

CONSERVATION RESEARCH REPORTS

Agricultural Contaminants Alter Gonadal Form and Function in Cane Toads

Many agricultural contaminants disrupt endocrine systems of wildlife. However, evidence of endocrine disruption in wild amphibians living in agricultural areas has been controversial. Typically, studies on the effects of pollutants on wildlife attempt to compare polluted with unpolluted sites. MCCOY ET AL. (2008. *Environmental Health Perspectives* 116:1526–1532) took a novel approach to addressing this question by explicitly quantifying the relationship between gonadal abnormalities and habitats characterized by differing degrees of agricultural activity. They quantified the occurrence of gonadal abnormalities and measures of gonadal function in at least 20 Cane Toads (*Bufo marinus*) from each of five sites that occur along a gradient of increasing agricultural land use. The number of abnormalities and frequency of intersex gonads increased with agriculture in a dose-dependent fashion. These gonadal abnormalities were associated with altered gonadal function. Testosterone, but not estradiol, concentrations were altered, and secondary sexual traits were either feminized (increased skin mottling) or demasculinized (reduced forearm width and nuptial pad number) in intersex toads. Based on the end points the authors examined, female morphology and physiology did not differ across sites. However, males from agricultural areas had hormone concentrations and secondary sexual traits that were intermediate between intersex toads and nonagricultural male toads. Skin coloration at the most agricultural site was not sexually dimorphic; males had female coloration. Steroid hormone concentrations and secondary sexual traits



The frequency of gonadal abnormalities in Cane Toad (*Bufo marinus*) tadpoles increased with exposure to agriculture.

correlate with reproductive activity and success, so affected toads likely have reduced reproductive success. These reproductive abnormalities could certainly contribute to amphibian population declines occurring in areas exposed to agricultural contaminants.

A Cocktail of Contaminants: How Mixtures of Pesticides Affect Aquatic Communities

The ubiquity of anthropogenic chemicals in nature poses a challenge to understanding how they affect ecological communities. Communities are exposed to suites of contaminants, yet investigations of the effects of diverse contaminant mixtures in aquatic communities are rare. RELYEA (2009. *Oecologia* 159:363–376) examined how a single application of five insecticides and five herbicides at low concentrations affected aquatic communities composed of zooplankton, phytoplankton, periphyton, and larval amphibians (Gray Treefrogs, *Hyla versicolor*, and Leopard Frogs, *Rana pipiens*). The author examined each pesticide alone, a mix of insecticides, a mix of herbicides, and a mix of all ten pesticides. Individual pesticides had a wide range of direct and indirect effects on all groups. The impact of pesticide mixtures could largely be predicted from the effects of individual pesticides for zooplankton and algae, but not for amphibians. An apparently direct toxic effect of endosulfan caused 84% mortality of Leopard Frogs and an indirect effect induced by diazinon caused 24% mortality of Leopard Frogs. When pesticides were combined, the mix of herbicides had no negative effects on the survival and metamorphosis of amphibians, but the mix of insecticides and the mix of all ten pesticides eliminated 99% of Leopard Frogs. Interestingly, these mixtures did not cause mortality in Gray Treefrogs, which grew nearly twice as large due to reduced competition with Leopard Frogs.

Translocating Amphibians and Reptiles

Translocations can be important tools for conservation. Despite increased use over the last few decades, the appropriateness of translocations for amphibians and reptiles has been debated widely over the past 20 years. To provide a comprehensive evalua-



Larval Leopard Frogs (*Rana pipiens*, top) were very vulnerable to low dosages of pesticides, especially when subjected to mixtures of them. In sharp contrast, Gray Treefrog (*Hyla versicolor*) larvae resisted the toxic effects of contaminants and grew nearly twice as large in the absence of competition with Leopard Frogs.

