

A Global Action Plan for Conservation of Tortoises and Freshwater Turtles

Strategy and Funding Prospectus 2002–2007



PRESENTED BY THE
Turtle Conservation Fund



A PARTNERSHIP INITIATIVE OF
CONSERVATION INTERNATIONAL / CENTER FOR APPLIED BIODIVERSITY SCIENCE,
IUCN/SSC TORTOISE AND FRESHWATER TURTLE SPECIALIST GROUP,
AND IUCN/SSC TURTLE SURVIVAL ALLIANCE



IN ALLIANCE WITH

WILDLIFE CONSERVATION SOCIETY, CHELONIAN RESEARCH FOUNDATION, FORT WORTH ZOO, ISLAND FOUNDATION, NANDO PERETTI FOUNDATION, SAVANNAH RIVER ECOLOGY LABORATORY, DISNEY WILDLIFE CONSERVATION FUND, ROTTERDAM ZOO, COLUMBUS ZOO, CLEVELAND ZOOLOGICAL SOCIETY, FRANKEL FAMILY FOUNDATION, DAYTONA REPTILE EXPO, KADOORIE FARM AND BOTANIC GARDEN, AMERICAN ZOO AND AQUARIUM ASSOCIATION/CHELONIAN ADVISORY GROUP, DURRELL WILDLIFE CONSERVATION TRUST, MELBOURNE ZOO, EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA, EUROPEAN STUDBOOK FOUNDATION, REPTILES MAGAZINE, ZOO ATLANTA, CHELONIAN RESEARCH INSTITUTE, INTERNATIONAL CENTER FOR CONSERVATION OF TURTLES/MÜNSTER ALLWETTER ZOO, IUCN—THE WORLD CONSERVATION UNION/SPECIES SURVIVAL COMMISSION

Turtle Conservation Fund (TCF) TCF Alliance Partners



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Kurt A. Buhlmann (Executive Director, TCF), Conservation International / Center for Applied Biodiversity Science, 1919 M Street NW, Suite 600, Washington, DC 20036 USA (803-725-5293; 202-912-1352; k.buhlmann@conservation.org; www.conservation.org) and Anders G.J. Rhodin (Chair, TCF), Chelonian Research Foundation, 168 Goodrich Street, Lunenburg, MA 01462 USA (978-582-9668; RhodinCRF@aol.com; www.chelonian.org).

The Turtle Conservation Fund is a partnership initiative between:

Conservation International / Center for Applied Biodiversity Science (www.conservation.org; www.biodiversityscience.org), IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (www.iucn.org; www.chelonian.org), and IUCN/SSC Turtle Survival Alliance (www.turtlesurvival.org).

Turtle Conservation Fund (TCF)



MISSION STATEMENT

To ensure that no species of tortoise or freshwater turtle becomes extinct and that sustainable populations of all species persist in the wild.

STRATEGY STATEMENT

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 programs 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.

Because they are still living, turtles are commonplace objects to us; were they entirely extinct, their shells—the most remarkable defensive armor ever assumed by a tetrapod—would be a cause for wonder.

— Alfred Sherwood Romer



A subadult angonoka tortoise (*Geochelone yniphora*) in conservation custody. This is the world's rarest tortoise species, restricted to a small area in the Baly Bay region of northwestern Madagascar. Photo by L.L. Smith. This species is almost entirely dependent on continued coordinated conservation action to prevent its extinction.

Cover photo: A wild adult elongated tortoise, *Indotestudo elongata*, from the tropical forests of Thailand. Photo by P.P. van Dijk. This species still occurs in reasonable numbers in some forests in Southeast Asia, but is being increasingly harvested for the international consumption trade destined primarily for East Asia.

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INTRODUCTION

The world's 300 living tortoise and freshwater turtle species¹ are an evolutionary success story (if we include subspecies, there are nearly 460 different kinds). Turtles and tortoises have existed for nearly 300 million years, since the Triassic Era, long before many dinosaurs walked the Earth. Turtles and tortoises have evolved a remarkable body armor that has remained relatively unchanged through evolution, and while other vertebrate species have arisen and subsequently gone extinct, the basic body form of the turtle shell has remained an obvious testament to the success of turtles and their ability to survive millions of years of natural selection pressures. However, the previously successful survival adaptations of turtles, including delayed sexual maturity, high juvenile mortality, and a long adult life-span with low natural mortality, have left turtle populations vulnerable to new, potentially devastating threats posed by human exploitation and development-related pressures.

Turtles and tortoises are major biodiversity components of the ecosystems they inhabit, often serving as keystone species from which other animals and plants benefit—desert and gopher tortoises in North America, giant river turtles in the Amazon basin of South America, pig-nosed turtles in Australia and New Guinea, giant tortoises in the Galapagos and the Seychelles, flapshell and softshell turtles in Asia—all represent major resources of their environments and participate in the web of interacting and co-dependent species that constitute a healthy functioning ecosystem. Without turtles and tortoises, those ecosystems would gradually degrade in ways still incompletely understood, and suffer from the loss of biodiversity. No turtle species should be lost to extinction, as none are expendable or unimportant.

Increasingly, however, human activities are endangering many turtle and tortoise species while driving others into extinction. We are the problem, but we must also be the solution. The conservation initiative presented here is a major new step in our on-going efforts to protect and manage turtles everywhere—a global action plan to create an inclusive partnership network of existing turtle conservation organizations that will work together to take responsibility for developing, supporting, and implementing the solutions necessary to forestall the present **global turtle survival crisis**. Without such concerted conservation action many of the world's turtles and tortoises will become extinct within the next few decades and we will have lost forever these remarkable, unique jewels of evolution.

¹ Sea turtles are not included in this Action Plan as many other conservation organizations already focus concerted efforts on their protection and management. So-called “freshwater turtles” also include non-tortoise species that live on land (e.g., box turtles) or in brackish estuarine habitats (e.g., diamondback terrapins).

THREATS TO TURTLE AND TORTOISE SURVIVAL

Turtles are in terrible trouble — throughout the world they are threatened by a plethora of problems to which they are succumbing. They are being collected, butchered, eaten, and traded in overwhelming numbers. They are used for food, pets, traditional medicine — eggs, juveniles, adults, body parts — all are exploited indiscriminately, with no regard for sustainability. Their habitats are being increasingly fragmented, destroyed, developed, and polluted. Populations are shrinking. Species worldwide are threatened and vulnerable, many are critically endangered, others teeter on the very edge of extinction, a few have already been lost forever.

Survivors of countless eons, turtles in our new millennium face imminent demise at the hands of humans. We are facing a turtle survival crisis unprecedented in its severity and risk. Without intervention, countless species will be lost over the next few decades. We must work together now to save these creatures that we care for so passionately. We must work for the survival of turtles throughout the world, help each other understand the risks and threats turtles face, define the survival and conservation objectives to which we must aspire, and develop the successful strategies and alliances that can help us reach those goals.

Our legacy must be that we succeed in preserving the diversity of turtles with whose care we have been entrusted. Our responsibilities emanate from the privilege we enjoy in sharing this world and its habitats with other creatures who have evolved, as we have, to grace this planet with a most extraordinary diversity of life. We must not lose any of that biological diversity, but instead celebrate and preserve it, and defend the inherent right to continued existence for all species of turtles.

Of all the threats that turtles face, the most urgent is the uncontrolled and overwhelming trade for food and traditional medicine in many parts of Asia. Imports of turtles to southern China from the



Many hundreds of adult southeast Asian box turtles (*Cuora amboinensis*) in a holding pen in Medan, Sumatra, Indonesia, awaiting international export to the food and Traditional Chinese Medicine markets of East Asia, representing an average day's volume in the trade of this species at this site, September 1999. Photo by C.R. Shepherd/TRAFFIC Southeast Asia.



Left: Interior of warehouse in Medan, Sumatra, Indonesia, where thousands of live turtles have been packed and await immediate export via air cargo to East Asian markets in September 1999. Photo by C.R. Shepherd/TRAFFIC Southeast Asia. The volume of turtles in the recent Asian Turtle Trade has been staggering, with about 15,500 metric tons exported annually from Indonesia, Bangladesh, Thailand, Malaysia, and Taiwan, representing ca. 10.3 million average market-sized adult turtles (1.5 kg each) annually, or 28,300 turtles per day. This huge volume of trade is unsustainable and has led to a series of population collapses as regional turtle stocks have been decimated.



Left: Turtle dealer in a market in Hong Kong offering live Asian box turtles (genus *Cuora*) for sale for food or Traditional Chinese Medicine, holding up an adult yellow-margined box turtle (*Cuora flavomarginata*), with many Chinese three-striped box turtles, “golden coin turtles” (*Cuora trifasciata*), and other turtle species, eels, and crabs in cages at his feet. Photo by A.G.J. Rhodin. **Right:** Turtle seller at Ching Ping market, Shenzhen, China, with several crates of turtles, including elongated tortoises, *Indotestudo elongata*, a CITES-listed species probably illegally imported. Photo by M. Lau.

Southeast Asian region have been measured in tons of live turtles per day, with more than 10 million individuals traded per year (see *Asian Turtle Trade*, edited by P.P. van Dijk, B.L. Stuart, and A.G.J. Rhodin, 2000, *Chelonian Research Monographs* No. 2). All species of turtles in Southeast Asia are traded, with indiscriminate exploitation of all accessible populations. This has resulted in severely depleted and extirpated populations near the consumer source in China, and ever-widening ripples of non-sustainable harvest reaching deep into all surrounding Southeast Asian regions and now even beginning to impact turtles in North America, Africa, Europe, and elsewhere.

Even turtles in the United States are being affected to a lesser degree by this global Asian Turtle Trade, with hundreds of thousands of adult and hatchling softshell and snapping turtles exported from the USA to food markets in China during the last decade, as well as over 8 million hatchling red-eared sliders during the same time period. Additionally, large numbers of North American turtles are sold for food in Chinese communities across the USA and Canada.

Further, throughout the world, turtle habitats are being extensively degraded, destroyed, fragmented, and developed, and where they still exist in reasonable populations turtles are being subjected to subsistence hunting as well as collection for regional (bushmeat trade) and international consumption markets, in addition to the growing international pet trade (see *Turtle Conservation*, edited by M.W. Klemens, 2000, Smithsonian Institution Press). In Africa and South America these are the primary threats, as the ripples from the Asian Turtle Trade do not yet appear to have reached those areas in a major way. In North America and Europe the threats facing turtles and tortoises are primarily those of development, habitat destruction and fragmentation, as well as pet trade collection. Increasingly, turtles in developed areas and elsewhere are also being affected by more insidious human-caused threats, including invasive alien species, chemical and hormonal pollution, gradual global warming (affecting temperature-dependent sex determination and habitat stability), and various illnesses due to introduced pathogens, such as the Upper Respiratory Tract Disease affecting North American desert tortoises.



Hundreds of adult Malaysian giant turtles (*Orlitia borneensis*) in a holding pen in Medan, Sumatra, Indonesia, awaiting international export to the food and Traditional Chinese Medicine markets of East Asia. Photo by C.R. Shepherd/TRAFFIC Southeast Asia.

TORTOISE AND FRESHWATER TURTLE CONSERVATION EFFORTS

Many individuals and organizations have worked long and hard to achieve conservation goals for various turtle and tortoise species. The IUCN—The World Conservation Union/Species Survival Commission established separate Tortoise and Freshwater Chelonian Specialist Groups in 1980, and merged them in 1987 into a combined IUCN/SSC



Tortoise and Freshwater Turtle Specialist Group (TFTSG). The TFTSG has been responsible for producing and revising threatened status determinations for all tortoise and freshwater turtle species according to the IUCN Red List criteria. (The IUCN Red List Criteria are described at www.redlist.org—all conservation status designations in



this document derive from the IUCN Red List, which is considered the standard source for such information). In addition, the TFTSG has been proactively engaged in population status determinations for CITES (Convention on International Trade in Endangered Species of Fauna and Flora) recommendations for regulations for species threat-



ened by international trade. In 1989 the TFTSG published the first *Action Plan for Tortoise and Freshwater Turtle Conservation*. Partially as a result, many ecologists, biologists, and conservationists have gradually focused increasing attention on research into life history traits and conservation needs of turtles and tortoises and the literature on these topics has grown almost exponentially over the last few decades.

As a response to this surge of information, and recognizing the global need for improved professional communications and the need for a focused respected forum for publishing turtle-related research, in 1993 Chelonian Research Foundation (CRF) founded the world's premier international professional peer-reviewed scientific journal focused exclusively on turtle and tortoise research, *Chelonian Conservation and Biology* (CCB), which has grown steadily in content and scope. As a response to the increasing needs to publish both longer research contributions, as well as shorter time-sensitive notes and field reports, CRF subse-

quently established *Chelonian Research Monographs* (CRM) in 1996 and *Turtle and Tortoise Newsletter* (TTN) in 2000. In addition, CRF has been active in support of turtle research through an annual small grants awards program established



in 1992, the *Linnaeus Fund*, which has funded many field-based, academic, and applied conservation studies.

