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## *Crayfish Symposium Held at AFS Meeting, Wheeling, West Virginia, USA*



Attendees of the Freshwater Crayfish symposium held in Wheeling, West Virginia, USA during the spring meeting of the Southern Division of the American Fisheries Society.

While the weather outside was cold, and at times quite snowy, there were also interesting discussions going on about freshwater crayfish at the spring meeting of the Southern Division of the American Fisheries Society. The meeting was held at the Oglebay Resort in Wheeling, West Virginia this year from 28 February — 2 March 2008.

As part of the meeting, a separate 2-day crayfish symposium was organized by IAA members Zac Loughman (West Liberty State College), with help from Tom Simon (Bloomington, Indiana) and Stuart Welsh (West Virginia University).

Speakers and attendees came from as far away as Arkansas, Missouri, South Caro-

lina and Georgia for the symposium. Over the course of the two day symposium, there were 23 presentations given (see below for a list of presenters and titles) and approximately 30-40 people attended the various talks.

A published proceedings based on the talks presented at the symposium is in the planning stages, although papers are *not* limited only to presentations given at the symposium. Authors with data on crayfishes from the southeastern U.S. that are interested in publishing a paper in the proceedings should contact Zac Loughman ([zloughman@westliberty.edu](mailto:zloughman@westliberty.edu)) for further details on formatting of

(Continued on page 13)





Catherine Souty-Grosset,  
IAA President (France)

## President's Corner

Dear IAA members,

It is now time for all members to think about participating in the IAA17 conference that will soon be held at Kuopio University (Finland), and is being organized by Paula Henttonen and Japo Jussila. The organizers have informed me that they have already received some abstracts from the USA, Australia, Mexico and Europe. The deadline for registration and abstract submission is *mid May*, but it is always better for the organizers to receive this information as early as possible, rather than a lot of registrations at the last minute; you know how it is particularly difficult to settle the scientific program, and print it, when last minute registrations are received. Please register now!

During the meeting, the general assembly is a good opportunity to inform you of the progress on the *Freshwater Crayfish* style guide. The publication of the journal will also be easier now that the manuscript tracking process is up and functioning. We will also present the revised bylaws, because the last thorough revision of the bylaws was more than ten years ago, and it is absolutely necessary to adapt them to the present situation of the IAA with its relatively recent change to the dissemination of society information and publications in electronic format via the website.

As announced in my previous letter, we have made a call for potential hosts for the IAA18 location and programme to be held in 2010. As of today, IAA18 will take place in the USA, as we only had proposals submitted from this country. Proposals were received from Columbia, Missouri, with Annie Allert, Susan Adams, Bob DiStefano,

and Chris Taylor as the organizing committee and also from Auburn, Alabama with David Rouse, William Daniels, Antonio Garza as the organizing committee. Full proposals have been turned in by both parties and the IAA officers, along with the executive board, will start discussions beginning in April about these two venues. Of course, the committee must first evaluate the proposals to ensure that all obligations for production of FW Crayfish are met and that the meeting is financially sound. Then we will ask for the membership vote on where they would like to hold the meeting. For that, Jim Fetzner is working on some web pages where members can vote on the venue they like best, along with the IAA e-ballot for the officer elections. Regarding the officer elections, we are still eager to have names of candidates submitted for the position of Secretary.

With the Spring, you will again have the opportunity to meet your favourite crayfish in the field, but also keep in mind meeting with your fellow colleagues during the IAA17 symposium for a fruitful exchange of information. Before registration, please remember to think about your IAA membership renewal. I hope you enjoy this newsletter, which is rich with information on meetings, research findings, announcements of forthcoming **events and newly published papers (don't hesitate to inform us of your new publications)**. I also have the difficult task of informing you about the passing of the famous Dr. Lipke B. Holthuis, his loss to the crustacean (and crayfish) community is immense. See you soon in Finland! H

Catherine Souty-Grosset  
IAA President

### Business Members:

- *Crawfish Import SA, Luxembourg*
- *Global Aquaculture Alliance, MO, USA*
- *Marron Growers Association of Western Australia*

### Institutional Members:

- *Alpenzoo, Innsbruck, Germany*
- *Arkansas Game & Fish Commission*
- *Natural Resources Research Institute Library, MN, USA.*
- *Senckenbergische Bibliothek, Germany*
- *The Natural History Museum, London, UK.*

The International Association of Astacology (IAA), founded in Hintertal, Austria in 1972, is dedicated to the study, conservation, and wise utilization of freshwater crayfish. Any individual or firm interested in furthering the study of astacology is eligible for membership. Service to members include a quarterly newsletter, membership directory, bi-annual international symposia and publication of the journal *Freshwater Crayfish*.

### Secretariat:

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IAA Board Members: In addition to the IAA Officers and Secretariat the board also includes Arnie Eversol (USA), Paula Henttonen (Finland), Jay Huner (USA), Julian Reynolds (Ireland), Stephanie Peay (UK) and Alastair Richardson (Tasmania).

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Statements and opinions expressed in *Crayfish News* are not necessarily those of the International Association of Astacology.

*This issue edited by James W. Fetzner Jr.*



IAA 17 SYMPOSIUM STARTS TO TAKE SHAPE  
REGISTER NOW!

# IAA 17

The first delegates have already done their registration. Avoid last minute stress and register today!

We are proudly announcing a special guest lecture by IUCN officer Dr. Nadia Dewhurst (SRLI Crayfish and Lobster Assessment Coordinator) on current Red List activities (see page 16 for additional details). The IUCN is also interested in recruiting expert assessors to evaluate the status of vulnerable species. The lecture will be held on Tuesday, after the scientific program. All delegates and interested parties are welcome, providing, of course, that they are in Kuopio!

The organizers have invited three key speakers to cover some of the most interesting and hot topics in crayfisheries: professor Pierre Horwitz (Edith Cowan University, Western Australia), professor Keith Crandall (Brigham Young University, USA) and professor Trude Vrålstad (National Veterinary Institute, Norway). The speakers will add some focus on the IAA17 scientific program with emphasis on conservation, molecular biology and crayfish plague.

There will be a special website on IAA 17 topics (namely [iaa17.net](http://iaa17.net)) with all the imaginable details about the symposium. Keep your browser ready, and please spread the word.

The organizers, Department of Biosciences of the University of Kuopio and the Crayfish Innovation Center, will strongly encourage everyone of our crayfish loving friends to make mental notes on the dates of the IAA 17 Symposium. One could even start discussions with those who run the finances on the possibility to hear, see, feel, taste and discuss crayfish in Kuopio with a special group of crayfriends. We warmly welcome everyone to Kuopio, Savo, Finland next August. Crayfish rule!

On behalf of the organizing committee,

*Paula Henttonen*    *Japo Jussila*

Paula Henttonen and Japo Jussila, IAA 17



August 2008  
KUOPIO, FINLAND



# News Items From Around the World

## Obituary



Dr. Likpe B. Holthuis  
(1914–2008)

Dear Friends and Colleagues,

It is with great sadness that I have to inform you that Dr. Likpe B. Holthuis, emeritus Curator of the National Museum of Natural History, Leiden, passed away on March 7, 2008. He was 86. Due to an infection, Prof. Holthuis had been in the hospital for the last couple of weeks. Funeral services were held on March 15th.