tion of the suitability of amphibians and reptiles for translocation, GERMANO AND BISHOP (2009. *Conservation Biology* 23:7–15) reviewed the results of amphibian and reptile translocation projects published between 1991 and 2006. The success rate of amphibian and reptile translocations reported over this period was twice that reported in an earlier review in 1991. Success and failure rates were independent of the taxonomic class (Amphibia or Reptilia). Reptilian translocations driven by human-wildlife conflict mitigation had a



A current review of translocation projects showed that recent efforts, such as those involving Gopher Tortoises (*Gopherus polyphemus*), have been more successful than those evaluated by a similar review in 1991.

higher failure rate than those motivated by conservation. Outcomes of amphibian translocations were significantly related to the number of animals released, with the most successful projects releasing over 1,000 individuals. The most common reported

causes of translocation failure were homing and migration of introduced individuals out of release sites and poor habitat. The increased success of amphibian and reptilian translocations reviewed in this study compared with the 1991 review is encour-

aging for future conservation projects. Nevertheless, more preparation, monitoring, reporting of results, and experimental testing of techniques and reintroduction questions need to occur to improve the likelihood of future success.

NATURAL HISTORY RESEARCH REPORTS

Vipers and Predator-prey Dynamics

Snakes typically are not considered top carnivores, yet they are major predators in many ecosystems. NOWAK ET AL. (2008. *Biological Reviews* 83:601–620) assessed traditional views of predator-prey dynamics to determine if they were consistent with what we know about vipers and pitvipers (Viperidae). Specifically, the authors compared behavioral and physiological characteristics of vipers with those of more commonly studied mammalian (endothermic) predators and discussed how functional and numerical responses of vipers are fundamentally different. Generally, when compared to similar-sized endothermic predators, vipers have: (i) lower functional responses owing primarily to longer prey-handling times resulting from digestive limitations of consuming large prey and, for some adults, tolerance of fasting; (ii) stronger numerical responses resulting from higher efficiency of converting food into progeny, although this response often takes longer to be expressed; and (iii) reduced capacity for rapid numerical responses to short-term changes in prey abundance. Given these factors, the potential for viperids to regulate prey populations would most likely occur when prey populations are low.



Viperids (which include vipers and pitvipers, such as this Palm Pitviper, *Bothriechis supraciliaris*) are major predators in many ecosystems, but probably have the capacity to regulate prey populations only when they are low.



An adult male pink iguana (*Conolophus* sp.) on the rim of Volcano Wolf (1700 m), Isabela island.

A Pink Land Iguana in the Galápagos

The Galápagos Islands are not yet depleted of evolutionary novelties. When Darwin visited the Galápagos, he observed both Marine (*Amblyrhynchus*) and Land (*Conolophus*) iguanas, but did not encounter a rare pink black-striped land iguana (herein referred to as “Rosada,” meaning “pink” in Spanish), which, surprisingly, remained unseen until 1986. GENTILE ET AL. (2009. *Proceedings of the National Academy of Sciences of the United States of America*, published online 05 January 2009; doi: 10.1073/pnas.0806339106) demonstrated that substantial genetic isolation exists

between Rosada and syntopic yellow forms and that Rosada is basal to extant taxonomically recognized Galápagos land iguanas. The Rosada, whose present distribution is a conundrum, is a relictual lineage with an origin dating to a period when at least some of the present-day islands had not yet formed. So far, this species is the only evidence of ancient diversification along the Galápagos land iguana lineage and documents one of the oldest events of divergence ever recorded in the Galápagos. Conservation efforts are needed to prevent this form from extinction. Imperiled due to devastation of the area's natural flora by invasive goats, the authors have suggested that

the species should be considered “critically endangered” according to IUCN criteria.

