

Article N°. 2 – 2024

CHELONIA SCIENCE

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20 years of IZS at Allwetterzoo Münster
and the 3rd Meier Symposium
from May 3 - 5, 2024

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The International Center for the Conservation of Chelonians (IZS) celebrated its twentieth anniversary last year. The concept of breeding highly endangered turtles as part of a joint project between a zoo and private individuals dedicated to the breeding of endangered turtles, which was unique at the time of its foundation, has developed into one of the world's most successful institutions for the conservation of Asian

turtles. This includes species whose areas of origin are not known, even a species whose area of origin is not known, even today, as it has so far only been found on animal markets. This concept thus became a model for the Citizen Science Initiative for cooperation between citizens and research institutions, just as it provided the blueprint for the Citizen Conservation Project within Europe (see <https://citizen-conservation.org>).



Fig. 1: Group picture.

Photo: P. Wagner

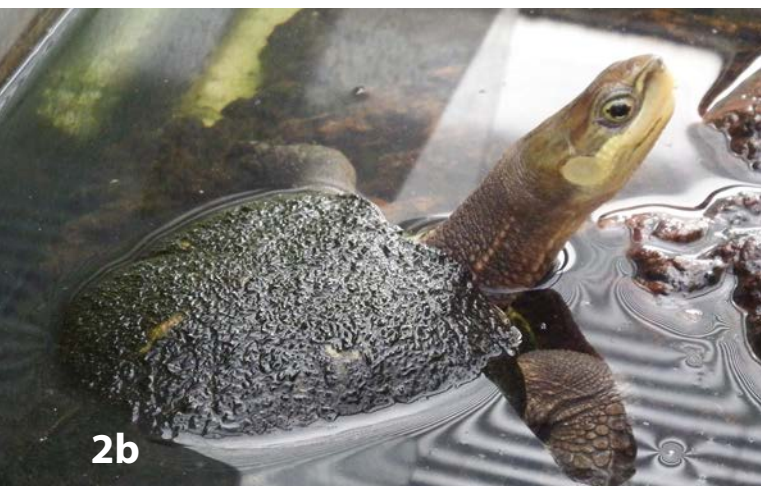


2a

Fig. 2a-c: A handful of hatchlings of *Cuora zhoui* from the IZS (a) and one of the females (b) and males (c) in their tanks at the breeding station. Photos: a: C. Langner; b,c: H.-J. Bidmon

The symposium began on Friday with a presentation by Dr. Preininger from Vienna on the conservation breeding and reintroduction of *Batagur baska*. Breeding began in Vienna in collaboration with Peter Praschag (see also DEDIEU et al., 2023). Subsequently, she provided further insights into the conservation of this species on site in now 2 breeding stations. The initially high losses of clutches due to ants and the subsequent increase in hatching rates to 62 % since 2013 with an incubation period of approx. 66 days demonstrate the successes achieved in Cambodia. There have been a total of 700 hatchlings so far. The clutches observed on site in the stations were mostly laid only after the creation of mock nests at a distance of 8 meters from the shore and about 1.75 m above the water level at ambient temperatures of 22.4°C in the more northern center and 25.4°C in the more southern location. Juvenile turtles were released and reared in ponds

located about 5 m from the natural river bank, achieving growth rates of about 1.5 kg/year. So far they have proved to be loyal to their location, as they have shown no tendency to migrate away from the ponds. However, adult wild-caught turtles fitted with transmitters showed very extensive migrations in the river courses, ultimately roaming an area of over 1300 km² at a speed of around 1.2 km/h (see also the notes on the presentation by P. PRASCHAG; BIDMON, 2022). Dr. Philipp Wagner and Heiko Werning then presented a tribute to the achievements of Ingrid & Elmar Meier with reference to the Pritchard Award presented to Elmar in 2023 for his life's work and the awarding of the Federal Cross of Merit to Ingrid and Elmar Meier in February 2024. This honour was then toasted with a specially labelled beer from a local brewery. This was followed by a cozy get-together and dinner (Fig. 3).