Prof. Holthuis started at the museum in 1941 and continued working until just 4 weeks before **his passing**. The focus of his life's research was the Crustacea.

He was very disciplined and productive, leaving an immense contribution to the field of over 600 scientific publications, in which he described hundreds of new taxa. He received an Excellence in Research award from The Crustacean Society and was an honorary member of many other societies. As the curator of Crustacea, he built the crustacean collection at the museum into one of the best in the world with regards to the Decapoda. He collected everything related to Crustacea. One of his greatest passions was his Carcinological Library, which holds many rare books and is almost complete with regards to literature on the Decapoda.

Above all, he leaves many many good memories to all of us who have known him. The void left by Lipke is immense. **H**

Charles Fransen

Researcher/Curator Crustacea  
Nationaal Natuurhistorisch Museum - Naturalis  
P.O. Box 9517, 2300 RA, Leiden, The Netherlands

**Editor's Note:** Dr. Holthuis also made an impact in freshwater crayfishes. During his career, he described 11 species of freshwater crayfish from New Guinea, all in the genus *Cherax*. Recently, a new species of crayfish from New Guinea (*Cherax holthuisi* Lukhaup and Pekny, 2006) was also named after him due to his many important contributions in this little-studied group of crayfish. Below are a few of the publications by Dr. Holthuis that are related to the New Guinea crayfishes that he studied over the years.

Holthuis, L. B. 1939. Decapoda Macrura, with a revision of the New Guinea Parastacidae. Zoological Results of the Dutch New Guinea Expedition 1939, 3: 289–328.

Holthuis, L.B., 1949. Decapoda Macrura with a revision of the New Guinea Parastacidae.— Zoological results of the

Dutch New Guinea Expedition 1939. No. 3. Nova Guinea (n. ser.) 5:289-330.

Holthuis, L. B. 1950. Results of the Archibold Expeditions. No. 63. The Crustacea Decapoda Macrura collected by the Archibold New Guinea Expeditions. American Museum Novitates, 1461: 1–17.

Holthuis, L. B. 1956. Contributions to New Guinea carcinology I. Nova Guinea, (n.s.) 7: 123–137.

Holthuis, L. B. 1958. Freshwater crayfish in the Netherlands New Guinea Mountains. SPC Quarterly Bulletin 8:36–39.

Holthuis, L. B. 1982. Freshwater Crustacea Decapoda of New Guinea, pp. 603–619, in J. L. Gressitt, (ed.), Biogeography and Ecology of New Guinea. Dr. W. Junk, The Hague.

Holthuis, L. B. 1986. The freshwater crayfish of New Guinea. Freshwater Crayfish 6:48–58.

Holthuis, L.B., 1996. *Cherax (Astaconephrops) minor* new species, a parastacid from the mountains of Irian Jaya (W. New Guinea), Indonesia (Crustacea: Decapoda: Parastacidae). Zoologische Mededelingen Leiden 70(24):361-366.

Lukhaup, C. and Pekny, R. (2006). *Cherax (Cherax) holthuisi*, a new species of crayfish (Crustacea: Decapoda: Parastacidae) from the centre of the Vogelkop Peninsula in Irian Jaya (West New Guinea), Indonesia. Zool. Med. Leiden 80(7):101-107.

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## Australian Crayfish Concern Missouri Biologist

One person's dream can be another's nightmare. The Australian red-claw crayfish is a perfect example, with serious implications for ecological damage to Missouri.

The Australian red-claw, *Cherax quadricarinatus*, sometimes is called the "freshwater lobster," because it grows much larger than most crayfish, topping out at more than a pound (Figure 1). Under favorable conditions, it can grow much more rapidly than crayfish native to Missouri, reaching three-quarters of a pound in its first year of life.

Naturally, commercial crayfish growers are interested in a species with that kind of growth potential. Actually, that is just the start. Equally important to crayfish culturists are the red-claw's ability to tolerate a wide range of living conditions and spawn several times a year. On top of that, Australian red-claws lack the burrowing habit that makes some crayfish species difficult to maintain in man-made ponds with earthen dams.

In short, the red-claw seems to be an aquaculturist's dream. So it is not surprising that the Missouri Department of Conservation receives periodic inquiries from crayfish pro-

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Figure 1. Officials with the Missouri Department of Conservation are concerned about ecological problems that could result if Australian red-claw crayfish were brought into the Show-Me State. The Wildlife Code of Missouri prohibits the importation or possession of Australian crayfish. Only species on the Approved Aquatic Species List may be brought into the state legally. (Photo courtesy of Clive Jones, Queensland Department of Primary Industries and Fisheries).

ducers asking about the possibility of importing the Australian species. Those calls send cold shivers up Resource Scientist Bob DiStefano's spine.

DiStefano's experience with crayfish goes back to graduate research into the effect of acid rain on North American species. His early work for the Conservation Department included studies of the importance of crayfish as food for smallmouth bass and other sport fish. He also is active in the International Association of Astacology (IAA), a group whose members include both scientists and commercial crayfish culturists.

DiStefano says that crayfish form a tremendously important link in Missouri's aquatic food chain. They inhabit every watery habitat in the state, from muddy Mississippi River bayous to pristine springs and caves. In many habitats they are extremely abundant.

Crayfish will eat almost anything. One of their staple foods is detritus - bits of leaves, dead insects and other organic debris that settles to the bottom of lakes and streams. Crayfish are, in turn, eaten by everything from bullfrogs to herons. They make up the overwhelming majority of the diets of some predators, such as goggle-eye sunfish, smallmouth bass and, in the warm months, river otters.

"The more than 30 crayfish species native to Missouri are a huge part of the food chain that sustains our lakes and streams," said DiStefano. "Our studies showed that goggle-eye eat almost exclusively medium-sized crayfish, hardly ever large ones. There is no telling what would happen to fish populations if those native species disappeared and were replaced by crayfish that grow too large for most fish to eat."

DiStefano said there is reason for concern that red-claw crayfish could replace native species if the Australian species was ever introduced into Missouri waters.

"Their size is a concern," he said. "In the crayfish world, size is a very big factor in competition. Large crayfish usually displace smaller ones. We are worried about our native crayfish fauna because these Australian crayfish are so much bigger."

Competition is not the only worrisome prospect for DiStefano. He says the introduction of North American crayfish into Europe provides a sobering case study in what can happen when people transplant crayfish to new areas. A fungus carried by new world crayfish without ill effects proved devastating to European species, decimating the native crayfish fauna.

"We have very little idea what these Australian crayfish might carry or what effect their parasites and diseases might have on our local fauna. Based on the European situation, it is not unreasonable to think that these Australian crayfish might carry some pathogen that could get out into our environment and cause a lot of damage. It has been a huge problem in Europe and a wake-up call to those of us who work with crayfish." H

By Jim Low

Published Tuesday, January 29, 2008

Kansas City infoZine

<http://www.infozine.com/news/stories/op/storiesView/sid/26710/>

*Check with the Conservation Department before bringing any crayfish from out of state.*

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## Illegal Crayfish Introduction Costs Colorado Company \$100,000

CASPER, WYOMING – The owner of a Colorado company must pay \$100,000 in fines and restitution for illegally transporting rusty crayfish into Wyoming, a U.S. District Court judge ruled on Monday.