A few other publications are also focused exclusively on turtles and tortoises, though most are non-peer-reviewed and/or semi-popular. These include: *La Tortue*, an eclectic and in-depth semi-popular French-language glossy magazine produced by Editions SOPTOM in France; *Manouria*, a French-language journal produced by CITS and A Cupulatta; *Emys*, a German-language journal produced by Schildkröten Freunde Österreich; *The Tortuga Gazette*, the newsletter of the California Turtle and Tortoise Club; *Testudo*, the journal of the British Chelonia Group; and *Marine Turtle Newsletter*, an independent peer-reviewed journal (distributed by CRF) focused exclusively on sea turtles. Other regional newsletters focused on turtles and tortoises also exist and help play a vital role in the dissemination of information and development and support of a network of informed scientists, turtle enthusiasts, and conservationists.

Numerous other organizations focusing on various aspects of tortoise and freshwater turtle conservation have been created worldwide over the last several decades. These organizations focus either on some particular geographic region, a particular species of concern, rescue and rehabilitation work, turtle research, captive care, or grassroots conservation efforts and advocacy. These organizations have become the gradually strengthening backbone of the global turtle conservation community, creating increased visibility and prominence for turtles and tortoises in the international conservation arena. Without their prior and present efforts, initiatives such as this Turtle Conservation Fund may never have materialized. Their on-going and continued efforts and support will be central to the success of future turtle conservation endeavors. Examples of these organizations include the following: Gopher Tortoise Council, University of Georgia's Savannah River Ecology



Laboratory, SOPTOM—Village des Tortues (France), Chelonia Institute, Chelonian Research Institute, AZA Chelonian Advisory Group, Desert Tortoise Council, Desert Tortoise Preserve Committee, Tortoise Reserve, Asian Turtle Consortium, Turtle

Recovery Program, British Chelonia Group (UK), California Turtle and Tortoise Club, Belzer Turtle Conservation Trust, Centre de Reproducció de Tortugues de l'Albera (Spain), CITS/SIGS (Switzerland), A Cupulatta (France), Federation Francophone d'Etude, d'Élevage et la Protection des Tortues (France), Centro CARAPAX (Italy), Deutsche Gesellschaft für Herpetologie und Terrarienkunde (Germany), Schildkröten Freunde Österreich (Austria), American Tortoise Rescue, Home For Wayward Turtles, Memphis Zoo, New York Turtle and Tortoise Society, Programme S.O.S. Sulcata (Senegal), Cuc Phuong Turtle Conservation Project (Vietnam), Madras Crocodile Bank Trust (India), Charles Darwin Research Station (Ecuador), Durrell Wildlife Conservation Trust (British Channel

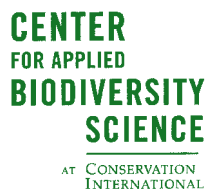


Islands), Cape Nature Conservation (South Africa), CENAQUA/IBAMA (Brazil), Wildlife Institute of India (India), Durrell Institute of Conservation and Ecology (UK), Kadoorie Farm and Botanic Garden (Hong Kong), International Center for Conservation of Turtles at Münster Allwetter Zoo (Germany), Zoologische Gesellschaft für Arten- und Populationsschutz (Germany), Melbourne Zoo (Australia), Rotterdam Zoo (Netherlands), AG Schildkröten (Germany),



TortoiseAid International, Tortoise Trust (UK), World Chelonian Trust, Turtle Hospital of New England, Turtle Back Zoo, and Turtle Homes. Many others exist as well, no less important in our global turtle conservation efforts, and all worthy of support and praise for their efforts.

Large international conservation organizations, such as Conservation International / Center for Applied Biodiversity Science (CI/CABS), Wildlife Conservation Society (WCS), The Nature Conservancy (TNC), Fauna and Flora International (FFI), and World Wide Fund for Nature (WWF) have long provided consistent major support for various field ecol-



ogy studies and conservation programs for freshwater turtles and tortoises in the regions where these organizations are most active. CI/CABS has over the past two years developed its own Turtle Conservation Program, and was also instrumental in

supporting the newly-formed Turtle Survival Alliance (see below) and raising funds for a number of turtle conservation projects.

Plans for National Parks and other protected areas have begun to consider turtle and tortoise conservation in their designs, and are applying existing academic research results and field survey data that have been compiled. For example, CI has recently been instrumental in establishing the Central Cardamoms Protected Forest in Cambodia, the largest protected area in Indochina, Wildlife Conservation Society (WCS) has established a successful protected areas program in Myanmar, and The Nature Conservancy is working in Indonesia. Many developing nations are rich in threatened turtle



species and managing protected areas with turtle conservation in mind will be critical for the TCF to achieve long-term success. Further field work and research is needed in order to more fully integrate conservation needs for turtles and tortoises into overall protected areas development. Enforcement of wildlife trade regulations at national levels via CITES and TRAFFIC (the joint wildlife trade monitoring program of WWF and IUCN—see www.traffic.org) have recently fo-



cused on freshwater turtles and tortoises, with a major recent initiative (in collaboration with TFTSG and CRF) to document and help regulate the Asian turtle trade, which has led to increased protection for many of the species involved in that trade. Additionally, the formation of Partners for Amphibian and Reptile Conservation (PARC) in the USA in 1999 has led to partnerships with public and private land managers and industry to manage lands to benefit, or at least minimize impacts to amphibians and reptiles, including turtles. Education programs have been developed to build turtle conservation capacity in developing nations, with training workshops and



research internships available through an increasing number of turtle conservation organizations, such as the Asian Scholarship Program of the New York Turtle and Tortoise Society and the Wetlands Institute. CITES turtle identification manuals

have been produced to assist law enforcement officials.

Recently, in light of the vast numbers of turtles being consumed as human food and medicine, particularly in Asia, a new and unique partnership has been forged among zoological parks and aquariums, serious and dedicated private captive-care specialists, and other interested individuals and organizations, to build a structured network of linked captive management and breeding programs into turtle and tortoise conservation efforts. This new group, established in 2001 as the Turtle Survival Alliance (TSA), and designated by THE IUCN/SSC as a largely autonomous Task Force of the TFTSG,



has embarked on an ambitious program of coordinating existing *ex-situ* collections of turtles into viable *ex-situ* conservation management programs, known as Assurance Colonies. The TSA has also attained global recognition for its ability to build partnerships with government regulatory authorities and help move otherwise doomed, illegally traded, and confiscated turtles and tortoises into such Assurance Colonies. The mission of the TSA is to develop and maintain an inclusive, broad-based global network of collections of living tortoises and freshwater turtles with the primary goal of maintaining chelonian species over the long term to provide maximum future options for the recovery of wild populations. The strength of the TSA lies in the diversity of its partners and supporting organizations.

As the TSA has grown rapidly to develop partnerships and expand its activities into many areas, it has recently re-organized into partially autonomous regional sub-groups, TSA-USA, TSA-Europe, and TSA-Austral-Asia, each with

its own Steering Committee, all united under the umbrella of a centralized TSA Executive Committee. Each regional TSA has been active in establishing regional partnerships of zoos and private individuals and organizations for the purpose of creating *ex-situ* Assurance Colonies to help prevent extinction of tortoise and freshwater turtle taxa, and to promote *in-situ* conservation efforts of extant populations in the wild.

Emblematic of this type of collaborative conservation effort has been the recent development and construction of the International Center for Turtle Conservation at Münster Allwetter Zoo in Germany. This facility features a large



collection of Critically Endangered Chinese endemic turtles managed as Assurance Colonies in a unique partnership between private captive-care specialists and a zoo.

All of the efforts to date, including priority-setting workshops and the development of action plans, status and regulatory needs determinations, academic and applied conservation biology research, field surveys, habitat protection, enforcement of regulations, education, and captive breeding, are all necessary components of a successful conservation strategy for turtle and tortoise survival. All the pieces are needed, some more urgently than others, but the parts need to work together, from the organizations setting and steering priorities and strategies, to the dedicated individuals that move the processes forward through their expertise, passion, and perseverance. Providing an improved strategic coherence and context for global turtle conservation efforts and establishing a coordinated funding initiative were the guiding incentives for creating the Turtle Conservation Fund.



The Chinese three-striped box turtle or “golden coin turtle” (*Cuora trifasciata*), purported by some turtle dealers to have cancer-curing effects when eaten, sells for up to US\$ 1000 per animal in East Asian markets. Photo by L.K. Shing.



CREATION OF THE TURTLE CONSERVATION FUND

Recognizing that freshwater turtles and tortoises urgently need further concerted coordinated efforts to more effectively support and promote their conservation and long-term survival, and recognizing also that sea turtles already benefit from numerous champions and well-coordinated established conservation programs, it was felt that a new comprehensive initiative for tortoise and freshwater turtle conservation funding support was desperately needed.

The ensuing creation of the Turtle Conservation Fund (TCF) in Thomasville, Georgia, USA, 28-31 May 2002, was the result of a strategic workshop bringing together a small group of turtle conservationists, ecologists, captive care specialists, and concerned individuals, specifically including the leadership from three prominent turtle conservation organizations, Conservation International / Center for Applied Biodiversity Science (CI/CABS), IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG), and IUCN/SSC Turtle Survival Alliance (TSA).¹ The workshop resulted in a successful initiative to agree to a new programmatic organizational framework, establish and define further partnership alliances, develop a mission statement and global action plan, initiate coordinated fund-raising efforts, and commence priority actions to prevent any further loss of the world's tortoise and freshwater turtle diversity.

The TCF was created as an equality-based partnership initiative between three founding organizations, CI/CABS, TFTSG, and TSA, to serve primarily as a new funding and strategizing mechanism for global turtle conservation efforts. The founding partners have structured a cooperative working relationship within TCF in addition to remaining independent to pursue their own missions separately. The TCF will be housed at CI/CABS to provide a single nonprofit organizational umbrella for its operational needs, but will be managed by its own TCF Executive Board, which has shared representation from its three founding organizations.

The TCF was also created to provide a framework for working partnership alliances with a wide variety of associated independent resource and funding partners. These TCF Alliance Partners would provide either financial or in-kind resource support to facilitate and aid the mission, strategy, and actions of TCF. Committed and potential TCF Alliance Partners were initially identified as Wildlife Conservation Society, Fort Worth Zoo, Chelonian Research Foundation, Zoo Atlanta, Cleveland Metroparks Zoo, Savannah River Ecology Laboratory, Chelonian Research Institute, Kadoorie Farm and Botanic Garden, AZA Chelonian Advisory Group, Disney Wildlife Conservation Fund, IUCN—The World Conservation Union/Species Survival Commission, Columbus Zoo, Nando Peretti Foundation, and Island Foundation, with many other associated partners anticipated.

¹ **TCF Founding Participants:** JAMES E. BARZYK, *TSA*; JOHN L. BEHLER, *Wildlife Conservation Society, TFTSG, TSA*; KURT A. BUHLMANN, *CI/CABS, TSA, TFTSG*; J. WHITFIELD GIBBONS, *Savannah River Ecology Laboratory, TFTSG*; RICK HUDSON, *Fort Worth Zoo, TSA, TFTSG*; DWIGHT P. LAWSON, *Zoo Atlanta, TSA*; THOMAS E.J. LEUTERITZ, *CI/CABS*; JOSEPH C. MITCHELL, *University of Richmond*; RUSSELL A. MITTERMEIER, *CI/CABS, TFTSG*; NORIKO OSHIMA, *Chelonian Research Institute*; PETER C.H. PRITCHARD, *Chelonian Research Institute, TFTSG*; ANDERS G.J. RHODIN, *Chelonian Research Foundation, TFTSG, TSA*; WALTER C. SEDGWICK, *Island Foundation*; TRACEY D. TUBERVILLE, *Savannah River Ecology Laboratory*; PETER PAUL VAN DIJK, *TRAFFIC Southeast Asia, TFTSG, TSA*.

The stated 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. “Species” in this context encompasses all recognized taxonomic units, including species, subspecies, and distinctive or significant regional populations, and sustainable populations need to fulfill their ecological role in their native habitats. 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 programs 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.

TCF EXECUTIVE BOARD

KURT A. BUHLMANN (Executive Director)
Director, Turtle Conservation Program, CI/CABS;
Executive Committee, TSA; Deputy Chair, TFTSG

ANDERS G.J. RHODIN (Chair)
Director, Chelonian Research Foundation;
Co-Chair, TFTSG; Executive Committee, TSA

RUSSELL A. MITTERMEIER
President, Conservation International;
Executive Committee, TFTSG

JOHN L. BEHLER
Wildlife Conservation Society;
Co-Chair, TFTSG; Executive Committee, TSA

RICK HUDSON
Fort Worth Zoo;
Co-Chair, TSA; Steering Committee, TFTSG

PETER C.H. PRITCHARD
Director, Chelonian Research Institute;
Executive Committee, TFTSG

WALTER C. SEDGWICK
Island Foundation

JAMES E. BARZYK
Program Manager, TSA

HUGH R. QUINN
Chair, AZA Chelonian Advisory Group;
Steering Committee, TSA-USA

CHRIS B. BANKS
Melbourne Zoo;
Steering Committee, TSA-Austral-Asia

HANS-DIETER PHILIPPEN
Steering Committee, TSA-Europe

KEVIN R. BULEY
Durrell Wildlife Conservation Trust;
Steering Committee, TSA-Europe

ASIAN REPRESENTATIVES (2)
Selection pending



An adult male painted terrapin (*Callagur borneoensis*) from Malaysia in full breeding color. Photo by D.K. Sharma.