Giant Neotropical Snake and Hotter Equatorial Temperatures

The largest extant snakes live in the tropics of South America and southeastern Asia, where high temperatures facilitate the evolution of large body sizes among air-breathing animals with body temperatures that are dependant on ambient environmental temperatures. We know very little about ancient tropical terrestrial ecosystems, limiting our understanding of the evolution of giant snakes and their relationship to climates in the past. HEAD ET AL. (2009. *Nature* 457:715–718) described a boid snake from the oldest known (58–60 Myr ago) Neotropical rainforest fauna in northeastern Colombia. They estimated a body length of 13 m and a mass of 1,135 kg, making it the largest known snake. The maximum size of poikilothermic animals at a given temperature is limited by metabolic rate, and a snake of this size would require a minimum mean annual temperature of 30–34 °C to survive. That estimate is consistent with hypotheses of hot Palaeocene Neotropics with high concentrations of atmospheric CO₂. A compar-



The discovery of the world's largest known snake, *Titanoboa cerrejonensis*, suggests that past tropical temperatures were higher than today.

ison of palaeotemperature estimates from the equator to those from South American mid-latitudes indicates a relatively steep temperature gradient during the early Palaeogene greenhouse, similar to that of today. Depositional environments and faunal composition are indicative of an anaconda-like ecology for the giant snake.

New Fossil Reveals How Turtle Got Their Shells

Turtles are unique vertebrates. The distinctive development of a shell, the turtle's most characteristic feature, is an evolutionary story that has always been a bit of a mystery. Previously, much of what scientists understood about the origin of turtles was derived from fossils of *Proganochelys*, an ancestor from Germany. This specific ancestor had a heavily built shell and spiked plates covering the neck and tail. Researchers suggested that this well-armored creature arose from an extinct line of armored reptiles known as pareiasaurs, and also suggested that the first turtles lived on land, where a shield was a useful defense for a slow-moving animal. However, *Proganochelys* provided no clues to how the turtle shell evolved because its own carapace is fully formed.



An artist's rendition of *Odontochelys semitestacea*.

LI ET AL. (2008. *Nature* 456:497–501) described a fossil in southwestern China's Guizhou Province that paints a rather different picture of the origin of turtles. This 220-million-year-old fossil reveals a primitive turtle that had only a plastron (the flat, bottom shell that protected the animal's soft belly). This apparently transitional creature was named *Odontochelys semitestacea*, meaning “half-shelled turtle with teeth.”

Odontochelys lacked osteoderms (bony plates in the skin). Some specialists had proposed that these osteoderms had fused gradually over millions of years to form a carapace (the shell covering a turtle's back), so the apparent lack of osteoderms in *Odontochelys* challenges the belief that turtles were at all closely related to pareiasaurs. This evidence makes a stronger argument that modern-day shelled vertebrates are more likely to be aligned with diapsids, a group of reptilian taxa that includes crocodiles, lizards, snakes, tuataras, and even some birds.

That conclusion has been challenged. Some researchers interpret *Odontochelys* as an early turtle that did in fact have an upper shell, but one that had not fully ossified. This supposition could mean that the unique shell structure of *Odontochelys* was not necessarily a primitive intermediate structure, but rather a specialized adaptation comparable to the soft shell of today's aquatic turtles. *Odontochelys*, then, may be the signal of an early invasion of water by ancient turtles that had originated on land.

NEWSBRIEFS

Sequencing the Extinct

Researchers have sequenced the mitochondrial genome of the extinct Tasmanian Tiger or Thylacine (*Thylacinus cynocephalus*), using museum-preserved tissue samples collected from some of the last remaining individuals. The mitochondrial DNA used to

complete the analysis (MILLER ET AL., *Genome Research*, published in advance, 12 January 2009) came from hairs on a Thylacine skin that had been stored at room temperature for more than 100 years and from a whole tiger preserved in ethanol since 1893.

These findings helped place the Thylacine in an improved phylogenetic tree with distantly related, extant marsupials and generated possible markers for geneticists seeking to trace the process of extinction through Thylacine DNA. They also open the door to the feasibility of successful



A 1921 photograph of a Tasmanian Tiger (*Thylacinus cynocephalus*) photographed in a cage with a chicken.

molecular analyses in museum specimens — something Schuster has dubbed “museomics”.