Thirty-four-year-old Shannon Skelton, owner of Fort Collins, Colorado-based Colorado Fisheries, Inc., a company that creates fish habitats and sells trophy-quality fish to high-end ranches and fishing lodges, pleaded guilty to one count of unlawful transportation of illegally possessed wildlife, a violation of the Lacey Act. Skelton and Colorado Fisheries, Inc. must jointly pay \$40,000 in fines for the Lacey Act violation, and \$60,000 in restitution to the Wyoming Game and Fish Department. The restitution will pay for expenses incurred to eradicate the illegal crayfish. Chapter 10 of the Wyoming Game and Fish Commission Regulations prohibits the importation of rusty crayfish into the state.

The Lacey Act, [16 U.S.C. §§ 3371-3378](#), protects both

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Figure 1. Collecting rusty crayfish.

plants and wildlife by creating civil and criminal penalties for a wide array of violations. Most notably, the Act prohibits trade in wildlife, fish, and plants that have been illegally taken, possessed, transported or sold. Thus, the Act underscores other federal, state, and foreign laws protecting wildlife by making it a separate offense to take, possess, transport, or sell wildlife that has been taken in violation of those laws. A violation of the Lacey Act automatically results in a federal case. This case was prosecuted in cooperation with the U.S. Attorney's Office and the U.S. Fish and Wildlife Service.

The case is centered around the illegal importation of rusty crayfish as a forage base for fish in ponds on three private ranches in Wyoming. In May of 2006, a ranch owner who had previously contracted with Colorado Fisheries, Inc. contacted Game and Fish for a permit to move some crayfish from one pond to another on a private ranch near Douglas (Figure 1). Fish biologists requested the identification of the crayfish prior to any movement between the ponds. Upon



Figure 2. The rusty crayfish (*Orconectes rusticus*).

investigation, biologists identified the prohibited rusty crayfish; a species not previously found in Wyoming. Game and Fish determined that the ranch was unknowingly the victim of illegally stocked crayfish through its dealings with Colorado Fisheries, Inc. Biologists also discovered rusty crayfish had entered a tributary of the North Platte River. Eradication efforts began immediately to remove the unwanted crayfish.

Rusty crayfish (*Orconectes rusticus*) measures two and one-half inches in length (not including claws). They have dark, rusty spots on each side of their carapace (outer body shell) (Figure 2). Their claws are grayish-green to reddish-brown and are smoother than most other crayfish. Rusty crayfish can cause a variety of negative environmental and economic impacts when introduced to new waters. They are an aggressive species that often displace native or existing crayfish species. Invading rusty crayfish also reduce the amount and kinds of aquatic plants and invertebrates, and **reduce some fish populations.** "Rusty crayfish are very aggressive and very prolific," said Al Conder, regional fishery supervisor for the Casper Game and Fish office. "If this species establishes in our waters we could potentially see a loss of our native crayfish species and severe impacts to other aquatic species."

Perhaps the most serious impact from rusty crayfish is the destruction of aquatic plant beds. Rusty crayfish have been shown to reduce aquatic plant abundance and species diversity. Submerged aquatic plants are important for habitat for invertebrates (which provide food for fish and ducks), shelter for young gamefish, panfish, or forage species of fish, **nesting substrate for fish, and erosion control.** "Illegal introductions are the most serious violations in terms of damage to aquatic resources and fishing opportunity," said Mike Stone, chief of fisheries for the Wyoming Game and Fish Department.

To date, Game and Fish has spent \$34,424.81 to remove the crayfish from several ponds and a portion of one stream. Additional expenses will be incurred for monitoring the site and any subsequent eradication efforts.

"We're very fortunate that we had the opportunity to get there early and control it," Conder said. "Had we not got there early they would be downstream in the North Platte drainage and upstream toward Casper. If they had made it to the North Platte River we could not have controlled them."

The Game and Fish Department will continue its efforts to prevent the introduction and/or spread of unwanted species in the state. "This case should show the residents of Wyoming that we take the illegal importation of injurious species very serious," said Mike Ehlebracht, Investigative Unit Supervisor for the Game and Fish Department. H

News Release from the  
Wyoming Fish and Game Department  
Jan 30, 2008

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## Ecological and Economic Benefits and Costs of Louisiana's Working Wetlands

Over 500,000 acres of land in rice and crawfish production in Louisiana provide nesting, wintering, and breeding habitat for 100 species of waterbirds. These working wetlands have become critical waterbird habitat compensating for loss of 1,000,000 acres of adjacent coastal wetlands. Land planted to rice has decreased due to falling rice prices and increasing production costs. These, along with recent salt-water damage from hurricanes caused a 35% reduction in land planted to rice. Despite problems associated with competing imported Chinese crawfish products, crawfish acreage has been stable. The long-run economic situation facing Louisiana's rice that sustains the nested crawfish industry is bleak. Without additional financial assistance, 35% of these agricultural wetlands (165,000 acres) and associated waterbird habitat may be lost. The level of financial support available under current conservation programs of the Farm Bill is \$100-\$200 per acre. The estimated economic costs for providing environmental benefits from these working wetlands are \$200-\$300 per acre. Estimated values of the environmental services associated with these working wetlands are \$300-\$400 per acre. If producers receive conservation payments offsetting expenses for maintaining seasonal agricultural wetlands, such a program may stem this potential habitat loss, and the societal economic benefits from such a program. **H**

John V. Westra<sup>1</sup>, Jay V. Huner<sup>2</sup>, and Rex H. Caffey<sup>1</sup>

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## Maryland DNR Proposes Monocacy Crayfish Bait Ban

The Maryland Department of Natural Resources is asking fishermen to help stop the spread of the rusty crayfish in the Monocacy River. The DNR held a public hearing April 2<sup>nd</sup> at the Greenbrier State Park Visitor Center to discuss proposed regulations for inland fisheries. One proposal calls for a ban on crayfish as bait in the Monocacy and Susquehanna rivers starting in 2009.

The rusty crayfish are an invasive species that crowd native crayfish out of their natural habitat. The rusties, as aquatic biologists call them, also have the same aquatic diets as many game fish. That means less food for smallmouth bass and channel catfish, game fish that are popular with local fishermen. Because it's hard for even trained biologists to tell rusties from native crayfish, DNR is asking fishermen to stop releasing any crayfish in their bait buckets into the Monocacy. "There's good reason to believe they got into the Monocacy by bait buckets," said Ron Klauda, director of monitoring for

freshwater streams for DNR, and a member of DNR's invasive species team. Klauda said he doesn't believe local bait shops carry crayfish bait. Rusty crayfish have found their way into the Susquehanna and other rivers in upstate New York and Pennsylvania. The DNR is also trying to stop the spread of rusty crayfish along the Susquehanna.

So far, rusties have not spread beyond the Monocacy at Sixes Bridge Road. In the upper Monocacy where they have taken hold, however, Klauda said there are no more native crayfish. Rusty crayfish are slightly larger and more reddish in color than native crayfish. Downstream from Sixes Bridge, other invasive crayfish co-exist with native species. In the lower third of the Monocacy, native crayfish still live unhindered by non-native species. Klauda said DNR officials hope to keep it that way. Invasive, or non-native, species tend to crowd out native wildlife. They often have no predators and devour native varieties' food sources.