THREATENED STATUS AND DISTRIBUTION OF THE WORLD'S TORTOISES AND FRESHWATER TURTLES

There are approximately 300 species of living freshwater turtles and tortoises worldwide, or about 460 taxa counting all recognized subspecies. Of these, 200 taxa (species and a few subspecies) are listed as threatened according to the official 2000 IUCN Red List of Threatened Species. Relatively common species considered to be of lesser conservation concern are not listed. Not all of the world's turtles and tortoises have yet been assessed and given a Red List status. Red Lists are updated periodically as new assessments lead to officially adjusted threatened status determinations. This is a direct responsibility and on-going task of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG).

Freshwater Turtles and Tortoises Officially Listed on the 2000 IUCN Red List of Threatened Species As a Percentage of Worldwide Species

Listed Threatened Taxa (species and a few subspecies):

Extinct	8	(2.7%)
Extinct in the Wild	2	(0.7%)
Critically Endangered	24	(8.0%)
Endangered	49	(16.3%)
Vulnerable	64	(21.3%)
Near Threatened	40	(13.3%)
Conservation Dependent	1	(0.3%)
Data Deficient	12	(4.0%)

Threatened: 200 (66.7%)

Unlisted Taxa (species only):

Least Concern or Not Evaluated	100	(33.3%)
Total:	300	(100%)

Categories of threatened species included on the Red List are: Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Near Threatened, Conservation Dependent, and Data Deficient. Categories of species not included on the Red List are: Least Concern and Not Evaluated.

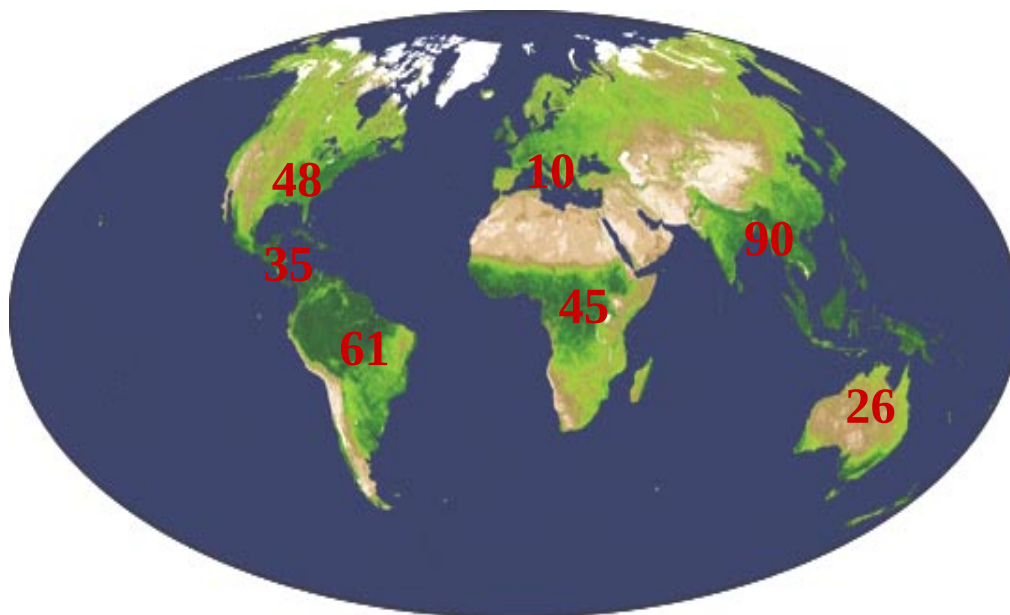
In addition to the 200 taxa of officially listed threatened freshwater turtles and tortoises, there are approximately 100 species currently considered to be either of Least Concern or Not Evaluated. Most of these taxa have not been adequately assessed and many of them no doubt are actually at least Vulnerable or Near Threatened. There are very few species of turtles and tortoises worldwide that can be considered relatively common and not presently at risk. But even those more common species are under the same global pressures as the threatened species but with more robust populations perhaps able to absorb greater adverse impacts before suffering declines.

The approximately 300 living species of freshwater turtles and tortoises worldwide are distributed over 7 major geographic regions (see map). Some species occur in more than a single region, with the greatest geographic overlap occurring within the Americas. Mediterranean species share some overlap with Africa. A few species found in Australasia (Australia and New Guinea) are shared with Southeast Asia. A few of Asia's species overlap with the Mediterranean region. Thus, the total number of turtle species recorded in the 7 regions involves some duplication from one region to another, leading to a total greater than 300.

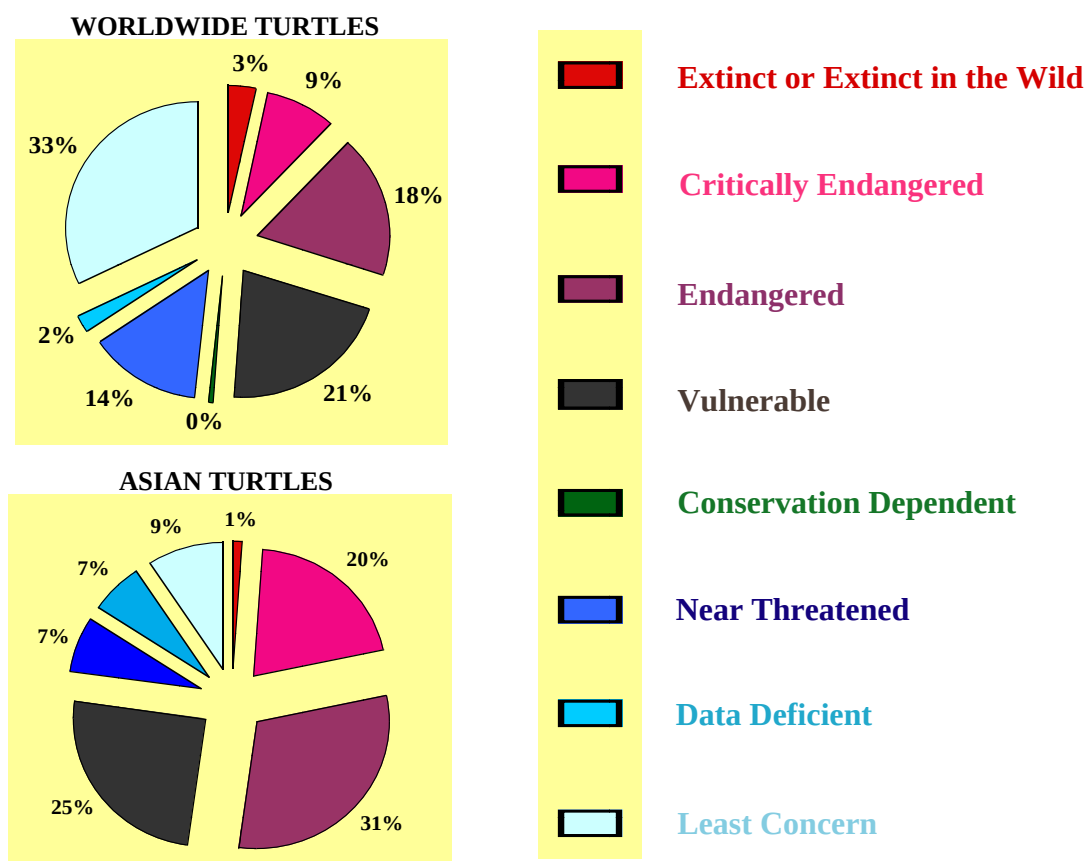
Asia is the most speciose area as well as having the greatest percentage of threatened species, with more than 75% Critically Endangered, Endangered, or Vulnerable, and 91% included in the IUCN Red List. As such it is the geographic region that warrants the highest priority actions if we are to avoid losing species in the near future.



The very last surviving Abingdon Island giant tortoise, Lonesome George (*Geochelone nigra abingdoni*) on his native island in the Galapagos when found in 1972, has lived in conservation custody since then, waiting for a possible female to help prevent final extinction of his kind. Photo by P.C.H. Pritchard.



Number of tortoise and freshwater turtle species for each of 7 broad geographic regions: North America (48), Mesoamerica (35), South America (61), Mediterranean (10), Asia (90), and Australasia (26), with most species in Southeast Asia.



Threatened status categories according to the 2000 IUCN Red List for 293 worldwide and 88 species of Asian tortoises and freshwater turtles.

“EXTINCTION ROW”

The following list of tortoises and freshwater turtles in survival crisis are arranged as an “Extinction Row” (similar to a “Death Row”), in descending order of threatened status (as listed on the 2000 IUCN Red List), starting with those taxa that we have already lost to extinction at the hand of modern man, to those surviving taxa that are at the highest risk for near-term extinction. These high-risk taxa are the ones that most desperately need our help before they move up this list to disappear forever into oblivion and the dustbin of history. A species extinguished can never be again, but is lost forever. The mission of TCF, and all who care for 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.

