

– Plenary presentation: Turtle and tortoise conservation –

Turtles in terrible trouble

– Global threats, conservation action, and hope on the horizon –

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Thank you, Kevin Buley and the organisers of this EAZA meeting, for inviting me to speak here at the launch of Shellshock. As a native Swede who emigrated to the US over 45 years ago, I am particularly honoured and thrilled to be here in Sweden today to address all of you, both my Swedish countrymen and the citizens of greater Europe's Zoo and Aquarium community.

I thank you all for your interest and hope that both Sweden and Europe will become leaders in this turtle campaign. Though wild turtles disappeared from Sweden more than 5000 years ago, you now have the opportunity to become leaders in saving them from their threat of extinction in the rest of the world.

So, why this growing interest in turtles and their troubles and why should we care? Looking into the large beautiful eyes of this juvenile big-headed turtle (*Platysternon megacephalum*) from Thailand evokes typical human emotions of care and concern – feelings more often associated with the larger charismatic mammalian megafauna. But these feelings work for turtles as well – and that is why the international zoo community is so ideally suited to help preserve them in their time of trouble.



Figure 1) Big-headed turtle (*Platysternon megacephalum*). Photo: Peter Paul van Dijk.

For many people, turtles represent the ideals of wisdom, patience, gentleness, and longevity. They have long played a major role in man's relationship with nature, often serving as tribal totems, revered native icons, and popular pets and symbols of nature for children and adults alike. Primitive drawings

of the Circle of Life often depict the notion that all life on earth sprang from the Mother Turtle – undoubtedly true if you believe in ancient myths and set aside modern notions of evolution. Turtles are a remarkable success story. They have a body plan that works so well that they have survived the test of time – they saw the dinosaurs come, and they saw them go. Today, however, they are experiencing a survival crisis of unprecedented severity. Millions are being harvested and traded for food and use in traditional medicines. This unsustainable trade, combined with severe habitat loss and development pressures, has pushed many species to the brink of extinction. Turtle hunters have quite literally swept entire regions clean of turtle populations, especially in Asia. The loss of these natural resources may have profound impacts on our global ecosystems as well as leaving us all the poorer for their passing.

Turtle and tortoise conservationists and scientists around the globe have come together to address this survival crisis. Individuals and organisations alike have risen to the challenge of finding solutions and turning the tide. Among the most urgently needed solutions are the establishment of successful captive management programmes, known as Assurance Colonies or Turtle Arks, for those species most critically endangered with imminent extinction, where continued survival in the wild appears most uncertain.

Playing a major role in developing these conservation solutions are those zoos and aquaria of the world where Assurance Colonies of endangered turtles and tortoises have been successfully established. In launching this Shellshock campaign, the European Association of Zoos and Aquaria is stepping to the forefront of the global effort to ensure survival of turtles and tortoises and thereby establishing itself and its member organisations as major stakeholders in the international chelonian conservation community. The effort and timing could not be more crucial as we gradually mobilise increasing resources and awareness to overcome the threats against these most gentle symbols of evolution.

The mission of all who care for turtles must be to ensure that all living species of turtles and tortoises survive and remain part of our shared global biodiversity heritage, and that no species are lost to extinction. We cannot allow turtles and tortoises to disappear on our watch.

So, why is it so appropriate to launch this campaign to preserve turtle diversity here in Sweden? Well, this is where the science of turtle diversity all started with Sweden's own Linnaeus in the mid-1700's describing the very first few species of turtles known to science. Since then, the diversity of known turtles worldwide has expanded considerably, and we now recognize over 300 species and subspecies of turtles and tortoises.

Among the very first species described by Linnaeus was the Brazilian yellow-footed tortoise (*Geochelone denticulata*), a popular terrarium animal. This species is increasingly threatened by rapidly advancing destruction of its jungle habitat, an increasing international pet trade, and accelerating local subsistence consumption. Any tortoise found in the jungle is a tortoise collected – eventually there will be no more tortoises in the jungles.