The results also validate ancient DNA sequencing techniques and put the sequencing of the complete Thylacine genome and that of other extinct organisms within reach. “It's not a question of whether [sequencing the entire Thylacine genome] can be done,” Webb said, “it's just about coming up with the resources. Any megafauna that went extinct in the last 100,000 years are within reach.”

Bob Grant
The Scientist.com
12 January 2009

New Facility Boosts Iguana Conservation Program

The new quarters at the San Diego Zoo's Wild Animal Park are hot and humid, and that's just the way its occupants like it. Seventeen iguanas — including three endangered species and a fourth whose population is at risk — are settling into a \$630,000 breeding and research center that opened at the park in the San Pasqual Valley late last month. Named after its primary donors, the 2,000-square-foot Kenneth C. and Anne D. Griffin Reptile Conservation Center is part of a 15-year-old conservation program aimed at boosting endangered iguanas' numbers in the wild.

The Grand Cayman, Cuban, Jamaican, and Anegada iguanas now at the park formerly lived at the zoo, where researchers studied, bred, and raised them. So far, the 15-year-old iguana program has produced more than 150 young reptiles that were released into their native habitats in the islands for which they are named. The new facility opened on 23 December 2008 in a section of the animal park that is not accessible to the public. Park spokeswoman Yadira Galindo said that conservation pro-

grams are clustered in that area because endangered species need “peace, quiet, and open space” to breed successfully.

Jeff Lemm, a research coordinator for the San Diego Zoo's Conservation Research Center, said the iguanas' zoo quarters were supposed to be temporary when the first wild iguana was brought there in 1994. The facility lacked heat and humidity controls, so researchers used heating lamps and other improvised methods to incubate eggs and provide the moist, warm environment in which the reptiles thrive.

Some of the iguana species adapted to the setting and successfully produced offspring, but at least one did not. Lemm said researchers hope to see the egg-laying and birth rate go up in the new facility. Designed to meet their needs, the conservation center has a nursery, kitchen, and large, individual pens equipped with ultraviolet lights, which help iguanas absorb calcium. The 18 x 6'-wide enclosures also have skylights, natural plants, and small doors that can be opened to give the reptiles access to the outdoors or neighboring enclosures. A special air-conditioning system keeps the humidity at the 70–95% range that iguanas like.

Lemm said that the numbers of Grand Cayman Iguanas had dropped to around 12 in the Caribbean before the zoo and several partners started the conservation program in the early 1990s. The Cuban and Anegada iguanas' populations also were very low, and the Jamaican species was believed to be extinct because of habitat loss and the introduction of non-native predators. “Cats, dogs, and mongooses that people brought in go after iguanas, and hooved animals — cattle, goats, horses, donkeys, sheep, pigs — eat the same plants (as the reptiles) and trample the iguanas.” “Luckily, preserves have been set aside for the Grand Cayman Iguana. A lot of the animals have started breeding



A rare Jamaican Iguana (*Cyclura collei*) in the opening of its shelter at the San Diego Zoo's Wild Animal Park's new research facility for iguanas from the West Indies.

again in clutches. So we think we've caught it in time.”

Lemm said conservation program participants occasionally exchange iguanas in an effort to ensure the captive population's genetic characteristics mirror those of wild iguanas on the islands. That way, researchers will be able to reintroduce the reptiles to their original homes if a catastrophic event ever makes that necessary, he said. “Some of those islands are only 2 or 3 inches above sea level, so a catastrophic event could be a hurricane. If a strong enough one comes along, it could wipe out all animal life on the island.”

For more information about the park's conservation programs, log onto www.sandiegozoo.org/wap.

Andrea Moss
North County Times
19 January 2009

Grim News from the Field Museum

The Field Museum is slashing its budget by 15%, thanks to the economic downturn. The venerable Field Museum of Natural History in Chicago is cutting its budget by 15% — laying off staff, paring salaries, and canceling projects — after being hit by the economic recession.

