What a difference ten years can make

In the “full court press” world of TSA and the steady demand to move forward with new programs and facilities, or respond to new crises, there is rarely time to reflect on our past. But recently I was flipping through our 2006 magazine and what struck me was how far we have come as an organization, and with some of our signature programs, in just ten years.

In 2006 we were coming off of Year 1 of our first major conservation grant from the Batchelor Foundation - $100,000 in 2005 – that really allowed TSA to begin investing in a diverse portfolio of range country programs that included Thailand, Malaysia, Burma, Cambodia, Mexico, India, China and Vietnam.

We hit the ground running in India where, based on recommendations from a 2005 strategic planning workshop that set conservation priorities for India’s diverse turtle fauna, the TSA started working on the iconic Red-crowned Roofed Turtle, designated as the flagship species for our India program. The National Chambal Sanctuary (NCS) is the last stronghold for this critically endangered river turtle, but there was a high incidence of nest loss due to jackal predation. In 2006 the TSA launched a program in the NCS and established protected riverine hatcheries where hundreds of clutches of river terrapin eggs were moved for incubation. This highly successful program is now in its tenth year, and tens of thousands of river terrapin hatchlings, that would otherwise have been lost to predation, have been released in the Chambal. In 2010 we expanded into four additional ecoregions in India, each with its own suite of target species and unique challenges. Today the TSA manages three turtle conservation and outreach centers, is actively engaged with riverine communities to reduce pressures on limited freshwater resources, and is rapidly becoming integrated into state government species conservation plans; being called upon regularly to assist with confiscations and rescues. I remember well my first trip to India in 2003 that was the impetus for this program, and look back with pride at how far we have come.

In terms of impact, our Myanmar program is certainly the most dynamic of TSA’s field programs and due to a strong partnership with WCS, has rapidly become a model for turtle conservation in Asia. In 2006 we were just getting involved with the Yadanabon Zoo (YZ) in Mandalay, helping them develop new facilities for both Burmese Star Tortoise and Burmese Roofed Turtles. Both of these endemic species were dangerously close to extinction in the wild, but small populations of star tortoises were held in government-run facilities. A small captive group of adult roofed turtles were living in a small pond at YZ, and the first cohort of wild hatchlings had just arrived from the Chindwin. Today, both of these programs are in full on recovery mode, with nearly ten thousand star tortoises held in three renovated breeding facilities and over 450 reintroduced to the wild. Nearly 700 roofed turtle hatchlings have been collected from protected nests, 60 were reintroduced in 2015 and close to 100 have hatched at the TSA-built breeding center at the YZ. These incredible milestones are largely attributable to the dynamo husband and wife team of Steve (WCS) and Kalyar Platt (TSA) who seem to be everywhere at once, capable of managing a mind boggling amount of work, from both a big picture, programmatic view down to the tiniest minutiae.

Back in 2006 we were casting about in Mexico, looking for a partner to help us find solutions to address the dramatic declines in populations of the Central American River Turtle. It would take four years before we identified the ideal partner, the Belize Foundation for Research and Environmental Education (BFREE) and went to work, first supporting field surveys then holding a workshop that led to a Hicatee conservation monitoring network in Belize. In 2011 we launched the Hicatee Conservation Research Center at BFREE to help answer questions about the reproductive biology of this challenging and enigmatic species. Today we are well on our way to building self-sustaining captive populations, and have produced twelve hatchlings from our breeding colony in just the first two years. There are now 54 adults in our colony, including 20 reproductive females, so this group will grow rapidly and soon provide us with options for taking pressures off of wild populations.

Finally, back in 2006 the Turtle Survival Center (TSC) was not even on our radar, though we were starting to realize that if we were going to make good on our promise of zero turtle extinctions, it would require a dedicated facility. In 2013 the TSC became a reality and today is a bustling hub of activity with over 700 turtles and five full time employees in the lowcountry of South Carolina. Our vision for having a centralized base of operations for TSA, and establishing successful breeding colonies for those species having little chance for survival in the wild, has been realized far faster than any of us could have predicted. This is due to generous donor support of course, but moreover this vision would not be what it is today without the hard work of our dedicated staff... And so to you – Cris Hagen, Nathan Haislip, Sheena Koeth, Carol Amell and Clint Doak – the 2016 Turtle Survival magazine is dedicated.
ABOUT THE COVER: In early November 2016, just as the TSA magazine was in the final stages before going to press, we were notified of a confiscation of over 800 Big-headed turtles (Platysternon megacephalum) in Tachileik, Burma. While not on the scale of last year’s Palawan Forest Turtle rescue, this still represents one of our worst nightmare scenarios. Kalyar Platt, Director of TSA’s Myanmar Turtle Conservation Program, sounded a cry for help and the situation indeed looked desperate. Responding to crises such as this is one of TSA’s strengths and we quickly began mobilizing resources. The turtles were moved to the TSA’s Turtle Rescue Center in May Myo and the grim task of triage began. Big-headed turtles are a difficult to manage species in captivity due to their aggressive nature, need for cool swift-flowing streams, and their ability to climb. As this amazing cover photo well illustrates, these turtles are able to scale vertical rock walls, making their husbandry and management much more challenging. Fortunately the cool montane climate at May Myo is favorable to this species, but there is simply no way to be prepared for individually housing this many turtles. Compounding the situation was the condition of the turtles; most had suffered long-term neglect and were succumbing to starvation and infections. Despite the best efforts of our dedicated and experienced teams of responders, we are down to ~120 turtles at the time of this writing. We are especially grateful to Wildlife Reserves Singapore for sending in the first veterinary and husbandry team, followed by staff from TSA’s Turtle Survival Center and the Wildlife Conservation Society. We also pay special tribute to the many donors – too numerous to list here - that generously supported this extraordinary rescue effort. If there is a bright side to this tragedy, it is that we will be better prepared next time. PHOTO BY KALYAR PLATT.
The Turtle Survival Alliance (TSA) was created in 2001 in response to the rampant and unsustainable harvest of Asian turtles to supply Chinese markets, a situation that came to be known as “The Asian Turtle Crisis.” For its first seven years, the TSA worked under the umbrella of the World Conservation Union (IUCN). In 2005, it was registered as an independent 501(c)(3) nonprofit, based in Fort Worth, Texas and a dedicated Board of Directors was selected in January 2009. From the day it was founded until today, the TSA has remained focused on a single goal: zero turtle extinctions.

The TSA is an action oriented global partnership focusing on species that are at high risk of extinction in turtle diversity hotspots around the world. We develop culturally sensitive conservation programs that utilize a combination of educational outreach, conservation in the wild, assurance colony management in range countries, and ex situ (out of range) captive management.

Through our working collaborations with zoos, aquariums, universities, private turtle enthusiasts, veterinarians, government agencies, and conservation organizations, the TSA is widely recognized as a catalyst for turtle conservation with a reputation for swift and decisive action. The TSA has grown into a global force for turtle conservation and currently supports projects or programs in Belize, Colombia, Europe, Madagascar, United States, and throughout Asia. The opening of the Turtle Survival Center in South Carolina in 2013 has greatly enhanced our ability to protect the most vulnerable species through ex situ assurance colony management and captive breeding.

Meet the Staff

DAVID HEDRICK
David joined the team as the Turtle Survival Alliance Social Media Manager this year. A native of Tennessee, David has worked in Zoo Herpetology for fifteen years. He is the Lead Ectotherm Keeper at the Chattanooga Zoo, a TSA supporting institution. David keeps fans of Chelonian conservation informed on the work of the TSA by giving our followers unique news and views into our work as it happens via Facebook, Instagram, and Twitter!

David is a member of the AZA Lizard Advisory Group Steering Committee, oversees Chattanooga Zoo’s Hellbender Project, and works with the International Iguana Foundation.

CHRIS CLARK
Chris Clark is the newest member of the Turtle Survival Alliance, and proud to be onboard as the new Chief Administrative Officer. In addition to his lifelong love of reptiles, he brings with him a wealth of experience in nonprofits, business, and administration. After nearly a decade in education, teaching everything from marching band to freshman biology, he pivoted to nonprofit work. He earned a Master’s Degree in Public Administration from the University of New Orleans, and was fortunate enough to support the work of dozens of nonprofits still working to improve South Louisiana since Hurricane Katrina.

When asked about his goals, Chris said, “My goal as CAO is to make sure the TSA operates as smoothly and efficiently as possible. We will continue to grow to meet the needs of turtle conservation worldwide. As we do, I will make sure we maintain compliance, keep administrative costs low, communicate program updates, and, most importantly, provide anticipatory service for all of our members and supporters. My hope is for future generations to make memories encountering turtles in the wild and grow to appreciate these wonderful creatures as much as you and I do.”

HOWARD GOLDSTEIN
Howard joined the Turtle Survival Alliance in May as the new Communications Coordinator. He is passionate about reptiles, especially turtles, and is delighted to be part of their conservation with TSA. Howard began working with TSA two years ago in Belize on the Hicatee Project. He has an M.S. in Wildlife & Fisheries Sciences, and has written for newspapers, nature magazines, and wildlife conservation nonprofits. When asked why he wanted to work for TSA, Howard replied, “TSA is quite simply the most effective boots on the ground freshwater turtle and tortoise conservation organization, and as a lifelong turtle lover, it is an extraordinary opportunity to help save the animals I care about so deeply.”
Our name says it all. The TSA is first and foremost an Alliance. We are an alliance of partners who share in a common goal – zero turtle extinctions. Since forming in 2001, our success has depended on building partnerships. The organizations listed here provide a range of services supporting our mission, including: guidance, networking, strategic planning, funding, turtle care and rescue facilities, animal management, marketing and public relations, field research, logistical and technical support, salaried positions, and a host of other resources. Some of these partners are new, while others have been with us from the start. However, all are integral to our success. On behalf of the Board of Directors of the TSA, we salute this remarkable group of dedicated partners.
Changes to the TSA Board of Directors

The TSA is pleased to welcome Andy Daneault as their newest Board member. Andy has a longstanding interest with reptiles and amphibians and has worked with them professionally in zoologically managed settings for over 20 years. Andy is currently Animal Operations Manager/ Curator of Ectotherms at Disney’s Animal Kingdom where he focuses his efforts on managing the living collection, staff, and conservation initiatives. He also serves as a steering committee member for the Association of Zoos and Aquariums (AZA), Chelonian Taxon Advisory Group, and is the Species Survival Plan (SSP) coordinator for African Pancake tortoises and Co-chair for the Radiated Tortoise SSP. In addition, Andy participates with several non-governmental and governmental organizations dealing with a wide range of conservation projects for various species.

Tischler Art for Conservation

Renowned artist Tom Tischler’s second sculpture in his Tischler Art for Conservation (TAFC) project is a Galapagos Tortoise dedicated to the Turtle Survival Alliance. The TAFC project was created to provide impact beyond what Tom’s life-sized sculptures, seen in more than 100 zoos, museums, and private collections around the world, have had on their viewers. 40% of the purchase price of each sculpture is donated to a conservation organization selected by Tischler, to support programs in the field so that the subjects of his wildlife sculptures can live on for future generations.

The Galapagos Tortoise measures approximately six inches long (tail to nose) by four inches wide and weighs about 4 pounds. The sculpture is cast in bronze with a hand applied and rubbed patina that makes each individual a unique creation. 40% of the purchase price supports TSA conservation programs and includes shipping in the U.S. Shipment confirmation and tracking information will be provided by TAFC. Please visit the online store at www.turtlesurvival.org to purchase your limited edition bronze today.
Growing the Coalition

Anders G.J. Rhodin and Hugh R. Quinn, Co-Chairs

The Turtle Conservation Fund (TCF) was founded in 2002 as a strategic funding partnership of the IUCN Tortoise and Freshwater Turtle Specialist Group, the Turtle Survival Alliance, and Conservation International; and has grown gradually into an expanding coalition of several key partners, supporting organizations, and individuals. These have included: the European Association of Zoos and Aquaria’s Shellshock Campaign, George Meyer and Maria Semple, Humane Society International of Australia, Frankel Family Foundation, Turtle Conservancy, Matthew Franchel, Robert Steinwurtzel, Chelonian Research Foundation, as well as Wildlife Conservation Society and Chelonian Research Institute.

This past year we also welcomed new major organizational support from Global Wildlife Conservation, whose commitment to turtle conservation has also been reflected in their support of the Behler Award as well as numerous other turtle conservation projects. We thank Wes Sechrest and Don Church for their enthusiastic support of our efforts. In addition, we are working increasingly in concert with the Mohamed bin Zayed Species Conservation Fund (MBZ) to help strategically and collaboratively fund the most urgently needed and compelling chelonian conservation projects (see our article on MBZ in the 2014 TSA Magazine).

This organizational synergy has helped to focus increasing resources on the world’s endangered turtles and tortoises, with MBZ and TCF disbursing a total of about US $160,000 combined in turtle-focused grants over the last year.

As of August 2016, the TCF granted over US $954,000 in total support to 217 conservation projects focused on the world’s most endangered turtles and tortoises. A total of 626 grant proposals were received by TCF since 2003, of which 35% were funded, with requests totaling US $3,303,000, of which 29% was granted. The average award was US $4,397. Grants were awarded to projects conducted in 53 nations, with support ranging from US $1,000 to $10,000. All of the Turtle Conservation Coalition’s “Turtles in Trouble: The World’s Top 25+ Most Endangered Tortoises and Freshwater Turtles – 2011,” projects representing 25 species, were funded. Of TCF’s 62 Priority Species (February 2014 list), projects representing 50 (81%) were supported. Of the 29 taxa currently listed by IUCN as Critically Endangered, TCF has supported projects for 27 (93%).

Through the ongoing efforts of TCF and its growing coalition of partner organizations and dedicated individuals, including the TSA, we continue to pursue our mission: conserving the world’s tortoises and freshwater turtles to ensure that no more species become extinct in our time. We greatly value the support of the turtle conservation community in these efforts and are honored to be able to provide as much support as we do for so many of the critically important frontline and on the ground efforts on behalf of global turtle conservation.
In August 2015, four former Rotterdam Zoo employees formally established and registered the ReHerp Foundation as the first serious step toward the establishment of a breeding center for endangered reptile and amphibian species.

The ReHerp Foundation seeks to support TSA’s Zero Extinction Goal by linking the ex situ reproduction of endangered species strongly with the in situ conservation component. The Foundation recognizes that the in situ recovery of species and habitats is vital to conservation and the ultimate goal of preserving wildlife.

It is anticipated that the ReHerp Foundation will be able to blend in situ and ex situ initiatives into comprehensive species conservation plans via the efforts of EAZA zoo people, ready access to ESF studbooks, and the cooperation of private NGO’s.

SPECIES CHOSEN AND A BREEDING SITE OFFERED

With ReHerp now well organized under a clear mission statement, a selection of species and the establishment of a breeding center remained to be accomplished.

Foundation experts ultimately selected three species for which a strong in situ conservation program already existed or was in progress: the Crocodile Tailed Lizard (Shinisaurus crocodilurus), the Egyptian Tortoise (Testudo kleinmanni), and the Vietnamese Freshwater Turtle (Mauremys annamensis). All were determined to be good candidates for both in situ and ex situ recovery.

In Spring 2016, the privately managed Serpo Zoo in the Netherlands offered a facility for breeding our three selected species. A specially designed and insulated section of 75 M2 was divided into both warm and cool rooms to accommodate the varied needs of the species. The warm room contains 35 terrariums for the breeding and rearing of the Egyptian Tortoise, while the cool room has 30 tanks and smaller rearing terrariums available for the two other species. In addition, 60 small terrariums are available for hatchlings.

The ReHerp breeding center is nearing completion and should be fully operational by January 2017. (c) ReHerp PHOTO CREDIT: TSA EUROPE

The plan for the breeding center calls for it to be fully operational by January 2017. The program currently boasts three wild caught and 22 captive born Vietnamese Freshwater Turtles in quarantine, along with 55 Egyptian Tortoises. Eleven of the tortoises are wild born and originate in Libya. The Shinisaurus collection will contain 10 captive born animals.

A FUTURE PLAN TO GO GLOBAL

Looking forward, the ReHerp Foundation has set a high priority on veterinary screening and DNA sampling of all the animals. Long term plans include working with zoos worldwide as well as strongly supporting the Turtle Survival Alliance. With two Dutch zoos already on board, there are good, cooperative initiatives under development regarding breeding efforts for the Egyptian Tortoises and the Crocodile Lizards. The Cologne Zoo is seeking to participate in DNA sampling of the lizards with in situ partners in both Vietnam and China. The ESF Shinisaurus studbook keeper, Michael Zollweg, continues to play a key role in fostering this important relationship.

While this first breeding center will initially focus on these three species, the future will determine whether other centers are feasible in the ongoing effort to create successful in situ recovery programs.
The TSA family, and indeed the entire chelonian conservation community, is deeply saddened by the untimely passing of two of Europe’s most impassioned turtle conservationists, Hans Dieter Philippen and Henk Zwartepoorte. Europe’s TSA leadership team has been sorely affected, as they are now without a Chair (Henk) and one of their Co-Chairs (Hans Dieter).