Biologists use sampling spots to determine the spread of a species. Klauda said the rusty crayfish problem is still controllable in the Monocacy, although that could change. That's why the agency is asking that fishermen cooperate with the new regulation. "A lot of it's education," he said. **H**

By Karen Gardner  
Frederick News-Post  
Published April 01, 2008

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## Crayfish are Capable of Facial Recognition

Australian scientists have discovered crayfish, known in Australia as yabbies, are able to recognize the faces of enemy crayfish. The two year University of Melbourne study that involved more than 100 pairs of yabbies revealed the most common species -- *Cherax destructor* -- is capable of facial recognition of individuals, particularly its opponents.

"This is a remarkable capacity for the invertebrate species of yabbies and freshwater crayfish," said Professor David MacMillan, who led the study. "Yabbies usually fight when they meet. It is as much a way of meeting each other as a way of establishing territory." MacMillan said an understanding of how simple nervous systems recognize features might assist in developing feature recognition technologies for robots.

In the study, after a fight a loser yabby was isolated and given a choice between its opponent and another crayfish not involved in the fight. The loser yabby moved towards the opponent it knew as opposed to the rival it did not, revealing it is capable of visual identity not just an acute sense of smell.

The study appeared in the Feb. 27 issue of the online journal PLoS One and a link to the abstract can be found in the [Literature of Interest to Astacologists Section](#) on page 18 of this newsletter. **H**



## Short Articles

### Intensive production of White-clawed crayfish (*Austropotamobius pallipes*) for restocking purposes in Ireland

The white clawed crayfish (*Austropotamobius pallipes*), is the only crayfish species present in Ireland. This crayfish is a naturalized native species there. Recent genetic studies have indicated that the Irish population of white-clawed crayfish was introduced to Ireland from Western France. However, at present, significant conservation importance has been applied to this crayfish population in Ireland. The main reason for interest in conservation is due to the decreased abundance of this crayfish due to decreasing water quality and damage to habitats in Irish waters.

The maintenance and enhancement of the current distributions of crayfish species in Ireland is not only an important issue for Ireland. We believe that it is possible for the Irish population of white-clawed crayfish to play an important role in restocking this crayfish species in mainland Europe in the future. The island of Ireland is the only area in Europe that remains free of other non-native crayfish. Therefore, Ireland can be considered a safe place for the production of white-clawed crayfish for future restocking programs throughout Europe.

In 2007, a special "Cross-Border Crayfish Project" (CBCP) was started in Ireland to establish a method for the intensive culture of white-clawed crayfish. This would allow for the production of juveniles for restocking purposes in Ireland. This project has been funded by European Union funding from the INTERREG IIIA, administered by the East Border Region organization. The participants in this project comprise a hatchery from Northern Ireland (Moneycarragh Fish Farm, Dundrum, Photo1) and a hatchery from the Republic of Ireland (PDS perch farm, Arvagh). These partners are from the private sector in Ireland. Other partners of CBCP are the University of South Bohemia, the Research Institute of Fish Culture and Hydrobiology at Vodnany in the Czech Republic (as a research partner) and the Cross-Border Aquaculture Initiative Team (EEIG) from Ireland (as the project manager and coordinator).

The aim of this project has been to find the most effective method to culture white-clawed crayfish under controlled conditions for the production of juveniles with a final total body length of approximately 30 mm (as material for restocking efforts).

Work started on this project during May 2007. Both farm partners only had previous experience with fin-fish farming. Dr. Tomas Policar has been a researcher for this project, and started the work on this project, by changing the hatchery facility equipment from fin-fish over to crayfish culture at the farm in Dundrum. Meanwhile, the hatchery in Arvagh was



Photo 1. View of the farm in Dundrum.



Photo 2. Trapping of broodstock.



Photo 3. Reared juvenile at the end of the August 2007.

used as a supplier of live and frozen zooplankton for feeding juveniles during rearing.

During work on this project, the most up to date and efficient methods were used to catch (Photo 2) the broodstock from natural Irish habitats, and the hatching and intensive rearing of juveniles under controlled conditions in the hatchery (Photo 3). At present the project has 300 berried females

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Photo 4. Equipment used for artificial incubation of eggs.

for the production of juveniles in 2008. This production period will use the artificial egg incubation in bottles (Photo 4) as well as the pleopodal egg incubation on females. The aim of the work in 2008 is to devise a method for the mass production of juveniles of white-clawed crayfish under controlled conditions, with a production target of producing thousands of reared juveniles, as the capacity of the hatchery increases in the future. H

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## An Update on Crayfish Research in Russia

From 13-18 August 2007 the international applied-scientific conference "Protection, Reproduction and Sustainable Use of Aquatic Freshwater Biological Resources" was organized in Volgograd, Russia in honour of the 55th anniversary of Volgograd- GosNIIORKh. The conference included a plenary and thematic sessions covering the following main topics:

- Structural-functional organization of aquatic ecosystems, communities and populations;

- The biology and ecology of water organisms, invasive species and their role in fresh water ecosystems;
- Reproduction and sustainable use of aquatic biological resources;
- Aquaculture biotechnology;
- Methodological and organizational-legal aspects for ecological monitoring of aquatic ecosystems and the development of a cadastre of aquatic biological resources;
- Criteria and methods for water quality assessment and human impact, improvement of existing approaches in calculating loss compensations;
- Protection of water organisms – species selection for Red Data Lists, determination of rareness, state assessment procedures, cadastre & monitoring, conservation measures;
- Experiences in implementing programs and projects for the benefit of a sustainable state and use of freshwater bodies and their aquatic resources.

In materials from the conference the following theses were listed:

Mickevich OI (2007). Artificial growing of crayfish and methods of intensification. pp. 201-203. [in Russian].

Fedotov VP, Sladkova SV, Kuznetsova TV, Kholodkevich SV and Udalova GP (2007). Functional state of crayfish as an indicator of environmental quality. pp. 263-266. [in Russian].

See Figures 1 and 2 (on page 11) which show results from the Fedotov et al. paper listed above.

From 16-19 October 2007, A Russian conference, with international participation, was held in honor of the 100<sup>th</sup> anniversary of the academician V.N. Chernigovsky. The title of the conference was "Functional Mechanisms of Visceral Systems" and was organized in Pavlov Institute of Physiology in Saint Petersburg (Russia).

In the proceedings of the conference, 3 papers were listed:

Kuznetsova TV, Fedotov VP (2007). Cardioactivity of the invertebrates as biomarker of water quality assessment" pp. 165-166. [in Russian].

Udalova GP, Sladkova SV, Kholodkevich SV and Fedotov VP (2007). Circadian rhythm of cardioactivity of crayfish *Pontastacus leptodactylus* used as biosensors on water quality biomonitoring stations. pp. 323-324. [in Russian].

Sladkova SV, Kuznetsova TV and Kholodkevich SV (2007). Total protein concentration in crayfish haemolymph as indicator of animal functional state and environment quality. pp.296-297. [in Russian].