Excerpted from an article by Rex Dalton
(www.nature.com)



The venerable Field Museum of Natural History in Chicago is cutting its budget by 15% after being hit by the economic recession.

Copperbelly Water Snake Recovery Plan

The northern population of the Copperbelly Water Snake (*Nerodia erythrogaster neglecta*) is listed by the U.S. Fish and Wildlife Service as a threatened Distinct Population Segment (DPS). The DPS consists of populations north of the 40th Parallel in Indiana, Michigan, and Ohio. Surveys over the last twenty years have documented an ongoing decline in these populations. Many popula-



Many of the northern populations of the Copperbelly Water Snake (*Nerodia erythrogaster neglecta*) are now extirpated, and the five that remain are very small.

tions are now extirpated, and the five that remain are very small. The principal recovery strategy is to establish and conserve multiple wetland/upland habitat complexes that provide adequate habitat for population persistence. Additional efforts also will focus on reducing take due to collection by humans and malicious killing. Outreach materials will be developed regarding the species' presence in the community as part of the natural environment, and to reduce the fear of snakes.

Megan Seymour
U.S. Fish & Wildlife Service
Columbus, Ohio

Visitors Arrested in the Exuma Cays for Killing Iguanas

The Bahamas National Trust (BNT) announced that two individuals were arrested for a recent incident of taking undersized conch and killing and eating iguanas in the Exuma Cays. Responding to an e-mail distributed by a concerned citizen, the Trust contacted authorities at all levels of government. BNT staff from the Exuma Cays Land & Sea Park and Royal Bahamas Defense Force (RBDF) marines stationed at the park responded by locating the vessel involved in the incident, transporting the local police officials to the vessel, and assisting in the arrest. The individuals have been arrested and are being held pending future court hearings.

Commenting on the situation, Executive Director of the BNT, Mr. Eric Carey, stated that he was "pleased that concerned citizens were able to bring this unfortunate situation to the attention of the Trust. It is unfortunate that a few tourists are able to brazenly violate the natural resources of our country and damage the reputation of the many valued tourists who appreciate and respect our environment. We are pleased

that this matter is now in the hands of the court system and that everyone came together towards a common goal."

The BNT is continuing its efforts to have the others involved in this disgusting incident arrested and brought before the courts. Officials of the Trust expressed appreciation for the assistance and support from the Minister of the Environment in getting this the attention it deserved.

Adapted from *Bahama Islands Info*

Two American tourists have been arrested after photographs of people cooking and eating endangered iguanas in the Exuma Cays were posted on a social networking website. Friends of those responsible for posting the pictures on Facebook circulated the photographs in an e-mail that worked its way to executive director of the BNT, Eric Carey.

Horrified by the gruesome images of the critically endangered species being

butchered, grilled, and devoured, and a dinghy filled with undersized juvenile conch, Mr. Carey alerted staff at the BNT Exuma Cays Land and Sea Park. The park warden and administrator worked with police in George Town and Black Point, Exuma, to track down the suspects.

Two people were arrested in connection with the offense that violates Fisheries Regulations and the Wild Animal Protection Act, prohibiting the possession of dead or live iguanas. Iguanas also are protected under the Convention on International Trade in Endangered Species (CITES) and, as the suspects in custody are understood to be U.S. citizens, Mr. Carey said they could also be charged under U.S. law that makes it illegal to commit an offense in a country that has a relationship with the U.S.

Two other individuals also were featured in photographs showing a group of people taunting, cooking, and eating iguanas, and taking juvenile conch.

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www.exo-terra.com



These photographs posted on Facebook showing tourists taunting, cooking, and eating iguanas, and taking juvenile conch led to the arrest of Alexander Daniel Rust of Indiana and Vanessa Starr Palm of Illinois for violating the Fisheries Regulations and the Wild Animal Protection Act.