Status	Scientific Name	Common Name	Region	Endemic To
Extinct	<i>Cuora yunnanensis</i>	Yunnan box turtle	Asia	China
	<i>Cylindraspis indica</i> ¹	Réunion Island giant tortoise	Africa	Réunion
	<i>Cylindraspis inepeta</i>	Saddle-backed Mauritius Island giant tortoise	Africa	Mauritius
	<i>Cylindraspis peltastes</i>	Domed Rodrigues Island giant tortoise	Africa	Rodrigues
	<i>Cylindraspis triserrata</i>	Domed Mauritius Island giant tortoise	Africa	Mauritius
	<i>Cylindraspis vosmaeri</i>	Saddle-backed Rodrigues Island giant tortoise	Africa	Rodrigues
	<i>Geochelone nigra nigra</i> ²	Charles Island (Santa Maria) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone nigra phantastica</i> ³	Narborough Island (Fernandina) giant tortoise	South America	Ecuador/Galapagos
	<i>Kinosternon hirtipes megacephalum</i> ⁴	Viesca mud turtle	Mesoamerica	Mexico
Extinct in the Wild	<i>Geochelone nigra abingdoni</i> ⁴	Abingdon Island (Pinta) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone nigra duncanensis</i> ⁵	Duncan Island (Pinzón) giant tortoise	South America	Ecuador/Galapagos
Critically Endangered	<i>Apalone spinifera ater</i> ⁶	Black spiny softshell	Mesoamerica	Mexico
	<i>Aspideretes nigricans</i>	Black softshell	Asia	Bangladesh
	<i>Batagur baska</i>	River terrapin	Asia	—
	<i>Callagur borneoensis</i>	Painted terrapin	Asia	—
	<i>Chelodina mccordi</i>	Roti Island snake-necked turtle	Australasia	Indonesia/Roti
	<i>Chitra chitra</i>	Southeast Asian narrow-headed softshell	Asia	—
	<i>Cuora aurocapitata</i>	Yellow-headed box turtle	Asia	China
	<i>Cuora galbinifrons</i>	Indochinese box turtle	Asia	—
	<i>Cuora mccordi</i>	McCord's box turtle	Asia	China
	<i>Cuora pani</i>	Pan's box turtle	Asia	China
	<i>Cuora trifasciata</i>	Chinese three-striped box turtle	Asia	—
	<i>Cuora zhoui</i>	Zhou's box turtle	Asia	China
	<i>Geochelone nigra hoodensis</i>	Hood Island (Española) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone platynota</i>	Burmese star tortoise	Asia	Myanmar
	<i>Heosemys depressa</i>	Arakan forest turtle	Asia	Myanmar
	<i>Heosemys leytensis</i>	Philippine pond turtle	Asia	Philippines
	<i>Kachuga kachuga</i>	Red-crowned roofed turtle	Asia	—
	<i>Leucocephalon yuwonoi</i> ⁷	Sulawesi forest turtle	Asia	Indonesia/Sulawesi
	<i>Mauremys annamensis</i>	Annam leaf turtle	Asia	Vietnam
	<i>Phrynops dahl</i>	Dahl's toad-headed turtle	South America	Colombia
	<i>Pseudemys umbrina</i>	Western swamp turtle	Australasia	Australia
	<i>Rafetus swinhoei</i>	Yangtze softshell	Asia	—
	<i>Testudo graeca nikolskii</i>	Nikolsky's spur-thighed tortoise	Mediterranean	Russia
	<i>Trionyx triunguis</i> ⁸	African softshell	Mediterranean	—
Endangered	<i>Chelodina pritchardi</i>	Pritchard's snake-necked turtle	Australasia	Papua New Guinea
	<i>Chinemys megaloccephala</i>	Broad-headed pond turtle	Asia	China
	<i>Chinemys nigricans</i>	Red-necked pond turtle	Asia	China
	<i>Chinemys reevesii</i>	Chinese pond turtle	Asia	—
	<i>Chitra indica</i>	Indian narrow-headed softshell	Asia	—
	<i>Clemmys muhlenbergii</i>	Bog turtle	North America	USA
	<i>Cuora flavomarginata</i>	Yellow-margined box turtle	Asia	—
	<i>Dermatemys mawii</i>	Central American river turtle	Mesoamerica	—
	<i>Elseya bellii</i> ⁹	Namoi River snapping turtle	Australasia	Australia
	<i>Elusor macrurus</i>	Mary River turtle	Australasia	Australia
	<i>Erymnochelys madagascariensis</i>	Madagascar big-headed turtle	Africa	Madagascar
	<i>Geochelone nigra darwini</i>	James Island (San Salvador) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone nigra porteri</i>	Indefatigable Island (Santa Cruz) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone nigra vicina</i> ¹⁰	Albemarle Island (Isabela) giant tortoise	South America	Ecuador/Galapagos
	<i>Geochelone yniphora</i>	Angonoka	Africa	Madagascar
	<i>Geoemyda japonica</i>	Ryukyu leaf turtle	Asia	Japan/Ryukyus
	<i>Geoemyda silvatica</i>	Cochin Forest cane turtle	Asia	India
	<i>Geoemyda spengleri</i>	Black-breasted leaf turtle	Asia	—
	<i>Graptemys flavimaculata</i>	Yellow-blotched map turtle	North America	USA
	<i>Graptemys oculifera</i>	Ringed map turtle	North America	USA
	<i>Heosemys spinosa</i>	Spiny turtle	Asia	—
	<i>Hieremys annandalii</i>	Yellow-headed temple turtle	Asia	—
	<i>Indotestudo elongata</i>	Elongated tortoise	Asia	—
	<i>Indotestudo forstenii</i>	Sulawesi tortoise	Asia	Indonesia/Sulawesi
	<i>Kachuga dhongoka</i>	Three-striped roofed turtle	Asia	—
	<i>Kachuga sylhetensis</i>	Assam roofed turtle	Asia	—
	<i>Kachuga trivittata</i>	Burmese roofed turtle	Asia	Myanmar
	<i>Manouria emys</i>	Asian brown tortoise	Asia	—
	<i>Mauremys mutica</i>	Yellow pond turtle	Asia	—
	<i>Nilssonia formosa</i>	Burmese peacock softshell	Asia	Myanmar
	<i>Ocadia sinensis</i>	Chinese stripe-necked turtle	Asia	—
	<i>Orlitia borneensis</i>	Malayan giant turtle	Asia	—
	<i>Palea steindachneri</i>	Wattle-necked softshell	Asia	—
	<i>Pelochelys cantorii</i>	Asian giant softshell	Asia	—
	<i>Phrynops hogei</i>	Hoge's sideneck turtle	South America	Brazil
	<i>Platysternon megacephalum</i>	Big-headed turtle	Asia	—
	<i>Podocnemis lewyana</i>	Magdalena River turtle	South America	Colombia
	<i>Psammobates geometricus</i>	Geometric tortoise	Africa	—
	<i>Pseudemys alabamensis</i>	Alabama red-bellied turtle	North America	USA
	<i>Pyxidea mouhotii</i>	Keeled box turtle	Asia	—
	<i>Pyxis planicauda</i>	Flat-shelled spider tortoise	Africa	Madagascar
	<i>Rafetus euphraticus</i>	Euphrates softshell	Mediterranean	—
	<i>Sacalia bealei</i>	Beal's eyed turtle	Asia	China
	<i>Sacalia quadriocellata</i>	Four-eyed turtle	Asia	—
	<i>Terrapene coahuila</i>	Coahuilan box turtle	Mesoamerica	Mexico
	<i>Testudo hermanni hermanni</i>	Western Hermann's tortoise	Mediterranean	—
	<i>Testudo kleinmanni</i>	Egyptian tortoise	Mediterranean	—
	<i>Trachemys adiutrix</i>	Carvalho's slider	South America	Brazil

¹Now includes *Cylindraspis borbonica* in synonymy (listed separately by IUCN). ²Listed by IUCN as *Geochelone nigra galapagoensis*. ³Not listed by IUCN. ⁴Only a single surviving male (Lonesome George) in captivity. ⁵Listed by IUCN as *Geochelone nigra ephippium*; a small wild population actually persists and has been augmented by repatriated headstarted animals. ⁶Listed by IUCN as *Apalone ater*. ⁷Listed by IUCN as *Heosemys yuwonoi*. ⁸Mediterranean subpopulation only. ⁹Listed by IUCN as *Elseya* sp. 1. ¹⁰Now includes *Geochelone nigra guntheri* in synonymy (listed separately by IUCN).



Endangered giant tortoises (*Geochelone nigra vicina*) congregating at muddy pools in the mist on the crater rim above the caldera of Volcan Alcedo, Isabela Island, Galapagos. Photo by P.C.H. Pritchard. Natural populations of protected wild tortoises and freshwater turtles must be preserved for future generations to enjoy.



An as yet undescribed species of snake-necked turtle (*Chelodina* sp.) scrambling rapidly towards water in the Kimberley region, Western Australia. Photo by J. Cann. The taxonomy of many tortoise and freshwater turtle species remains in a state of flux with new species and subspecies being recognized and described on a regular basis. We need to more fully investigate and understand the basic taxonomy and systematic relationships of all turtle species, using both morphology and genetics, if we are to better document their status and to adequately protect them from the threats they face. The recognition of taxonomic distinctness is a basic precursor to effective conservation action.



TURTLE CONSERVATION FUND

GLOBAL ACTION PLAN

Under the ambitious, yet achievable TCF Global Action Plan, proposed funding support and conservation actions will be implemented in three general prioritization **Phases**, of which each has three standard **Action Components**. The chronologic **Phases** reflect the urgency of first focusing on those Critically Endangered and Endangered species facing the highest risk of imminent extinction, and then gradually expanding the focus of the program to encompass less endangered species as well. The **Action Components** reflect the different types of conservation programs and efforts that need support, including *Assurance Colony Development*, *Conservation Biology Research*, and *Range Country Capacity Building*.

CHRONOLOGIC PHASES AND OVERVIEW OF ACTION COMPONENTS

Phase 1

Preventing Imminent Extinction (planned for 2002–2007)

Action Component 1 (Assurance Colonies): Initiation of captive breeding and management programs through the TSA using approved Taxon Management Plans—as well as through other existing zoo and private breeding programs in North America, Europe, and Australasia—to establish both in-range and out-of-range *ex-situ* Assurance Colonies, focusing these efforts primarily on the Critically Endangered and Endangered species at highest risk of becoming extinct in the wild within the first decade of this century (as determined by IUCN and TFTSG). Turtles are disappearing so rapidly in some areas of the world that the opportunities to establish Assurance Colonies are also evaporating, but early captive management efforts are already being prioritized and funded.

Action Component 2 (Conservation Biology): Continuation and support of field surveys and ecological research focusing primarily on Critically Endangered and Endangered species, although recognizing that opportunities to study less critically threatened and poorly known species designated for Phase 2 (see below) should not be overlooked. Studies should prioritize research (e.g., genetics, relocation methodologies, pathology, temperature tolerances, husbandry, effects of global warming) and field and natural history surveys (e.g., habitat ecology, distribution, threats, native diet, nesting behavior, egg development) that

are critical to the immediate survival, management, and breeding of turtles in Assurance Colonies. These types of field-based and applied research projects are already being prioritized and funded worldwide, by CI/CABS, WCS, CRF, university research programs, and other conservation partners.

Action Component 3 (Capacity Building): Development of range country support for assistance with trade monitoring, illegal trade confiscations, establishment of rescue centers, sustainable harvest programs, ecologically sound turtle farming operations (for commercial purposes to lessen pressures on wild populations), relocation and repatriation methodology research, public outreach and education programs, trade regulations and enforcement (national wildlife authorities, with facilitation from TRAFFIC, CITES, and others), and identification and establishment of protected areas that include tortoises and freshwater turtles, concentrating efforts primarily on Critically Endangered and Endangered species. These projects include long-range conservation endeavors and management objectives necessary to support sustainable *in-situ* wild populations of tortoises and freshwater turtles, and criteria that need to be met before possible repatriation of captive-bred turtles into wild protected areas can be realized. These types of proactive projects will be implemented concurrently with Action Components 1 and 2, and are currently being undertaken by larger conservation organizations and zoos (e.g., CI, WCS, TNC, FFI, WWF, DWCT) that have the capacity to realize those goals.

Phase 2

Expanding the Focus (planned for 2007–2012)

Action Component 1: Continuation and augmentation of *ex-situ* captive breeding and management programs as initiated in Phase 1, now also adding increasing efforts directed at Vulnerable and Near Threatened species presently at lower risk of becoming extinct in the wild in the near future. We anticipate, however, that many of these species currently ranked as less threatened may soon be assessed by IUCN and TFTSG to be in further decline and assigned to Endangered or Critically Endangered status, thereby requiring more urgent focus.

Action Component 2: Continuation and support of field surveys and ecological research as initiated in Phase 1, now also adding increasing efforts directed at Vulnerable and Near Threatened species at lower risk, as well as for species of lower concern or uncertain status that need evaluations to determine possible needs for upgrading in terms of threatened status.

Action Component 3: Continued development and support of range country conservation endeavors and capacity building to secure the presence into perpetuity of sustainable *in-situ* managed wild populations of tortoises and freshwater turtles.

Phase 3 Securing the Future (long-term goals)

Action Components 1–3: The TCF has the long-term goal of maintaining sustainable managed wild populations of all tortoise and freshwater turtle taxa in their natural range habitats. We intend to accomplish this through a combination of threatened status and regulatory needs determinations, evaluation and development of protected areas, encouragement of range country support for conservation endeavors, capacity building in range countries, and possible repatriation as needed of progeny produced through captive breeding efforts in Action Component 1 projects. All TCF program aspects will need to be supported by field-based and applied research and threatened status evaluations in Action Component 2 projects as well as capacity building and collaborative range country programs supported in Action Component 3 endeavors. This will constitute a web of interconnected projects that will extend over a broad time scale. Coordinating these goal-oriented projects under a single umbrella initiative will facilitate the cooperative alliances and directed conservation actions necessary for eventual success, and optimize the use of scarce resources for these critical efforts.

DETAILS OF ACTION COMPONENTS

Action Component 1 Assurance Colony Development

Programs Managed Primarily by TSA – IUCN/SSC Turtle Survival Alliance

Establishment of viable breeding populations of endangered tortoises and freshwater turtles is recognized as a critical conservation action for a significant number of the world's species. Establishment of TSA-managed Assurance Colonies is a top priority for funding under the Turtle Conservation Fund. The Asian region is of most concern as 18 of 24 of the world's Critically Endangered chelonian species (IUCN Red List assessment by the TFTSG) occur there. Establishment of Assurance Colonies for all species



A Critically Endangered Indochinese box turtle, *Cuora galbinifrons*, from Vietnam. This specimen was rescued from illegal trade destined for East Asia and placed into an assurance colony at the in-range Cuc Phuong Turtle Conservation Project. Photo by D.B. Hendrie.

will be prioritized and conducted in a systematic manner by providing support to the Turtle Survival Alliance.

Some species are being acquired for stewardship by the TSA directly from government confiscations of illegally traded specimens. The TSA is able to incorporate these confiscated specimens into its Assurance Colony program through direct collaboration between a number of governments around the world, CITES, and non-governmental conservation organizations and zoos, such as CI/CABS, Fort Worth Zoo, and Rotterdam Zoo. In addition, funds are needed to acquire turtles from legal and ethical sources to serve as founder stock for Assurance Colonies for species unavailable through confiscation.

Through funds raised under the TCF, support would be available to the TSA for assistance to establish both in-range and out-of-range *ex-situ* Assurance Colonies for priority species under the following general protocol.

1. Each TSA Taxon Management Group (TMG) manager completes an Assurance Colony establishment and management plan (Taxon Management Plan – TMP) for a given species and submits it to the TSA Executive Committee for approval, identifying the various TSA partners (individuals and organizations) participating in the TMP.

2. The TMG manager then presents a funding proposal for the TMP to the TSA Executive Committee. The proposal may request support to acquire founder stock, develop maintenance facilities, and provide captive breeding program expenses, including facility support, human resources, veterinary services, medicines, and supplies.