Both men were giants in the European turtle community. Their passing leaves a huge void in our ability to manage global populations of endangered chelonians, and to respond effectively to turtle crises around the globe. I have known Henk and Hans Dieter since the founding days of the TSA and always knew I could count on both of them for guidance and information. They were flowing fountains of knowledge regarding turtle biology, history in captivity, and husbandry, and I will dearly miss their wise and informed counsel.

Rick Hudson
TSA President/CEO

I N M E M O R I A M

The loss was unexpected and came as a great shock to the turtle conservation community. On May 9, 2016, Turtle Survival Alliance Europe Vice Chairman, Hans Dieter Philippen, suddenly passed away, at the age of 58, peacefully in his sleep. On May 13th, his remains were cremated, and on the 21st of May, his ashes were given back to the earth at the Bergerbos cemetery in the Netherlands.

TSA Europe has lost a Vice Chair, and the turtle conservation community a dedicated and well-loved conservationist. Preferring to live close to the Dutch border, Hans Dieter was often affectionately referred to by Dutch turtle keepers as “an almost Dutchman.”

We met, for the first time, at the Rotterdam Zoo, during a meeting of the Dutch Turtle and Tortoise Society in October of 1984. That meeting saw the beginning of a personal friendship that would last 32 years and up to his death. During the 1980's, Hans Dieter introduced us to an expanding network of German, Austrian, and Swiss turtle keepers and breeders. We enjoyed numerous visits to zoos, and he was always a very welcome guest at the Rotterdam. The reptile and amphibian keepers community know they have lost a truly great icon of chelonian conservation.

Hans Dieter had a rare, innate ability to bring and bind people together with his easy, natural charm. This gift, coupled with an immense knowledge of flora and fauna, enabled him to capably fulfill the roles of advisor for the European Association for Zoos and Aquariums, advisor to the European Studbook Foundation, and, since 2002, TSA Europe’s Vice Chairman.

In addition to these activities, Hans Dieter built a large reference library of books, magazines and periodicals. Always friendly and cooperative, he never refused when anyone requested access to his extensive collection.

On his memory card was written:

There are people in the world,
Having the gift,
To find friends everywhere;
And
The best thing a person can leave behind,
is a smile on the face of those who remember him.

His name will forever be connected to all those who share his great love for animals. When we remember him, it will be with a smile. He will never be forgotten.

Our condolences are given to his wife Elke Grünwald and his family. We wish them strength.

On behalf of the TSA Europe board
Henk Zwartepoorte, TSA Europe Chair

Hans Dieter Philippen

Henk Zwartepoorte

As this issue of Turtle Survival was about to go to press, word reached us of the untimely passing of Henk Zwartepoorte on 28 October, at the age of 67 years. Henk passed away, peacefully in his sleep, soon after arriving in Australia for a holiday with his partner, Mary Vriens.

Henk was a giant within the turtle conservation community. He led the way, envisioning an innovative, collaborative approach in which zoos and private collectors could work together to help safeguard species in captivity, begin repatriation of captive bred animals to bolster depleted populations, and develop the means for reintroducing a species where it had disappeared from the wild. His ability to assemble and work with a team of field researchers, zoo people, hobbyists, and volunteers was always inspirational and incredibly effective.

His many influential roles included co-Chairing TSA Europe, overseeing the European Studbook Foundation, and leading the Dutch Turtle & Tortoise Society. He also maintained a devoted involvement in the Turtle Conservation Fund, the EAZA Shellshock campaign, and many other institutions and initiatives.

Henk will be sorely missed by all those people around the world dedicated to saving freshwater turtles, tortoises and other species. He is especially missed by those who had the great good fortune to work with him.

Our deepest sympathies are extended to Mary and all who loved him.

Peter Paul van Dijk, Co-Chair
IUCN Tortoise and Freshwater Specialist Group

Our condolences are given to his wife Elke Grünwald and his family. We wish them strength.

On behalf of the TSA Europe board
Henk Zwartepoorte, TSA Europe Chair
Within our turtle nation, the word “collaboration” has a profound impact on the success of conservation efforts. The results of this important research would not be possible without the collaborative endeavors of our volunteers within the North American Freshwater Turtle Research Group (NAFTRG), the work of other leading scientists that share a passion for chelonians, the colleges and universities that support student research, along with eager citizen scientists. The breadth of our turtle research and conservation efforts makes these types of collaborations invaluable.

A BRIEF HISTORY OF NAFTRG

Seventeen years ago, the NAFTRG started as a field excursion. A young adventurous professor (think Indiana Jones with a twist of the Crocodile Hunter) and a few inquisitive students – willing to follow their teacher, unquestioningly, into alligator infested waters – traveled from Pennsylvania to Florida’s crystal clear Wekiwa Springs in search of turtles. At the time, the group didn’t have a name, but this young professor, Dr. J. Brian Hauge, turned a passionate hunt for turtles into an undergraduate class for students at Penn State University first offered in the Spring of 1999.

The course offering was so popular that students in subsequent semesters had to go through
NAFTRG volunteers Melissa Smith and Rachel Atkinson pit tagging a Suwannee River cooter. PHOTO CREDIT: DR. BETH WALTON
an extensive application process to be admitted. One was so enthusiastic he later returned to the course as a Teaching Assistant. Later, when he couldn’t tag along as a student or TA, and the course was discontinued at Penn State due to Dr. Hauge’s departure to another university, that student convinced his college sweetheart and several friends to keep coming back to Wekiwa Springs, season after season. He had maintained the permits and data collection and continued the study as a hobby.

This young man eventually made connections at other universities, at his place of employment, SWCA Environmental Consultants, and through local turtle interest and conservation groups, such as the Turtle Survival Alliance. When TSA board members realized he was seriously committed, they invited his group to become part of their mission.

Today, Eric Munscher is the director of TSA-NAFTRG, and continues giving students the gift which he found invaluable as an undergrad: offering them the opportunity of working with other passionate individuals and finding mentors in the turtle world, making connections, and growing individually as they continue to dedicate time and effort to making a difference for turtle conservation.

NAFTRG VOLUNTEERS

As our turtle work has continued over the seventeen years since the group’s inception, we’ve made lasting friendships with a vast network of volunteers.

These citizen scientists initially signed up with nothing more than a love of turtles in common. After camping for a week in humid, hundred degree heat, swimming in lagoons chasing turtles and avoiding gators, and then spending hours processing the animals in the hot sun, they found that they shared a new bond of camaraderie as deep as their passion for chelonians.

Our volunteers return, year after year, bringing new volunteers with them. Some even branch off to perform other turtle work, inspired by their experiences with NAFTRG. This collaborative effort is what makes our work special, while enabling our continual growth as we expand into other states with new sites.

UNIVERSITY SUPPORT

The word research goes hand-in-hand with university support, and NAFTRG would not be as productive had we not had the consistent support of universities.

To date, we’ve worked with Penn State University, Freed-Hardeman University, Peninsula College, University of North Florida, University of South Florida, University of Central Florida, University of Florida, Western Washington University, Texas State University, University of St. Thomas, Indiana University of Pennsylvania, and Duquesne University, just to name a few!

These institutions of higher learning have provided student researchers, funding, a platform to spread the importance of the research, and helped make turtle conservation a global priority. Several students have also received credit for research collaborations done with NAFTRG.

CITIZEN SCIENTISTS

Unified by a great love of turtles, NAFTRG has become a family.

When we think of collaboration, we think of family. Research trips are typically centered around family, both figuratively and literally. Moreover, interacting with families has become a critical part of our work. We dedicate countless hours to educating the public that gathers at research sites to witness our turtle processing methods. And many young children may begin down the road to becoming conservationists when they ask a NAFTRG volunteer: “what are you doing to the turtles?”

Volunteers often recruit friends or family to help in the research effort; some of these “non turtle people” have turned into key contributors. From turtle catching, to canoeing, to processing – we have many tasks requiring a diverse set of skills, and there’s always something for “newbies” to do and they’re always welcome.

NAFTRG also conducts yearly public forums at Wekiwa Springs State Park. Over the past three years, more than 350 people, including families on vacation, locals, and peers in other fields of biology, have come out to attend these events to learn about turtles and why they are important.

FUTURE STUDENT INVOLVEMENT

A project of this size and longevity can only be sustained through continued student involvement and collaboration. Our group is open to allowing use of data for graduate student projects. It’s our hope the NAFTRG can elicit increasing interest from potential Master’s Degree and Ph.D. students.

The group maintains healthy relationships with the Florida, Texas, Tennessee, and Pennsyl-
vania permitting departments. These relationships allow greater ease in gaining permits for additional study sites and side projects to existing permits.

NAFTRG also has funding and equipment to facilitate the starting of new research projects. Students with an interest in current NAFTRG research, or in adding projects to the NAFTRG project framework, should contact NAFTRG and TSA personnel to start discussions and find out what opportunities exist.

STANDING AND FUTURE COLLABORATIONS

NAFTRG actively seeks out collaborations. We currently maintain several ongoing partnerships, with others in the works.

We have been collaborating with Dr. Jerry Johnson at Ichetucknee Springs since 2014. That partnership has allowed this huge site to be studied in comparison to previous work done by Dr. Peter Meylan in 2007, and it now exists as a long term monitoring project. We’re also joining with the Turtle Room and Dr. Josiah Townsend from Indiana University of Pennsylvania to work on a wood turtle population monitoring project in Pennsylvania starting in March 2017. The research group could also potentially be partnering with Dr. John Iverson on a research study he has been conducting for over 30 years in Indiana.

We’re also actively looking for grants and funding for all research projects. NAFTRG was recently awarded a significant grant to conduct home range and movement studies on two River Cooter species, *Pseudemys peninsularis* and *P. nelsoni*, at Wekiwa Springs State Park. Over the past few years we’ve observed significant movement events regarding these two *Pseudemys* species. We plan on conducting at least a year long home range and movement study to ascertain where these animals are traveling within the larger Wekiwa Springs area. The research group could certainly use student involvement for this project, and would welcome inquiries.

NAFTRG has grown from a single study site in Florida in 1999 to eight study sites in Florida, two in Texas, one in Tennessee, and one in Pennsylvania, as of late 2016. It is our hope that with continued collaboration and volunteer involvement we can expand to new study sites, new side projects, and new species.

We live by a simple motto, **We Are Turtle Rich**, and we would like you to be, as well. Please come join us.

Contacts: Eric Munscher, emunscher@turtlesurvival.org

Acknowledgments:
Disney Wildlife Conservation Fund
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The Turtle Room
Sante Fe College
Entering only its third year of operation, the Turtle Survival Center (TSC) continues to grow at a rapid rate, exceeding expectations and bringing our vision for a world class turtle conservation center into clearer focus. New facilities are coming on line, new species are reproducing and visitors are now experiencing the TSC first-hand through our outreach program. All these changes are made possible because of stability at the staffing level, with a cohesive group of five dedicated individuals, each with their special skills and abilities.

**COLLECTION GROWTH**

As the enclosures and facilities mature, and the turtles acclimate to their naturalistic surroundings, we continue to observe natural behaviors not previously seen here. Settling in and adapting to the coastal South Carolina “lowcoun-
The TSC clinic has a new digital microscope that allows documenting and sharing images like this one of *Cuora galbinifrons* blood cells.
try” environment has had a significant impact on reproductive success. During the 2016 breeding season, 16 species of chelonians produced fertile eggs — more than double the number from 2015. Of the 73 hatchlings produced (representing 13 species), six are significant species ‘firsts’ for the center. With a living collection now numbering 700 individuals, the TSC can anticipate further success and growth, which means that we will be building new enclosures well into the foreseeable future to accommodate that growth.

NEW RESIDENTS, NEW CONSTRUCTION

In October 2015, the TSA received a donation of 105 turtles from a private individual in Hong Kong comprised primarily of Cuora galbinfrons, Cuora bourreti, and Cuora picturata. All these species are ranked as Critically Endangered on the IUCN Red List.

The turtles acclimated well at the TSC, and even produced eggs during the 2016 breeding season. Their growing numbers precipitated a very generous donation from the Barbara B. Bonner Charitable Fund to support the construction of a second Cuora Complex, which got underway in October 2016. The complex will provide 90 new, secure and naturalistic enclosures for raising and breeding terrestrial and aquatic Cuora species.

In July 2016, the TSC finally achieved one of our long-term goals with the completion of the new Quarantine Building. The 9m x 12m block building is equipped with four animal rooms, a general muck room, a necropsy room with a separate entrance, and a dual storage and disinfection area. The new building allows staff to properly quarantine both new arrivals and small-scale confiscations. It also provides a place for breeding groups considered subclinical carriers of pathogens potentially harmful to other animals. The new building allows for the maintenance of potentially contagious groups of turtles to remain part of our breeding program, but safely out of proximity to the rest of the collection. We believe that these turtles can thrive under specialized care and potentially contribute offspring to future breeding programs, pending further testing and research of course.

The first residents moved into the new Quarantine Building in late summer. Anecdotally, it appears that at least some turtles that are carrying pathogens of concern can produce offspring that test negative for those same pathogens.

The building is as energy efficient and secure as we could make it. It rests on a 61 cm solid concrete footer and was engineered to withstand both hurricane force winds and flooding. Designed as a wet lab, all surfaces, including ceilings and walls, can be hosed down and disinfected. Additionally, each animal room is equipped with separate heating and cooling units to allow individual temperature control and prevent air-borne pathogens contaminating other rooms.

The quarantine building could not have been completed without the generosity of our friends and supporters. We owe a debt of gratitude to Will McGuire, for serving as the general contractor on this project. Special thanks to Jay Allen and Derrek Beavor for their valuable time, materials, and expertise, and Jay Epting for the donation of the HVAC systems. The quarantine building was
The vegetation growth at the TSC from summer 2015 to summer 2016 provides shade and security for turtle residents in their lush enclosures.

PHOTO CREDIT: CRIS HAGEN
made possible, in large part, by a grant from the Arthur L. and Elaine V. Johnson Foundation.

**VETERINARY PROGRAM EXPANDS OUTREACH**

The veterinary program at the TSC continues to grow as we collaborate with two consulting veterinarians, Dr. Shane Boylan of the South Carolina Aquarium, and Dr. Terry Norton, Director of the Georgia Sea Turtle Center. Both of these valuable contributors serve our veterinary medical efforts by making ‘as needed’ house calls to the TSC, being available for case discussions and mentoring, providing expert opinion, sharing both staff and equipment when needed, and procuring essential equipment donations.

This year alone, our associated vets have facilitated the donation of an endoscope and a high quality necropsy table for the new necropsy suite in the Quarantine Building. In turn, the TSC staff and collection provide learning opportunities for staff and veterinary student externs from the South Carolina Aquarium and the Georgia Sea Turtle Center. The invaluable experience gained by working with many of the species at the TSC, combined with the shared expertise of the TSC staff, presents a unique learning opportunity that works for everyone involved.

Our most exciting donation was a much needed microscope upgrade in the TSC laboratory. Thanks to a grant from the Levelers Foundation and spearheaded by Peter Miller of Woodland Park Zoo, we acquired a brand new digital microscope that can be transported easily for use in the field. The new scope allows Sheena Koeth, the TSC’s Veterinary Care Manager, to take high quality photos and video of microscopic findings. The photos and video facilitate the teaching of students, both in person and via Internet sharing, enabling them to watch a live video monitor rather than take turns at the microscope. Images and videos from the microscope can also be used when diagnostic samples require additional opinions, for publication in professional journals, and for use during professional presentations.

**HORTICULTURE**

One of the most noticeable changes around the Center is the number of cultivated plants. The staff at the Center has procured, mostly through donations, more than 100 species of edible and ornamental plant and tree species to enhance the aesthetics of the center, as well as provide food for its residents. Horticulture at the TSC got a significant boost when Facilities Manager/Lead Keeper Nathan Haislip joined the staff in the summer of 2014. His knowledge and dedication has transformed the TSC into a botanically lush turtle haven.

**NEEDS FOR THE FUTURE**

For the immediate future, the primary need for the TSC is a facility for intern housing. With full time staff capped at five for the foreseeable future, and with the collection growing rapidly, we must develop an internship program that will allow us to continue to deliver high quality animal care. We frequently receive inquiries for students interested in volunteering, but are currently limited by the lack of on-site housing. Our goal is to install a modular home directly across from the Center that would not only support an intern program but training opportunities as well. Our goal is to develop curriculum for a turtle conservation course that can be offered at the TSC, and to expand opportunities for training our international colleagues that visit the Center in conjunction with the annual conference.