Neotropical slider turtles (*Trachemys* spp.) are ubiquitous and popular as pets and laboratory animals, with overwhelming numbers from large commercial breeding farms being sold internationally in the pet trade and also entering the food trade. Often abandoned in exotic environments when no longer wanted as pets, these turtles have become invasive species of increasing concern around the world. An Australian snakeneck turtle (*Chelodina* sp.) still undescribed by science demonstrates that in order to get ahead it really does have to stick its neck out. Its only current threat is lack of focused conservation effort because it does not yet have a formal scientific name – effective conservation depends on adequate taxonomy.

The North American desert tortoise (*Gopherus agassizii*) is a species threatened by habitat destruction, pet collection, wildfires, invasive alien plants, and respiratory disease caused by the reintroduction of sick captive animals into wild populations.

The pig-nosed turtle from New Guinea (*Carettochelys insculpta*) is now the latest species to see huge numbers of hatchlings appear in the international pet trade, especially in Asia. As a member of a monotypic and ancient turtle family it represents major biodiversity value and warrants careful protection from unsustainable trade.

The Roti Island snake-neck turtle (*Chelodina mccordi*) from Indonesia, an isolated endemic from a tiny island, occupies very limited habitat and has become commercially extinct from collection for the international pet trade in the ten years since its description as a new species. Sometimes new taxonomy increases the risk of exploitation for a species as everyone wants to have the latest and rarest species in captivity. Fortunately, Assurance Colonies of this species are already in existence and its continued survival may well depend on private turtle keepers and zoos around the world.

The plowshare tortoise, or angonoka (*Geochelone yniphora*), from Madagascar, is one of the rarest of all turtle species. Known only from a tiny geographic range it owes its continued existence to *in situ* captive breeding efforts and habitat protection, but continues to be threatened by the international pet trade, including the theft of captive-raised animals entering the trade illegally.

The western swamp turtle (*Pseudemydura umbrina*) from Australia, is also one of the rarest of all turtle species, its population in the wild was down to less than a hundred animals when captive breeding efforts by a single devoted individual (Gerald Kuchling) led to a gradual restoration of the population. The survival of this species is a testament to the power each of us has to make a difference if we really care.

The Yangtze softshell (*Rafetus swinhoei*) from Vietnam and southern China, is among the largest and rarest turtles in the world, known from only about five living specimens and only a few dozen skeletal remains. One animal lives alone in Hoan Kiem lake in downtown Hanoi where it is revered by the local people. Possible breeding partners are present in a couple of Chinese zoos, but so far no efforts have been made at captive breeding.

And finally, Lonesome George, the rarest turtle of all – the only survivor of its race, the Abingdon Island Galapagos giant tortoise (*Geochelone nigra abingdoni*). It is at once both a symbol of our failure to prevent its eventual extinction yet also a symbol of the major success in the Galapagos by the National Park and Charles Darwin Research Station to save most of the races of Galapagos tortoises from extinction, many saved through the use of Assurance Colonies and reintroductions into the wild. Here is one of the true success stories in the concept of captive care and breeding leading to improved survival in the wild.



Figure 2) Abingdon Island Galapagos giant tortoise (*Geochelone nigra abingdoni*). Photo: Anders G.J. Rhodin.

So far I have focused on a few of the rarer and more charismatic turtles. I would like now to discuss briefly how all the rest are doing, and for that I turn to the IUCN Red List of Threatened Species. This list forms the basis for the international categorisation of threatened status of species and as such provides part of the scientific support for proposed conservation efforts to protect species and their habitats.

So, how are turtles in general doing in terms of their threatened status? About thirty years ago there were very few species considered Endangered, Threatened, or even Listed by the IUCN. Since then there has been an alarming and rapid rise in the number of species becoming Threatened and Endangered. The world is facing a global turtle survival crisis of unprecedented proportions. As of the 1996 Red List 40% of the world's turtles were Threatened. By 2002 the number of Threatened turtles had grown to over 50%, with nearly 30% Endangered or worse.

