NATURAL HISTORY RESEARCH REPORTS

Copperheads in the Northeastern United States

Smith et al. (2009. *Herpetological Monographs* 23:45–73) studied the spatial and reproductive ecology of a population of Copperheads (*Agkistrodon contortrix*) in a basalt trap-rock ecosystem in the central Connecticut River Valley, a region that constitutes the northeastern extreme of this species' geographic range. Adult males (n = 20) and females (n = 15) were surgically implanted with radio-transmitters and tracked every 48 h during the active season (April–October) for three consecutive years (2001–2003). From late autumn to early spring (November through March), when snakes were hibernating and thus inactive, tracking was reduced to once per week. Activity range size and multiple movement parameters differed significantly by sex. Throughout the active season, males had greater activity range sizes and showed greater movement than females. This trend was pronounced during the mating season, which was restricted to late summer and early fall (late July through September). In contrast to most populations of *A. contortrix* from more southern and western localities, the authors observed no sexual activity (e.g., courtship, coitus, and male-male fighting) in the spring. Individuals of both sexes showed annual fidelity to: (i) Activity range location, (ii) activity range size, (iii) movement distances, (iv) particular features of their activity ranges (e.g., refuges), and (v) hibernation sites. Males and females showed no difference in preferred seasonal habitats. In both sexes, shifts in habitat associations during the active season included migrations from over-wintering sites within basalt trap rockslides to higher-elevation open deciduous forest during the summer foraging and reproductive season. Parturition in the field was recorded in eight instances and was always close to one of the two hibernacula used by the individuals in the study area. The authors dedicated this paper to Henry S. Fitch.

GEORGE R. PISANI

Unlike populations of Copperheads (*Agkistrodon contortrix*) from more southern and western localities (like this snake from Kansas), a population from the northeastern extreme of the species' range exhibited no sexual activity in the spring.

Secretive Snakes in a Grassland Community

Fitch (1999) summarized his fifty years of intensive fieldwork on the snake fauna of the Fitch Natural History Reservation (FNHR) and adjacent study areas, commenting upon the relative scarcity of two small, secretive species, the Smooth Earth Snake (*Virginia valeriae*) and the Brown Snake (*Storeria dekayi*). Location of a population of *V. valeriae* (Pisani 2005) as a component of a diverse snake fauna that includes *S. dekayi* on land adjacent to Fitch's main study areas provided an opportunity to accumulate considerable new information on these species in a similar snake community. **Pisani** (2009. *Journal of Kansas Herpetology* 32:20–36) conducted an intensive mark-recapture study of this community from September 2006 through November 2008. The ongoing study included observations on feeding, defense, home range, morphology, and population sizes along with relevant microhabitat characteristics. Data accumulated indicate considerably greater use of available grassland habitat by these and syntopic small snake species than had been recognized. An extensive review of literature and unpublished dissertations provided insights to aspects of the community interrelations of small vermivorous snakes in northeastern Kansas. These interrelations are considered in light of land-management and other anthropogenic factors affecting the abundance of earthworms.

SUZANNE L. COLLINS, CNAH

Smooth Earth Snakes (*Virginia valeriae*) and Brown Snakes (*Storeria dekayi*) exploit available grassland habitats in northeastern Kansas to a much greater extent than had been documented.

Eavesdropping Lizards

Madagascar Spinytail Iguanas (*Oplurus cuvieri cuvieri*) use their ears to eavesdrop on the Madagascar Flycatcher's (*Terpsiphone mutata*) alarm calls to protect themselves from predators. **Ryo Ito and Akira Mori** (2009. *Proceedings of the Royal Society B, Biological Sciences* 277:1275–1280) conducted a study in the Ampijoroa dry deciduous forest and discovered that the lizards use auditory signals for predator detection. The iguanas have well-developed ears, but are not vocal like the flycatchers. Eavesdropping is the first step for the lizard; it then moves its head while keeping its body still to help identify the predator and evaluate the risk. The lizards and the flycatchers do not have direct interactions nor do they compete for resources, but they do share predators such as raptors and snakes. Evidence suggesting that Galápagos Marine Iguanas (*Amblyrhynchus cristatus*) also eavesdrop on heterospecific alarm calls led the researchers to believe that this might be a widespread phenomenon in iguanid lizards.

JIALIANG GAO

Madagascar Spinytail Iguanas (*Oplurus cuvieri cuvieri*) eavesdrop on the alarm calls of Madagascar Flycatchers to alert themselves to potential predators.