**Contacts:** CHagen@turtlesurvival.org
Significant Breedings

Cris Hagen

The 2016 breeding season brought a significant increase to the number of species successfully reproducing at the Turtle Survival Center. First breeding events this year for the TSC include the Forest Hinge-back Tortoise (*Kinixys erosa*), Home’s Hinge-back Tortoise (*Kinixys homeana*), Sulawesi Tortoise (*Indotestudo forstenii*), Indochinese Box Turtle (*Cuora galbinifrons*), Keeled Box Turtle (*Cuora mouhotii mouhotii*), and Ryukyu Black-breasted Leaf Turtle (*Geoemyda japonica*). Also, for a second year in a row, the expert staff at the TSC continued to facilitate reproduction of Big-headed Turtles (*Platysternon megacephalum*), a species generally known to be difficult to reproduce in captivity. This year a total of eight hatchlings from two different bloodlines were produced.
The staff at the Turtle Survival Center recognizes the importance of community involvement, encouraging our neighbors to learn about biodiversity and conservation through participation in outreach events, group presentations and school field trips. These opportunities not only afford encounters with some of the world’s rarest turtle species, but also educate the public about the conservation efforts underway to preserve them.

“"My dream is to become an exotic animal vet so I was very interested in the TSA and the work they do in turtle and tortoise conservation. In my time volunteering with them I’ve learned not only the incredible way they impact turtle populations worldwide but also the incredible way they impact people with dreams, like me." Abigail Oldfield (13), Buist Academy. PHOTO CREDIT: STACY OLDFIELD

Contact
To schedule a tour of the Turtle Survival Center, please contact Ilze Astad, Director of Development, ilze.astad@turtlesurvival.org.
In 2011 we had a dream of establishing a centralized base of operations where the TSA could develop a dedicated conservation/breeding center for critically endangered chelonians. The vision for the Turtle Survival Center was to provide us with the much needed ability to manage our assurance colonies from a single location and to build healthy, self-sustaining captive populations for many turtle and tortoise species that have little or no chance for survival in the wild. In other words, the Turtle Survival Center was central to our mission of achieving zero turtle extinctions.

In 2012 we launched a $1.6 million capital campaign with a goal to purchase property in South Carolina, and to renovate and operate the Turtle Survival Center through 2016. Thanks to the investment of generous donors, we exceeded our campaign goal, raising $2.03 million. With donor support, in just three years after opening the Center, our collection has grown to nearly 750 animals, we have added 15,620 sq. ft. of space in new facilities and enclosures, and have already hatched over 50% of our target species. Much of the construction has been done in house by a very dedicated staff of five incredibly hard working individuals. Doing so has allowed the TSA to generate huge savings while serving as mindful stewards of your investment and giving your donation the greatest efficacy possible. Simply put, we are much further along at this point than where we thought we would be. We hope that you will join us in Charleston in 2017 for our annual conference, and take this opportunity to visit the Turtle Survival Center.

Thank you for putting your trust in and supporting us on this important journey. We thank each and every one you for your continued support in making the Turtle Survival Center into a world class conservation center that we can all be proud of.

We wish to acknowledge the individuals and organizations who donated during the capital campaign (2012-2016).

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Please contact Ilze Astad, Director of Development, at (843) 790-4483 or ilze.astad@turtlesurvival.org to learn about major initiatives at the Turtle Survival Center and how you can support them.
Opening of Tortoise Conservation Center Offers Ray of Hope Amidst a Brutal Year of Intensive Poaching Activity

Rick Hudson, Herilala Randriamahazo, Christina Castellano and Riana Rakotondrainy

THE SURGE IN TORTOISE POACHING activity that began in 2015 continued, seemingly unabated, throughout 2016, and reached crisis proportions.

A highly organized poaching network exists in Madagascar involving high ranking government officials and gendarmes. Despite this, our anti-poaching unit continues to work with local communities, informants and enforcement officers to arrest and bring poachers to justice.

These activities resulted in the seizure of thousands of tortoises, many of which found their way into one of five TSA managed rescue centers. At the time of this writing, the TSA is managing close to 6,000 Radiated Tortoises (Astrochelys radiata), a number that stresses available resources and far exceeds our anticipated capacity.

LAUNCHING THE TORTOISE CONSERVATION CENTER

The ultimate goal of the Tortoise Conservation Center (TCC) is to provide recovery options for the Radiated Tortoise. First conceptualized in 2012 as the lynchpin in TSA's Confiscation to Re-introduction Strategy, the TCC is finally a reality, and not a moment too soon given the burgeoning number of tortoises under our care.

The TCC provides a centralized base of operations for tortoise conservation work in the South, supporting and encouraging local communities to join forces to combat tortoise poachers. The TCC also helps government officials and local people to clearly visualize and understand
the intensity of confiscations by seeing the huge number of tortoises in its care.

Situated at the core of the remaining Radiated Tortoise's range, the TCC will ultimately provide safe sanctuary for the thousands of “refugee tortoises” seized from the trade, allowing them to recover and readjust to a natural habitat. This sanctuary allows us some needed time while plans are made to responsibly reintroduce the animals to community protected areas and restore wild populations once (and if) the threats are abated.

In October 2014, four communities within the Nikoly and Marovato Commune agreed to give the TSA access to a 227-hectare parcel of largely intact spiny forest for tortoise conservation. A year later, this offering became official when a traditional zebu ceremony welcomed the TSA as a member of these communities.

The four communities – Bereny, Anosiala, Besakoa and Ambazoa – are collectively recognized as the Ala Mahavelo Association. A legal agreement was subsequently endorsed by the Tandroy Regional Forest Department giving the TSA management authority of the Ala Mahavelo Forest.

In return, the TSA agreed to help provide benefits to the four communities through jobs and other opportunities. A total of four permanent local staff members along with some construction workers are currently employed by the TCC, and we also purchase tortoise food from the communities weekly. The Ala Mahavelo Association has agreed to help with forest restoration work and have already planted 12 Baobab trees at the Center.

With start-up funding from the Helmsley Foundation, work at the TCC got underway in 2015 with site preparation and infrastructure improvements. We hired Denis Andrianarisoa as Construction Coordinator to coordinate and oversee development of the TCC. We also purchased access to the central water line that runs along the main road in the South, and installed a water storage cistern and tower to allow water to gravity-feed throughout the center. Water is always in critically short supply in the arid South and very few villages can afford access to this pipeline. Now we have a steady supply and the bonus ability to provide a weekly ration of water to each of the four communities.

Other modest, but necessary, improvements completed at the TCC include: the construction of an office and staff housing, construction of restroom and shower facilities, and establishment of limited solar power. Two large primary
tortoise enclosures were erected then subdivided into four size classes. The enclosures are set within a natural forest habitat and provide optimal security and protection from predators, such as dogs.

Thanks to funding from the Association of Zoos and Aquariums (AZA), 2016 also saw the construction of a perimeter fence and gates that surround nearly eight hectares of forest that will become the core of the TCC. Two gardens were planted to grow fresh tortoise food, and a massive effort was made to rid the Center of invasive prickly pear cactus.

By the end of 2016, a tortoise diet prep/kitchen area will be completed, and construction will be underway for a tortoise hospital and quarantine area. These are necessary additions, as tortoise numbers at the TCC have already swelled beyond expected capacity; in just the first full year of operation we are now caring for ~3,600 tortoises at this facility.

TCC goals for 2017 include: improving phone service and power (both solar and via generator), constructing an education pavilion and meeting center, building cabanas for visiting researchers and veterinarians, and adding staff housing. New staff will include a TCC manager, additional tortoise keepers, and security guards.

The TCC was officially opened with a launching ceremony on 7 October and attended by a delegation of both local and national politicians led by the Minister of the Environment, Ecology and Forestry (MEEF), Madame Johanita Ndahimananjara, who presided over the ribbon cutting ceremony. Amid lively traditional dancing and celebration, hundreds of members of the local communities and high ranking officials from the Tandroy region listened to speeches about the importance of the Center in helping preserve the tortoises as a vital part of the cultural heritage of southern Madagascar.

We were honored by the participation of the MEEF, and the minister’s presence underscored the gravity with which the government now regards the ongoing tortoise poaching crisis. After touring the TCC, Madame Johanita’s speech gave high praise for the TSA's sustained collaboration in the South, and expressed hope that these conservation activities will bring development opportunities to the region. Following the ceremony, the delegation returned to the TCC for a cocktail reception and meal. Prepared by the staff, it was the first affair to be hosted there.

A TORTOISE REFUGEE CRISIS

Despite a tightening of the enforcement network, poachers continue to remove tens of thousands of tortoises from their dwindling spiny forest habitat for transport to shipment points in Tulear and Antananarivo.

The vast majority of tortoises placed with the TSA are seized from the Ivato International Airport in Antananarivo, where the tortoises are packed into boxes and suitcases destined for Asian pet markets. TSA's rescue center in Antananarivo handles the brunt of these seizures, necessitating the movement of tortoises to facilities in the South in order to accommodate the next group of confiscated tortoises.
TCC keeper Tsithaina Rehoahy with one of the adult Radiated Tortoises fortunate enough to have been spared and brought to the Center for care. Hopefully – one day – this tortoise will be able to be returned to the wild in a protected area. PHOTO CREDIT CHRIS SCARFFE
In the rural South, however, tortoise confiscations are more complicated and catching poachers requires more effort. The TSA has developed an effective anti-poaching unit, headed up by our Enforcement Coordinator, Sylvain Mahazotahy, an exceptional individual with a passion and tenacity for bringing wildlife criminals to justice.

Mahazotahy occupies a multifaceted position that is always challenging and sometimes dangerous. He serves as the nexus linking all the various individuals, agencies and authorities involved in making a case against tortoise poaching. Sylvain coordinates a complex process that includes instructing and supporting law enforcement in the performance of their duties, explaining the proper but often complicated application of the local enforcement (dina) process, documenting illegal tortoise activity, and ensuring the proper collection of evidence so that cases can be effectively prosecuted. The TSA supports the informant network and witnesses by providing transport, lodging and per diem allowances for travel when making court appearances.

In order to be successful, enforcement must occur at two levels. Community enforcement occurs through the application of the dina process, and nationally through the arrest and conviction of poachers. Following the historic adoption of the Lilintane de Tandroy in 2012, which is strongly linked to the Tandroy tradition, or fady, of not harming tortoises, Sylvain works with local communities to help them enforce the dina.

Many are proud to do so and cooperate willingly. The whole process is dependent on a network of informants in the five communes where tortoises are still abundant. Using cell phones to communicate tortoise crimes effectively, 63 dina applications have been performed from 2014–2016, saving 4,315 tortoises from the illegal trade. Most were released into the field but 1,085 were turned over to the TSA.

This process comes at a heavy cost to the offending community, in that they must purchase a zebu for sacrifice (~$700 US), providing a serious deterrent.

However, one village, Soamanitra, continues to poach, despite five dina applications. They’ve also gained the unwanted attention of regional...
Due to the proximity of this village to Cap Sainte-Marie – the location of the most abundant and important tortoise population in Madagascar – and due to the repeated violations there, the TSA convened a workshop in July 2016 where a collective decision was made to deal with the problem.

Regional authorities have now implemented regular community checkpoints along the road to detect tortoises in vehicles. One checkpoint, in particular, installed two years ago but never operated in Tsihombe, a well known poaching hotspot, is finally being used thanks to the new head of the Gendarmes. As a result, poachers are starting to move tortoises at night to avoid detection.

The TSA's poaching action unit works in conjunction with authorities in the Tandroy regional capital of Ambovombe, including the Forestry and Justice Departments, and with the support of the Head Prefecture of the Region. This brings increased clout to the process. One informant call resulted in the seizure of 643 tortoises collected in the Tandroy region and headed to Tulear on the west coast. Local gendarmes and Forestry Department officials made the arrest and returned the tortoises and the poachers to Ambovombe, where chances of prosecution are higher. Those tortoises now safely reside at the TCC.

In recent years, UHZ directed significant funding support to the TSA's Madagascar tortoise program. The conservation strategy of Utah's Hogle Zoo, known as the “Big Six”, allows the Zoo to focus resources on six key species in a core program that includes the Radiated Tortoise. The additional revenue from UHZ has propelled the TSA program in the past year and culminated in the recent official opening of the Tortoise Conservation Center (TCC).

The TCC is the result of a shared vision to have a base of operations for tortoise conservation work with a visible presence in the heart of the Radiated Tortoise’s range in southern Madagascar. The Center also provides a safe refuge for the thousands of tortoises confiscated from the illegal trade until reintroductions can be responsibly planned. To date, UHZ funding has supported new employee positions, the purchase of a truck, and new equipment and specialized facilities at the TCC.

The TSA/UHZ partnership has catalyzed an enormous amount of momentum. The TCC is emblematic of this dynamic impetus, having gone from concept to reality in just three short years. We have much left to do if we are to save the Radiated Tortoise, but we have confidence that our efforts are having an impact on poaching. At the very least, we are preserving the ability for wild populations to recover once the poaching threat is brought under control. This partnership is in it for the long haul.

Contacts: Rhudson@fortworthzoo.org

Acknowledgements: The TSA recognizes the following organizations and individuals for their generosity and commitment to our mission in Madagascar: Harry and Leona Helmsley Charitable Trust, Utah’s Hogle Zoo, the AZA’s Conservation Grant Fund, Disney’s Rapid Response Fund, Nature’s Own, Owen Griffin/Francois Leguat Ltd., British Chelonia Group and Conservation International.
In a country encumbered with one of the highest human population densities the world has ever seen, conservation success stories are a welcome rarity. The Creative Conservation Alliance (CCA), with the support of the Turtle Survival Alliance and several other organizations, is proud to be creating several such stories by leading a widespread effort in the remote Chittagong Hill Tracts (CHT) of Bangladesh.

Bangladesh harbors more turtle species, per unit area, than any other country in the world. This startling fact is easily understood when one remembers this country includes a wide variety of suitable habitat — with a massive flood plain and impressive tracts of forests in the hill regions to the northeast and southeast — where our programs are focused.

CHITTAGONG HILL TRACTS PROGRAM

The Chittagong Hill Tracts are located in the remote southeast corner of Bangladesh, and remain the least explored area in the country. Exploratory biological research within these rugged hills occurred mostly during the colonial era, but since the departure of the British 70 years ago, the area has become politically complex and virtually inaccessible to outsiders. Large tracts of old growth forest have been removed by illegal logging and by shifting agricultural practices.

Despite many challenges, the fauna that persists here is remarkable. The CHT is home to at least 26 globally threatened species, including a spectacular assemblage of large mammals and birds. The Clouded Leopard, Chinese Pangolin, Asian Elephant, Asiatic Black Bear, Sun Bear, Dhole, Great Hornbill, Gaur, and Tiger, have all been captured on camera traps.

This hilly terrain extends north into the Himalayas, so any ecological win or lose scenario here will be felt across the greater cross boundary region.
BUILDING LOCAL RELATIONSHIPS LEADS TO SUCCESS

Due to the region’s political complexity and remote nature, the CHT remains a dangerous place for biologists like CCA co-founder and CEO, Caesar Rahman, to work.

Caesar has explored the most remote reaches of the CHT and gained the trust of locals over the past five years; building up an understanding of their society and receiving valuable insights for designing conservation solutions.

One of those solutions included the building of four primary schools in exchange for hunting and logging moratoriums on 15 threatened species, including seven species of freshwater turtles and tortoises: the Asian Giant Tortoise (Mannoria emys), Arakan Forest Turtle (Heosemys depressa), Keeled Box Turtle (Cuora mouhotii), Elongated Tortoise (Indotestudo elongata), and Sylhet Roofed Turtle (Pangshura sylhetensis).

Further, hunters from the local Mro tribe were trained as conservation ambassadors to carry out basic research tasks. Currently, four former hunters, known as parabiologists, have been employed to set up camera traps, recover and repatriate captured animals, maintain a secure presence in their areas, and manage local programs.

During the first year of the project in 2015, the parabiologists repatriated more than 50 turtles. In the second year, at least 20 turtles were rescued, while our data shows an over 80% reduction in turtle hunting in study areas. While the hunting mitigation program has proven successful, it’s not enough to ensure long-term forest preservation. Many other villages in the area require similar, immediate intervention.

CRAFT FOR CONSERVATION CREATING NEW LIVELIHOODS

The CCA continues to work holistically, striving for harmonic balance between bottom-up and top-down conservation approaches that include alternative livelihood programs implemented within local indigenous communities to reduce dependency on forest resources. Our pilot program, Craft for Conservation, has shown tremendous potential to develop into a successful social business model.

Craft for Conservation partners with other organizations to combat transboundary poaching. Working in conjunction with the Wildlife Conservation Society, we hope to establish SMART patrolling, utilizing ex-hunters to combat illegal logging and poaching. Through the employment of local hunters, we now monitor and access the wildlife trade in the region – unfeasible until now.

With these projects underway, CCA continues to advocate for policy changes necessary for permanent forest preservation. At a series of important and successful meetings in June we discussed conservation action with the Prime Minister’s Office. That session resulted in a promised site visit by the Director General.

EXPANDED NORTHEAST PROGRAM

The CCA, best known for the Bangladesh Python Project, this year expanded its agenda in the forests of northeast Bangladesh.

Established, multi-year telemetry studies of the Burmese Python (Python bivitattus) and Elongated Tortoise (Indotestudo elongata) gathered significant movement data and behavioral observations, while also achieving public outreach and student trainings. Elongated Tortoise telemetry data from seven individuals is being prepared for publication in the coming months, while data from the tracking of relocated conflict pythons was used to inform the Forest Department on best conservation practices for the species.