2b



2c

Saturday began with the regular lecture program with M. Pawlinsky and a detailed introduction to the world of pelomedus turtles and their species diversity, which unfortunately can only be proven by molecular genetics in some cases, followed by insights into the keeping and breeding of *Pelusios adansonii* by S. Nickl. Mr. O. Klawoon presented an interesting and detailed report on the keeping and breeding of *Claudius angustatus*. In particular, reference was made to the observations on the stimulation of reproduction and the incubation of clutches laid at different times. Here it was observed that the first two clutches laid in the annual cycle at the beginning of the dry season go through a diapause, which cannot be

broken by time (incubation period), but by going through a dry phase lasting 1-2 months, after which the hatching success is so far only about 33%, while with the 3rd clutch the development continues immediately after laying, whereby higher hatching rates are also achieved. It is still unknown why about 67% of the eggs in the first clutch do not develop after the diapause, but this has also led to discussions.

T. Schlichter reported on the establishment of a facility for keeping *Clemmys guttata* indoors and after the obligatory group photo (Fig. 1) and the lunch break, Elmar Meier & Christian Langner presented the twenty-year success story of the IZS, emphasizing in particular the rescue

of *Cuora zhoui* among the many other species. This is because 70% of the world population of *C. zhoui* has so far been bred in Münster (Fig. 2a-c). Mr. Werning then continued this success story by once again highlighting the project as a blueprint for the Citizen Conservation Initiative and explaining it to the audience (<https://citizen-conservation.org/>). This was followed by Mr. M. Auer, who gave two presentations on the keeping and breeding of *Cuora cycloornata annamitica* and *Cuora mccordi* (Fig. 4a, b), thus once again establishing a direct link to the species kept at the IZS. While Mr. M. Klempt presented the long-term husbandry of *Chelodina rugosa* at Tiergarten Berlin.

Fig. 3: A toast to the Pritchard Award and the Federal Crosses of Merit for Ingrid and Elmar Meier (left) and the laudators Heiko Werning (center) and Philipp Wagner (right).





Fig. 4a-b: Hatchlings of *Cuora cycloornata cycloornata* (a) and *Cuora mccordi* (b) from the IZS.

Finally, Dr. P. Wagner rounded off the lecture series with a presentation of a conservation center of the Allwetterzoos Münster on site in Cambodia (ACCB; Angkor Centre for Conservation of Biodiversity). He paid particular attention to the breeding of *Indotestudo elongata* and their release and reintroduction into the wild. The selection of areas for reintroduction, the “gentle one-year acclimatization” of the young tortoises in one of the first reintroduction sites and the involvement of the monks, which helps to focus the attention of the local population on the protection of the animals, were also highlighted. Afterward, those who wanted to stay met up for a communal meal and to talk shop. The following Sunday morning, as usual, there was a visit to the IZS breeding station itself for those

interested, as well as a presentation of the specimens kept and their numerous offspring that have seen the light of day and their future existence here since the 2nd Meier Symposium (2022) (see Fig. 2, 4-9, 12). Of course, there was also an opportunity to talk shop about the one or other special feature or phenotype of one or other species (Fig. 10-11). In this respect, it was once again a very successful event, which showed everyone the success of this project, which has now been running for just over 20 years. However, we should not forget the time that Elmar and Ingrid Meier had already devoted to this conservation breeding project in private for many years. Yes, and also those who had supported Mr. and Mrs. Meier with their help and the supply of suitable or affordable breeding animals.

Fig. 5: Those who quickly accepted the invitation to the IZS on Sunday were welcomed by a *Cuora glabrinifrons* offspring in the public entrance area to the station.





Fig. 6a-d: Offspring of *Cuora bouretti* (a), *C. picturata* (b), *C. cycloornata annamitica* (c), *C. cycloornata meieri* (d).