(Continued on page 10)



## The Circadian Rhythm and Cardio-activity of the Crayfish *Pontastacus leptodactylus* as Biomarkers of Water Quality Assessment During a Long-term Period

By G. P. Udalova and S. V. Sladkova  
 Scientific Research Center for Ecological Safety,  
 Saint-Petersburg, Russia

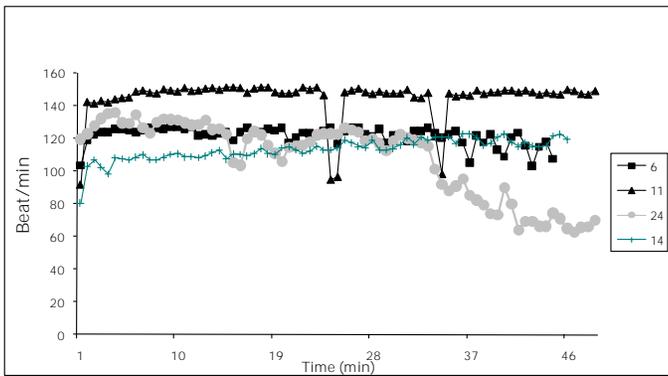


Figure 1. Change of heart rate of crayfish *Astacus astacus* (№ 6, 11, 24, 14) in a stress state during hanging in water. Ordinate: heart rate (beat/min). Abscissa: Time (min). Each curve in the figure is the change of heart rate in individuals.

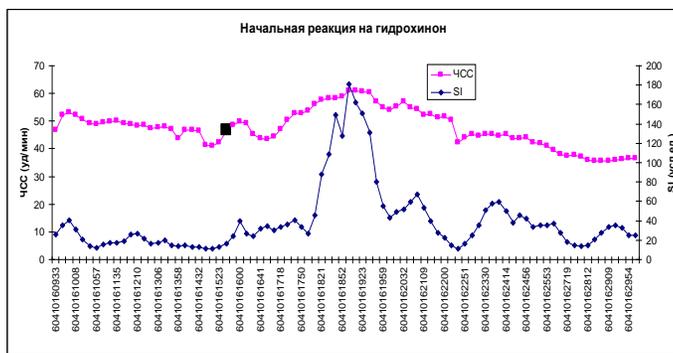


Figure 2. Change of heart rate and stress-index (SI) of crayfish to addition of hydroquinone (1g/L). Left axis: heart rate in beats/min; Right axis = SI (condition unities); bottom axis = time : year, month, hours, minutes, seconds. Black marker – time of hydroquinone addition.

(Continued from page 9)

In addition the following papers were published in 2006-2007:

Kholodkevich SV, Ivanov AV, Kuznetsova TV, Kurakin AS, Kornienko EL and Fedotov VP (2007). Fiber-optic remote biosensor systems for permanent biological monitoring of the surface waters quality and bottom sediments in the real time. ICES Annual Science Conference 17-21 September, Helsinki, Finland. p. 167.

Kholodkevich SV (2007). Fiber-optic remote biosensor systems for permanent biological monitoring of the surface waters quality and bottom sediments in the real time. SETAC Europe 17<sup>th</sup> Annual Meeting 20-24 May 2007, Porto, Portugal, P.236.

Mahnev PP, Bekrenev AV, Baklanov VS, Kholodkevich SV, Ivanov AV, Donchenko VK, Kurakin AS, Kornienko EL and Fedotov VP (2006). System of Water Supply Safety at Water Supply Stations of St. Petersburg. Water Supply and Sanitary Technique 9(1):6-16. [in Russian].

It is known that many species of freshwater crayfish have a circadian rhythm of cardiac activity (Pollard and Larimer 1977; Bojsen et al. 1997, 1999 etc.). This rhythm manifests in a higher heart rate during darker periods than in lighter ones. In our study, the diurnal cardio-activity was investigated in the crayfish *Pontastacus leptodactylus*. These animals were used as test organisms at various water quality biomonitoring stations. The experimental setup consisted of a water flow aquarium system, plethysmograph with fiber-optic cable, AD-converter and a personal computer with specialized software. This setup allows crayfish cardiac activity to be recorded through a non-invasive method and to analyze animal functional state in real time, based on their heart rate.

In different seasons, one experiment examined the effect of illumination of the aquaria containing crayfish, which changed according to the natural light conditions, and also the effect of temperature change, which ranged from 14.4°C to 21.3°C. These results were compared to another experiment where the artificial illumination was weaker and almost constant.

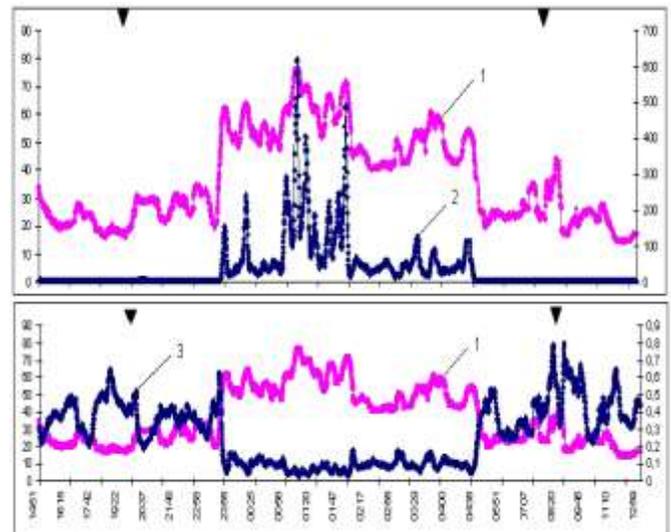


Figure 3. Example of a typical circadian rhythm of crayfish cardiac activity. *Top graph*: Normal light conditions, left axis = heart rate in beats/min, right axis = stress index in sec/u; *Bottom graph*: Artificial light conditions, left axis = heart rate, right axis = SD in seconds. Bottom axis is time in minutes. Triangles point at 8 h and 20 h of daytime. SI and SD = characteristics of variational pulsometry.

(Continued on page 11)



Table 1. Some estimates of animal material in crayfish diet.

Species	Habitat	% animal material	Zoobenthos biomass, g/m <sup>2</sup>	Density of crayfish individual/m <sup>2</sup>	Author
<i>Astacus leptodactylus</i>	Don River	49	79.2	Approximately, 0.05	Shpolyanskaya 1980; Cherkashina 2002
<i>Astacus leptodactylus</i>	Lake Katlabukh	47.7	4.03 o.	0.17	Brodskij 1981
<i>Astacus leptodactylus</i>	Don River	57.5	211	Approximately, 0.07	Cherkashina 1985
<i>Astacus leptodactylus</i>	Caspian Sea	71.8	500-1000	Approximately, 0.07	Cherkashina 2002
<i>Astacus astacus</i>	Lake Steinsfjorden	14	-	0.21	Hessen, Skurdal 1986; Hessen 1989
<i>Astacus pachypus</i>	Don River	86.1	260	-	Cherkashina 2002
<i>Astacus pachypus</i>	Caspian Sea	92.4	500-1000	0.01	Cherkashina 2002
<i>Orconectes luteus</i>	Ozark stream	19	2.0-2.2	5.6	Rabeni, Gossett & McClendon 1995
<i>Orconectes punctimanus</i>	Ozark stream	13	2.0-2.2	1.1	Rabeni, Gossett & McClendon 1995
<i>Orconectes propinquus</i>	Georgian Bay, Ontario	10.8	-	30	Saffran & Barton 1993

(Continued from page 10)

Three criteria were developed to reveal heart rate changes during “night” periods compared to “diurnal” periods:

1. the presence of heart rate increase
2. the duration of such reactions
3. the degree of heart rate increase in relation of preceding values

The variation pulsometry characteristics were used to reveal these reactions. As a rule the typical heart rate circadian rhythm was observed under illumination levels similar to the natural one (Figure 3). The break of normal rhythmic activity was observed when illumination was artificial. Seasonal diversities of heart rate and the peculiarities of heart rate circadian rhythm were found.