BANGLADESH TURTLE CONSERVATION CENTER

Several captive Arakan Forest Turtles, Keeled Box Turtles, Elongated Tortoises, and even Asian Forest Tortoises were discovered inside local households within the Chittagong Hill Tracts. The identified households were convinced to willingly donate the animals to CCA for conservation breeding purposes.

To house these and other animals, we’re engaged in talks with government officials about the creation of a state of the art turtle conservation center, a facility to be operated in collaboration with the Forest Department of Bangladesh and the TSA. Once formalities are concluded, the CHT specimens will be transported to Dhaka to establish new assurance colonies for some of the rarest chelonians in the region.

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Acknowledgements Mohamed bin Zayed Species Conservation Fund and Turtle Conservation Fund
Last year’s successful opening of the second breeding facility for the Northern River Terrapin (Batagur baska), in Karamjal, in the South of Bangladesh, couldn’t have been more timely. The facility quickly demonstrated its valuable role in the overall husbandry and management of this critically endangered river terrapin when several juveniles in the main breeding facility in Bhawal National Park developed bacterial and fungal infections that quickly spread to other juveniles.

Karamjal staff, Drs. Peter Praschag and Shannon DiRuzzo, DVM, immediately rushed to Bangladesh to diagnose and treat the infected turtles. As the juveniles’ health improved, up to 100 individuals were moved to the new station in Karamjal where the brackish water of the south aided in quickly curing the infections.

RENOVATIONS AT BHAWAL TO SUPPORT NESTING ADULTS

Renovations to support breeding adults were realized at the main breeding facility in Bhawal with the support of the Zoological Society for the Conservation of Species and Populations (ZGAP), and Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT). Work was completed on hatching tanks and sand beaches along with the installation of a new water filtration pump.

Unfortunately, the previously mentioned outbreak did not affect the adult breeding group and 50 eggs were found during the nesting season. Despite optimal weather, and after the usual period of 60-70 days, however, no hatchlings had emerged. Eventually, some eggs were opened and small holes were found at the bottom. Undetected by monitoring from above, the eggs had been attacked by ants and the empty shells filled with sand. Unfortunately, all eggs were lost to ant predation, including several well developed embryos. Due to this unprecedented incident, the building of ant secure incubation boxes is now part of the plan for the upcoming breeding season.

REINTRODUCTION EFFORTS CONTINUE

In addition to captive breeding, a sustainable reintroduction of B. baska requires locating suitable habitat and nesting beaches. With funds from the Ocean Park Conservation Foundation, Hong Kong, four field surveys and several community education programs were conducted in 2016 to fulfill this important part of our mission.

The survey team covered a large area in the Bangladesh Sundarbans, both before and during the monsoon season. Although unable to observe breeding individuals, the team’s project manager, Rupali Ghosh, did find some unidentified eggshells. The shells were later analyzed by geneticists Cäcilia Spitzweg and Uwe Fritz from the Senckenberg Institute in Germany, and determined to originate from the Olive Ridley Sea Turtle (Lepidochelys olivacea). The team also located several suitable nesting beaches as potential sites for future reintroduction of captive bred terrapins.

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India, fabled land of the tiger, is known for the spectacular wildlife that makes it one of the globe's premier biodiversity hotspots. Her unique chelonians are a good example of this natural bounty, as India has no fewer than 28 species of tortoises and freshwater turtles. Among the world's most dense turtle diversity hotspots, India is ranked in the top five Asian countries according to importance for turtle conservation.

Unfortunately, India's turtles and tortoises are not exempt from the grave challenges facing wildlife around the world. A continually expanding human population, coupled with increasing exploitation of the country's watersheds poses a significant threat to all species of Indian riverine turtles. Over 40% of Indian turtles are currently listed as either Endangered or Critically Endangered on the IUCN Red List.

In response to the Indian Turtle Crisis, the TSAAI Indian Turtle Conservation Program (ITCP) was initiated in 2005 and remains the longest running turtle conservation program in the country. Two important turtle conservation workshops were held in India, in that first year of 2005, and later in 2010. Recommendations from these workshops have formed the nucleus for a comprehensive program targeting eight species and four Turtle Priority Areas (TPAs) to be addressed through six projects. The project goals emphasize population monitoring, recovery efforts through nest protection and headstarting, survival and dispersal studies, and new community outreach programs to minimize threats to key populations.

Another Successful Year for India’s Turtle Conservation Programs in 2016

Shailendra Singh, Bhasker Dixit, Sneha Dharwadkar, Arunima Singh, Rachna Tiwari, Neeraj Pal, Nilandri Dasgupta

Schools children participating at Kukrail Guided Nature Tour and learning about turtles. PHOTO CREDIT: SHAILENDR A SINGH
December 2016

NORTHERN RIVER TERRAPIN RECOVERY PROJECT IN SUNDERBANS

The Sunderbans of India are world famous for its tigers, yet a far more endangered creature roams the sloughs and mangrove swamps of this wild landscape. The Northern River Terrapin (Batagur baska) is one of the world’s most endangered turtle species with an estimated wild population of less than 50 adults in three countries. If not for the efforts of the TSA, beginning in 2005, the species would most likely be an extinction statistic by now. It is no exaggeration to state that the Northern River Terrapin conservation program has been incredibly successful in pulling this turtle back from the brink.

In a close partnership with the West Bengal Forest Department, we’re working with 12 adult terrapins as the nucleus for a captive breeding program. Reproduction has been successful in building up the numbers for this species and in May 2016, 95 hatchlings emerged from four nests, bringing the total to 240 since this program got underway in 2012.

During the second week of January 2016, a survey for potential locations suitable for soft release was conducted near the entrance of the core zone of the Sunderbans National Park. ‘Soft release’ sites are areas in which animals are enclosed and acclimated prior to release. Ultrasonic transmitters with temperature sensors and a 48 months long life span were attached to ten headstarted juvenile and sub-adult B. baska. The turtles were placed in a soft release pen and spent just one month in the enclosure before a major storm caused a breach and allowed them to escape before scheduled release. These animals have not yet been accounted for despite three active search and tracking efforts between February and June.

We carefully prepared the temporary nesting enclosure this year before shifting all four gravid adult females there in late February. During the second week of March, we encountered the first nest and found the remaining three within a week. All four nest sites were regularly monitored for temperature and the enclosure was covered with agro-net and leaves to avoid any harm to the incubating eggs from extreme temperatures. The hatchlings emerged from all nests during the evening of 18 May 2016. A record hatch rate of 96 percent was recorded resulting in 96 hatchlings.

PROTECTING THE RED-CROWNED ROOFED TURTLE ON THE CHAMBAL RIVER

The National Chambal Sanctuary (NCS) contains the last known wild population of the Critically Endangered Red-crowned Roofed Turtle (B. kachuga). With fewer than 250 adult females remaining in the Chambal system, the program for their conservation has proven essential for the survival of this beautiful river turtle.

The program currently maintains several captive assurance colonies, headstarts juveniles for release, translocates threatened nests, and provides ex-situ protection after release. A critical part of these efforts include developing alternative means of livelihood for the riparian villages whose traditional activities, such as indiscriminate fishing and livestock grazing on shorelines and in the gallery forest, have had severe detrimental effects on the Chambal River’s wildlife ecology.

The hatchery program continues with three established riverside ‘nurseries’ for the protection and incubation of eggs. We initiated the nest protection program in partnership with 50 Forest Department rangers trained in turtle identification, nest translocation, illegal fishing net removal, and documentation of potential
threats along turtle nesting banks. Patrols detected 17 active or defunct illegal fishing nets in the Chambal. The nets were removed after 52 turtles belonging to five species were rescued and released.

A total of over 598 vulnerable Batagur nests, containing 11,529 eggs were protected and translocated between mid-February and early April, 2016. One hundred and fifteen B. kachuga nests were protected, with the remaining nests in the count identified as belonging to the Three Striped Roofed Turtle (B. dhongoka).

All of the nests hatched out in May recorded an overall 83% success rate with the majority of hatchlings later released close to the site of their original nests. A total of 482 B. kachuga and 2,934 B. dhongoka hatchlings were produced on the lower Chambal, while 1,327 B. kachuga and 4,879 B. dhongoka hatched out on the upper and middle Chambal.

A subset of 160 hatchlings was translocated to the Deori Eco-Centre and the Garhaita Turtle Facility for the rear and release program. The cumulative impact of this TSA program is impressive over its ten year span from 2006 to 2016: 20,111 B. kachuga and 80,678 B. dhongoka have been successfully hatched and released in the NCS.

To determine survival and dispersal patterns, we continued tracking sonic telemetered sub-adults released from our nursery in March 2013. We were only able to locate four individuals, possibly due to weak batteries on the telemeters. We suspended the operation based on technical issues, but still consider this a successful year considering the large number of eggs protected and hatched along the Chambal River.

TURTLE CONSERVATION PROJECT IN THE TARAI – THE FOOTHILLS OF THE HIMALAYAS

The spreading arc of foothills that reach across northern India is known as the Tarai region and is home to 13 species of turtles. It is currently designated as one of India’s Turtle Priority Areas (TPAs).

Our regular monitoring program, conducted from January to March, resulted in a total of 130 individuals captured at three separate locations. Concurrent with these efforts, an experiment in artificial oviposition was conducted with the Crowned River Turtle (Hardella thurjii), a species commonly believed to nest underwater. We captured 26 females and radiographed them to detect the presence of calcified oviducal eggs. The females were temporarily held in a newly constructed 9m x 5m facility comprised of two sections with three tanks. Eight of them tested positive and were injected with oxytocin to induce egg laying.

A total 50 eggs in six clutches were obtained within twelve hours of the injections. The eggs were later translocated to the Kukrail Center. While only five eggs hatched after a prolonged incubation period, we consider this a cause for optimism. The success in inducing egg laying adds to the arsenal of knowledge and techniques to help increase the number of Crowned River Turtle hatchlings and effectively conserve this magnificent animal.

Central to conservation programming for turtles and sympatric species in this area is an effort to train local communities for alternate means of livelihoods and away from a dependency on river resources. The River Conservation Center (RCC) was established along the Ghaghra River in the Bahraich district to help accomplish this goal with the Center hosting regular community programs teaching pisciculture and better agricultural techniques. Crops produced through the new agricultural model and large fish grown in the farms ponds have already been sold at market and demonstrate to the local communities that these alternatives can be both profitable and worth pursuing.

The Center continues to grow and improve with the addition of solar panels and a new water circulation system. Educational signs and panels have been placed throughout the community center and on other project locations to assist with community awareness.

Recognizing that outreach to children is pivotal to a long term conservation strategy, the Center created vital educational programming for local schools. The RCC organized a full day Teacher’s Training Program in which 40 upper and primary schools from villages along the river were selected to participate. The teachers were trained in the importance of, and threats to, aquatic wildlife while learning about ongoing conservation initiatives in their region. These programs will enable them to effectively facilitate implementation of local conservation education modules developed by the RCC project team.

BLACK SOFTSHELL TURTLE

Field assistants managing a Batagur hatchery in the National Chambal Sanctuary. PHOTO CREDIT: SHAILENDRA SINGH
CONSERVATION IN ASSAM

Relentlessly hunted for meat and cartilage, the Black Softshell Turtle (*Nilssonia nigricans*) is a critically endangered species endemic to northeastern India and Bangladesh. Only a single population was known to exist at one temple in Bangladesh until a survey revealed their presence in a few locations within the Brahmaputra River system and within several temple ponds in the eastern Indian state of Assam.

Although protected from human predation on temple grounds, *N. nigricans* colonies still endure extreme conditions in the eutrophic ponds with overcrowding resulting in a lack of nesting and basking space. Well intentioned pilgrims feed the turtles biscuits and rice and many of the temple pond softshells display signs of malnutrition, disease and cannibalism.

The Black Softshell project is working to protect nests, headstart hatchlings, and supplement severely depressed wild populations. Efforts to achieve these goals include initiatives to improve husbandry at selected temple ponds, expand head-starting by setting up makeshift hatcheries and rearing facilities, and create community outreach programs. Six vulnerable nests with a total of 138 *N. nigricans* eggs were translocated to a temporary hatchery in the Hayagriva temple in April, 2016. Twenty hatchlings currently reside in a modest pool at the temple. At a temple in Nagshankar, a defunct kitchen was renovated into a turtle awareness kiosk to educate people on their plight and offer constructive ways for villagers to help. We’re looking forward to continued success in helping this critically endangered animal.

CHELONIAN CONSERVATION PROJECT AT KUKRAIL GHARIAL REHABILITATION CENTER

Since 2014, the TSA Chelonian Conservation Project has partnered with the Kukrail Gharial Rehabilitation Center in Uttar Pradesh to create assurance colonies for threatened Indian turtles, rescue and rehabilitate confiscated animals, and provide vital information for captive management of turtles throughout the region. The Kukrail Gharial and Turtle Rehabilitation Center (KG-TRC) currently co-manages 168 turtles representing 12 species. We also maintain assurance colonies of the Crowned River Turtle (*H. thurjii*), the Red-crowned Roofed Turtle (*Batagur kachuga*), and the Three Striped Roofed Turtle (*Batagur dhongoka*) within a 10 square kilometer area that has been set up to provide a sustaining source of edible vegetation for these herbivorous species.

One of the Center’s main focal points is the rescue and repatriation of turtles, and 2016 proved very successful in giving displaced, threatened and confiscated turtles a second chance to thrive. We rehabilitated a total of 628 turtles representing a total of five species from

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northern India. Among them were 26 Spotted Pond Turtles (Geoclemys hamiltonii), confiscated from the illegal wildlife trade in Bangalore in 2015 and brought to the Center on 28 July 2016. After a period of quarantine at the turtle conservation facility at the Narora Atomic Power Station in Bulandshar, these endangered turtles were released into the Ganges River.

In May 2016, we provided assistance in rehabilitating and repatriating 146 critically endangered Malagasy tortoises to their homeland following a confiscation. This incident is an excellent example of the collaboration and support between two TSA programs and underscores the need for additional programming in turtle hotspots where the illegal trade in wildlife is rampant.

With technical assistance from the TSA, a rescue unit at the Center was established to handle large scale turtle confiscations. In July 2015, we rescued two nests of Indian Narrow -headed Softshell Turtle, Chitra indica with a total of 345 eggs, from flood conditions on the Ganga. The nests were later translocated to the Kukrail Center. In early October, 40% of the eggs hatched, but were plagued by high mortality with only five hatchlings surviving. In late September 2016, we rescued another C. indica nest containing 47 eggs from a local poacher on the Ganges River and translocated the eggs to the Center, where they are currently under incubation.

The Center received support from the government to refurbish and expand our Laboratory for Aquatic Biology (LAB) that included the development of an operations manual for the collection and facilities at Kukrail.

**KGTRC COMMUNITY OUTREACH PROGRAM AND ALTERNATE LIVELIHOOD INITIATIVE**

In order to combat the harmful effects of current river use on turtles, we created community outreach programs to target a large number of specific groups over several project sites. These populations include riverside schools, teachers, turtle poachers, fisherman, frontline forest department staff, sand miners, and riverside agriculturists.

Awareness programming was implemented in order to engage communities with our conservation efforts. This included a Kukrail Guided Nature Tour which allowed over 1,800 students the opportunity to learn about endangered turtles and crocodilians in their areas. We launched national wide awareness campaigns such as “Declare Your Pet Turtle” and “The Blind Spot,” the latter of which was conducted in association with our partner, Turtle Limited.

The KGTRC also provided technical support for the development of low cost interpretive centers in wetland areas across western Uttar Pradesh, in Chambal, Sarsainawar, and Sursarovar.

Overall, 168 programs were conducted which reached over 9,500 participants. Nine native and foreign volunteers were trained in turtle biology and conservation to further the goals of establishing outreach efforts to save Indian turtles. We were able to develop viable economic models for river dependent communities at the Center in the Tarai where we trained a total of 62 fisherwomen from riparian villages in handicraft production. Taught by a tribal master craftsman, participants developed 58 new products in 19 categories with strategies being developed to establish markets to sell them.

In September, we conducted workshops, in association with Usha International, to provide stitching and weaving training for ten women from different villages. Under the supervision of the project, these women will be encouraged to establish ten new training schools in their respective hamlets to teach these skills to more women.

Concurrent with the crafts program, we’ve set up models for arid horticulture, low cost organic cultivation, pisciculture, and mushroom farming at the Chambal and Tarai sites. These are all examples of addressing the root cause of human conflict with wildlife by redirecting human activities to less destructive livelihoods. Programs like these are a crucial component of proactive conservation that pay big dividends for both turtles and people.

On World Turtle Day, 23 May 2016, the TSA signed a long term MOU with the government of Uttar Pradesh to cooperate for turtle conservation. As a testament to the success of this project, several staff members from different projects were nominated to advise the government on various conservation committees.