Nevertheless, for me at least, I often leave such successful meetings with a “laughing and crying eye”. Laughing – because they show how personal and communal (zoos) joint efforts and commitment can contribute to successfully ensuring the preservation of biodiversity, both here on site and in the natural habitats of the respective species. Yes, and because it is slowly becoming apparent that even small populations are perhaps beginning to suffer from genetic inbreeding depression less quickly than expected (DEHASQUE et al., 2024). Weeping – because it also makes us realize what we have changed for the worse through our actions, so that we are now dependent on such measures. So a few more personal thoughts on the topic and future prospects.

Final thoughts

As beautiful, well-intentioned and forward-looking as such projects are planned and managed, they are also an expression of a much more far-reaching problem, which was also expressed by the much more broadly conceived Citizen Conservation Initiative presented by Mr. Werning. For when the question arose at the end of his

presentation as to how and how many of the animals that were raised in private hands would be practically released back into the wild, since, as was expressed in most of the conservation project presentations, these were released tortoises that were raised in conservation facilities and released into the nature reserves using the so-called soft release method?



Fig. 7a-b: Offspring of *Cuora aurocapitata* (a) and an adult *C. a. dabiessani* (b).





Fig. 8a-d: One of the female (a) and male (b) *Leucocephalon yuvoni* in the breeding station and one of last year's offspring (c). This is probably the only species whose portrait adorns a beer brewed according to the German purity law in support of the IZS.

The terse answer was that this question was not asked, as it was about conservation and everything else was a problem that society had to answer. The priority is the preservation of evolutionary lines that have been developing for millions of years!

One of the participants added that it was impossible to predict the future and how everything would develop politically. Whether this attitude is correct, however, must be questioned. For one thing, species also continue to evolve (e.g. BIDMON, 2019 and the literature there), whereby even locally only those that can adapt to the changes will survive (e.g. ROTH et al., 2021; KROCHMAL & ROTH, 2023; FLEURY et al., 2024; REBER et al., 2023; MILLER et al., 2024). As good as the husbandry conditions may be, keeping animals in human care also means foregoing natural selection, which, as far as we know, is essential for survival in the wild. Yes, and moreover, this approach clearly shows us the dilemma of species conservation, because even under the most optimistic assumptions, we can only conserve very few of the species affected by decline



Fig. 9a-d: Adult breeding individuals of *C. glabinifrons*(a, b) and *C. maccordi*(c) and *C. picturata*(d) in the IZS.





10a

in this way (e.g. BERTOLERO et al., 2007). Even the recording of all species that make up a so-called “ecosystem” to which living beings are adapted is still impossible (and the hope that quantum computers will make it possible remains uncertain). Even if this is the case, it can be assumed that previously disturbed ecological niche balances will no longer be as they once were (EASTWOOD et al., 2023). In this respect, it can already be seen today that everything essentially boils down to the fact that this conservation concept can only lead to an artificial form of conservation that is socially acceptable. There are certainly good examples of how this has already been achieved in the past and has often only been realized with the help of individual committed private individuals (see e.g. BAKER & BAKER, 2014). However, societal changes also show us the problems that arise as societies restructure, so that even in this country today, politicians do not know what to do. Apart from a few conservationists, we only hear from

a few people that they consider free-living bison to be important for Germany again, as the example in Wittgensteiner Land shows us. Certainly reptiles, turtles and birds are likely to have an easier time in terms of social acceptance than big game or wolves and bears, but this also depends on what restrictions would be associated with this for some interest groups and business representatives (insect protection vs. agricultural lobby; factory plant construction vs. field hamsters or lizards, to name just

a few well-documented examples from Germany). Certainly, individual species can be propagated and preserved in appropriate facilities, but on the one hand this is probably only possible for a very limited number and on the other hand these selected species will also change, as they are subject to an artificial selection pressure defined by humans, which does not correspond to that which a living creature has to withstand in the wild. Even if we stick with turtles, individuals reared in a Headstart program do not undergo or “learn” the behaviour they need to avoid predators (e.g. CURRYLOW et al., 2017). A point that was already addressed in 2022 under the topic of “Animal culture”. If, in addition, the parent animals have been living in an artificial, protected environment for one or two generations, even the limited inheritance of appropriate protective behaviors can make the offspring less fit for life in the wild. The impressive work of ROTH & KROCHMAL cited above has shown us the effects of such



10b

Fig. 10a-b: Elmar gave the new guests lots of information on taxonomy and husbandry, which was clearly a source of pleasure.