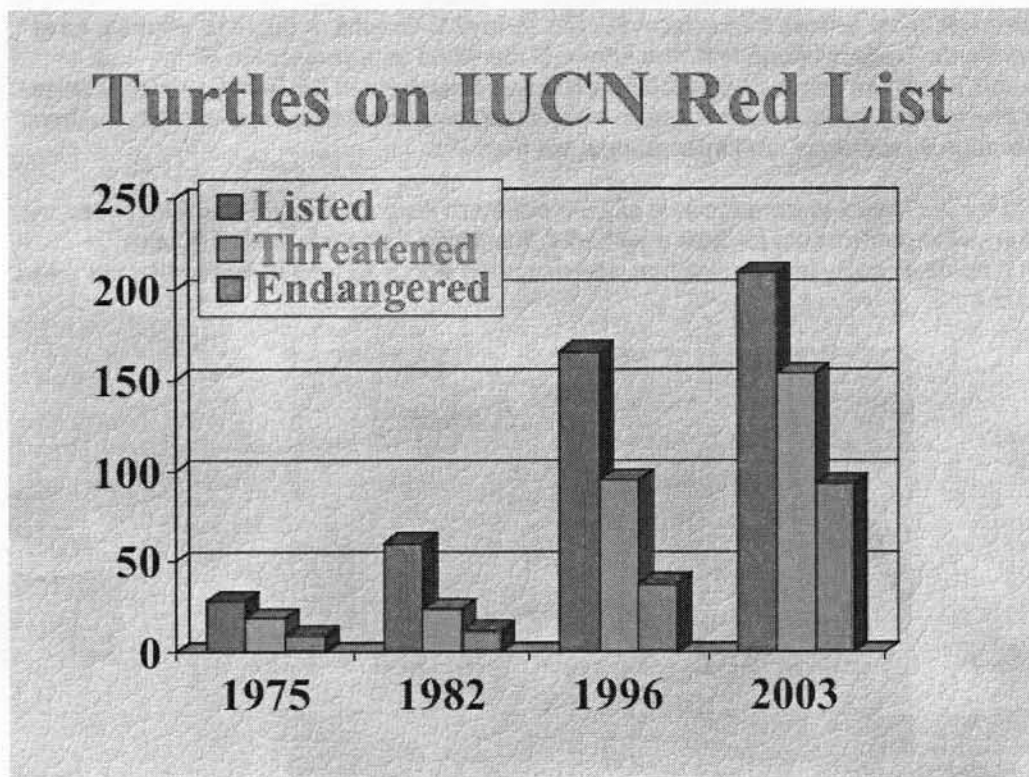


Figure 3) Turtles on the IUCN Red List.