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The Turtle Survival Alliance/Wildlife Conservation Society (TSA/WCS) Team faced challenges on many fronts this past year in the unrelenting struggle to save the imperiled turtles and tortoises of Myanmar.

Our principle efforts remain focused on species endemic, or nearly so, to Myanmar, namely the Burmese Star Tortoise (*Geochelone platynota*), Burmese Roofed Turtle (*Batagur trivittata*), Burmese Peacock Softshell Turtle (*Nilssonia formosa*), and Burmese Narrow-headed Softshell Turtle (*Chitra vandijkii*).

All are classified as Endangered or Critically Endangered by the IUCN after being decimated by decades of over harvesting to supply food, medicinal, and pet markets just across Myanmar’s porous northern border with China. Challenges notwithstanding, the program continues to gather momentum and is slowly turning back the tide of extinction that threatens this unique and vulnerable fauna.

**BURMESE STAR TORTOISE REINTRODUCTION**

Perhaps our greatest challenge centered on
continuing efforts to establish a wild popula-

tion of Burmese Star Tortoises at Minzontaung

Wildlife Sanctuary (MWS).

This program was initiated in 2013-14, when we began returning captive bred, headstarted tortoises back to the wild. After a rigorous health check to insure the release group is free from infectious diseases, headstarted tortoises are transferred from assurance colonies to circular bamboo “acclimation” pens erected in natural habitat deep within the sanctuary. The tortoises remain here for periods of up to one and a half years before being released by simply removing sections of the bamboo fence and permitting them to freely wander off at a time of their choosing.

Termed “soft release”, the idea behind this approach is to familiarize the tortoises with the immediate release area. This makes it less likely they’ll disperse into agricultural lands surrounding the sanctuary where poaching risk is high. VHF radio transmitters attached to the carapace enable monitoring of the movements of each tortoise and allow for the evaluation of the efficacy of a soft release approach.

Results have been encouraging and few tortoises have wandered out of the sanctuary. Several that did stray into neighboring village lands were retrieved by the TSA/WCS monitoring team and returned to the safety of the protected area. Even more promising, villagers discovered a few tortoises in their fields and promptly gave them to the monitoring team. They chose to forfeit the hefty sum they would have received from an illicit wildlife buyer had they opted to sell the tortoises. These actions attest to both the strength of local religious beliefs that confer protection to tortoises, and the effectiveness of continuing community outreach and awareness efforts.

During 2013-14, 150 tortoises were successfully reintroduced into the sanctuary. In 2015, these numbers were doubled, when 300 headstarted tortoises were transferred from assurance colonies to the acclimation pens with releases planned to begin later in the year and continuing into 2016. And then disaster struck.

In October 2015, tortoises began to disappear from the pens. At first, only one or two animals went missing and we suspected the missing tortoises had slipped out through an overlooked hole in the fence. When more and more began to vanish, it quickly became obvious that tortoise thieves had somehow gained access to the pens despite stringent security measures.

A prompt investigation by high ranking officials from the Myanmar Forest Department revealed the theft as a classic case of the “fox guarding the henhouse” – a guard assigned to the acclimation pens and a local criminal gang had worked together to steal the animals, and a total of 183 tortoises disappeared into the hands of these nefarious operators.

We later learned the stolen tortoises had been whisked to Mandalay, and funneled into a global nexus of international wildlife traffickers catering to the high end pet market (see side bar). The Forest Department put a hold on our reintroduction projects pending the outcome of an internal security procedure review. While the loss of so many tortoises, painstakingly reared from hatchlings, was heartrending, the theft did not compromise our ability to continue reintroductions. Indeed, over 3,000 young tortoises were hatched in the three assurance colonies during the 2015-16 breeding season; a figure more than 16 times the number stolen.

REINTRODUCTION EFFORTS RESTARTED AFTER INVESTIGATION

In early July 2016, the Myanmar Forest Department completed its investigation and gave
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The green light to continue reintroductions of star tortoises. The 117 tortoises that had escaped the attention of the thieves were immediately liberated at MWS in what amounted to a “hard release”, an approach that will eventually offer an interesting comparison with the original soft release method of on-site penning for extended periods.

Although still preliminary, post release monitoring suggests the tortoises are dispersing widely, often moving in erratic paths over long distances as though disoriented, with some leaving the protection of the sanctuary. Plans are currently underway to construct three additional acclimation pens at MSW to accommodate an additional group of 300 headstarted tortoises with a goal of release in late 2017.

After receiving clearance from the Forest Department, we launched the delayed reintroduction of Star Tortoises at Shwe Settaw Wildlife Sanctuary (SSWS). Originally established for the protection of Eld’s Deer (Panolia eldi thamin), the 553 square kilometers sanctuary had once hosted a robust population of tortoises until they were wiped out by poachers in the late 1990s. Given the extent of this sprawling sanctuary, a successful reintroduction could eventually result in a population of thousands of wild tortoises, perhaps the largest such population in Myanmar.

As a first step towards the realization of this objective, we conducted a “release ceremony” in July 2016, attended by community members, village leaders, teachers, and Buddhist monks. During the ceremony, 150 headstarted tortoises were symbolically donated to a local Buddhist monastery and blessed by the Pongyi or leading monk. The idea behind transferring “ownership” of the tortoises to the monastery is to reduce the likelihood of the animals being poached. This protection is further reinforced by tattooing Buddhist icons on the carapace of each tortoise along with a unique identification number. At the conclusion of the ceremony, the tortoises were carefully placed into wicker baskets and transported to acclimation pens where they will remain for the next 12 months before liberation and beginning the task of repopulating a forest now empty of their species.

Staying one step ahead of potential poachers, roving teams of TSA/WCS staff and Forest Department rangers conduct law enforcement patrols that scour the sanctuary on a frequent but irregular basis to remain unpredictable to poachers. Coupled with these actions, a cadre of locally recruited Community Conservation Volunteers (CCVs) is now established in villages abutting the sanctuary. The CCVs are paid a modest monthly stipend to assist with fieldwork and, most importantly, serve as a tripwire force to provide early warning of local poaching activity targeting released tortoises.

**BURMESE ROOFED TURTLE CONSERVATION**

The Burmese Roofed Turtle (Batagur trivittata) conservation project continues to be a “close run thing” as the Duke of Wellington once said of his hard fought experience at the Battle of Waterloo.

Endemic to the large rivers of Myanmar, the Burmese Roofed Turtle is one of the most critically endangered turtles in the world, with the only surviving wild population restricted to a remote stretch of the upper Chindwin River. Genetic analyses recently completed by F. Gözde Çilingir, a doctoral student at the National University of Singapore, suggest that as few as ten breeding adults remain in the wild with only one or two males in the group.

There is no doubt that B. trivittata would have joined the ranks of the dinosaurs had not TSA/WCS intervened with effective *in* and *ex situ* conservation measures in 2006. An assurance colony at the Mandalay Zoo, combined with an egg collection and headstarting program along the upper Chindwin River, slowly and surely halted an inexorable slide towards extinction of this once common turtle. In a landmark event, 60 Burmese Roofed Turtles, headstarted from eggs collected in the wild, were released into the Chindwin River in 2015.

Despite this glimmer of hope, the road to recovery remains perilous. After years of collecting
and successfully incubating eggs from the handful of nests still being found along the Chindwin River, all of the eggs we recovered in 2014, and again in 2015, proved infertile. We feared a Doomsday scenario where only females remained in the wild population. Concerns abated somewhat in March of this year when a single clutch of viable eggs – from a total of five clutches – was unearthed from a sandbank. Twenty-seven of the 30 eggs later hatched successfully and the young turtles are now being headstarted for eventual release. We suspect, but cannot be certain without genetic testing, that a young male from the group released in 2015 may be responsible for the paternity of this clutch.

In addition to collecting eggs and headstarting hatchlings along the Chindwin River, assurance colonies play a critical role in Burmese Roofed Turtle survival. The original assurance colony at the Mandalay Zoo continues to serve as the bulwark of the ex situ conservation effort. Another 18 hatchlings was produced this year; bringing the total captive population to over 700 animals.

A second colony of 100 subadult Burmese Roofed Turtles, established at Lawkanandar Wildlife Sanctuary in 2011, is expected to begin reproducing within the next few years. Males and females are already exhibiting the dimorphic coloration that indicates the onset of sexual maturity.

Yet another assurance colony was established this year when 100 headstarted turtles were transferred from the base camp at Limpfa Village to a new facility constructed in the riverside hamlet of Htamanthi. The turtles were moved over a period of three days in late February, a trip that included an eight hours long journey downriver, before being unpacked and liberated in the spacious breeding pond.

In another landmark event for turtle conservation in Myanmar, 25 headstarted Burmese Roofed Turtles were flown to Singapore in May to found the first out of country assurance colony. According to husbandry personnel at the Singapore Zoo, the turtles quickly settled into their new home and began displaying hitherto unobserved courtship behavior.

In the wild, we continue monitoring headstarted turtles released into the Chindwin River in 2015. Initially the turtles remained in the vicinity of the acclimation pens, rarely straying more than a kilometer or two up- or down-stream. But with the beginning of the wet season in July 2015, floodwaters surged down the rivers, flushing turtles many kilometers away from the
release area and presenting logistical challenges in the attempt to find them. Several turtles fell victim to fishing nets and drowned, while others simply disappeared, most likely because their radio transmitters had malfunctioned. But other turtles remain at large in the river as attested to by villagers who occasionally see them basking or swimming. Although the outcome of this first ever reintroduction of Burmese Roofed Turtles remains somewhat equivocal, much has been learned that can be applied to ensure the future success of our continued efforts.

The Burmese Eyed Turtle is endemic to Myanmar and virtually nothing is known about its natural history. The species is being decimated by the illegal wildlife trade as huge numbers are sent north to burgeoning wildlife markets in southern China.

The primary objective of this assurance colony, as in all others, is to serve as a hedge against future extinction in the wild by maintaining a breeding population, while providing offspring for eventual reintroduction into protected habitats. We have a long way to go with the Burmese Eyed Turtle as we begin these efforts.

**SOFTSHELL TURTLE CONSERVATION**

In an exciting new development, we expanded the focus of our program this year to include softshell turtles. Myanmar hosts five species—three of them endemic—and all heavily impacted by the illegal wildlife trade.

Until recently, conservation efforts for softshell turtles have lagged behind those for more imperiled species, mainly due to budget limitations and lack of staff availability. This changed in 2015-16 when the Turtle Rescue Center in Maymyo expanded to include facilities for the care and husbandry of softshell turtles confiscated from wildlife traffickers. Three large ponds could potentially house breeding groups of two targeted species, the Burmese Narrow-headed Softshell Turtles (*Chitra vandijki*), and Asian Giant Softshell Turtles (*Amyda cartilaginea*) seized from the illegal trade.

Construction of a second softshell turtle breeding facility on seven acres of farmland recently acquired in Htamanthi, and near the existing Burmese Roofed Turtle assurance colony, is expected to begin late in 2016.

A number of softshell turtles temporarily housed at other facilities will be transferred to Htamanthi as ponds become available. Most of the turtles were rescued and donated by fishermen after being entangled in nets, while others were confiscated during a series of anti-poaching raids by the “Flying Squad” of the Myanmar Forest Department.

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The Great Star Tortoise Caper of 2015

The Turtle Survival Alliance/Wildlife Conservation Society conservation efforts for the Burmese Star Tortoise (Geochelone platynota) at Minzontaung Wildlife Sanctuary in Myanmar suffered a heavy blow in October 2015 when poachers circumvented security at the acclimation pens and purloined 188 headstarted tortoises.

Information received from a Community Conservation Volunteer pointed to a local criminal gang acting in collusion with a corrupt Forest Department (FD) ranger. Hearsay evidence suggested the ranger had contacted members of the gang by cellphone and allowed them to enter the pens and steal tortoises while he kept watch. The theft occurred over several weeks and became apparent when a large number of tortoises turned up missing during the monthly health inspection.

Local police investigating the theft requested our assistance, and armed with all the knowledge of law enforcement gleaned from years of watching Law and Order, we jumped at the chance to help. Within a few weeks, the major players at the village level had been identified and seven suspects arrested in follow up raids. The miscreants remain in jail awaiting trial. Unfortunately, none of the stolen tortoises were recovered.

THE TRAIL LEADS TO THAILAND

Further investigation revealed the tortoises had been sold to shadowy figures in the Mandalay underworld and later smuggled into Thailand. Within a few hours, a colleague we contacted in Bangkok revealed startling news: several of our tortoises, readily identifiable by the unique Buddhist icons tattooed on their carapaces, were being offered for sale by a known wildlife trafficker on his Facebook page. The chase was on!

We quickly arranged a meeting with the National Park Police (responsible for wildlife law in Thailand) in Bangkok and revealed the information. Unsurprisingly, the trafficker was a person of interest well known for his illegal activities.

Shortly before Christmas 2015, Thai authorities raided the trafficker and seized five tortoises. Because government personnel in Myanmar cannot travel on short notice, I was deputized by the FD and traveled to Thailand to confirm the origin of the confiscated tortoises. While the carapacial tattoos had been removed by sanding the scutes; notches in the marginal scutes and implanted microchips provided absolute identification of the contraband tortoises.

Charges were immediately filed against the suspect and a subsequent interrogation resulted in the arrest of a second trafficker. Though not in possession of tortoises, this trafficker had an illegally acquired orangutan. High level law enforcement officials conducted a Christmas Day press conference in Bangkok, in which I participated, to announce the arrests.

As a result of quick action by authorities, staff, and colleagues during the great Burmese Star Turtle Caper, two Thai suspects are now captured and facing trial for receiving stolen goods, several villagers and a corrupt forest ranger have been unmasked in Myanmar, and five young tortoises are on their way back to Minzontaung Wildlife Sanctuary after a harrowing descent into the dark underworld of wildlife smuggling.

Contact: Steven G. Platt, Turtle Survival Alliance and Wildlife Conservation Society, Building C-1, Aye Yek Mon 1st Street, Hlaing Township, Yangon, Union of Myanmar, sgplatt@gmail.com
New Optimism for the Painted Terrapin in 2016

Painted Terrapins (*Batagur borneensis*) hold the unfortunate distinction of being one of the world’s most endangered turtles. The species is listed as Critically Endangered on the IUCN Red List, and included in the Top 25 World’s Most Endangered Freshwater Turtles and Tortoises; a 2011 Turtle Conservation Coalition report noted their continuing decline.

The Painted Terrapin’s historic range once extended across the east coast of Sumatra and the west coast of Kalimantan (Borneo), in Indonesia. Field surveys by Guntoro (2010), Kholis (2010), and Mistar (2013), found the species locally extinct within much of its Sumatran range. Wild populations still remain in rivers and mangrove estuaries in Aceh Tamiang, Aceh, and the Langkat Timur Laut Wildlife Reserve in the District of Langkat, North Sumatra. Aceh Tamiang is *B. borneensis*’ last stronghold, and...
our field survey estimates a maximum wild population of about 300 animals. Sixty-five percent of these are female.

Decline of the wild population was caused by large scale poaching of both eggs and adults during the 1990s throughout the animals’ range. Aceh Tamiang was no exception. According to Abu Bakar, a former hunter with the Satucita Foundation, hundreds of adults were caught and sold every month from Aceh Tamiang throughout that decade. Their eggs were collected by villagers every nesting season.

Though this practice still continues in Tamiang, it decreased sharply once conservation efforts began in 2010, as nest patrols, field monitoring, and educational programs were combined with the annual headstarting and release of turtles. Several villagers now regularly assist with patrols and monitoring.

As of August 2016, 187 hatchlings have been released into the Tamiang River and thousands of local people have been educated about the plight of this Critically Endangered animal. Additionally, 10,000 seedlings of the Mangrove Apple Tree (Sonneratia alba) were planted to restore riverine vegetation.

MORE HATCHLINGS AND SPECIES

For 2016, we implemented an in situ method, with a hatchery built on a nesting beach. This compares to previous years when we used a headstarting facility, or an ex situ method.

Nest patrols were organized by our team – which included BKSDA Aceh along with trained villagers – and which was conducted from December 2015 to April 2016. The team’s vigilance resulted in the successful hatching of 666 individuals for a hatching rate of 73 percent. Twenty of this year’s 666 hatchlings were released on 16 August to commemorate National Conservation Day in Aceh Tamiang. The remaining 646 hatchlings were implanted with microchips and released in October.

Combined with other chelonian species, a total of 833 hatchlings were released in 2016.

Pit tags were employed for the first time during this project, and the new technology should help us monitor released hatchlings more effectively than previously used tracking methods. For instance, three released hatchlings were fitted with radio transmitters last year, but monitoring failed when the radio signals quit after five months. Nevertheless, initial tracking in January 2016, one month after release, demonstrated that the hatchlings had migrated about 10-15 km upstream from their natal beach location.

INCREASE IN FIELD MONITORING YIELDS RESULTS

We managed to stay a total of 150 days in the field this year; a significant increase compared to the 40 to 50 days in previous years, when funding was limited. The team found 910 eggs in a total of 56 nests, with an average 17.07 eggs per nest. The lowest tally was 7 eggs, while the highest, 25. The first nest was located on 20 December 2015, and the last on 28 February 2016.