Fig. 11a-b: The presentation of special phenotypes was also very well received by the experts.

changes (see also BIDMON, 2019; BIDMON, 2022). Of course, there may also be the reverse process, in which animals that were once bred in human care have re-established themselves in the wild, but the latter has so far mostly only been observed for relatively large mammal species. Yes, and as already mentioned above, the conditions and the conditions provided by humans in the sense of managed nature must also be right, otherwise it remains doubtful whether a society would tolerate this.

However, I myself see a far more significant problem with regard to biodiversity and species conservation, which is also caused by our own human behavior as a society in the sense of a global, responsible civil society. Of course, change is always associated with uncertainty, but it should already be clear to us today, at least in the industrialized nations, that we need to change the way we use natural resources. And I don't just mean the resources that we as humans absolutely need to live! In this respect, we are faced

with very complex tasks, with most people probably perceiving climate change as the most serious (see e.g. MURALI et al., 2023, WALDE et al., 2024). In the context of biodiversity and species conservation, however, I would like to clarify this again for everyone using a more understandable example. Species are integrated into so-called "ecosystems", which are determined by both abiotic environmental factors and biotic factors. In this respect, we lament the increasing extinction of insects as a problem





Fig. 12: Since sun and shade are an important part of artificial species conservation, this view through a futuristically patterned surface hopefully does not just point to a future electronically digitized “image existence”.

for the preservation of biodiversity, at least in this country. What has contributed to insect mortality is also known, namely the abundant use of very effective pesticides, possibly even in connection with climate change and road traffic (see also EASTWOOD et al., 2023). Yes; even modern genetic engineering in agriculture is still not only aimed at breeding higher-yielding crops, no, the main aim is to make crops more resistant to pesticides and herbicides or, as in the case of maize, more resistant to certain insects that appear as pests. However, the insects damaged by this are important components of food chains in such ecosystems, not only for birds, but also for amphibians and reptiles, which in turn are links in the food chain. However, such food chains will inevitably break down if we continue to farm in this way. This problem is well known! One way out is certainly to consistently separate agricultural land from the natural landscape formations. However, this would mean that we would need much larger nature reserves with at most

very traditional farming methods. Or we would have to abandon the extensive use of herbicides and pesticides on agricultural land, or at least drastically restrict it. However, the latest findings contradict the latter (GOLDEN-KRONER et al., 2019; Senior et al., 2024). However, as is clear to us even in our relatively enlightened society, such an approach leads to more, even life-threatening protests and disputes, forcing even the EU to withdraw certain restrictive requirements for the protection of nature and biodiversity (NAVARRO & LÓPEZ-BAO, 2024). Although even the protesters should already be able to see where “business as usual” would lead, and the further loss of natural pollinators would result in considerable additional costs, at least for fruit growers. Of course, some may think that we are doing our best and are already switching to e-mobility! Nevertheless, new problems for nature conservation are already emerging, as the associated consumption of so-called rare earths leads to more endangered species, as the mi-

ning process destroys habitats for endemic species (just as a recent example, YIN et al., 2024). Which also raises the question of where to reintroduce species whose habitats have been completely destroyed? This problem will not end with the switch from e-mobility to hydrogen, either, as we will then very likely use up the resources saved there for „even more“ social media and the expansion of AI. Yes, and ultimately we should also recognize that the conservation of species in human care consumes energy and contributes to global warming as long as we do not consistently change course and only implement the conservation of such species directly on site in the area of origin or in regions where the climatic conditions are such that no additional energy consumption is required for artificial air climatization. Fortunately, the latter is already being practiced, at least by institutional facilities, as mentioned above (see also KUCHLING, 2006; PLATT et al., 2022; DEDIEU et al., 2023; GINAL et al., 2023; NGO et al., 2023; LE et al., 2024).

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