3. When approved by the TSA Executive Committee, all participating TSA partners (individuals and organizations) who will be receiving funding for acquisition of founder stock must sign a Memorandum of Understanding with CI/CABS¹ agreeing to manage the turtles only for conservation breeding purposes under the rules of the TMP and to adhere to the guiding conservation goals of the Turtle Survival Alliance.

Separate from the TSA and its protocols outlined above, the American Zoo and Aquarium Association and its AZA Chelonian Advisory Group also manage Species Survival

Plans that function as Assurance Colonies. Similar programs are also managed by the European Association of Zoos and Aquaria (EAZA) through its EAZA Amphibian and Reptile Taxon Advisory Group using their Endangered Species Programmes, as well as by the private European Studbook Foundation (ESF), and the Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA). Support for these existing programs under their respective protocols will also be available from the TCF as determined by its Executive Board.

Action Component 2 **Conservation Biology Research**

Programs Managed Primarily by TFTSG and CI/CABS TCP – IUCN/SSC Tortoise and Freshwater Turtle Specialist Group and CI/CABS Turtle Conservation Program

Support for field surveys, conservation biology research, and threatened status and regulatory needs determinations for tortoises and freshwater turtles is also a top priority for funding under the Turtle Conservation Fund. Ultimate success in achieving sustainable protected wild populations will depend on knowledge of a species' conservation status, biology, ecology, reproduction, distribution, habitat requirements, genetics, and diseases, as well as how these may impact captive breeding and potential repatriation projects. For some Critically Endangered species, much of this information needs to be obtained as rapidly as possible while populations still persist in the wild under natural conditions.

Through funds raised under the TCF, support will be available to both the TFTSG and CI/CABS TCP for assistance to direct and provide support for conservation-related projects on tortoises and freshwater turtles. Research proposals for such projects will be solicited from the TFTSG membership as well as from the broader turtle conservation community. Proposals will be peer-reviewed within the TFTSG Steering Committee and CI/CABS TCP and independent reviewers as necessary. Full support may be provided for smaller projects and partial support involving strategic partnership alliances with other conservation organizations may be provided to facilitate larger projects. In addition, some support for smaller projects will be available from CRF's Linnaeus Fund small grants program. Support would target the following 6 broad TFTSG and CI/CABS TCP responsibilities and endeavors as guided by TCF leadership. Although TFTSG and CI/CABS TCP share these 6 broadly overlapping responsibilities, TFTSG-directed endeavors are primarily points 1, 2, and 6, whereas CI/CABS TCP focuses more on points 3, 4, and 5.

1. Continue and accelerate the constantly on-going global review of threatened status determinations for all species of freshwater turtles and tortoises according to IUCN Red List

¹The TSA is a stewardship program and cannot own animals under IUCN protocols. MOUs needed with CI/CABS for US-based animals, with EAZA or ESF for European-based animals, etc.



Live New Guinea snapping turtles, *Elseya novaeguineae*, for sale at a remote regional market in the Sepik River area of northern Papua New Guinea. Photo by J.W. Lang. Exploitation of turtles in this region has previously been at subsistence levels but appears to be increasing for both local consumption and export to the international ornamental curio trade. Similar on-going field and status surveys around the world are important in order to ascertain developing threats and potentially unsustainable exploitation of turtle species. Some subsistence use and limited regional trade are usually not a major problem for turtle survival and may be beneficial to local human populations, as long as the markets do not expand into an unsustainable international or regional bushmeat trade.

criteria, with re-evaluations performed in a manner to allow for time-sensitive updates and reality-based assessments.

2. Continue to work closely with CITES and IUCN to review and recommend regulatory needs for species threatened by international trade. Continue to participate in CITES Animals Committee Meetings, Technical Workshops, and Conferences of the Parties in order to maintain productive working relations with CITES leadership and to provide effective input regarding needs for species protection from trade by appropriate listings on CITES Appendices.

3. Provide support for prioritized field surveys of threatened or poorly known species to document distribution, status, levels of threat, and potential conservation and protection needs.



A Jamaican slider, *Trachemys terrapen*, live-trapped in a marsh in Jamaica during a conservation biology field study. Photo by T.D. Tuberville. Studies of this type, documenting habitat, diet, reproduction, density, ecology, and other life history characteristics of native turtles in the wild are important in order to increase our understanding of their biology and to help manage populations not only in the wild, but also in assurance colonies, and eventually in repatriated populations.

4. Provide support for prioritized conservation biology research on threatened or poorly known species to study their ecology, biology, systematics, genetics, and life history characteristics.

5. Implement a review of existing worldwide protected areas and reserves for the presence or absence of freshwater turtles and tortoises, focusing on the occurrence, abundance, and possible persistent threats within those protected areas. Identify those species that have inadequate protection in reserves, whether due to non-presence or continued exploitation despite apparent protection, and perform a gap analysis of where additional protected areas may be needed.

6. Continue to develop and enhance global communications among all turtle specialists by promoting and supporting on-going efforts to provide timely publication outlets and shared literature database resources. Current efforts by CRF include input from TFTSG and TSA leadership, and include the turtle publications CCB, CRM, and TTN. In addition, CRF maintains a large literature database of turtle references; expansion of search capabilities for this database through web-based resource sharing would be beneficial to all turtle specialists and help provide literature support for a wide variety of turtle-related conservation and biological research endeavors.

Action Component 3 **Range Country Capacity Building**

Programs Managed Collaboratively Between CI/CABS, TFTSG, TSA, and TCF Alliance Partners

Support for conservation endeavors and capacity building in range countries is also a top priority for funding under the TCF. In order to assure the long-term goal of sustaining *in-situ* viable and managed populations of each taxon of tortoise and freshwater turtle in the wild, range countries will need assistance and support to develop conservation strategies, facilities, and protected areas that will realize those goals.

Through future funds raised under the TCF and currently supported through CI/CABS, support has been and will be available to the TCF Executive Board to help direct and manage support for a variety of range country conservation endeavors, focusing primarily on those projects most directly related to prior TCF conservation projects supported under Action Components 1 and 2. It is anticipated that much of this TCF-directed support would be achieved through strategic partnership alliances with other conservation organizations in order to leverage enough support to be effective at the higher funding levels necessary for major conservation programs. Support would target the following types of projects as determined by TCF leadership.

1. Assist range countries in matters dealing with turtle trade issues, including support for confiscations and governmental regulations for disposition of confiscated animals, including development and support of regional rescue and breeding centers and placement of selected founder stock in



A group of Thai Zoo veterinarians being instructed in husbandry and medical management techniques for a group of recently confiscated Critically Endangered Burmese star tortoises, *Geochelone platynota*. Photo by C. Tabaka. This capacity building was arranged by the TSA sponsoring a veterinarian from the USA to travel to Thailand. Building liaisons of this type will be critical to the long-term success of assurance colonies and possible repatriation programs.

Assurance Colonies. Provide support for organizations and personnel to monitor and regulate turtle trade issues. Work with range countries to assess commercial turtle farming and alternative Traditional Chinese Medicine practices to deflect pressure from wild turtle populations.

2. Assist range countries to develop and maintain protected reserves harboring *in-situ* populations of wild turtles and tortoises, focusing on assuring the inclusion of turtles in planning efforts for the protection of major ecosystem habitats and wilderness regions. Provide support for field surveys of turtles in reserves with assessments of their occurrence, abundance, and potential persistent threats. Provide support for guards and anti-poaching efforts as needed to assure persistence of turtle populations in reserves.

3. Provide input and on-site support for potential future repatriation of Assurance Colony animals back into protected wild areas no longer harboring viable populations of turtles. Support the field surveys and veterinary assessments critical to the long-term success of such repatriation efforts.



The Cuc Phuong Turtle Conservation Project, Vietnam, an in-range rescue center and assurance colony. Photo by K.A. Buhlmann.

TURTLE CONSERVATION FUND

GLOBAL ACTION PLAN

Funding Strategy with Proposed Budget and Committed Support

Phase 1 – Preventing Imminent Extinction

Initial 5 Years, 2002–2007

This section outlines the primary components, staff positions, and geographical regions where and how the initial TCF funding efforts should be directed and allocated. This includes a proposed budget for the first year with projections for a 5-year budget. The plan proposes a program in broad terms based on priority areas where critical funding is needed, and is based on a variety of factors, including:

- Regions with high degrees of endemism or connected to global “Hotspots” or those with a number of Critically Endangered turtle species in urgent need of assistance
- Areas having a level of existing infrastructure on which to build partnerships
- Potential for success
- Existence of committed and potential resource and funding partners for support.

This funding strategy is presented in broad strokes to achieve the following goals:

- provide support to launch the TCF initiative and extend it through Phase 1 for the first 5 years from 2002 to 2007
- involve the TCF in key areas for turtle conservation
- establish the TCF as an effective and successful partnership program
- develop organizational capacity and staffing.

This outline presents several proposed Phase 1 Action Components of the TCF strategy and is focused primarily on those efforts most urgently needed for the near-term survival of Critically Endangered and Endangered species. As conservation needs evolve and urgencies shift the TCF will also need to respond appropriately with funding support for other developing turtle survival crises. Projects not listed in this action plan will also emerge as needing urgent support and the TCF will need to be able to meet those needs.

Primary Action Components

- *Assurance Colony Development*: both in-range and out-of-range, including support for triage teams and rescue operations to assist with confiscations, market rescues, specimen acquisition, and facility construction and maintenance.
- *Conservation Biology Research*: including field and trade surveys, collection of biological data, develop-

ment of reintroduction techniques, and urgent applied genetic and taxonomic studies.

- *Range Country Capacity Building*: including education and training programs, veterinary and husbandry assistance, and facility enhancements for zoos, rescue centers, and breeding and headstart programs.
- *Turtle Action Fund*: a general multipurpose action fund for rapid mobilization of urgent seed funding to develop and initiate larger projects for later in-depth proposals.

PERSONNEL

- TCF Executive Director
Budget: \$45,000/yr
Funding committed by CI/CABS
- TCF Program Assistant
Budget: \$20,000/yr (50% of time x annual salary)
- TSA Co-chair
Budget: \$21,000/yr (50% of time x annual salary).
Funding committed by Fort Worth Zoo
- TSA Program Manager
Budget: \$35,000/yr
\$25,000 committed by Island Foundation
- TSA Records Keeper (Registrar)
Budget: \$20,000/yr (30% of time x annual salary; office supplies, postage, etc.)
\$10,000 committed by Fort Worth Zoo
- TFTSG Program Officer
Budget: \$40,000/yr
\$10,000 committed by Chelonian Research Foundation
- Research Fellow
Budget: \$34,000/yr
\$17,000 committed by Savannah Ecology Research Laboratory
- Field Biologist(s)
Budget: \$40,000/yr
Could be on a consultancy basis
- Veterinarian and/or Field Coordinator in Southeast Asia
Budget: \$40,000/yr
Could be on a consultancy basis
- Travel budget for various TCF-associated personnel to respond appropriately to developing conservation needs, including workshops, rescue actions, and meetings
Budget: \$40,000/yr

Personnel Budget, First Year:

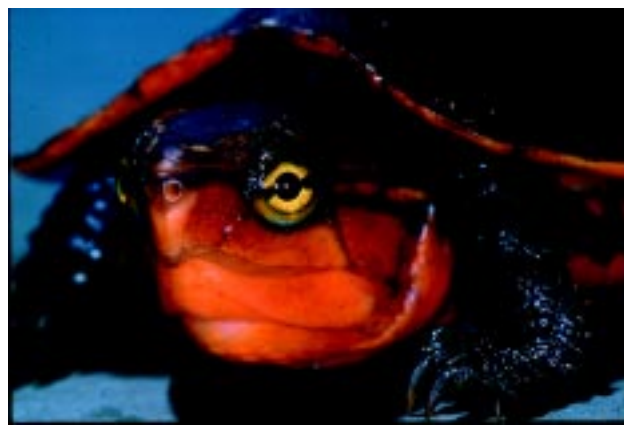
\$335,000

Personnel Budget, 5 Year Projection:

\$1,842,000



The Malayan snail-eating turtle, *Malayemys subtrijuga*, from Thailand. Photo by P.P. van Dijk.



A juvenile big-headed turtle, *Platysternon megacephalum*, from Thailand, an Endangered species inhabiting rocky hillside streams. Photo by P.P. van Dijk.

PROJECT PROPOSALS

The TCF encourages the broad turtle conservation and scientific community, including TFTSG members, TSA partners, TSA TMG's, and all other turtle conservationists, either individuals or organizations, to submit regional or species-focused projects and other proposals to the TCF Executive Board for evaluation and possible funding. At this point, the following priority projects have been identified for inclusion in this initial funding prospectus, but support is not limited to these specific projects and on-going TCF funding will require additional priority projects, therefore, please submit your project proposals to the TCF Executive Director. Projects concerning Phase 1 species (see "Extinction Row" listing above) will have priority for funding and implementation.