Circadian cardioactivity was less distinct during autumn-winter months. At this time, the break of rhythm depended on the decrease of illumination or the decrease of water temperature. It is supposed that the observation of circadian heart rate rhythm is important when the crayfish are used as test-organisms at biomonitoring stations for water quality assessment. H

Summary of Russian research was sent in by  
Valera P. Fedotov  
Scientific Research Center for Ecological Safety  
Saint-Petersburg, Russia

## What Determines the Percentage of Animal Material in Crayfish Diets?

Crayfish were referred to as detritivores/herbivores for a long period. However during the last few years of research, it appeared that animal food sources were probably more important to crayfish in nature than previously thought (Souty-Grosset et al. 2006). The research of Momot (1995) seemed to support this conclusion. The author proved that crayfish should be referred to as primary carnivores using a great

number of examples (indirect in the majority). However the  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$  values of *Orconectes* spp. were more similar to coarse benthic organic matter and filamentous green algae than to invertebrates, fine benthic organic matter and periphyton (Evans-White et al., 2001). Nevertheless, crayfish were referred to as omnivores.

I believe that if animal food is important to crayfish, there should be a positive connection between the percentage of animal material in crayfish diet and the biomass of zoobenthos invertebrates. There is also a negative correlation between the density of crayfish and the percentage of animal material in their diet. You can find all available data below (Table 1).

I calculated an average value instead of the range of the listed parameter. More often I had to analyze pictures and tables and estimate the value of a parameter by myself. In those cases I wrote “approximately” in the table. The dependence of the percentage of animal material in crayfish diets, the zoobenthos biomass and density of crayfish appeared to be rather significant. To estimate the dependency, I used the following logarithmic functions.

$$Y = 10.08 \ln B + 15.01. \quad R^2 = 0.81 \quad (1)$$

$$Y = -9.66 \ln D + 29.85 \quad R^2 = 0.69 \quad (2)$$

Where Y = percentage of animal material in the crayfish diet, B = zoobenthos biomass (g/m<sup>2</sup>) and D = density of crayfish (individual/m<sup>2</sup>).

The coefficient of determination ( $R^2$ ) appears to be rather high, which means that the line of regression is close to the results listed in Table 1. The value of  $R^2$  from the second equation can be adjusted upwards by excluding two species of small crayfish from the analysis - *Orconectes luteus* and *Orconectes propinquus*. In this case the equation looks like:

$$Y = -17.76 \ln D + 8.36 \quad R^2 = 0.80 \quad (3)$$

Mathematical equations 1 and 2 can be integrated using multiple regression. But it seems to me, that there is not enough initial information for these calculations. Everything I

(Continued on page 12)



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found is presented in Table 1. To analyze the data further, I need more initial information. I would be glad to receive some additional data about the benthos biomass, the density of crayfish and the percentage of animal material in crayfish diets to extend the table and to estimate more precise coefficients of equations 1 and 2.

I would appreciate if someone could send me that kind of data. H

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#### References

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## Advances in Crustacean Phylogenetics 2<sup>nd</sup> CIRCULAR

Dear Colleagues,

We would like to invite you to the first international symposium on Advances in Crustacean Phylogenetics. The symposium will take place from 7 - 11 October 2008 in Rostock, Germany.

We are pleased to announce that 25 high profile international speakers have affirmed their attendance. They will provide us with a broad overview of the following topics:

- (1) the place of crustaceans within arthropods,
- (2) the phylogeny of single sub-taxa and
- (3) the contribution of certain character complexes to the phylogeny of Crustacea.

These talks are scheduled to take 30 mins, plus 10 mins discussion per talk, spread over the four days. In addition, the conference is open for posters on all aspects of crustacean phylogeny. The best student posters will be awarded by The Crustacean Society.

Alongside the stimulating scientific program, there will be space and time for individual discussions and social events. On Wednesday evening there will be a river cruise to the Baltic Sea, including an excellent fish buffet. On Thursday afternoon a general poster session will be held which will be precluded by a public lecture. On Friday there will be an excursion to the newly built Ozeaneum in Stralsund, followed by a visit to a site near Stralsund where thousands of Eurasian cranes rest on their migration South.

We hope the program will tempt you to come to the historic city of Rostock to hear about and discuss with us recent Advances in Crustacean Phylogenetics.

Organizers and Venue:

Stefan Richter, Christian Wirkner, Ole Sten Møller Universität Rostock, Allgemeine & Spezielle Zoologie Universitätsplatz 2, D -18055 Rostock, Germany. Phone +49 (0)381 498-6261 FAX +49 (0)381 498-6262

Please visit our home page for further information

[http://www.biologie.uni-rostock.de/zoologie/acp\\_home.htm](http://www.biologie.uni-rostock.de/zoologie/acp_home.htm).

On behalf of the ACP 2008 organizers. H

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## Books & Multimedia

### Two New Crayfish Posters Available

Two new crayfish posters have been produced by member Chris Lukhaup and are available by contacting Chris directly at [craykeeper@hotmail.com](mailto:craykeeper@hotmail.com).

These include the "Flusskrebse" poster which contains a variety of colorful crayfish forms and the "Kansas Crayfish" poster, which was produced in conjunction with the Kansas Department of Wildlife and Parks. H



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manuscripts and submission deadlines. Organizers expect the proceedings to be published by the end of 2008.

Presentations covered many topics, including several state conservation status assessments, results from various surveys and several genetic studies. Interestingly, the understudied burrowing crayfish species were the topic of several presentations.

Presentations include the following (authors making the oral presentation are listed in bold):

1. Zachary J. Loughman. Opening remarks: a symposium on conservation, ecology, and natural history of crayfishes.
2. Jay V. Kilian, Becker AJ, Ashton MJ, Gerber JP and Stranko SA. The conservation status of Maryland crayfishes.
3. Loughman Z J and Stuart Welsh. Conservation and status of West Virginia crayfishes.
4. Tom Simon. Status of the crayfishes of Indiana.
5. Guenter Schuster and Johansen JW. Crayfishes of Alabama: What we do and don't know?
6. Christopher E. Skelton and Miller SM. History, status, and conservation of crayfishes in Georgia.
7. Stephen J. Fraley and Simmons JW. Crayfish inventory and monitoring in western North Carolina.
8. Thomas G. Jones, Swecker C and Donahue K. The crayfishes of the Ohio River.
9. Zachary J. Loughman. Ecology and conservation of Western Maryland crayfishes.
10. Roger F. Thoma and James W. Fetzner Jr. The conservation status of three rare crayfish species in southwest Virginia.
11. Casey D. Swecker, Jones TG, Donahue II. KG, McKinney DW and Smith GD. The extirpation of *Orconectes limosus* from West Virginia due to the introduction of the non-native crayfish species *Orconectes virilis*.
12. Christopher A. Taylor and Schuster GA. Status and distribution of the rusty gravedigger, *Cambarus miltus*: a case of recovery or neglect?
13. Casey B. Dillman, Wood RM and Wagner BK. Molecular systematics and biogeography of *Orconectes nana* and *Orconectes macrus*: Midget crayfish from western Ozarks.
14. Casey D. Swecker and Jones TJ. Invasive crayfishes of the New/Kanawha River system in West Virginia and a comparison of large river collection techniques.
15. Matt J. Ashton, Gerber J, Kilian JV and Becker AJ. Preliminary results of a multi-year survey to monitor *Orconectes rusticus*, a recent invader of Maryland.
16. Jacob L. Burskey and Simon TP. Effects of habitat, land-use, and water quality on freshwater crayfish (Decapoda: Cambaridae) across an agricultural gradient in west-central Indiana.
17. Shane M. Welch and Eversole AG. Differential production of *Procambarus troglodytes* across a large river floodplain in South Carolina.
18. Charles F. Walton and Cook SB. Microhabitat characterization of the Nashville Crayfish (*Orconectes shoupi*) in Mill Creek watershed, Tennessee.
19. Zachary J. Loughman. Ecology of *Cambarus (J.) dubius* in north central West Virginia.
20. Brian K. Wagner, Taylor CA and Kottmyer MD. Status and Distribution of Williams' Crayfish, *Orconectes williamsi*, in Arkansas.
21. Robert J. DiStefano, Litvan ME and Walker KJ. A recreational fishery for longpincered crayfish (*Orconectes longidigitus*) in Table Rock Reservoir, Missouri: Effects of season and environmental factors on trapping.
22. Tyler R. Black, Herleth-King SS and Mattingly HT. Efficacy of internal PIT tagging of small-bodied crayfish for ecological study.
23. Thomas G. Jones and Channell KB. Implementation of a spatial-temporal focus to predict habitat locations and distribution of *Cambarus veteranus*. H

