1). The listings were based on observed degradation of populations, including disappearance of localities, changes in the vertical ranges of species in water bodies, decreases in population number, reduced size and conchological variation in some species in the order Unionoidea.

Table 1. Numbers of mollusc species in different threat categories, as listed in the *Red List of Threatened Species of Animals in Poland*.

	THREAT CATEGORY							
	EX	**CR**	**EN**	**VU**	**NT**	**LC**	**DD**	**TOTAL**
BIVALVIA	1	-	4	12	1	-	2	**20**
GASTROPODA TERRESTRIAL	-	16	1	11	37	1	9	**75**
GASTROPODA AQUATIC	-	1	3	13	10	-	7	**34**
TOTAL	**1**	**17**	**8**	**36**	**48**	**1**	**18**	**129**

EX – extinct, CR – critically endangered, EN – endangered, VU – vulnerable, NT – near threatened, LC – least concern, DD – data deficient.

The main threats to the listed species are habitat degradation or its complete destruction. Anthropogenic changes affect approximately 70 % of the bivalves and are the main threat to species in the family Sphaeridae and to marine species. The most important causes of the elimination of marine species seem to be pollution of the Baltic Sea and a considerable reduction of submerged macrophytes. Bivalves are exceptionally vulnerable to water pollution and habitat change resulting from hydro-engineering works in reservoirs, water courses or their nearest surroundings. The majority of snail species is threatened also by loss of appropriate habitats (mainly forests and marshes), land reclamation and drainage, regulation of rivers, eutrophication and pollution of water, different types of management and exploitation of open areas, and emissions of industrial pollutants, especially those acidifying the environment. Another threat, although poorly recognized, is posed by invasive alien species.

No snail species has died out in historical times; however, many are endangered, as shown in the list. A direct threat is posed to *Helix lutescens* by accidental exploitation. This species is often not distinguished from *Helix pomatia*, collected for commercial purposes. The rarest and most threatened aquatic gastropods are *Borysthenia naticina*, *Gyraulus acronicus* and *G. laevis*. One species, quite new to the Polish fauna, is included in the *Red List*. In the 19th century, *Lithoglyphus naticoides* spread out over the lowland area of Poland, first colonizing all large and medium lowland