REGIONAL PROJECTS

Myanmar

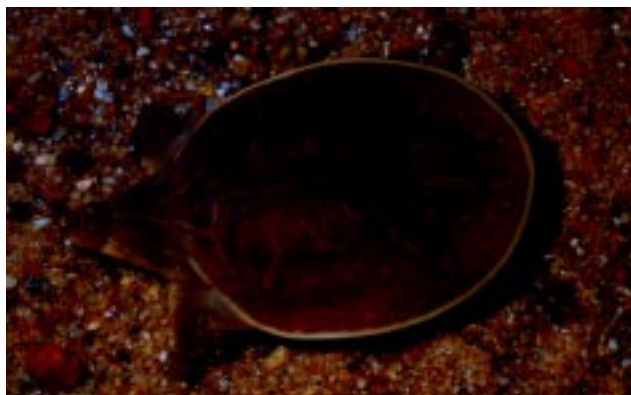
- Focus: Seven endemic turtles, particularly those listed as Critically Endangered (*Geochelone platynota*, *Heosemys depressa*, *Kachuga trivittata*); also new *Chitra*, *Nilssonina formosa*, *Lissemys scutata*, and *Morenia ocellata*.
- Partners: WCS field and vet program, and Chelonian

Conservation Services (G. Kuchling).

- Components: Range country capacity building (Mandalay Zoo, Myanmar Forestry Department), assurance colony TMG development and conservation biology (field surveys; reintroduction techniques, etc.).
- Budget: \$35,000/yr
- Range country coordinator: John Behler (WCS).
- Comments: Build on a solid and ongoing field research and technology transfer program through WCS and Kuchling's work which is commencing there.

Thailand

- Focus: *Chitra chitra*, *Batagur baska*, *Pelochelys*, *Manouria emys*, *Indotestudo elongata*, *Malayemys*, *Callagur*, and a range of other species contained in large numbers in the system of Thai zoos and rescue centers.
- Partners: Thai Zoos, Fisheries Department, Cleveland Metroparks Zoo, Chulalongkorn University.
- Components: Range country capacity building (Dusit Zoo, Khao Kheow Open Zoo, Chiang Mai Zoo) and assurance colony TMG development through market rescues and confiscations.
- Budget: \$20,000/yr
- Range country coordinator: Chris Tabaka (Memphis Zoo),



A hatchling Critically Endangered Southeast Asian narrow-headed giant softshell turtle, *Chitra chitra*, from Thailand. Photo by P.P. van Dijk.



The Yangtze softshell turtle, *Rafetus swinhoei*, from Hoan Kiem Lake, Hanoi, Vietnam. This species is Critically Endangered and appears to be on the very brink of extinction, with very few live specimens known. Photo by Ha Dinh Duc.

Rick Hudson (Fort Worth Zoo), Kumthorn Thirakhupt (Chulalongkorn University).

- Comments: Builds on an established infrastructure of Thai zoos (see CBSG Thai Zoo Masterplan document, 1993) and rescue centers that are holding large numbers of targeted species, a Fisheries Department involved with a successful breeding and headstarting program for the Critically Endangered *Batagur baska* and *Chitra chitra*, and the potential to rescue large numbers of targeted species that frequently turn up in the markets.

Vietnam

- Focus: Critically Endangered endemic *Mauremys annamensis*, and a range of other important species including *Manouria impressa*, *Cuora trifasciata*, *Geoemyda spengleri*, and *Cuora galbinifrons*. Continue search for *Rafetus swinhoei*.
- Partners: WCS Field vet program, CI/CABS, CI-Asia Pacific Program, AZA Chelonian Advisory Group, Fauna and Flora International (FFI), Cleveland Metroparks Zoo, Chelonian Research Institute (P.C.H. Pritchard), Melbourne Zoo.
- Components: Range country capacity building (Cuc Phuong Turtle Conservation Project - CPTCP); conservation biology research (field surveys, reintroduction techniques); assurance colony TMG development.
- Budget: \$35,000/yr
- Range country coordinator: Doug Hendrie (CPTCP).
- Comments: Builds on an established relationship and history of support for the CPTCP that is widely recognized as a model rescue center for the region.

India

- Focus: Indian endemic turtles including several of the endangered *Kachuga* (especially *K. kachuga*) and softshells *Chitra indica* and *Aspideretes* (especially *A. leithii*).
- Partners: Zoo Outreach Organization, Cleveland Metroparks Zoo, Madras Crocodile Bank Trust (MCBT), Wildlife Institute of India.
- Components: Range country capacity building (MCBT Centre for Herpetology needs infrastructure support); assurance colony TMG development (especially *K. kachuga* at MCBT).
- Budget: \$20,000/yr
- Range country coordinator: Harry Andrews (MCBT).
- Comments: The success of this program is dependent on developing a solid working relationship with MCBT staff and the improvement of facilities there to facilitate conservation-based breeding programs; there is also an extensive network of zoos throughout India.

Malaysia

- Focus: Large riverine turtles *Batagur baska*, *Callagur borneoensis*, *Orlitia borneensis*, and the softshell *Chitra chitra*; goal is to rejuvenate the successful but sporadic Fisheries Dept. program of egg collection, hatching, headstarting and release for *Batagur* and *Callagur*.
- Partners: Fisheries Dept., Columbus Zoo, WWF-Malaysia.



The Vulnerable impressed tortoise, *Manouria impressa*, from hill forests in Thailand. Photo by P.P. van Dijk.

- Components: Range country capacity building; conservation biology research (headstarting and reintroduction techniques), rescue center development.
- Budget: \$20,000/yr
- Range country coordinator: Peter Paul van Dijk (TFTSG) and Dionysius Sharma (WWF-Malaysia).
- Comments: Success will depend on partnering and providing incentive for the Fisheries Dept. to restart their turtle conservation program; Columbus Zoo has established contacts with a private facility breeding *Chitra chitra* which can form basis for a successful TMG assurance colony.

Cambodia

- Focus: *Batagur* population on the Sre Ambel River; Cardamom Mountains; *Hieremys annandalii*, the most important population in Indochina.
- Partners: CI/CABS funded with support from Disney Wildlife Conservation Fund, Cleveland Zoological Society, and CABS (funds transferred to WCS for implementation by WCS–Cambodia; an example of a suc-



An adult female Critically Endangered river terrapin, *Batagur baska*, from an *in-situ* Malaysian headstart breeding center operated by the Fisheries Department. Photo by A.G.J. Rhodin.



An adult male Sulawesi forest turtle, *Leucocephalon yuwonoi*, in an out-of-range *ex-situ* TSA assurance colony in USA after rescue from a southeast Asian food market. Photo by J.E. Barzyk.

cessful collaborative conservation alliance).

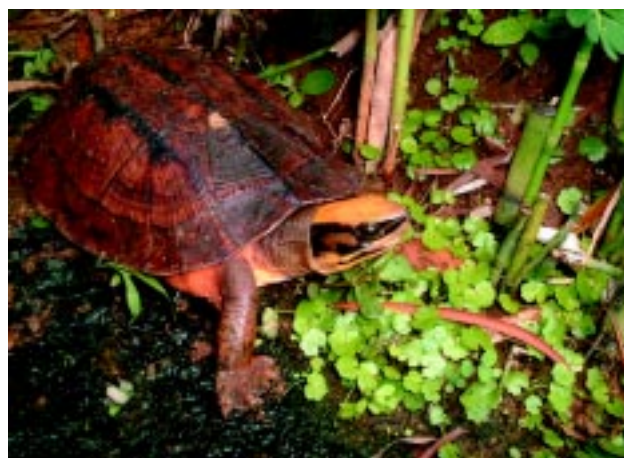
- Components: Range country capacity building (villagers along rivers with rediscovered *Batagur* population); conservation biology research (nesting beach protection, egg incubation, and reintroduction techniques; field surveys in the Cardamoms by CI/CABS and CI-Asia Pacific).
- Budget: \$35,000/yr
- Range country coordinator: Colin Poole (WCS).
- Comments: Builds on ongoing support for the Sre Ambel River project which hires and empowers local villagers as Royal Turtle Guards to protect nesting beaches for a small but viable population of *Batagur*, the only remaining in Indochina.

Indonesia

- Focus: Two Sulawesi endemics, Critically Endangered *Leucocephalon yuwonoi* and Endangered *Indotestudo forsteni*; one Roti Island endemic, Critically Endangered *Chelodina mccordi*; and Endangered *Orlitia borneensis*.
- Partners: WCS Indonesia program in Sulawesi; The Nature Conservancy project in Lori Lindu National Park; Chelonian Research Foundation (A.G.J. Rhodin).



The Critically Endangered Roti Island snake-necked turtle, *Chelodina mccordi*, an extremely restricted and isolated species from Indonesia driven into commercial extinction by the international pet trade. Assurance colonies are being formed by the TSA and protection is needed in the wild. Photo by A.G.J. Rhodin.



A Chinese three-striped box turtle, *Cuora trifasciata*, in an in-range *ex-situ* assurance colony in Hong Kong. Photo by P. Crow and Kadoorie Farm and Botanic Garden.

- Components: Range country capacity building (training National Park guards to protect turtles), conservation biology research, field surveys and protected areas evaluations in both Sulawesi and Roti.
- Budget: \$30,000/yr
- Range country coordinator: Rob Lee (WCS).
- Comments: Success will depend on linking with WCS field team and TNC Park staff and continuing to develop collaborative programs and research with Indonesian conservation biologists.

China

- Focus: Kadoorie Farm and Botanic Garden animal rescue center; Chengdu Zoo turtle education and husbandry program; field research program on Hainan (Shi Haitao); field surveys for *Cuora* spp.
- Partners: State Forestry Administration (China), Nando Peretti Foundation, CI/CABS, Cleveland Zoo, Rotterdam Zoo (with Kadoorie), Zoo Atlanta, Memphis Zoo, Island Foundation, AZA Chelonian Advisory Group, Fort Worth Zoo (with Chengdu), Cleveland Zoo (with Hainan program), Melbourne Zoo,



A big-headed turtle, *Platysternon megacephalum*, from Thailand, an Endangered species appearing increasingly in the food trade. Native wild populations in Hong Kong need study. Photo by P.P. van Dijk.

International Center for Conservation of Turtles at Münster Allwetter Zoo.

- Components: Range country capacity building (at Kadoorie, Chengdu, and Hainan Normal University, Haikou); conservation biology research (Shi Haitao and students on *Sacalia quadriocellata*, CI/CABS and Kadoorie on *Platysternon megacephalum*); assurance colony TMG development (at International Center for Conservation of Turtles at Münster Allwetter Zoo for several Critically Endangered endemic Chinese *Cuora*; at Kadoorie for *Cuora trifasciata*, *C. flavomarginata*, and *Mauremys annamensis*, and at Chengdu for *Manouria impressa*).
- Budget: \$40,000/yr
- Range country coordinator: Dwight Lawson (Zoo Atlanta) and Kurt Buhlmann (CI/CABS).
- Comments: Establishing an Asian Field Coordinator position based in Hong Kong would greatly improve collaborative efforts in China and the Southeast Asian region.

Madagascar

- Focus: Southern region radiated tortoise (*Geochelone radiata*) program particularly the Cap St. Marie population; Baly Bay program on the angonoka tortoise (*Geochelone yniphora*); health assessments and repatriation techniques for all Malagasy tortoises and *Erymnochelys*; all *Pyxis*, but emphasis on *P. planicauda*.
- Partners: WCS, Durrell Wildlife Conservation Trust (DWCT), WWF-Madagascar, Madagascar Fauna Group,



The world's rarest species of tortoise, the angonoka (*Geochelone yniphora*), being studied in its native habitat in Madagascar with the use of Global Positioning System. Photo by M. Pedrono.

ANGAP, Madagascar Eaux et Forêts Department.

- Components: Range country capacity building (hiring Park guards, developing opportunities for ecotourism, education kiosks); conservation biology research (focusing on reintroduction techniques and field surveys); assurance colonies (in-range programs for *G. yniphora*, *P. planicauda*, and *Erymnochelys* already successfully established at Amphijora by DWCT; organization of TMG for captive *P. planicauda* populations out-of-range in USA and Europe).
- Range country contacts: John Behler (WCS) and Mark Stanley-Price (DWCT).
- Budget: \$35,000/yr
- Comments: Success of this program may depend on the realization by the local communities of the positive benefits of tourism to their lifestyle, thereby providing incentives for tortoise protection and the maintenance of robust natural populations.