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# Meeting Announcements

## 8th Larval Biology Symposium, Lisbon, Portugal



Dear Friends and Colleagues:

It is our great pleasure to invite you to the Larval 2008 symposium. The meeting will take place from 6 to 11 July 2008 in Lisbon, Portugal. Information on the event together with the registration form and guidelines for abstract submission, can be viewed at: <http://larval2008.fc.ul.pt/>. Please note that the website address has changed!

The website has been updated and you can find information there about the event, accommodations, social events and even practical information about life in Portugal, and Lisbon in particular.

We are also very pleased to inform you that we have 6 very attractive symposia (please see <http://larval2008.fc.ul.pt/symposia.html>), and we would like to thank all those who have agreed to organize them.

Please, keep in mind that the deadline for the abstract submission is the 30 March 2008. The deadline for the economic registration fees is 15 March 2008.

Please feel free to pass this announcement on to other members of your organization who may be interested in attending. Register today at: <http://larval2008.fc.ul.pt/registration.html>.

We are looking forward to seeing you in Lisbon. H

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## Call for papers

### IX CCDM

Torino, Italy, September 2-6, 2008

Theme: *Alien Decapods - Marine and Freshwater*

Co-chairs: Bella Galil and Francesca Gherardi

Invasive alien species are increasingly seen by scientists and policy makers as a major threat to biodiversity and ecosystem function: "Invasions ... are now widely recognized as one of the most significant components of global change, with far reaching and often harmful effects on biodiversity"

([www.eupolitix.com](http://www.eupolitix.com)). The "Jakarta Mandate on Marine and Coastal Biological Diversity", adopted by the Parties to the "Convention on Biological Diversity" (CBD), cites "invasion of exotic species" as one of the five main categories of the anthropogenic impact on marine and coastal biota ([www.biodiv.org](http://www.biodiv.org)). In the last decades, records of alien decapod species in the Mediterranean Sea, and in the peri-Mediterranean freshwater catchments, have greatly increased.

We invite abstracts for presentation on the theme, *Alien Decapods - Marine and Freshwater*, covering the full range of subject including the identity, distribution, and impact of marine and freshwater alien species, the dynamics of their invasion, and the possible means of prevention, control and mitigation.

Manuscripts of the presentations (oral and poster) will be published as the CCDM 2008 Proceedings in the monograph series "Atti di Convegni" edited by the Regional Museum of Natural Sciences of Torino. Publication is anticipated by the end of 2009.

Abstracts should be presented on a single A4 page with 2 cm margins.

Abstracts shall be submitted as Microsoft® Word files (\*.doc), the filename being surname\_abstract.doc (e.g., Smith\_abstract.doc). The surname must be the first author's. In case an author is first author in different abstracts, the surname must be followed by consecutive numbers (e.g. Smith1\_abstract.doc; Smith2\_abstract.doc; etc.).

The text should consist of: author's name (surname in bold), affiliation, mailing and email addresses. The name of the presenter must be underlined; presentation title (in bold), followed by the text (200-400 words). The Abstract submission should be left justified throughout, written in English, Times New Roman 12 pt, single-spaced, with italics reserved for species names only.

Please indicate clearly if an oral or a poster presentation are requested, the relevant session theme (with ref. to the list included in the Temporary Program), and, whether a student is the presenter.

Abstracts MUST be submitted by e-mail ([9ccdm.dba@unito.it](mailto:9ccdm.dba@unito.it)) or by fax (+39 011 2364539).

The receipt of the abstract will be acknowledged as soon as possible. The authors are kindly requested to contact the secretariat ([9ccdm.dba@unito.it](mailto:9ccdm.dba@unito.it)) in case they have no receipt notice of their abstract within 7 days after sending.

Authors are limited to two abstracts submissions as lead author whether for oral or poster presentation.

(Continued on page 15)



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- Deadline for submission of abstracts: 15 May, 2008
- Notification of authors: 15 June, 2008
- Deadline for submission of manuscripts for inclusion in the Proceedings: 31 October, 2008

Manuscripts will follow the standard international peer-review evaluation.

Oral presentations: 15 minutes long, including discussion (10 minutes for presentation, 5 minutes for discussion). Visual aids will be available: directly from PC, in form of Microsoft PowerPoint files (\*.ppt); in which case, the presentations should be placed in a CD or a pen drive; overhead projector; VHS video recordings.

Posters : Posters are limited to H 140 cm x W 90 cm. The poster session will take place on Thursday afternoon September 4, 2008 .

Student awards: Awards will be presented to the best oral presentation and the best poster presented by students. In order to be eligible for the competition, the student must be the sole or principal author, and also be the speaker at the Colloquium. A few grants (lodging at the Lingotto Campus) will also be made available. Requests of students applying for said grants will be considered on the basis of scientific merit, originality, and quality of the abstract, as well as country of origin.

Conference fees: 250.00 € (early registration, payable before 30 June 2008), 280 € (after 30 June 2008). Students 150.00 € (early registration, payable before 30 June 2008), 180 € (after 30 June 2008).

Students are requested to enclose in the registration form a declaration by their Supervisor or University stating their status.

Cancellations and refunds. Cancellations received before July 31, 2008 will be refunded 50% of the congress fee; refunds will be made after the Colloquium is held. H

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## Project IMPASSE

The project IMPASSE "Environmental impacts of alien species in aquaculture" was funded within the EU's Sixth Framework Program for Research and Technological Development in order to address the EC's need for a thorough evaluation of the potential impacts of non-indigenous species in aquaculture. Its overall goal is to develop guidelines for environmentally sound practices for the introductions and translocations in aquaculture, guidelines on quarantine procedures and risk assessment protocols, and procedures for assessing the potential impacts of invasive alien species in aquaculture and related activities.