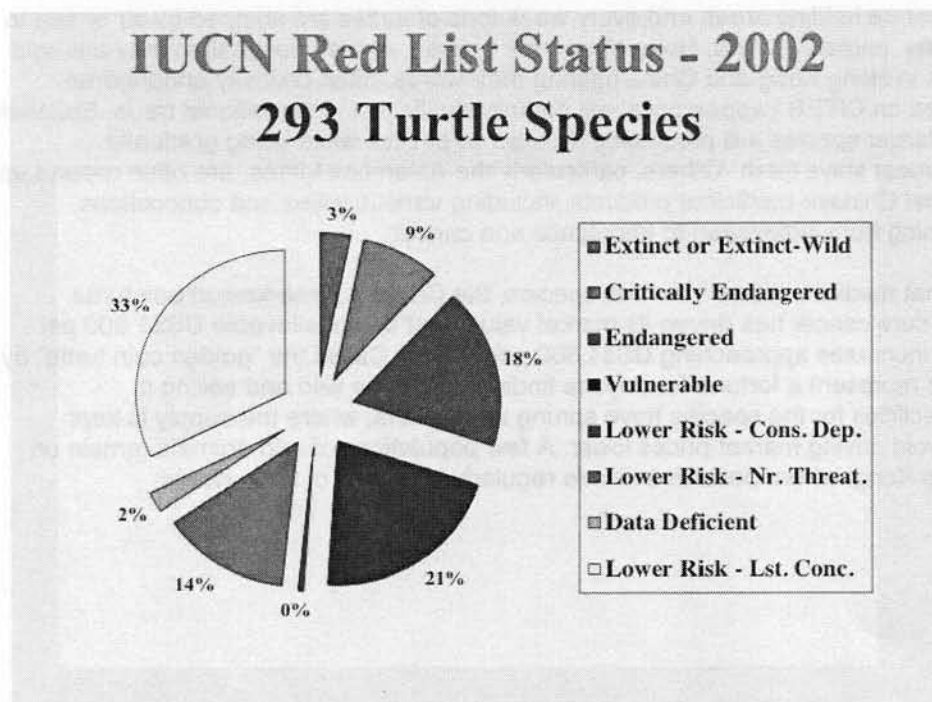


Figure 4) Status of turtles on the IUCN Red List.

As we look at Man's track record since the 1500's in terms of turtle species already Extinct or on their way towards oblivion, in what might be called an "Extinction Row" (much like a "Death Row"), we see that nine taxa have already disappeared forever, with many others at major risk of ending up the same way. The mission of all who care for this planet and its turtles must be to ensure that all living turtles and tortoises survive and remain part of our shared global biodiversity heritage, and that no more are lost to extinction.

What then is the single most serious threat facing turtles today? Without a doubt, it is what we have termed the Asian Turtle Trade. Though first and foremost identified as a problem in China and Southeast Asia, this is now an increasing problem spreading elsewhere in the world as well. Turtles are facing an overwhelming threat from a massive trade in turtles destined for local and international food markets, traditional medicines, and international pet markets.

Huge numbers of turtles collected from the wild all over southern Asia are bought and processed by middlemen brokers who gather them for bulk shipments, like these Asian box turtles (*Cuora amboinensis*) in a holding facility in Sumatra that was exporting about 25 tons of live turtles per week to China and East Asia.



Figure 5) Asian box turtles (*Cuora amboinensis*). Photo: Chris Shepherd.

Species are kept in separate holding areas and every week tons of turtles are shipped by air or sea to markets across East Asia, primarily China, Hong Kong, and Taiwan. At their destination they are sold in markets, with dealers in Hong Kong and China offering their wares, often critically endangered Asian turtles, many listed on CITES I appendices and completely illegal in international trade. Softshell turtles and most of the larger species are processed for food, kept alive while being gradually butchered so that their meat stays fresh. Others, particularly the Asian box turtles, are often ground up and turned into traditional Chinese medicinal products, including various jellies and concoctions believed to cure everything from indigestion to impotence and cancer.

The unfounded belief that medicine made from one species, the Chinese three-keeled box turtle (*Cuora trifasciata*), can cure cancer has driven its market value past an unbelievable US\$1,000 per live animal, with recent increases approaching US\$1,500 per animal. Called the "golden coin turtle" by Chinese, it has come to represent a fortune for anyone finding one in the wild and selling it. Commercial breeding facilities for the species have sprung up in China, where the supply is kept under tight control to avoid driving market prices lower. A few populations of wild animals remain on private property in Hong Kong, where poachers invade regularly in search of turtle riches.



Figure 6) Chinese three-keeled box turtle (*Cuora trifasciata*). Photo: Lee Kwok Shing.

Our analysis of the Asian Turtle Trade in 1999 measured it at over 15,000 tons of turtles annually, or ca. ten million turtles annually, or ca. 30,000 animals per day. These volumes cannot be sustained, especially for turtles, where the biological parameters of delayed sexual maturity, long life, and relatively low reproductive output with high juvenile mortality render population recovery highly difficult. Turtle populations simply cannot withstand these levels of exploitation pressure.

So, what can we do about this problem and what has been done? Through concerted conservation action, there *is* hope on the horizon.

At a remarkable meeting in Cambodia in 1999 we gathered together a relatively small group of turtle and trade experts from the Asian region and analysed the extent of the Asian Turtle Trade. The meeting became the catalyst for regional and global conservation efforts over the ensuing years and has led us through a series of concerted conservation actions, reaching all the way here to Sweden and the European zoo community's Shellshock campaign.