Mediterranean Region

- Focus: The Critically Endangered Egyptian and Negev tortoises, *Testudo kleinmanni* and *T. wernerii*, from Libya, Egypt, and Israel, the softshell turtle *Rafetus euphraticus* in Turkey, *Testudo graeca* ssp. from throughout the region, *T. h. hermanni* populations in western Europe, *Emys orbicularis* ssp. and isolated regional populations undergoing rapid extirpation.
- Partners: TSA-Europe, Tortoise Care Egypt, SOPTOM—Village des Tortues, A Cupulatta.
- Components: Range country capacity building (to support captive care and reintroduction efforts for tortoises in Egypt and investigation of breeding or headstarting program potential for *Rafetus* in Turkey); assurance colony TMG development (for Egyptian tortoise); conservation biology research (field surveys for *Rafetus* in Turkey and development of reintroduction techniques for tortoises in Egypt).
- Range country contacts: Sherif Baha el-Din (Egypt); Ludek Hojny (Czech Republic); Jarmo Perälä (TFTSG); Henk Zwartepoorte (Rotterdam Zoo), Esther Wenman



The Endangered and rare Euphrates softshell, *Rafetus euphraticus*, from southeastern Turkey, where it is threatened by habitat destruction and dam construction. Photo by E. Taskavak.



A Critically Endangered subspecies of European tortoise, *Testudo graeca nikolskii*, from the Black Sea region of Russia. Additional taxa of the *T. graeca* species complex (some still undescribed) are under intense development pressure. Photo by A.A. Inozemtsev.

(Rome Zoo), Alexander Pieh.

- Budget: \$20,000/yr
- Comments: Significant taxonomic work is still needed to unravel multiple undescribed and unrecognized species and subspecies of Mediterranean tortoises (especially different subspecies of *Testudo graeca*), many of which are extremely restricted and under intense development pressure.

Africa

- Focus: South Africa is the global Hotspot for tortoise diversity—the distribution, habitat requirements, and protected area status for the genera *Homopus* and *Psammobates* requires further investigation. Two Critically Endangered taxa are of special concern, *P. geometricus* and *H. signatus cafer*. The massive bushmeat trade in West and Central Africa involving, among others, the poorly known softshells *Cycloderma* and *Cyclanorbis*, needs urgent investigation.
- Partners: CI/CABS, University of the Western Cape (Thomas Leuteritz), Cape Dept. of Nature Conservation (Ernst Baard), Savannah River Ecology Laboratory, Homopus Research Foundation (Victor Loehr).
- Components: Conservation biology research (assessing the impact of global climate change on the Cape Floristic Region and associated tortoise fauna; field surveys to assess tortoise distribution patterns); assurance colony TMG development (support captive programs where indicated by Cape Department of Nature Conservation).
- Range country contacts: Ernst Baard and Retha Hofmeyer (South Africa), Jerome Maran, Roger Bour.
- Budget: \$15,000/yr
- Comments: An extensive system of protected areas has been established in South Africa. It is important to assess the ability of these existing protected areas to protect the tortoise diversity. Two avenues will be explored: assessments of viable populations and analyses of changing needs in the face of climate change.

United States

- Focus: As one of the global Hotspots for aquatic turtle diversity, the southeastern USA should receive some



The yellow-blotched map turtle, *Graptemys flavimaculata*, an Endangered species restricted to a single river system in the southeastern USA. Photo by D.E. Collins.

initial attention from the TCF. Turtles of the genus *Graptemys* (including *caglei*, *ernsti*, *flavimaculata*, *gibbonsi*, *oculifera*, and *versa*), the Rio Grande cooter (*Pseudemys gorzugi*), flattened musk turtle (*Sternotherus depressus*), and the alligator snapper (*Macrochelys*) need attention; *Clemmys* conservation initiatives including trade issues with *C. guttata*, surveys and habitat protection for *C. muhlenbergii*, and western pond turtle conservation (*C. marmorata*). Liaison with and potential support for multiple organizations focused on conservation of threatened populations of *Gopherus agassizii* in southwestern USA, which are being increasingly endangered.

- Partners: Partners in Amphibian and Reptile Conservation (PARC), Savannah River Ecology Laboratory, U.S.



Top: The spotted turtle, *Clemmys guttata*, a popular species from the eastern USA increasingly threatened by the pet trade. Photo by B. Mansell. **Bottom:** The Endangered bog turtle, *Clemmys muhlenbergii*, a secretive and rare eastern USA species threatened by destruction of its limited habitat as well as collection for the pet trade. Photo by R.W. Barbour.

Fish and Wildlife Service, and TNC. State Wildlife Agencies from range states (Mississippi, Louisiana, Georgia, Texas, etc.); Tennessee Aquarium in Chattanooga (*G. flavimaculata*), Project Bog Turtle, Knoxville Zoo and North Carolina State Museum (*C. muhlenbergii*); Oregon Zoo, Woodland Park Zoo, and Washington Department of Fish and Wildlife (*C. marmorata*); Desert Tortoise Council, Gopher Tortoise Council (*Gopherus*).

- Components: Range state capacity building (to initiate dialogue with state wildlife regulatory agencies to determine their willingness to involve the TCF in Species Recovery Plans and conservation efforts for endangered USA chelonians); assurance colony TMG development (if indicated and approved by state agencies, or in conjunction with Federal Recovery Plans). Conservation biology research (*Gopherus polyphemus* relocation as a surrogate for other species: CI/CABS, Savannah River Ecology Laboratory, U.S. Forest Service).
- Range Country coordinators: Whit Gibbons (SREL), Joe Mitchell (Univ. of Richmond).
- Budget: \$15,000/yr
- Comments: State and Federal fish hatcheries in the southeast USA would be ideally suited for these type of programs. The TSA should build an active partnership with PARC, through the Habitat Management working group and with the USFWS.

Mesoamerica

- Focus: The heavily exploited Central American river turtle *Dermatemys mawii* which has undergone rapid declines in southern Mexico, Belize, and Guatemala; *Terrapene coahuila* from Mexico; and *Gopherus flavomarginatus* in Mexico, which is approaching Critically Endangered status rapidly.
- Partners: Belize Zoo, ZOOMAT in Chiapas, CI-Guatemala Program, CI-Mexico Program, Philadelphia Zoo.
- Components: Conservation biology research (development of cost effective rearing and farming techniques for *D. mawii*); assurance colony TMG development and range country capacity building (efforts aimed at involving range country zoos in maintaining breeding populations of *D. mawii* and expanding educational mission



An adult male Central American river turtle, *Dermatemys mawii*, a heavily exploited large turtle from a limited range in Mexico and Belize. Photo by J. Polisar.



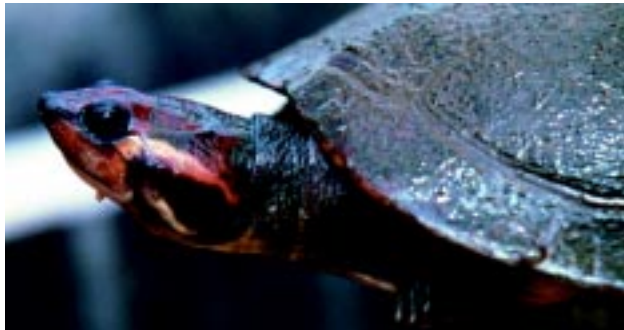
The Endangered Hoge's side-necked turtle, *Phrynops hoguei*, from a very limited and patchy distribution in southeastern Brazil where it is threatened by development. Photo by R.A. Mittermeier.

about freshwater turtle conservation).

- Range Country coordinators: Mexico: Richard Vogt (INPA, Brazil); Guatemala, Belize: John Polisar.
- Budget: \$20,000/yr
- Comments: Vogt has extensive experience in field surveys and applied conservation biology research in Mexico and would be suited to continuing his previous efforts.

South America

- Focus: The endemic Endangered *Phrynops hoguei* and other poorly known chelid turtles in Brazil; two endemics from Colombia (highly restricted Critically Endangered *Phrynops dahl*i and Endangered *Podocnemis lewyana*); Amazonian river turtles, *Podocnemis* spp.; on-going conservation efforts for various *Geochelone nigra* spp. in Galapagos, Ecuador.
- Partners: INPA, IBAMA, CENAQUA, CI/CABS, CI-



Top: A hatchling red-headed turtle, *Podocnemis erythrocephala*, from the Brazilian Amazon basin, where river turtles of the genus *Podocnemis* are heavily exploited for food. Photo by R.A. Mittermeier. **Bottom:** A rarely-seen adult Endangered *Podocnemis lewyana* from the isolated Magdalena River drainage of Colombia. Photo by R.A. Mittermeier.

Brazil, Tortoise Reserve (in Venezuela), Charles Darwin Research Station, Charles Darwin Foundation.

- Components: Conservation biology research (field surveys in Brazil, Colombia, and Galapagos); assurance colony TMG development and range country capacity building (efforts aimed at involving range country zoos in maintaining breeding populations of *P. hoguei* and *P. dahlia*); capacity building and educational support in Galapagos, Brazil, Colombia, and elsewhere.
- Range country contacts: Olga Castaño-Mora (Colombia), Fernando Espinosa (Ecuador), Richard Vogt (INPA, Brazil).
- Budget: \$25,000/yr
- Comments: Building further support for existing conservation efforts, especially in Brazil and Galapagos, will help those organizations expand their turtle programs.

Australasia

- Focus: The Critically Endangered *Pseudemydura umbrina* and the Endangered *Elusor macrurus* in Australia. Status surveys of little-known species in Australia, including *Elseya bellii* and *Rheodytes leukops*. Field and trade surveys of poorly-known species in Papua New Guinea, especially *Pelochelys bibroni*, *Pelochelys* sp. (Sepik region), *Chelodina pritchardi*, and *Carettochelys insculpta*.
- Partners: TSA-Austral-Asia, Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA), Perth Zoo (PZ), Melbourne Zoo (MZ), University of Western Australia (UWA).
- Components: Assurance colony development (expansion of successful colonies of *P. umbrina* from Perth Zoo to include other ARAZPA institutions, establishment of colonies of *E. macrurus*); conservation biology research (field surveys of little-known areas of Papua New Guinea and Australia).
- Range country contacts: Chris Banks (MZ), Gerald



The Vulnerable New Guinea giant softshell turtle, *Pelochelys bibroni*, restricted to southern Papua New Guinea and Indonesian Irian Jaya, a species recently recognized as distinct from the more widespread Asian *P. cantorii*. Photo by A.G.J. Rhodin.

Kuchling (UWA), Arthur Georges, Rod Kennett.

- Budget: \$15,000/yr
- Comments: Initiate a dialogue with Australian regulatory agencies and ARAZPA to determine feasibility of expanding *P. umbrina* Species Recovery Plan to include out-of-range assurance colonies.

Regional Projects Budget, First Year: \$380,000
Regional Projects Budget, 5 Year Projection: \$1,938,000



The Critically Endangered western swamp turtle, *Pseudemydura umbrina*, from an extremely limited distribution near Perth, Western Australia. This extremely rare species with a recent total world population of less than 100 animals has been saved from extinction through a combination of *ex-situ* in-range captive breeding and *in-situ* habitat protection leading to gradually increasing population numbers. Photo by G. Kuchling.



The Vulnerable pig-nosed turtle, *Carettochelys insculpta*, from southern New Guinea and northern Australia, a unique and specialized turtle—essentially a living fossil—the last species surviving of an ancient and formerly wide-spread and abundant family of turtles. A huge trade exists for hatchlings exported to the international pet market from Irian Jaya in Indonesian New Guinea. Photo by J.W. Lang.

GLOBAL AND OTHER PROJECTS

Turtle Trade Regulations and Enforcement

- Focus: The TCF needs to focus major networking efforts to help improve range country and international endeavors to monitor, regulate, and limit the currently unsustainable mass turtle trade, with a goal of establishing eventual sustainability for limited purposes (e.g., ancient native traditions of turtle consumption in China and elsewhere will need to be met through sustainable turtle farming operations until cultural usage patterns change). Focus on improving development and enforcement of various National Wildlife Regulations, enhancing CITES regulatory recommendations, and enforcing IATA (International Air Transport Association) regulations. Participate in turtle trade monitoring through TRAFFIC, WCS, and other wildlife and bushmeat trade monitoring programs. Attend the CITES Convention of the Parties and other workshops and turtle working group meetings to insure that turtle protection is at the forefront of the international agenda. Interact with major airline carriers to urge them to adhere to IATA guidelines and the potential negative public relations implications of continuing to ignore them.
- Point person: P.P. van Dijk.
- Budget: \$30,000/yr

Operational Support for Rescue and Rehabilitation

- Funds need to be available for rescue and rehabilitation of confiscated illegally traded turtles being donated to the TSA by governmental agencies. A TSA Rapid Response confiscation task force needs to be available and ready to mobilize into action when confiscations occur so that minimal time is lost and the maximum numbers of individual turtles can successfully be placed into Assurance Colonies. Entails travel support for a team of specialists including veterinarians, husbandry experts, logistical support, and shipping. Establishment of liaison arrangements with various turtle rescue organizations and adoption groups are also needed to



Softshell turtles being packaged for export from Sumatra, Indonesia, destined for East Asian food markets. Photo by C.R. Shepherd/TRAFFIC Southeast Asia. This trade must be reduced and regulated according to the recommendations of CITES and IATA. Continued monitoring of the international turtle trade is critical

help arrange appropriate placement as necessary for confiscated turtles of less threatened species not requiring Assurance Colonies at this time or representing capacity overload for the TSA.