Mr. Carey said: "We have had people poaching iguanas for the pet trade, but I have never seen this sort of barbaric butchery for consumption by visitors." ... "To see

guys gloating with such disrespect and putting the pictures on such a public profile as Facebook clearly shows they have no fear of prosecution — and we need to prove them wrong. We take the responsibility to enforce wildlife law very seriously."

Adapted from *BahamasB2B.com*

The two American visitors, 24-year-old Alexander Daniel Rust of Indiana and 23-year-old Vanessa Starr Palm of Illinois, arrested after being found in breach of the Fisheries Regulations and the Wild Animal Protection Act were given police bail in the amount of \$500 each.

The two had posted photographs of themselves in the Exuma Cays on a social networking website on the Internet. The series of photographs displayed shows the suspects catching an iguana, parts of an iguana on a grill, two men eating the iguana pieces, and a man and a woman cleaning what appears to be undersized conch. The photos were widely distributed via email to persons around the country by concerned individuals.

Adapted from *The Freeport News*

Alexander Rust received a \$1,000 fine (\$800 for removing undersized conch and \$200 for killing an endangered species). Vanessa Palm received only a warning. This event may trigger changes in proscribed fines (current amounts date to implementation of the Wild Animals Protection Act in 1968).

Court Order Forced the State to List the Endangered California Tiger Salamander

The California Fish and Game Commission last week formally designated the California Tiger Salamander (*Ambystoma californiense*) as a candidate for threatened or endangered status under the California Endangered Species Act, extending legal protections to the species for one year while a status review is conducted. The Commission was forced by a Center for Biological Diversity petition and lawsuit, and a recent court of appeals ruling, to make the designation.

"Despite the Fish and Game Commission's misguided attempts to repeatedly deny protected status to the California Tiger Salamander, the candidate designation sets the listing process back on the right track and should ultimately result in the Tiger Salamander getting the state-protected status it deserves," said Jeff Miller, a conservation advocate with the Center for Biological



California Tiger Salamanders (*Ambystoma californiense*) are candidates for state threatened or endangered status. This individual was being released to augment a natural population.

Diversity. "Every expert biologist who studies the California Tiger Salamander has weighed in and recommended the species be listed."

The Center for Biological Diversity petitioned the Commission in 2004 to list the California Tiger Salamander as endangered due to the impacts of urban and agricultural development. The Santa Barbara County salamander population has been listed as endangered under the federal Endangered Species Act since 2000, as has the Sonoma County population since 2003. The central California population has been federally listed as threatened since 2004.

The Commission rejected the petition in 2004, falsely claiming it did not contain all of the data necessary to prove the salamander population deserved protection. The Center filed suit, and the Commission was forced by court order and a state appeals court ruling in September 2008 to accept the petition. The state Supreme Court refused to review the appeals court ruling. The Commission last week voted 3–2 for candidacy, clearly reluctant to protect the species. One Commissioner repeatedly referred to the presence of California Tiger Salamanders on private land as a "salamander problem" and referred to the court that issued the petition acceptance order as "jerks" and "stupid."

State candidate species are afforded many of the legal protections of endangered or threatened species while a year-long status review is conducted. A final state listing determination for the California Tiger Salamander is due in February 2010.

The court decision on the California Tiger Salamander has potential implications for other poorly monitored species, since the court ruled that the Commission must consider a listing petition if the information would "lead a reasonable person to conclude there is a substantial possibility" that the species could be listed.

The California Tiger Salamander depends on ephemeral vernal pools for breeding. In recent decades, 95% of California's vernal pools have been lost, and at least 75% of the salamander's habitat throughout the state has been eliminated. In Sonoma County, 95% of the fragmented and minimal remaining salamander habitat is threatened by development; the Santa Barbara population also is on the verge of extinction. The Sonoma population survives in only seven viable breeding sites and the Santa Barbara population consists of only six breeding groups.