First, we produced and published our findings, disseminating the information through the Chelonian Research Foundation and TRAFFIC. This document (Asian Turtle Trade, Chelonian Research Monographs No. 2, edited by Van Dijk, Stuart and Rhodin) has served as the basis for much of the action that has followed. Efforts at solutions have been global and cooperative, with input from many organisations.

Central among those have been efforts by the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG), of which I am honoured to be Co-Chair, to help develop a shared vision and foster cooperation between many of the larger organisations – including IUCN, CITES, TRAFFIC, Wildlife Conservation Society, and Conservation International. Through these joint efforts we have gained increased monitoring and partial control of the Asian turtle trade through improved CITES listings and helped foster increased cooperative approaches to these problems through new conservation partnerships.

We have worked closely with CITES and IUCN to help improve international trade protection and with range countries to improve national protection and monitoring. As a result of these and other efforts, at the most recent CITES Conference of the Parties, over twenty additional species of Asian turtles were added to Appendix II to help monitor and control that trade, and currently several more Asian species are being considered for Appendix II status at the upcoming CITES meeting in October 2004.

My own organisation, Chelonian Research Foundation, has played a central role in helping to publish and disseminate conservation-relevant turtle research and has also provided significant philanthropic support for worthy conservation-related turtle research, as well as helping to foster cooperation and providing support for new turtle conservation partnerships.

A second major turtle meeting focused on potential solutions for the Asian turtle trade was held in the USA at the Fort Worth Zoo in 2001 under the guidance of the Captive Breeding Specialist Group

(CBSG) as well as the TFTSG. This seminal meeting led to the formation of the Turtle Survival Alliance, a unique and broad-based association of independent captive care facilities, including private individuals and zoos. The mission of the TSA is to develop and maintain Assurance Colonies of endangered turtle species to provide maximum future options for the recovery of wild populations. The TSA has active organisations both in the USA and here in Europe, where several members are in attendance here at these meetings.

To further help mobilise efforts for turtle conservation and to forge a partnership approach to funding and strategy, a couple of years ago several of us also helped found the Turtle Conservation Fund, which I am honoured to chair.

The TCF was created as a partnership initiative between Conservation International, the TFTSG, and the TSA, to serve primarily as a new funding and strategising mechanism for global turtle conservation efforts focused exclusively on tortoises and freshwater turtles. The TCF was created to provide a framework for developing working partnership alliances with a broad variety of associated and collaborating independent partners.

The mission of TCF is to ensure that no species of tortoise or freshwater turtle becomes extinct and that sustainable populations of all species persist in the wild. The mission of TCF will be achieved through facilitation and funding of coordinated global turtle conservation initiatives, including strategic partnership alliances and directed conservation action. This will include support for *ex situ* captive breeding and management programmes both in-range and out-of-range, *in situ* protection and management of native populations, field-based conservation biology and applied research, field and trade surveys, threatened status and regulatory needs determinations, protected areas evaluations and development, and capacity building and other conservation endeavors as needed.

The TCF has published a Global Action Plan which outlines our shared vision for turtle conservation needs. We have placed our focus first on Preventing Imminent Extinction of the 75 most Critically Endangered species. These include among others two Malaysian turtles: the painted terrapin (*Callagur borneoensis*), surely one of the most exquisitely beautiful turtles in the world; and the river terrapin (*Batagur baska*), extirpated from its primarily estuarine and river habitats.



Figure 7) Painted terrapin (*Callagur borneoensis*). Photo: Dionysius S.K. Sharma.

Our strategy consists of three primary components with broad overlap between them. The first is the development and maintenance of Assurance Colonies. This is the focus of the TSA as well as other captive care organisations, including EAZA. The second component is the conduct of conservation biology studies and associated endeavors. This is the focus of CI and TFTSG, as well as multiple other academic and science-based organisations. The third component is the critical task of capacity building. This needs to be the focus of all organisations, including CI, the TSA, the TFTSG, and EAZA and others.