- Point persons: J.E. Barzyk, R. Hudson, H. Zwartepoorte.
- Budget: \$40,000/yr

TSA Dedicated Facilities for Assurance Colonies

- The International Center for Conservation of Turtles at Münster Allwetter Zoo in Germany is a critically important facility being developed for captive breeding and maintenance of several Critically Endangered freshwater turtles, most notably several Chinese endemic species of *Cuora*. This center is a model for TSA partnership initiatives between a private captive care specialist (Elmar Meier) and an institutional organization (Münster Allwetter Zoo) focusing on Assurance Colonies of Critically Endangered species. It has already received support from Island Foundation through CI/CABS and warrants further support.
- Funds should also be available for a TSA dedicated turtle management facility for Assurance Colonies in Florida. Existing tropical fish farms offer much potential in this regard and could be easily converted for TSA's purposes. A more detailed proposal describing the various components of such a facility (ponds, greenhouses, operating budget, staff) is available. Until such a facility can be acquired and developed, funds to rent greenhouse space from the aquaculture division of the Harbor Branch Oceanographic Institution (Ft. Pierce, Florida) for growing and stockpiling aquatic turtles are desperately needed. Existing facilities (e.g., Tortoise Reserve, USFWS Orangeburg fish hatchery) can also be utilized for Assurance Colonies.
- Point persons: E. Meier, J.E. Barzyk, R. Hudson, K.A. Buhlmann, J.L. Behler.
- Budget: \$50,000/yr

IUCN Red List Assessments

- Focus on rapid re-assessments of all tortoise and freshwater turtle species not recently evaluated, especially poorly known species with limited distributions. Work within the TFTSG and its Red List Authority to assure upgrading of threatened status designations of species so that official IUCN listings reflect true conservation status. Support for specific investigations to re-assess those species thought to be in most urgent need for re-evaluation, especially as based on perceived survival threats.
- Point persons: A.G.J. Rhodin, P.P. van Dijk.
- Budget: \$10,000/yr

Capacity Building Training Programs

- Capacity building through training programs need continued support. Funds are needed to continue and expand the very important capacity building training program at the Wetlands Institute (WI) in New Jersey. Funded by the



The TSA Hong Kong rescue operation, where TSA handled placement of nearly 7000 turtles confiscated from the illegal trade in Hong Kong and shipped via international cooperative agreements to TSA-USA and TSA-Europe to be placed into Assurance Colonies. This was the scene in Florida, where some 3000+ turtles were successfully processed and placed by a large team of volunteer veterinarians, captive-care specialists, and turtle enthusiasts from all walks of life, demonstrating the value of working together with passion for the well-being of turtles. Photo by R. Hudson.

New York Turtle and Tortoise Society and Gopher Tortoise Council, this program brings young turtle biologists to the USA for training in turtle field research techniques and empowers them to become advocates for turtle research and conservation when they return home. Thus far students from several Asian nations have been through this training program. Support for other USA-based training courses in population management and studbook techniques for other trainees is also important. In Europe, the Durrell Wildlife Conservation Trust has administered a long-running conservation training program that has instructed a large number of trainees from developing nations, including turtle conservation personnel. Support



A juvenile *Mauremys pritchardi*, a recently described species supposedly from Myanmar and Yunnan, China, but based on specimens acquired from Chinese commercial turtle dealers. Photo by W.P. McCord. This species is listed by the 2000 IUCN Red List as Data Deficient. Recent evidence from other recently described species from similar commercial origins have suggested that some of these “species” may actually be cross-bred hybrids produced in commercial turtle farms in China. Genetic analysis is helping to unravel these taxonomic mysteries and helping us properly evaluate which “species” are real and worthy of conservation efforts. Other genetic analysis, such as recent work on the Critically Endangered species *Chitra chitra* is demonstrating the presence of an undescribed species in Myanmar, where that undescribed species is under even greater threat. The recognition of taxonomic distinctness is a basic precursor to effective conservation action.

for this program would benefit further capacity building.

- Point persons: R.C. Wood (WI), W. Espenshade, H. Quinn (Cleveland Zoo), K. Buley (Durrell).
- Budget: \$30,000/yr

Conservation Systematics and Genetics

- Funds are needed to urgently investigate and determine the taxonomic status (through both morphologic and genetic studies) of many undescribed and potentially new taxa of tortoises and freshwater turtles. Species may be lost to extinction before we even knew they existed. Many geographically isolated populations may indeed be unrecognized species; these need to be systematically defined and named in order to adequately investigate their survival status and threats and to facilitate appropriate and effective conservation action. In addition, further studies are needed to more adequately delineate a few currently described species which may actually represent hybrids produced in commercial turtle farms.
- Point persons: A.G.J. Rhodin, J.B. Iverson, J.F. Parham, H.B. Shaffer, J. Perälä.
- Budget: \$30,000/yr

Turtle Action Fund

- A general multipurpose action fund is needed to support a broad range of urgently required activities by the global turtle conservation community to serve either as total funding for small critical projects or as catalyzing seed funding to initiate or develop larger and more comprehensive projects for possible later in-depth funding proposals. Grants from the Turtle Action Fund would be limited to a maximum of \$5000 each and would be used for rapid mobilization of support for urgently needed conservation action.
- Projects supported by the Turtle Action Fund would typically involve geographic regions and species not already targeted by the country-specific projects and focus species designated in the previous sections. For example, field surveys for the Critically Endangered and possibly Extinct *Heosemys leyensis* in the Philippines, or field surveys and capacity building in any other poorly known or needed region, such as Laos, Nepal, Pakistan, etc. In addition, field surveys and conservation action for species not yet officially listed as at least Endangered on the IUCN Red List, but known or suspected to be in urgent conservation need due to major threats, would also be prioritized to receive support. For example, the recently described *Testudo wernerii* from Israel, which is in the process of being listed by the IUCN as Critically Endangered, or the possibly Extinct *Pelusios seychellensis* in the Seychelles, or the poorly known *Kinosternon angustipons* in Costa Rica, or isolated and endemic *Trachemys* spp. in the Caribbean, etc.
- Point persons: TCF Executive Board.
- Budget: \$150,000/yr

Global Projects Budget, First Year: \$340,000
Global Projects Budget, 5 Year Projection: \$1,870,000

BUDGET PROPOSAL AND SUPPORT SUMMARY

Budget Proposal, First Year (2002–2003)

Personnel Sub-Total:	\$335,000
Regional Projects Sub-Total:	\$380,000
Global and Other Projects Sub-Total:	\$340,000

Total Budget Proposal, First Year: \$1,055,000

Budget Proposal, 5-Year Projection (2002–2007)

Personnel Sub-Total:	\$1,842,000
Regional Projects Sub-Total:	\$1,938,000
Global and Other Projects Sub-Total:	\$1,870,000

Total Budget Proposal, 5-Year Projection: \$5,650,000

TCF Alliance Partners –

In-Hand and Committed Funding and Resource Support:

Conservation International/
Center for Applied Biodiversity Science
(Support for TCF Executive Officer and other Projects)
Wildlife Conservation Society
(Support for Myanmar and Madagascar and other Projects)
Island Foundation
(Support for TSA Program Officer and other Projects)
Fort Worth Zoo
(Support for TSA Co-chair and Records Keeper)
Savannah River Ecology Laboratory
(Support for Research Fellow)
Chelonian Research Foundation
(Support for TFTSG Program Officer and Linnaeus Fund Grants for other Projects)
Rotterdam Zoo
(Partial support for Asian Turtle Conservation Officer)
Nando Peretti Foundation
Frankel Family Foundation
Disney Wildlife Conservation Fund
Columbus Zoo
Cleveland Zoological Society
TSA Auction, Daytona Reptile Expo
Kadoorie Farm and Botanic Garden
American Zoo and Aquarium Association/
Chelonian Advisory Group
Durrell Wildlife Conservation Trust

Melbourne Zoo
European Association of Zoos and Aquaria
European Studbook Foundation
Reptiles Magazine
Zoo Atlanta
Chelonian Research Institute
International Center for Conservation of Turtles/
Münster Allwetter Zoo
IUCN—The World Conservation Union/
Species Survival Commission

Total In-Hand and Committed Support (1 year): \$310,000

Other Pending and Potential TCF Alliance Partners:

Panaphil Foundation
Wade Foundation
Michael Cooperman Foundation
National Fish and Wildlife Foundation
Partners for Amphibian and Reptile Conservation
Chelonia Institute
Houston Zoo
Detroit Zoological Institute
Australasian Regional Association of Zoological Parks and Aquaria
Perth Zoo
Sedgwick County Zoo
Zoological Society of San Diego
Metro Toronto Zoo
St. Louis Zoo
Dallas Zoo
Cincinnati Zoo
Los Angeles Zoo
Philadelphia Zoo
San Francisco Zoological Society
Woodland Park Zoo
Dallas World Aquarium
Lowry Park Zoo
Miami Metrozoo

Total Additional Support Needed (1 year): \$745,000

Total Additional Support Needed (5 years): \$5,300,000



TCF CONTRIBUTIONS

In order to fulfill our mission, the Turtle Conservation Fund (TCF) depends on the support and contributions of all members of the global turtle conservation community, including the large foundations and non-profit organizations that lead the global charge for turtle protection, the smaller focused turtle conservation, research, and advocacy groups who battle in the trenches, and the dedicated individuals who provide the necessary manpower and critical mass to help accomplish advancement in the field. Turtle conservation progresses in small steps, each building on the former—tiny drops combine through time to form a mighty torrent. The contributions made by each of us will enable successful turtle conservation efforts and then combine with other support to gradually generate a new global groundswell of support for turtle conservation and the prevention of extinction.

Please give what you can — your contribution will make a difference.

Donations to the Turtle Conservation Fund are handled by Conservation International (CI) and are fully tax deductible under US laws for 501(c)(3) non-profit organizations. As an added benefit, a gift of \$1,000 or more to TCF will also bring you into CI's Emerald Circle, a community of people who have made a significant commitment to advance the cutting-edge work of CI and TCF. Members of the Emerald Circle receive in-depth reports of CI programs, opportunities to travel to the field, and invitations to special events—all who contribute to TCF will also receive and be acknowledged as TCF Supporters in the next TCF Progress Report.

Name (Individual or Institution) _____

Address _____

Please accept my contribution for the Turtle Conservation Fund at Conservation International as follows:

Donation Amount: ☐ \$10,000 Chairman's Club ☐ \$5,000 President's Club ☐ \$2,500 Protector
☐ \$1,000 Partner ☐ \$500 Friend ☐ \$100 Contributor
☐ Other _____ ☐ My employer will match my gift

Payment Method: ☐ CHECK ☐ MASTERCARD ☐ VISA

Credit Card No. _____ Expiration Date _____

Signature _____

Please designate how you want your TCF contribution to be directed:

☐ UNRESTRICTED TCF SUPPORT FOR TSA, TFTSG, AND CI/CABS TCP PROGRAMS AS NEEDED

Or restricted support for one of the three partnership programs:

☐ TSA PROGRAMS ☐ TFTSG PROGRAMS ☐ CI/CABS TCP PROGRAMS
(IUCN/SSC Turtle Survival Alliance) (IUCN/SSC Tortoise and Fresh-water Turtle Specialist Group) (CI/CABS Turtle Conservation Program)

Payment only in US dollars by either a check drawn on a US bank, a US money order, an International Postal Money Order, an International Banker's Check in US\$ drawn on a US bank, or by Credit Card (MasterCard or Visa only). Please do not send non-US currency checks. Please photocopy this form and mail or fax to the address below.

Make checks or money orders payable to
Conservation International — Turtle Conservation Fund
and remit to:



Sal Spada, Turtle Conservation Fund,
Conservation International / Center for Applied Biodiversity Science
1919 M Street NW, Suite 600, Washington, DC 20036 USA
(Phone: 202-912-1516; Fax: 202-912-0772; E-mail: S.Spada@conservation.org)
Non-Profit Organization Federal Tax ID Number: 52-1497470



A Global Action Plan for Conservation of Tortoises and Freshwater Turtles

Strategy and Funding Prospectus 2002–2007

PRESENTED BY THE
Turtle Conservation Fund

A PARTNERSHIP INITIATIVE OF
CONSERVATION INTERNATIONAL / CENTER FOR APPLIED BIODIVERSITY SCIENCE,
IUCN/SSC TORTOISE AND FRESHWATER TURTLE SPECIALIST GROUP,
AND IUCN/SSC TURTLE SURVIVAL ALLIANCE



An ancient Duncan Island (Pinzón) giant tortoise (*Geochelone nigra duncanensis*) in its native habitat in the wild in the Galapagos. Photo by A.G.J. Rhodin. This isolated and nearly extinct subspecies owes its continued existence to heroic and concerted conservation efforts, including the use of headstarted repatriated animals.

Ancient Chelonians – ANDERS G.J. RHODIN

*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.*