Jeff Miller
Center for Biological Diversity

Native Snake Snacks on Alien Iguana

Golfers were not expecting to see a snake eating an iguana on the 5th hole of the Britannia golf course, but James Robinson and two friends came across this snake, an indigenous Grand Cayman Racer (*Cubophis caymanus*), swallowing a Common Iguana or Green Iguana (*Iguana iguana*), which is an invasive species.

Robinson said they were just walking onto the green when they saw the snake. "At first my mates didn't believe me. We watched it for maybe 5 minutes and then finished the hole and then came back again. To start, it just had the head, and then when we left it had got past the iguana's legs. Then the snake dragged it off into the bushes."

Local naturalist Fred Burton identified the snake from Robinson's photograph and noted that the Cayman Racer is a rear-fanged snake, capable of envenomating a young iguana, so the iguana was probably comatose by the time the photo was taken. He also indicated that snakes need about five days to digest a big frog before they want another meal, so this particular diner was probably set for a while.

Cayman News Service
23 February 2009

Unregulated trade in Southeast Asian Box Turtles

Unregulated trade — at 10–100 times legal levels — has caused Southeast Asian Box Turtles (*Cuora amboinensis*) almost to vanish from parts of Indonesia, where they once were common. The species is one of 29 native freshwater turtles in Indonesia. It has a low reproductive rate, making it susceptible to over-harvesting. The turtles are used for meat



A Grand Cayman Racer (*Cubophis caymanus*) swallowing a Common Iguana (*Iguana iguana*), which is an invasive species on Grand Cayman.

and in traditional Chinese medicine, with major markets in Hong Kong, China, Singapore, and Malaysia, mostly supplied from Indonesia. Animals also are exported as pets, mainly to the U.S., Europe, and Japan.

The study by TRAFFIC, the wildlife trade monitoring network, found at least 18 traders operating in Java, Sulawesi, Sumatra, and Kalimantan dealing illegally in Southeast Asian Box Turtles. Each trader handled an average of just under 2,230 turtles a week, a combined total of 2.1 million turtles per year. The vast majority is destined for export, although Indonesia's official annual export quota for this species is just 18,000 turtles, a figure set without a scientific basis.

"The number of Southeast Asian Box Turtles currently traded is certainly ten times the official export quota, and probably nearer 100 times it," said Dr. Sabine Schoppe, author of the report. Thirteen of the 18 traders investigated were registered for some trade in reptiles (but not in box turtles) with the provincial offices of the government's Directorate General of Forest Protection and Nature Conservation (PHKA), which is required to inspect such businesses regularly.

Collectors in Riau and Sulawesi reported huge falls in Southeast Asian Box Turtle numbers in the wild, and registered pet traders said they had experienced difficulties in obtaining turtles compared to a decade ago. "The current level of illegal exploitation will result in Southeast Asian Box Turtles being systematically wiped out across Indonesia, indications of which are already obvious at collection and trade centers," said Schoppe.

"The Southeast Asian Box Turtle has historically been considered common, but is currently listed as "Vulnerable" on the IUCN Red List of Threatened Species," said Dr. Anders Rhodin, Chair of the IUCN

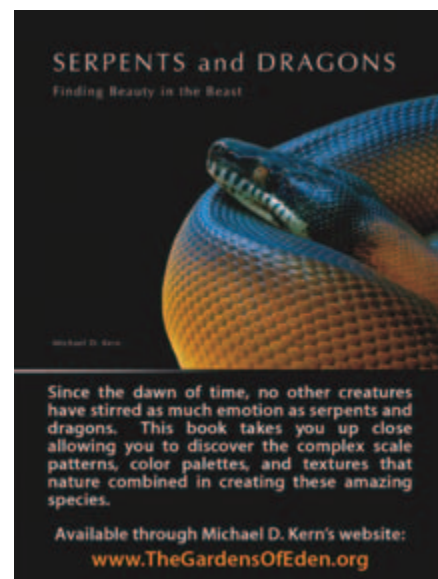


Southeast Asian Box Turtles (*Cuora amboinensis*) are disappearing from parts of Indonesia, where they once were common.