During nest patrol, we discovered 120 successfully hatched Green Turtle eggs. All were released by the head regent of the Aceh Tamiang district and other local leaders on 30 April 2016. We also found another endangered freshwater turtle, Pelochelys cantorii, inhabiting the Tamiang River estuary, while a Hawksbill Turtle (Eretmochelys imbricata) was caught in fishing nets. These findings indicate that Painted Terrapin habitat is important for other endangered chelonian species.

An increase in the number of eggs and nests found this year may be an indication that the wild population is stable. The poaching of adult terrapins no longer seems to exist. We did see two cases where Painted Terrapins, a P. cantorii, and the Hawksbill Turtle caught in the net, were kept as pets. Fortunately, after the fishermen were informed of the endangered status of these animals, they were all returned to the wild.

The education program reached 200 students and fishermen this year. Meanwhile, the creation of a local regulation for protecting the Painted Terrapin, and an effort to designate it as a mascot for Aceh Tamiang, are in the works.

A vision is crystalizing that could turn Aceh Tamiang into an educational eco-tourism destination – a plan that would allow people, Painted Terrapins, and other endangered wildlife to live in harmony. However, our hope for the future is tempered with vigilance, as the threats to the species still exist and are very real. Work to stop egg poaching and habitat destruction is essential; it is critical that the mangroves be protected against ongoing logging to produce charcoal, farmland conversion, and pollution from plastic trash.

Despite all the many endeavors to save the species, much more still needs to be done to secure the future for the Painted Terrapin in Indonesia.

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Acknowledgements: We would like to thank the TSA, Houston Zoo, Chester Zoo, PT Pertamina, and EP Field Rantau for their continuing support.
The year 2016 did not start well for the Giant Yangtze Softshell Turtle (*Rafetus swinhoei*), with two serious setbacks threatening their future. Failure to find individuals in the wild during a WCS survey of the Red River in Yunnan, China, combined with the unfortunate death of the large *R. swinhoei* of Hoan Kim Lake in Hanoi, in January, has given conservationists their greatest challenge yet in the effort to save the species. 

*R. swinhoei* is now in a precarious breeding position with only three known Yangtze Giant Softshell Turtles left on earth. The survey on the Red River, in Yunnan, China, conducted in May and June 2016, failed to find evidence that a large Rafetus, reported in previous years by local people, was still extant. One captive pair still exists in Chinese zoos, and the other known specimen inhabits Dong Mo Lake in Vietnam.

The close medical examination of the Suzhou Zoo’s male in May 2015 revealed a horribly mangled and scarred penis preventing effective copulation – making it clear that artificial reproductive techniques would be necessary. It also became clear that the Changsha Zoo’s last female Yangtze Giant Softshell Turtle had to produce a viable clutch of eggs if the species was not to die with her.

An initial attempt at artificial insemination (AI) via the cloaca in May 2015 did not result in fertile eggs. Later, in October 2015, a session of electro ejaculation, with the male under anaesthesia, did not produce enough semen for another attempt at AI. The team scheduled another effort for AI in early April 2016.

A week before the surgery was to be performed in China, I visited with Dr. Calle at the Henry Doorly Zoo in Omaha, Nebraska, and worked with their veterinary and reptile staff to perform anaesthesia, monitoring, and cloaca examinations of two species of softshell turtles in the zoo collection. The experience proved valuable when it became apparent that coelioscopy – a surgical approach entering via the body cavity for surgical insemination directly into the oviducts – would improve the sperms’ chances to fertilize an egg over the previously attempted cloacal route.

During the surgery, semen was injected through a needle into the uterine horns of the oviducts. The procedure was performed successfully and the female recovered well. Although the female laid three clutches of eggs during June and July, once again, none developed. The ninth year of the *Rafetus swinhoei* captive breeding program has, frustratingly, not yet resulted in successful reproduction.

The team assembled in Suzhou included Lu Shunqing of WCS-China, Suzhou Zoo’s Dir. Chen Daqing, Sun Ai Guos, Di Min, Tang Enen, Tang Deqi, Chen Jing Han Shichang, Liu Xing Feng Qi, and Lu Fang and Changsha Zoo’s Dir. Yan Xiahui, Lu Qingtao, and Yang Junlong, Barbara Durrant of San Diego Zoo’s Center for Conservation Research, Emily King from the TSA, Paul P. Calle of WCS, and Liu Nonglin of China Zoo Society.

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**Acknowledgement:** Financial support was provided by Kadoorie Farm and Botanic Garden and the Turtle Conservation Fund (TCF).
Cambodia Increases Royal Terrapin Conservation Efforts with Opening of Koh Kong Reptile Conservation Center

Sitha Som and Brian D. Horne

It's been an exciting year for the conservation of the Royal Terrapin (Batagur affinis) of Cambodia, also known as the Southern River Terrapin. The Wildlife Conservation Society (WCS), together with Cambodia’s Fisheries Administration (FiA), constructed a new conservation facility in the Mondol Seima district of Koh Kong province, and named it the Koh Kong Reptile Conservation Center (KKRCC). The new center is not only working to protect the Critically Endangered and iconic terrapin, it is also pursuing the conservation of the Critically Endangered Siamese Crocodile (Crocodylus siamensis).

“With very few Royal Terrapins left in the wild, and many threats to their survival, Cambodia’s official national reptile is facing a high risk of extinction. By protecting nests and head starting hatchlings, we’re increasing the chances of survival for this important species,” said Ouk Vibol, Director of the Conservation Department in the Fisheries Administration.

The KKRCC is currently caring for 206 juvenile Royal Terrapins, the result of head starting efforts within the nest protection program. The young animals benefit from a predator proof, juvenile rearing area for hatchlings and turtles measuring under 20 cm. Larger juveniles have roomier, 20m × 40m ponds surrounded by sand banks and large trees where they swim and bask as in the wild. The larger ponds decrease habituation to humans, and strengthen the juvenile turtles’ ability to swim in moving water after release. A 3m × 20m × 100m rainwater retention pond ensures an adequate freshwater supply during the dry season.

MONITORING B. AFFINIS

The monitoring program continued to document location and survival rates for the first group of 21 headstarted B. affinis released into the Sre Ambel River system in July of 2015. We estimate the survival rate for this group at over 85%, with numbers possibly higher. Turtles that could not be located may still be alive outside the study area, as monitoring revealed that some of the released animals had moved over 100 kilometers away into a separate river system. Possible transmitter failure along with other factors make it difficult to state a definitive rate of survivorship. Positive proof of mortality events have not been found.

Three of the released turtles, captured later by fishermen, were returned to the project unharmed thanks to successful community outreach and educational programs. It is hoped that our new SMART (Spatial Monitoring and Reporting Tools) initiative will increase efficiency in reducing illegal or prohibited fishing techniques and further enhance our community efforts. Ameliorating threats is key to the recovery of the Royal Terrapin to its full ecological function. FiA and WCS have provided scientific evidence on the impact of sand dredging on Royal Turtle population. This has led the government to postpone issuing dredging licenses. We hope that this will aid our Royal Turtle Recovery efforts.

With the establishment of the KKRCC, we were able to direct attention to the protection of critical habitats. We are working with the Cambodian Ministry of Environment (MoE) to create a Conservation Corridor that includes rivers and wetlands that will connect the Southern Cardamom Protected Area, the Dang Peng Multiple Use Area, and the Bokor National Park. Together, these areas comprise most of the known B. affinis habitat in Cambodia.

Over the past ten years, we’ve continued to build on a successful recovery program by conserving a growing population of wild turtles, focusing on the reduction of mortality threats, creating community engagement, and now, increasing the effort to protect key habitat for all life stages of the iconic Royal Terrapin.

Aknowledgements: We thank the Alan and Patricia Koval Foundation for donating towards the turtle center property, Aquarium Innovations and Ponds and Plants for aiding in the construction, Building Trust International for both design and construction, and Wildlife Reserves Singapore and Critical Ecosystem Partnership Fund for their continued support of the field program. The monitoring program was made possible by funding from the U.S. Fish & Wildlife Service, IUCN SOS – Save Our Species, and the National Geographic Society. We sincerely thank The Chicago Zoological Society Endangered Species Fund for the support of a community survey to understand the use of the river for their livelihoods. We thank FiA and MoE for engagement and support.
A Breakout Year for Central American River Turtle Program in Belize

THE POPULATION OF Central American River Turtles (Dermatemys mawii), at the Hicatee Conservation and Research Center (HCRC), has more than doubled during the past year. Known locally as the Hicatee, the critically endangered river turtle has been intensely harvested and eliminated throughout much of its former range in southern Mexico, Guatemala and Belize.

The arrival of new hatchlings in May and June, plus the transfer of turtles confiscated by Belize Fisheries Department this spring, expanded the population at the HCRC to 54 individuals. With twenty of the adult females loaded with eggs and follicles, the captive breeding facility is right on track with a mission to investigate the reproductive biology of this freshwater turtle while in captivity. Ultimately, the HCRC seeks to test the feasibility of large scale captive management as a critical component within a broader, long term conservation program for the species.

EXPANDING POPULATION

Within the first year of introducing the founder population of 22 turtles to the HCRC, a clutch of eight eggs was deposited. Seven were fertile. After 193 days of incubation at ambient temperature and humidity, seven babies hatched at HCRC from 14-19 June 2015. This is one of only a handful of successful hatchings, while in captivity, for this species. Now nearly sixteen months old, the seven are in great condition and continue to grow rapidly.

A second clutch of 10 eggs was laid on December 15, 2015. The clutch was removed from the nesting area and divided into two groups: five eggs were placed in a large plastic tub with a 2:1 ratio of water to vermiculite and set into an electric incubator at 29° C (86° F). We believed this procedure would produce females. The other five eggs were placed in a similar set up and kept at ambient temperature. After a few weeks, four eggs were determined to be infertile. Four of the incubated eggs at 29° C hatched in April 2016, while two of the eggs at ambient temperature hatched one month later. Weights and measurements are collected weekly to monitor growth.

UNDERSTANDING THE REPRODUCTIVE BIOLOGY OF THE HICATEE

In mid-September, 2016, a team of TSA biologists joined the Belize Foundation for Research and Environmental Education (BFREE) staff in Belize to perform biannual health checks and ultrasound exams on all the adult turtles. The team consisted of Dr. Shane Boylan, Dr. Thomas Rainwater, Dr. Isabel Paquet, a veterinarian based out of the Belize's Cayo District, Felicia Cruz and Gilberto Young of the Belize Fisheries Department, Robert Mendyk of the Jacksonville Zoo, and Dr. Ben Atkinson of Flagler College.

Adults were netted out of the ponds and both physical exams and ultrasound evaluations were conducted. The 54 Hicatee at the center include: 20 reproductive females, 16 confirmed males, many of which are either reproductive or approaching sexually maturity, six sub-adults, with sex yet to be determined, and twelve juveniles hatched over the last two years. Ultrasound exams revealed twelve adult females with follicles and eggs and 8 adult females confirmed with follicles. Based on this assessment, the laying of 60-120 eggs is expected by December 2016.

Health checks also identified scratches and gouges on the carapaces of some of the adult females introduced into the two ponds earlier this year. The injuries are healing and could be due to stress and aggression during the adjustment period or from breeding activity.

HICATEE CONSERVATION FORUM AND WORKSHOP

The HCRC is just one piece of a larger plan to secure the future of the Hicatee in Belize. In order to affect real change, outreach and education programs must continue, as needed legislation happens, and law enforcement improves
and monitoring strategy to include the identification of priority populations for protection which will serve as source populations for the species’ recovery.

Additionally, workshop attendees participated in an IUCN Red List meeting to update the species report, now ten years out of date. The new IUCN report will be based on the most current information. The Hicatee continues to be ranked Critically Endangered and at risk of extinction throughout its range. Participants also discussed advocating for the Hicatee to become officially recognized as the “National Reptile of Belize.”

**DOCUMENTARY FILM PRODUCTION**

To increase public awareness of the plight of the Hicatee in Belize, we have engaged Emmy-award winning wildlife filmmakers, Richard and Carol Foster of Wildlife Film Productions to produce a 12-minute documentary film.

The film will spotlight the past and tenuous future of the Hicatee by focusing on the turtle’s natural history, with *D. mawii* presented as the sole representative and last of an ancient lineage; the species’ critically endangered status and the pressures propelling it toward extinction; current work being done in Belize to save these chelonians; and a hopeful message for the future if the Hicatee is managed sustainably.

**ACKNOWLEDGEMENTS**

We would like to thank the Houston Zoo, Columbus Zoo, and Jacksonville Zoo for program funding and support. Additionally we acknowledge the support of the following organizations and individuals: Members of the Hicatee Conservation Network, Dr. Thomas Rainwater (USFWS), Shane Boylan, DVM, (South Carolina Aquarium), Richard and Carol Foster (Wildlife Film Productions), Felicia Cruz and Gilberto Young (Belize Fisheries Department), Isabel Paquet Durand (Belize Wildlife Clinic), Nichole Bishop (University of Florida), and the BFREE/HCRC Volunteers: Mark Mumaw, and Erin Baldwin.

**THE FUTURE OF THE HCRC**

The HCRC was conceptualized in 2010, with construction and development begun in 2013. Support from the Association of Zoos and Aquariums (AZA) and Disney allowed for a rapid expansion of the HCRC research program with the past three years marked by major milestones that are cause for celebration.

Our vision for the HCRC as a catalyst for Hicatee conservation in Belize is on the verge of being realized, and the upcoming film will bring much needed exposure to this heavily exploited species along with increased awareness to HCRC’s mission.

Confidence in our ability to reproduce Hicatee in captivity is growing, as is the number of sexually mature females, and we are poised for a breakout year in reproductive output. But along with growth comes new costs and the challenge of identifying funds for new infrastructure associated with rearing young. With 60-120 rapidly growing new hatchlings anticipated in 2017, HCRC facilities must add new ponds for isolation and grow out, as well as new incubators and hatchling tanks. The funding for this expansion will need to be in addition to maintaining the existing $25,000 annual operating budget.

We eagerly anticipate the release of the new Hicatee natural history film and are confident it will elevate the profile of this important program. Meanwhile, we continue to seek partnerships within the zoo and NGO communities to join TSA in sustaining this groundbreaking effort, and commit to ensuring a future for this iconic species.

**Contact** RHudson@turtlesurvival.org
The WCS/TSA joint program in Colombia strongly believes that the best way to address the threats faced by river turtles is working with local communities. Two projects in different areas of the country, led by two communities, are making great efforts to protect two endangered river turtle species in Colombia, while strengthening their governance and economic activities.

**COTOCÁ ARRIBA COMMUNITY WORKS FOR THE PROTECTION OF THE SINÚ RIVER TURTLE (PODOCNEMIS LEWYANA)**

One of the main threats that the Magdalena River Turtle (Podocnemis lewyana) faces in the Sinú River Basin is the flooding of nests caused by the generation of energy at the Hydroelectric Dam. The flooding of the nesting beaches is sporadic and unpredictable, and can last anywhere from a few days to several weeks. To mitigate this threat, different management efforts are being developed by the TSA/WCS team along with the community of Cotocá Arriba, in Córdoba, both *ex situ* and *in situ*. These efforts aim to provide nesting sites for reproductive females above the river’s flood line, and to rescue nests laid on vul-
nerable beaches that are prone to flooding.

CONSTRUCTION OF ARTIFICIAL BEACHES

Communities built elevated beaches, imitating natural beaches in terms of location and type of substratum. For proper construction, the slope and riverbank were weeded. The slope was also reduced to allow turtles to move up the shore more easily, and the soil on the riverbank was loosened until it was free of lumps. Once the soil was loosened, a 30cm layer of sand was laid, resulting in a beach consisting of a mix of sand and soil.

This year, three artificial beaches were constructed and maintained in the Cotocá Arriba area: Guamal, Benito Osorio, and Edmundo. Beaches were located in areas where natural beaches once existed or currently exist. This resulted in 13 nests laid on artificial beaches, which produced 244 eggs.

RESCUE OF NESTS VULNERABLE TO FLOODING

This year an effort was made to constantly monitor the natural beaches of Benito Osorio, Corrales Negros, Mompós, and Tranquilina, all in Cotocá Arriba. Of the 43 nests found during the season, 30 were found on these natural beaches. Every day during the reproductive season, the beaches in the area were checked for nests. The nests that were found in natural beaches, or in artificial beaches with a presence of ants, were collected and transported in polystyrene containers to an incubator in Cotocá Arriba. Nests that were not threatened (by risk of flooding, pillage, predation, or trampling by livestock) were left in place and monitored daily. Each of the collected nests was incubated individually in plastic containers along with sand from the beaches from which they were collected.