The first component is the establishment of Assurance Colonies (or Turtle Arks), essentially captive management of endangered species in a global network of inter-related breeding colonies established *ex situ* both in range countries (such as the turtle conservation facility in Vietnam's Cuc Phuong National Park) and out-of-range (such as private sector breeding facilities in the USA and Europe).

The second component is to perform the basic biological research necessary for effective conservation assessment. This includes status surveys, ecology, reproduction, conservation systematics and genetics, and threats determination, among others. Partnerships with academic institutions and science-based conservation organisations are particularly important in this area.

The third and ultimately most important component is capacity building in all its broadest aspects. This essentially involves field management plans, including trade monitoring, illegal trade confiscations, rescue and rehabilitation centers, turtle farming, relocation and repatriation, trade regulations and enforcement, and protected areas identification, development, establishment, and maintenance. It is here where we must ultimately make the greatest difference in helping to stimulate and support sustainable turtle conservation endeavors. It is also the area most in need of broad-based partnership efforts between multiple members of the international chelonian conservation community.

Here in Europe there is certainly hope on the horizon for turtles. At the Allwetter Zoo Munster and its International Center for Conservation of Turtles you have created a world-class turtle assurance colony focusing on rare Chinese box turtles. The facility and its organisation are inspirational as models for others wishing to follow suit. At the Durrell Wildlife Conservation Trust you have long focused on maintaining and breeding rare turtles, including your Madagascar-based facility for angonoka tortoises. At Rotterdam Zoo you have demonstrated leadership in the support of turtle conservation efforts, and at TSA Europe you are forging new partnerships between private turtle keepers and larger organisations. And now, here in Sweden, EAZA is launching its Shellshock campaign, as your powerful and broad-based organisation lends its support and influence to the international chelonian conservation community. I can feel the tide turning for turtles in trouble – with your help and support I know we can accomplish our goals.

So, where do we go from here? What are our goals and how do we achieve them? What principles and guidelines do we follow in our effort to help preserve turtles of the world? I see several simple principles as the foundation for how our conservation community needs to move forward and improve the survival status of turtles.

- First, we need to Facilitate Research. Without basic data we struggle in the dark – science-based knowledge drives effective conservation and validates our concerns.
- Second, we must Promote Communication. Without publishing or otherwise disseminating our knowledge we achieve no effective impact from our research efforts.
- Next, we must Encourage Education. Without teaching and sharing our knowledge our message fails to grow and our conservation community remains small.
- In addition, we must Improve Capacity. Without empowering those most closely involved at the community level we fail to capitalise on our knowledge base and we fail to expand our conservation community where it matters most.
- Most importantly, we need to Develop Shared Vision. Unified purpose and concerted action with common goals will allow us to grow our conservation community and succeed in our efforts to promote turtle conservation.
- To achieve this, we need to Foster Cooperation. There is increased strength in growing numbers of people and organisations working together.
- And finally, we need to Forge Partnerships. Our efforts to promote turtle conservation will be most successful if we develop working partnerships among the many participating organisations engaged in the international chelonian conservation community. By working together we can successfully achieve improved conservation status for the species in our charge and turn the tide of this turtle survival crisis. In this we must not fail.

Our long-term vision must be the preservation of natural populations of turtles and tortoises for future generations to enjoy. These gentle jewels of evolution must not be allowed to pass into the dustbin of history. It is our solemn duty to endeavor to preserve them and their wildness, like these primeval giant tortoises in the mist on the crater rim of Volcan Alcedo in the Galapagos, as our lasting legacy to the future.



Figure 8) Tortoises in the mist. Photo: Peter C.H. Pritchard.

I close, as I am wont to do, with a personal poem about turtles and conservation as an inspiration for all of us to work together for turtles.

*Ancient chelonians of lineage primeval
Their survival now threatened by man's upheaval*

*We gather together to celebrate our perception
Of turtles and their need for preservation and protection*

*For turtles forever to play their part ecological
To prosper and maintain their diversity biological*

*For turtle and tortoise, terrapin and kin
Their kind to preserve, their future to win*

*We must work together, I tell you from the heart
Whether we work together, or apart.*