## International conference MALIAF

Among the actions required to disseminate the knowledge accumulated in the course of the 2-year project, IMPASSE foresaw the organization of the final international conference "**Management of Alien Species for Sustainable Development of Aquaculture and Fisheries**" (MALIAF) to be hosted by the University of Florence (Italy) between 5 and 7 November 2008.

Its main objective is to present IMPASSE's results to the scientific community, administrators, and stakeholders, but also to extend the discussion on the strategies needed to develop sustainable and profitable aquaculture and fisheries across the world.

The conference will be followed by the production of a proceedings volume gathering the main talks and contributions given.

## Unique opportunity

MALIAF will provide a unique opportunity for many leading scientists engaged in research on invasive alien species to meet and share their knowledge with practitioners, stakeholders, and regulatory agencies. This will have a positive impact on the ongoing process, at the EU level, of developing regulations governing the use of alien species in human activities, including aquaculture. Specifically, MALIAF will contribute to strengthen cooperation at international, regional, trans-boundary, and local levels and to develop integrated actions to standardize guidelines or protocols for species movement, risk assessment, and quarantining. By suggesting strategies for an effective management of aquatic ecosystems and for a mitigation of the risks posed to organisms, communities, and ecosystems by alien invasive species, MALIAF will pinpoint means and opportunities that might ultimately improve the quality of life, assuring both human well-being and economic development of the society in general. H

## Contacts

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*The IMPASSE Consortium acknowledges the financial support of the European Commission, within the Scientific Support of Policies of the 6th Framework Program (contract no: 044142).*

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## IAA Related News

### Freshwater Crayfish 16 Update

March 2008

I am very happy to report that after some lengthy investigations I have managed to secure some funding towards the actual publication costs of *Freshwater Crayfish 16*. I anticipate that this volume of *Freshwater Crayfish* will be published in hardcopy, CD, and on-line formats.

At present all manuscripts (23 in total) have completed the review process, many authors have responded to the recommendations and comments from their reviewers, and have uploaded their revised manuscripts into the IAA Manuscript Submission & Tracking System (MS&T). Currently all manuscripts are going through a process of editorial review where I am checking all manuscripts for errors and any inconsistencies in formatting, prior to the production of page proofs. Some of you will have already been contacted by myself with my editorial comments, will have already responded to them, and approved your page-proofs. About nine of the 23 manuscripts are ready, or almost ready to go to press: so we are almost half-way there.

All other authors can expect to be contacted by me in the very near future and please kindly try and respond as soon as possible to my communications/editorial requests as I am anxious to ensure that *Freshwater Crayfish 16* be completed and printed in time for IAA17 in Kuopio, Finland, in August this year: but there is still much to do.

A common hold-up in the production of final page proofs is the resolution of some figures in some manuscripts, which do not meet the publication quality resolutions that have been specified. All authors please check and ensure that all images, figures, and line drawings are at 1200 dpi (or 600 dpi for color or half-tone images). Figures that do not meet these specifications will not be sent to press.

Please keep a close eye on your e-mail inbox over the next few weeks, and if you have any questions or require further information please feel free to contact me at [j.furse@griffith.edu.au](mailto:j.furse@griffith.edu.au). H

Best Regards from down-under,  
James Furse  
Managing Editor,  
Freshwater Crayfish 16

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### Dear Australian Crayfish Colleagues!

I am preparing a tour to Australia to study redclaw, yabby and marron farming. Our goal is to introduce one or two or all

of these species into Hungarian thermal waters. I am looking for partners who are ready to help us to organize visits to at least one farm of each species and find experts and specialists who might help us to get the starting knowledge for farming Aussi crays.

Thanks for your kind help in advance! H

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### All Crayfish and Lobsters to Hit Red List

In recent years, the conservation status of species has been a hot topic in both the scientific and public arena. The IUCN Red List of Threatened Species has been documenting the extinction risk of taxa over recent decades, in order to promote conservation actions. To date, this catalogue has concentrated on the better known vertebrates, but now a project being undertaken by the Zoological Society of London (ZSL), is determining the global status of a representative sample of the lesser known invertebrates, which includes the assessment of all crayfish and lobster species.

As part of the Convention on Biological Diversity (CBD), 188 Nations have committed to significantly reduce the current rate of biodiversity loss by 2010. The Red List Index (RLI) has been adopted by the CBD as one of the global biodiversity indicators by which to measure progress towards the target. It has also been selected by the United Nations as a measure for its Millennium Development Goals. By carrying out repeated Red List assessments over time, a trend in extinction risk can be obtained from monitoring the movement of species between the categories of conservation status. However, RLIs can currently only be calculated for a few fully assessed vertebrate groups which do not truly represent global biodiversity.

To remedy this, ZSL has led the development of a sampled approach to the RLI, making it more indicative of all biodiversity. The sampled approach selects species from a broad range of taxonomic groups, from vertebrates and invertebrates, to plants and fungi, for inclusion into this indicator, rather than just using data on the more well studied species such as birds. In addition to this, the sampled RLI will identify which taxonomic groups, biogeographic realms, and habitats are deteriorating most rapidly, why species are threatened, and what conservation actions are needed or already in place. The assessments and index will provide a much

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needed source of information for policy makers, resource managers, scientists, educators, and conservation practitioners, as well as the general public.

In 2007, assessments on the first invertebrate groups, such as dragonflies and corals, to be included into the sampled RLI, were carried out, and in 2008 work will commence to assess species in further groups including dung beetles, cephalopods, and, as previously mentioned, crayfish and lobsters.

Conservation assessments are based on publicly available literature, as well as field observations. Data are collated on distribution, population size and structure, habitat preferences, and impacting threats to a species and its environment, in order to apply the IUCN Red List Categories and Criteria, and determine the conservation status of it. Over the next year, a small team at ZSL will be preparing draft assessments on all crayfish and lobster species. These preliminary assessments must then be reviewed by species experts before being accepted onto the Red List. ZSL is therefore looking to the crayfish and lobster community for assistance with assessing the conservation status of these species.

At the IAA 17<sup>th</sup> Symposium being held in Kuopio, Finland in August 2008, ZSL will be holding a short introductory event on the Red List assessments and Index. Planned for the afternoon of Tuesday 5<sup>th</sup> August, ZSL will welcome any astacologists interested in helping assess the conservation status of crayfish and lobsters, and to answer any questions there may be on Red Listing or the sampled approach to the RLI. However, if there are prior queries or you are unable to attend this event but would still like to be involved with the assessment please contact Nadia Dewhurst ([nadia.dewhurst@ioz.ac.uk](mailto:nadia.dewhurst@ioz.ac.uk)).

We look forward to meeting many of you in Finland later in the year. H



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## Recently Published Reports

1. **Govedič M. (2006). Crayfishes of Slovenia: Their Distribution, Ecology and Conservation.** Life Around Us. Center za kartografijo favne in flore, Miklavž na Dravskem polju. 26 pp. [in Slovene].

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2. Dubé J. et Desroches J.-F. (2007). Les écrevisses du Québec. Biologie, identification et répartition géographique. **MRNF Direction de l'aménagement de la faune de l'Estrie, de Montréal et de la Montérégie. 73p.**

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3. Schmitt CJ, Brumbaugh WG, Besser JM and May TW (2007). Concentrations of metals in aquatic Invertebrates from the Ozark National Scenic Riverways, Missouri. U.S. Geological Survey Open-File Report 2007-1435, 23 p. with appendices.

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