CAPTURE/RECAPTURE STUDY

With the objective of gaining a better understanding of the population of *Podocnemis lewesiya* in the region, and starting a long term monitoring of the population, a capture/recapture study was started. During a period of four weeks, five hoop traps were set and reset along the shores of the river in the areas of Cotocá Arriba and Campano. A total of 30 individuals were captured, weighed, marked, and returned to the river at the same point where they were captured. This study will be important to evaluate effectiveness of conservation actions and provide recommendations for future actions.

LA VIRGEN COMMUNITY WORKS FOR THE PROTECTION OF THE GIANT SOUTH AMERICAN RIVER TURTLE (*PODOCNEMIS EXPANSA*) ON THE META RIVER

As part of a larger initiative in the Orinoquia region of Colombia, the WCS/TSA team works along with Fundación Omacha and the community of La Virgen to protect adult female Giant South American River Turtles and their nesting areas. The initiative is focused on the middle Meta River, home of the second largest known population of this species in Colombia. In this area, people from the community work along with biologists to: a) protect nesting beaches agreed upon by the community, b) protect nesting females, c) monitor nests and d) generate awareness and education programs. In its second year of implementation the project expanded to include nine nesting beaches (from seven on the first year) and successfully monitor 831 nests. Nest survival was lower this year (79%) because of early natural floods, but egg harvesting from humans dropped to zero in protected beaches, as did hunting of female turtles during nesting.

This year the project also expanded to involve more people from the community. More than 15 families participated in the surveillance and monitoring of nesting beaches. The community of La Virgen strengthened their organizational and decision making mechanisms, as well as their participation in other initiatives for the conservation of natural resources. At the end of the reproductive season, the community organized a symbolic release event, with the participation of other communities and members of the government, the media and other environmental organizations to disseminate the importance of these areas for the species and highlight their work for its conservation.

In June 2015, the largest ever confiscation of a single, critically endangered freshwater turtle species occurred when 3,831 live Palawan Forest Turtles (*Siebenrockiella leytensis*) were seized in Southern Palawan (Devanadera et al. 2015).

The number of seized forest turtles was dangerously close to the estimated remaining wild population, and unless a release back to appropriate habitats could be achieved, and quickly, the species was at severe risk of becoming functionally extinct in the wild.

The overwhelming task of pulling together a rescue team became an urgent one, as it was abundantly clear that the sooner the animals were returned to the wild, the better their chances for survival.

One of the biggest concerns of the rescuers: the adult turtles of this species typically show severe aggression toward each other and fare poorly when confined in large numbers. So any protracted quarantine of such a large group would certainly result in high mortalities.

**RESEARCH TO THE RESCUE**

Upon consulting the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG), it was agreed that apparently healthy animals would be released back to the wild as soon as possible. IUCN/SSC TFTSG recommended: “animals that do not clearly need extensive rehabilitative care should be released into the wild swiftly, ideally into areas that were previously inhabited by these turtles.”

Translocation programs, including re-introductions for threatened species, usually require long planning and careful assessments. But in this case, important decisions had to take place within a few days.

Fortunately, we could draw on extensive
experience gained from over ten years of working with the species: research on wild Palawan Forest Turtles equipped with transmitters demonstrated high site fidelity, while immature animals exhibited higher dispersion rates when compared to adults (Jose et al. 2013). Telemetry studies on released juveniles showed that they settle at 10-3,000m (mean 1,603m) from the release site (Schoppe 2013). Long term mark recapture studies demonstrated that the recapture rate is relatively high in undisturbed areas (Schoppe and Acosta 2013).

As site fidelity is an important requirement for successful translocation, there was more than enough research evidence to suggest that the Palawan Forest Turtle qualified for this tactic, provided the release areas were carefully selected.

FROM RESCUE TO RELEASE

Between 22 June 2015 and 19 February 2016, almost the entire population of confiscated Palawan Forest Turtles, 3,385 individuals, were released back into ten wild habitats within the indigenous range of the species.

All animals selected for release underwent a thorough health check and received a cohort marking in the form of a notch. Eighty-one percent were released within the first ten days after their arrival at the Palawan Wildlife Rescue and Conservation Center (PWRCC).

In July 2015, the Katala team quickly started monitoring release sites. During the first month, visual inspections of the sites and adjacent areas 500m up and downstream were conducted to search for dead or weak animals.

Starting in August 2015, we conducted regular trapping surveys at all ten release sites. We allocated two days for each site during release site surveys – one day and night for the area 1000m upstream, and one day and night for the area 1000m downstream. At sites two and eight, 12-day samplings were conducted to assess the entire stream system where turtles had been released. For this, streams were divided into four sections, and each section surveyed for three consecutive nights.

Turtles were surveyed visually, but most were caught by funnel traps baited with fish. We took standard measurements from recaptured turtles and new captures were notched with an identification code specific for each site. During consecutive surveys we no longer assessed recaptured adult turtles for size, to minimize handling stress, but body weight was measured on every capture. Juveniles were measured during every recapture to assess growth.

RESCUE, RELEASE, RESULTS

Between July 2015 and September 2016 we conducted a total of 77 monitoring surveys (Table 1). We found a total of 115 (3.4%) dead turtles. One turtle was brought back into captivity to treat an eye problem. Most of the translocated turtles were caught by funnel traps baited with fish. We took standard measurements from recaptured turtles and new captures were notched with an identification code specific for each site. During consecutive surveys we no longer assessed recaptured adult turtles for size, to minimize handling stress, but body weight was measured on every capture. Juveniles were measured during every recapture to assess growth.

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TABLE 1: NUMBER OF SURVEYS AND NUMBER OF TRANSLOCATED AND RESIDENT TURTLES ENCOUNTERED.
were readily identifiable by shell lesions and all were healing well.

We encountered dead turtles within the first two survey months, with no more found after August 2015. All dead turtles were from release sites used during the first 10 days after confiscation.

We recaptured a total of 488 (15%) of the released turtles (Table 1); some repeatedly. Recapture success ranged from 1.4 to 34%. On average, 18.3% of the translocated turtles were recaptured (Table 1).

The lowest recapture site is a relatively large river used during the very first release on 22 June 2016. According to interviews with local people, the site had no resident population, and during surveys we never caught a resident individual.

There is another site without resident population in our release areas, but it had an anecdotal record of previous species presence.

The eight additional release sites always had healthy resident populations. In total, 671 resident turtles were trapped during surveys.

Surveys at sites where we had divided the entire stream system into four sections revealed, in both, that the highest recapture rate of released turtles was in the direct vicinity of the release site. In both cases all recaptures were within a maximum of 2,300m from release.

Further research is needed to better analyze the success of this project, with steps taken to analyze possible gender related distribution patterns, size variations of released and resident individuals, weight increase, etc.

Current data enables definition of project success based only on mortalities, health conditions and recapture success. Overall mortality at rescue centers and after release was 14.5%; much lower than expected when compared to other large confiscations. With lesions resolving, and no mortalities beyond August, the data implies good healing progress. Recapture success was relatively high, showing that released turtles became established in their areas.

For now, we can say that the release was successful and that the Palawan Forest Turtle is a good candidate for conservation translocation within its indigenous range.

Contact: Katala Foundation Inc., PO Box 390, Puerto Princesa City, PH-5300 Palawan, Philippines, sabine_schoppe@web.de, Wildlife Reserves Singapore, 80 Mandai Lake road, Singapore 729826, sonja.luz@wrs.com.sg

Acknowledgements: Monitoring activities from July 2015 to March 2016 were funded through donations generated during the 2015 Palawan Forest Turtle Rescue. We again thank all those people and organizations who made the 2015 rescue a success. Special thanks to Wildlife Reserves Singapore for continuing support and funding of this project; North of England Zoological Society and the Society for the Conservation of Species and Populations, for support monitoring activities in two release sites. Thanks to TSA Europe for funding IEC activities in release areas; all the people that helped with the field work: Edziel, Imma, Fely, Elvie, Alvin, Dexter, Eudelyn, and John Rey; and Nicolas Cegalerba and Joanna Szwemberg for photography.
Joko Guntoro Named Disney Conservation Hero

Howard Goldstein

TSA takes great pride and pleasure in announcing Joko Guntoro as a winner of the Disney Conservation Hero Award for groundbreaking work with the Painted Terrapin (Batagur borneoensis) in Sumatra, Indonesia.

Every year, the Disney Conservation Fund recognizes local citizens for their commitment to reversing the decline of wildlife and engaging communities in conservation. Recipients from around the world are nominated by nonprofit environmental organizations. Each honoree, along with his or her nominating organization, will share a $1,500 award from the fund.

Joko is a perfect example of how some of the greatest conservationists can be found in the most unlikely of places and situations. He earns a living as a chicken farmer, has had no formal conservation training, and speaks rudimentary English. Moreover, he was born and raised in a society that placed little value on wildlife conservation. Despite all this, and motivated by an inspiring passion for turtles, Joko taught himself conservation biology and became a discerning and meticulous conservationist who achieves tremendous success under difficult conditions.

In 2010, Joko founded an active group of volunteers, now officially known as the Satucita Foundation, to protect Painted Terrapin nesting beaches in Aceh Tamiang, Sumatra. The organization quickly became a force for conservation with its establishment of a small headstarting facility for the Batagur borneoensis.

In 2016, 669 hatchlings were produced. This represents an eightfold increase over the highest recorded count from previous years. Efforts and successes like these have inspired a growing grassroots movement for Painted Terrapin protection throughout the region. The governor of Aceh Province recently honored the Satucita Foundation by presenting the group with the Environmental Savior Award.

Joko's work first came to the attention of the global conservation community when he received initial project funding from the Mohammed bin Zayed Species Conservation Fund. The Satucita Foundation now receives support from the Chester Zoo in the United Kingdom, the Houston Zoo, and the Turtle Survival Alliance.

A TIMELY ENTRANCE

Joko’s introduction to the conservation world could not have come at a more urgent time for the Painted Terrapin. Once common in Sumatra, Indonesian Borneo, and Malaysia, the entire population of this formerly secure species plummeted during the 2000’s in the midst of the Asian Turtle Crisis. Easily captured with predictable nesting behaviors and accessible nest sites, huge numbers of Painted Terrapins were collected from the wild and sent to food markets in China.

This situation, coupled with negligible legal protection and enforcement, contributed to the disappearance of the magnificent and beautifully colored Painted Terrapin over much of its former range. A small, yet viable, population still remains in the Aceh Tamiang region of Sumatra with the species now listed as Critically Endangered.

GROWING A GRASSROOTS EFFORT

Not content to merely produce headstarted turtles, Joko is keenly interested in balancing conservation goals, actions, and techniques to ensure a sound future for the Painted Terrapin. He spends considerable time protecting nest sites and camping out on remote and sometimes dangerous locations. This dedication sets a strong example for the local communities, and is the chief reason Joko has been able to rally support for the chelonian cause and find colleagues willing to endure hardships in the field, just as he does, for very meager pay.

This motivated leadership, combined with a vast knowledge of the Painted Terrapin and local Indonesian turtle fauna, allowed him to transform a grassroots effort into a growing conservation program.

Joko has also long realized that education and public awareness are both key to a successful, long term conservation program. Since 2011, Joko and the Satucita Foundation have engaged over 5,500 people within local communities to conduct nest patrols, restore critical Painted Terrapin habitat, and plant fruit trees for terrapins along rivers. Perhaps most impressively, Joko garnered the attention of his government and spoke before the Aceh Tamiang House of Representatives in an effort to craft a Memorandum of Understanding (MOU) for the protection of Painted Terrapins that is currently pending approval.

“One once in a great while, someone like Joko emerges from the shadows, with a perceptive ability to see what needs to be done, and the resourcefulness to do it. Individuals like Joko do not cross our path often, and when they do, we have a profound responsibility to recognize their talent and find ways to support them,” states TSA President, Rick Hudson.

And so it is, with immense pride, that we announce Joko Guntoro as a winner of the Disney Wildlife Conservation Hero Award. He is indeed a champion for turtle conservation in Indonesia, and embodies all the characteristics of a true conservation hero.
Secure a Future for the Bellinger River Turtle

Michael McFadden, Adam Skidmore, Karrie Rose, Jane Hall and Peter Harlow

The Bellinger River Turtle (*Myuchelys georgesi*) was, until recently, an abundant species within a relatively limited range. Found only in the Bellinger River drainage of northern New South Wales, Australia, it inhabits the deeper pools along the upstream stretches of the river. A recent and sudden population crash has seen their numbers plummet dramatically.

In early 2015, local community members canoeing the river found a growing number of sick and dying turtles. After raising the alarm with wildlife authorities, further searches revealed the rapid spread of a mortality event that soon encompassed the entire range of the species. In the two months following the initial discovery, over 400 dead or dying turtles were removed from the river. Due to a subsequent flooding event that prevented further collection, this figure is likely an underestimate of the true extent of the die-off.

Each of the turtles presented with a number of symptoms, including: swollen eyes, lethargy and emaciation. Attempts to treat the turtles failed and the mortality rate appears to be 100 percent in clinically ill specimens.

RAPID RESPONSE INVESTIGATION

The catastrophic die-off sparked a rapid response from authorities. An incident management team, established to investigate the cause...
of the mortality and guide further management, was led by the NSW Office of Environment and Heritage, and included a diverse team of organizations such as the Taronga Conservation Society Australia, NSW Department of Primary Industries (DPI), Western Sydney University (WSU), NSW Environment Protection Authority, and others.

Immediately after dying animals were discovered, a number of specimens were sent to the Australian Registry of Wildlife Health at the Taronga Zoo for analysis. In collaboration with NSW DPI, they identified a pathogen that was attributed to the mortality. Work to further identify and understand this pathogen is continuing, along with studies to understand potential methods of transmission and identify any reservoir host species.

It is not yet known if the susceptibility of the species was due to the disease alone, or whether the turtles were weakened by other environmental pressures such as an unseasonal increase in water temperatures, low water levels, habitat development or lack of suitable diet. Parts of the species’ range have been impacted by habitat modification and the clearing of riparian vegetation. The resulting increase in sedimentation can heavily impact the benthic macro-invertebrate community, which constitutes a significant component of the turtle’s diet.

Other threats to the species are also operating within the Bellinger River. The Murray Short-necked Turtle (Emydura macquarii), another Australian species, has been introduced to this drainage, creating a threat through potential competition and hybridization. Furthermore, an introduced predator, the Red Fox (Vulpes vulpes) is known to predate on turtle eggs and nesting females.

Since the recent decline of M. georgesi, repeated surveys have been conducted throughout the river system and confirmed that the species was heavily impacted throughout the extent of its range. It is estimated that the number of Bellinger River Turtles has dropped from 1,500-4000 individuals, to a few hundred young animals.

**ESTABLISHING AN ASSURANCE COLONY**

To prevent possible extinction, the decision was made to secure the species in an *ex situ* breeding program. A small group of turtles was collected from the upstream reaches of the Bellinger River prior to the incidence of sick turtles reaching this section of the river. They were transferred to a newly established quarantine facility at WSU where they were put through an extensive quarantine period before testing negative for the pathogen.

In early 2016, sixteen turtles (nine males and seven females), were transferred to a newly constructed facility at the Taronga Zoo in Sydney. Nine large tubs were established for the species in which they will live under strict quarantine protocols. After undergoing their first overwintering in captivity, it is hoped the turtles will resume breeding activity in the coming months.

Although we are starting with relatively few turtles, the rapid response by a multi-institutional team has provided hope that the species can be saved. An assurance colony has been established with plans to secure additional founders.

Further research will investigate the wild population and disease dynamics of the species and the influence of threatening processes. The species has received state threatened species listing as Critically Endangered, and a CBSG conservation planning workshop is scheduled to take place with major stakeholders in order to devise a plan that secures the persistence of the Bellinger River Turtle.

**Contact:** Michael McFadden, Taronga Conservation Society Australia, PO Box 20 Mosman, NSW, Australia, 2088, mcmfadden@zoo.nsw.gov.au.

**Acknowledgements:** Many people made great contributions to the conservation efforts for this species, including: Gerry McGilvray, Shane Ruming, Dr. Ricky Spencer, Murray Austin, Professor Arthur Georges, Dr. Peter Kirkland, Dr. Bruce Chessman, Josh Maher, and many others.
April 2016 saw the launch of Bowling for Batagur Turtles, as the Australasian Society of Zookeeping (ASZK) nominated and chose the conservation efforts of the Turtle Survival Alliance (TSA) on behalf of Batagur species as the focus for their annual fundraising events.

ASZK is a professional association representing the zookeeping and aquarium industries throughout Australasia. Started in 1976 in Adelaide, South Australia, and now in its 40th year, ASZK has a diverse international membership that provides support in keeper development, training, networking, and career opportunities. Beyond the ASZK’s focus on professional development, there is a strong commitment toward global species conservation.

Every year, ASZK sponsors a regional series of fundraising events – including ten-pin bowling and auctions – to generate financial support for a chosen conservation project. This year’s project nomination was for the conservation of Batagur species on behalf of the Turtle Survival Alliance. The TSA, along with its other global partners, has many in situ and ex situ conservation initiatives across the world. Their project with the Batagur species is just one example of many international efforts.