Tortoise and Freshwater Turtle Specialist Group. "If present trends of massive over-harvesting and unsustainable illegal trade continue, this formerly common species will soon be "Critically Endangered," and could follow the Passenger Pigeon into the annals of conservation failures. We cannot afford to lose any more of these animals. We need to stamp out illegal trade in this and all other overexploited species before it's too late."

"Authorities should concentrate on eradicating illegal trade, and in setting realistic limits on what numbers can be harvested safely," said Chris R. Shepherd, Senior Programme Officer with TRAFFIC Southeast Asia. Weak enforcement of existing laws is a key problem, caused through a combination of factors including non-inspection of shipments, falsification of CITES export permits, and lack of training among enforcement officers.

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23 February 2009



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Editor's Remarks

We've had a very busy and exciting few months watching this new incarnation of the journal take shape — and we hope you like what you see. Our new title, after much consideration, has become *Reptiles & Amphibians: Conservation and Natural History*, a name we hope balances description with aesthetic presentation. The biggest and most obvious change on the inside is the use of color throughout, and, given the magnificent variety of our subject matter, the results are sure to please. Imagine our delight at being able to present the newly discovered pink Galapagos Land Iguana in its proper hues! Particular acknowledgements need to go to team members John Binns, Michael Ripca, and Robert Powell for their countless hours and many sleepless nights in bringing our new look to fruition.

AJ Gutman, Editor

STATEMENT OF PURPOSE

The International Reptile Conservation Foundation works to conserve reptiles and amphibians and the natural habitats and ecosystems that support them.

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Spot-tailed Earless Lizards — A Vanishing Species



R. WAYNE VAN DEVENGER

The Spot-tailed Earless Lizard (*Holbrookia lacerata*) appears to have been extirpated from many of its historical locations in central and southern Texas and adjacent areas in northern Mexico. Although the species does not currently appear on any state or federal threatened or endangered lists, its conservation status is uncertain. Mike Duran, a zoologist with The Nature Conservancy of Texas (TNCT) believes that a species disappearing from its historic range is indicative of an environmental problem, probably pesticides in this case. “If pesticide use is so devastating that it’s wiping out an entire species, that’s something at which we need to take a closer look.”

These lizards are about 6 in long and covered with spots on the back and tail. The name, however, refers to spots underneath the tail, which are lacking in related “earless” species (so called because they lack external ear openings). Habitat appears to consist of areas that are sparsely vegetated with some bare ground, on a variety of soil types, but never on pure sand. These include upland savannas, plowed fields in places that originally were grasslands, thinly vegetated Mesquite shrublands, semi-xeric mesquite, Prickly Pear brushlands, and coastal prairie.

In order to determine the current distribution and develop a habitat model for the species, TNCT is beginning range-wide surveys at 207 sites in March–June 2009, months when these lizards are most active, and is seeking volunteers and information. The surveys are being undertaken with the help of a grant from the Texas Parks and Wildlife Department’s Horned Lizard License Plate Fund and in cooperation with Ralph Axtell and a number of Texas herpetologists and universities.

If you would like to volunteer to assist in surveys, or if you have information about *Holbrookia lacerata* that may not currently be included in the historical record, contact Mike Duran at mduran@tnc.org or visit www.nature.org/wherewework/northamerica/states/texas/features/art27236.html for more information about the project.



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Puerto Rican Groundsnakes or Small Racers (*Arrhyton exiguum*) are uncommon and secretive on Guana Island in the British Virgin Islands. However, at the Sage Mountain Reserve on nearby Tortola, the highest and wettest spot in the Virgin Islands, these snakes are much more frequently encountered, suggesting that the dry conditions on Guana may limit activity and numbers. See article on p. 6.