Repeated Adaptations of Garter Snakes to Deadly Prey

Where do the genetic variants underlying adaptive change come from? Are currently adaptive alleles recruited by selection from standing

SUZANNE L. COLLINS, CNAH

Pacific Newts, such as this California Newt (*Taricha torosa*), contain deadly tetrodotoxins that are lethal to many potential predators. However, at least three species of Garter Snakes in the genus *Thamnophis* have independently evolved a resistance to those toxins and readily prey on newts.

genetic variation within populations, moved through introgression from other populations, or do they arise as novel mutations? **FELDMAN ET AL.** (2009. *Proceedings of the National Academy of Sciences* 106:13415–13420) examined the molecular basis of repeated adaptation to the toxin of deadly prey in three species of Garter Snakes (*Thamnophis*) to determine whether adaptation evolved through novel mutations, sieving of existing variation, or transmission of beneficial alleles across species. Functional amino acid substitutions in the skeletal muscle sodium channel are largely responsible for the physiological resistance of Garter Snakes to tetrodotoxin found in their Newt (*Taricha*) prey. Phylogenetic analyses rejected the hypotheses that the unique resistance alleles observed in multiple species of *Thamnophis* were present before the split of these lineages, or that alleles were shared among species through occasional hybridization events. The authors' results demonstrated that adaptive evolution occurred independently multiple times in Garter Snakes via the *de novo* acquisition of beneficial mutations.

NEWSBRIEFS

Loggerhead Turtles Nesting in Pakistan

Renowned turtle expert Nicolas J. Pilcher, who was in Karachi for a seminar on threats to the turtles in Pakistan, has confirmed that a third species, the Loggerhead (*Caretta caretta*), was also nesting on these shores. Until now, the only two species recorded nesting in the country were Green Turtles (*Chelonia mydas*) and a smaller number of Olive Ridleys (*Lepidochelys olivacea*). By far the most widespread nesting is by the Green Turtle, from the eastern shores of Sindh Province all the way to the western shores of Balochistan. Recent findings by the IUCN Pakistan team, under the auspices of the Balochistan Partnerships for Sustainable Development project, have documented a third species, the Loggerhead, nesting at Daran beach, some 11 km southeast of Jiwani.

Positive identification of adults and hatchlings was made by Dr. Nicolas Pilcher, Co-Chair of the IUCN Marine Turtle Specialist Group, and a long-time turtle researcher and conservationist. Some sixty nests were recorded during 2009, and the work will expand in the coming months to determine the extent of this nesting. Loggerheads are known to nest in large numbers in Oman, on Masirah Island, and a small number nest in Yemen, but this is the first record of Loggerhead nesting in Pakistan. This latest discovery expands the nesting range for Loggerheads and raises their survival outlook in a climate where critical nesting habitats are being rapidly lost to development. The discovery also boosts known diversity of wildlife in Pakistan.

Pakistan used to host substantial numbers of Olive Ridleys along the shores of Sindh Province, but most have ceased to nest. Commercial fisheries are the main reason for this decline; with over 1,900 active trawlers operating just offshore, turtles have been accidentally lost to fishing nets. Trawling for shrimp and fish is known as one of the major causes of sea turtle mortality.

Luckily for the Loggerheads, Sindh-based commercial fisheries do not generally operate as far away as the western end of Balochistan, so the turtles have avoided the threats. Turtles can be saved from drowning in fishing nets through the use of Turtle Excluder Devices (TEDs), which are clever adaptations to nets that allow fish and shrimp to enter the net but turtles to escape through a special opening. The IUCN intends to work with partners in the country to help introduce and promote TEDs so that fishing will have less impact on turtles. This may also result in the reappearance of Olive Ridleys.

For the past several decades marine turtle conservation programs have been underway in Pakistan. Most noticeable is the work undertaken in Sindh Province, on Sandspit and Hawkes Bay, where thousands of turtles have been protected through hatchery enclosures.

IUCN 14 February 2010

JOSEPH WHITE

Nesting Loggerhead (*Caretta caretta*) have been documented at Daran beach, near Jiwani, Pakistan.

New Specialist Group for Chameleons

Chameleons are primarily found in Madagascar and Africa, with a few species distributed in the near east and along the coast of southern Europe. Although some species have broad distributions, many have extremely small ranges. Important habitats for chameleons are heavily impacted by human activities, and some restricted-range species are particularly vulnerable. Because of their unique appearance, and, in some cases, their exceptional ornamentation, chameleons are one of the most sought-after reptiles in the pet trade. Tens of thousands of wild chameleons are legally exported every year, which, with an illegal trade at unknown levels, is cause for concern. A Chameleon Specialist Group was established in February 2010 to address issues of sustainability and conservation of these unique reptiles. Its first major objective is to conduct a conservation assessment of all chameleon species for the IUCN Red List.

IUCN SSC e-bulletin
March 2010

STUART BERMAN

Veiled Chameleons (*Chamaeleo calyptratus*) are but one of many species exploited in the pet trade. An IUCN Chameleon Specialist Group has been established to address issues of sustainability and conservation of these spectacular reptiles.