The genus Batagur describes six species of river turtles endemic to Southeast Asia and the Indian subcontinent. All of the Batagur species have suffered drastic declines across most of their historic range due to the unsustainable harvest of adults and eggs, pollution, habitat and nesting site destruction, and climate change. These threats are further exacerbated by pressure from some of the most densely populated human communities in the world. Currently, five out of the six Batagur species are listed as Critically Endangered, with the sixth listed as Endangered, according to the IUCN Red List.

Additionally, five of the six species of Batagur are among the top 25 species of tortoises and freshwater turtles considered at highest risk of extinction; with two Batagur species counted as number four and five on the list. The TSA provides valuable community awareness programming and habitat protection while supplementing wild populations with captive bred and captive reared individuals. Their efforts continue to bolster the global populations of these iconic and colorful freshwater turtles.

The ASZK Sydney event brought together over 100 animal caregivers and zoo professionals from local animal institutions for what turned out to be the largest and most successful fundraising opportunity we’ve ever hosted in that city. Money was raised in several ways: through a registration fee for all night bowling, a raffle, auctions, and a lolly guessing competition (guessing the number of jelly beans in a jar).

To assist in regional annual fundraising, the ASZK also always designs and produces a distinctive custom-made T-shirt. This year’s Batagur Turtles tees proved to be quite popular! All profits from production and sale of the shirts contributed to the fundraising grand total.

The ASZK ultimately held several different bowling and fundraising events, and was very pleased to donate a total of AUD $8,032 directly to the Turtle Survival Alliance. The ASZK is proud to help fund the ongoing, successful programs to conserve this colorful group of freshwater turtle species – especially those projects supporting B. kachuga, B. affinis and B. borneoenesis, across India and Sumatra.

The ASZK recognizes the continued and tireless commitment of the Turtle Survival Alliance towards global turtle and tortoise conservation with their benchmark of zero extinctions, and we know the funds raised and committed to the TSA will be well utilized in serving their many TSA Batagur conservation programs.

Contact: Chris Dryburgh, Memberships Officer, the Australasian Society of Zookeeping (ASZK) cdryburgh@zoo.nsw.gov.au
BREWERY PARTNERSHIPS

Drink Beer. Save Turtles

Ilze Astad and Eric Munscher

In 2014, the Turtle Survival Alliance teamed up with Martin House Brewing for the ultimate turtle and beer lover collaboration: “Drink Beer. Save Turtles.” Two years later, this partnership has grown to include breweries around the U.S., raising funds and awareness for the plight of turtles with limited edition beers and special tasting events:

Martin House Brewing Company, Fort Worth, TX
martinhousebrewing.com
Turtle Power
7% ABV Blackberry Altbier
TSA partner since 2014

Terrapin Beer Company, Athens, GA
terrapinbeer.com
Partnered with World of Beer New Orleans for a fundraising event during the 14th Annual Symposium on the Conservation and Biology of Tortoises and Freshwater Turtles.

Spoonwood Brewing Company, Pittsburgh, PA
spoonwoodbrewing.com
Turtle Eclipse
7.4% Tropical Stout with Pineapple/Mango/Passion Fruit Compound
TSA partner since 2016

Holy City Brewing Company, Charleston, SC
holycitybrewing.com
Gimme Shell-ter
7% ABV American Blonde Ale with a hint of blackberries
TSA partner since 2015

Interested in hosting a “Drink Beer. Save Turtles” event at your favorite local bar, taproom or brewery?
Please contact Ilze Astad, Director of Development, ilze.astad@turtlesurvival.org
The foundation of the Turtle Survival Alliance (TSA) is our partnerships, including those with our individual members. With that in mind, we firmly believe that anyone can contribute to turtle conservation in some way, regardless of background or experience. These are three exceptional members who do just that. We hope that you enjoy getting to know them.

JOHN EDWARDS

Hometown: Ashton, Ontario, Canada
Occupation: Business Manager, Holohil Systems Ltd. (www.holohil.com)

Can you tell our readers a little bit about Holohil (for those who don’t know):
Holohil manufacturers VHF transmitters for wildlife research. While we manufacture some of the smallest units commercially available, the largest quantity of units we now build are for turtle/tortoise research. It wasn’t always this way. When I first started with Holohil (in 1996), the bulk of our customers were bat/bird biologists. In fact, the primary model now used for turtles/tortoises (the RI-2B) had only ever been used as a necklace on quail! Fast forward 20 years and we now sell thousands of these units to hundreds of turtle/tortoise projects annually!

How did you first come to be involved with the TSA?
Andrew Walde (a long time user of our transmitters with desert tortoises) invited me to my first TSA annual symposium in 2014 (Orlando, FL). I had never heard of the TSA prior to that meeting. I quickly discovered an incredibly well organized, well run conference the TSA puts on each year. I had the chance to meet with dozens of TSA members whom I'd only ever corresponded with by phone or e-mail. Getting the opportunity to meet so many of them in person and discuss their research, using our products, made it one of my favourite conferences!

How does being involved with the TSA add value to your business?
Since that initial conference, I’ve returned every year, with the TSA annual symposium now on our “can’t miss” list of meetings to attend. The 2015 and 2016 symposiums were easily the best conferences I’ve ever attended on behalf of Holohil. The annual conference allows me to network with our customers in a manner that is simply not possible at any other venue. Between interacting at our vendor booth, attending talks and poster sessions, socials, and impromptu field trips, the TSA’s annual meeting allows me to interact with our customers on a more personal level. It’s been my experience that once you’ve made those personal connections and friendships, a real loyalty is created to your brand.

Do you ever get a chance to be out in the field with turtles?
YES! In fact, my first ever trip afield was to Madagascar (go big or go home!), assisting with radio tracking Spider and Radiated tortoises. A bit of background: While attending the 2014 TSA conference, I was given a copy of Turtle Survival magazine and read about work being done in Madagascar by one of our customers, Andrea Currylow (USC). The following year, I met Andrea in person at the 2015 TSA conference and asked if her work ever included volunteers. It did, so in January 2016, I travelled with her to...
As a kid, my dad was always bringing home wildlife. He was known in the neighborhood as the “Animal Guy.” One day he brought home a clutch of Snapping turtle eggs. He worked residential construction and one morning when they arrived on site there was a large Snapping turtle sitting on the top of a mound of dirt. My dad removed the turtle for his terrified coworkers, who then began to bulldoze the pile. They unknowingly unearthed a clutch of eggs, destroying about half. My dad quickly retrieved the remaining eggs and brought them home. He set the eggs up in our garage in the drawer of an old piece of furniture to incubate. We hatched around 20 snapping turtles and took a trip out to a more rural area to release them. It was a really unique experience; we even went out to this property a few times in the next year to check on our turtles.

**Can you tell us a little about your work at Flagler College?**

One of the most rewarding aspects of my job is getting undergrads involved in turtle research. We’ve dubbed our team the “Tortuga Crew.”

**How did you first become involved with the TSA?**

I first became involved with TSA by attending the 4th Symposium in St. Louis, Missouri (2006). At the time, I volunteered on an alligator snapping turtle project and hadn’t even begun grad school. TSA brings together partners from many like minded groups and institutions. This diversity and shared holistic vision provides the organization's strength and efficacy. I am proud to be a member!
We’re serious about saving turtles—join us!

Visit turtlesurvival.org to become a TSA member. Or, complete this form and send, with a check (payable to TSA) to:
TSA, PO Box 12074, Fort Worth, Texas 76110

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How did you hear about the TSA? ____________________________________________

Membership Levels (Figures represent annual dues):

- Student ($25)
- Senior ($25)
- Individual ($50)
- Organization ($300)

Would you like to make your membership “green?” Green members will not receive a hard copy of the TSA’s annual publication in the mail. Instead, they are invited to read it online.  

- Yes  
- No

Thanks for your support! Please visit turtlesurvival.org to learn more about options for Organizational Memberships.

TSA members enjoy a **10% discount** every day on most items in the TSA’s online store. Log into your membership account at turtlesurvival.org and select “Member Benefits” from the dropdown menu to learn about additional offers and rewards throughout the year.
How Can You Help?

There are many ways that YOU can contribute to turtle conservation and support the TSA’s mission of zero turtle extinctions. Visit the TSA website to learn more!

• **Make a Donation** Your support moves us closer to a goal of zero turtle extinctions.

• **Purchase Equipment** Check out the TSA’s Wish List on amazon.com to purchase equipment that is needed by our staff at the Turtle Survival Center and in the field.

• **Join the TSA** Become a member of the TSA or buy a gift membership for a friend.

• **Support the TSA at No Extra Cost to You** There are several programs available through which you can support the TSA’s mission by doing what you do every day!
  
  » **Amazon.com** – Access amazon.com via the TSA link (http://bit.ly/tsa_amazon) and a portion of your purchase will be donated to turtle conservation!
  
  » **eBay** – The TSA is part of the eBay Giving Works program. So, you can support our mission when you buy and sell on eBay.
  
  » **Good Search** – What if the TSA earned a donation every time you searched the Internet? Or how about if a percentage of every purchase you made online went to support our cause? It can, with Good Search!

• **Shop for the Cause** Visit the TSA’s online store to purchase t-shirts, art, publications or other merchandise to support conservation projects around the world. A number of designs are available on a wide variety of merchandise in the TSA’s Café Press store.

• **Volunteer** Pitch in and get your hands dirty! Volunteer opportunities are posted on the TSA website.

http://www.turtlesurvival.org/get-involved
I was fortunate to grow up in rural northern California, in the 1960’s and 70’s, where my family gave me an appreciation and love for the natural world. I spent my childhood exploring the family’s 250-acre ranch, hiking in the hills, trout fishing in crystal clear streams, and searching for native wildlife. I had a particular fascination with reptiles and amphibians and kept a record of every species I encountered long before I knew about “Life Lists”.

Pond turtles, Western newts, California King snakes, Red-sided Garter snakes, Pacific Giant salamanders, and Yellow- and Red-legged frogs were all common in our streams and ponds. California was a paradise in those halcyon days and little did I know that so many of the common species of my childhood would soon be rare or entirely gone in just a few decades. Looking back, I realize how all these creatures were taken for granted.

Today, when I return to my family ranch, there are no Yellow- and Red-legged frogs, no newts, Pond turtles, or King snakes, and the most common species of all, the beautiful California Red-sided Garter snake, has disappeared completely. Sadly, what happened in Sonoma is a microcosm of what has happened to species around the globe.

On my sixth birthday, I received a Mediterranean tortoise named Ajax. My love affair with Ajax led to a postage stamp collection of turtles and tortoises that I kept in my bedroom until college: Indian Star tortoises, Red-footed tortoises, Burmese Black Mountain tortoises, Leopard tortoises, Texas tortoises, North American Wood turtles, Box turtles, Spotted turtles, Amazon Yellow-spotted Side-neck turtles, Indian Spotted turtles, along with an assortment of snakes and a 3-foot long Argentinian tegu that shared my bed. I grew up in the era that predated CITES and the Endangered Species Act. Anything and everything exotic was readily available in the pet trade.

By the mid 1990s, I realized that the toll placed on wildlife, both from over collecting for the pet trade and from other anthropogenic pressures, was not sustainable. The turtles and tortoises native to my home state of California, and globally, were disappearing at an alarming rate. By this time I had become acutely aware of the plight of the world’s wildlife and started to think about my role in conservation, particularly the dire need to protect turtles and tortoises, as they were fast becoming one of the most endangered groups of animals on the planet. This passion for turtles and tortoises has been a constant thread throughout my life and remains with me to this day.

As luck would have it, in January of 2003 I received a phone call from John Behler that would change my life forever, and answer the calling in me to make a difference.

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— Eric Goode, founder and President of the Turtle Conservancy in his Behler Award acceptance speech at the TSA Conference in New Orleans, August 2016.
(Manouria impressa), Speckled Padloper (Homopus signatus), Arakan Forest turtle (Heosemys depressa), and Okinawa Leaf turtle (Geomyda japonica), to name a few. The center has also bred 2nd and 3rd generations of many at risk species.

In January 2012, the TC became the first to repatriate internationally bred, threatened turtles when we returned Golden Coin turtles (Cuora trifasciata) to Hong Kong for an ongoing reintroduction program. Over the past decade, the TC has bred many turtles and tortoises for conservation, hatching 25 species totaling 1,400 offspring surviving.

Over these same ten years, the TC supported and collaborated with researchers, ecologists, conservationists, naturalists, students, and artists. Many of the world’s leading authorities on turtles and tortoises have spent time on the Ojai, California campus, researching reproductive biology, physiology, genetics, and the natural history of the many species in the collection.

Eric currently sits on the boards of: Chelonian Research Institute, the Turtle Conservation Fund, Rainforest Trust, and Global Wildlife Conservation. He is a member of the IUCN Tortoise and Freshwater Turtle Specialist Group.

THE ECCENTRIC CONSERVATIONIST

Goode experienced an unorthodox career path for a naturalist and conservationist. He’s evolved from a turtle keeper, to an innkeeper, to an Earth keeper.

His unique connections to both the entertainment and hospitality industries allowed him to leverage a very visible conservation platform, and to raise public awareness of chelonian challenges by being profiled on CBS’ 60 Minutes and Charlie Rose, and in The New Yorker, The New York Times, Wall Street Journal, and with other media outlets.

To bring awareness of the plight of turtles to tens of millions of people, he created the Turtle Ball, one of New York’s more exclusive and idiosyncratic benefits that regularly brings together artists, celebrities, philanthropists, conservationists, and the fashion world for a festive evening that focuses a spotlight on the global turtle extinction crisis.

Eric is the publisher and co-editor of The Tortoise magazine, a periodical of the Turtle Conservancy that merges science, travel, culture, art, and conservation.

Through the Turtle Conservancy, Eric’s work extends to the far corners of the globe, including Argentina, China, Indonesia, Madagascar, Myanmar, Taiwan, Thailand, Namibia, the Philippines, South Africa, and Mexico. The organization’s proudest achievement, to date, is the 45,000 acres protected over just the past 18 months.

HABITAT CONSERVATION MILESTONES

Eric’s land conservation efforts began a number of years ago with a conservation easement to create a 250-acre nature preserve on the family ranch where he grew up. With the Turtle Conservancy, he’s helped create the 1,000-acre Geometric Tortoise Preserve in South Africa. Quite possibly, this enclave is where this Critically Endangered tortoise will make its last stand against extinction and where it will begin to make its march back from the brink.

Later, Eric secured a major grant from the Leonardo DiCaprio Foundation to catalyze purchase of 43,540 acres in the heart of the Bolson tortoise range in north central Mexico — now the only completely protected area dedicated to this imperiled species.

Shortly after that, Goode’s Thornscrub tortoise (Gopherus evgoodei) was named in honor of Eric’s longstanding turtle and tortoise conservation work. He teamed up with scientific authors who described the species in order to raise funds and purchase 1,000 acres of its tropical, deciduous forest habitat in Sonora, Mexico.

More than any other recognition I have received, the Behler Turtle Conservation Award means the most to me. I am deeply honored to be recognized by my peers in the turtle conservation world, and I share this award with the Turtle Conservancy Family because I could not have done what we have collectively achieved without you: Ursula Britton, Rebecca Chaiklin, Andrea Currylow, Taylor Edwards, Walton Ford, Matt Frankel, Gregory George, Paul Gibbons, Alfonso Gonzalez, Nicholas Goode, Juan Hernandez, Margaretha Hofmeyr, Angel Jimenez, Armando Jimenez, Rene Jimenez, Jim Juvik, Ross Kiester, Gerald Kuchling, Christine Light, James Liu, Max Maurer, Miye McCullough, John Mitchell, Russell Mittermeier, Lukasz Pogorzelski, Rosalinda Palomo Ramos, Samuel Ramirez, Anders Rhodin, Rick Ridgeway, Lynn Rinkus, Maurice Rodrigues, Andrew Sabin, Julian Sands, Chris Shepherd, Craig Stanford, Fisher Stevens, Peter Paul vanDijk, Mercy Vaughn and Michael Zilkha; and our major funding partners who make it all possible, Andrew Sabin, Matthew Frankel, Global Wildlife Conservation, Leonardo DiCaprio, Rainforest Trust, Stuart Salenger, Weeden Foundation, and Michael Zilkha.
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The Chittagong Hills Tract (CHT) is a vast tract of tropical rainforest in eastern Bangladesh, on the border with Burma, that still supports a stunning array of highly endangered Asian megafauna – including elephants, tigers, clouded leopards and gaur – as well as hornbills, pangolins and at least five turtle/tortoise species of special concern, including this Burmese Mountain Tortoise (Manouria emys phayrei). But the CHT forest and its wildlife are under tremendous threat from land clearing, hunting and logging and are unlikely to survive without protective intervention. The Creative Conservation Alliance (CCA) – working with local Mro tribes - have developed innovative strategies to significantly reduce hunting pressures on endangered species. This creative program has quickly captured the imagination of some of the world’s leading conservation organizations, and donor organizations are enthusiastically supporting it. The TSA is proud to partner with the CCA on this ground-breaking project.