CONSERVATION RESEARCH REPORTS

Amphibians and Reptiles Declining at La Selva, Costa Rica

Amphibians stand at the forefront of a global biodiversity crisis. More than one-third of amphibian species are globally threatened, and over 120 species probably have become extinct since 1980. Most alarmingly, many rapid declines and extinctions are occurring in pristine sites lacking obvious adverse effects of human activities. The causes of these "enigmatic" declines remain highly contested. Still, lack of long-term data on amphibian populations severely limits our understanding of the distribution of amphibian declines, and therefore the ultimate causes of these declines. WHITFIELD ET AL. (2007. *Proceedings of the National Academy of Sciences (USA)* 104: 8352–8356) identified a systematic community-wide decline in populations of terrestrial amphibians at La Selva Biological Station, a protected old-growth lowland rainforest in lower Central America. The authors used data collected over 35 years to show that population densities of all species of terrestrial amphibians had declined by 75% since 1970, and they demonstrated identical trends for all species of common reptiles. The trends are neither consistent with recent emergence of chytridiomycosis nor the climate-linked epidemic hypothesis, two leading putative causes of enigmatic amphibian declines. Instead, the data suggest that declines are due to climate-driven reductions in the quantity of standing leaf litter, a critical microhabitat for amphibians and reptiles in this assemblage. These results raise further concerns about the global persistence of amphibian populations by identifying widespread declines in species and habitats that are not currently recognized as susceptible to such risks.

GAD PERRY

Declines in populations of amphibians and reptiles, such as the Speckled Racer (*Drymobius margaritiferus*), at La Selva, Costa Rica, have been attributed to climate-driven reductions in the quantity of standing leaf litter.

Herpetofauna of Longleaf Pine Savannas

MEANS (2006. Chapter 6. Vertebate Faunal Diversity in Longleaf Pine Savannas. Pp. 155–213 in S. Jose, E. Jokela, and D. Miller (eds.), *Longleaf Pine Ecosystems: Ecology, Management, and Restoration*. Springer, New York) thoroughly reviewed the vertebrates (including 9 salamanders, 26 frogs, 29 snakes, 14 lizards, 1 amphisbaenian, and 10 turtles) that are characteristic species residing in longleaf pine savannas. The author discusses at length each of the specialists (species whose geographic limits are confined within or closely associated with the limits of longleaf pine, and which live in the longleaf pine community itself) and then the importance of temporary ponds, dead trees (snags, fallen logs), stumpholes or tree bases, fire, problems associated with pine plantation silviculture, habitat fragmentation, and declining species.

KENNETH L. KRYSKO

The Florida Worm Lizard (*Rhineura floridana*) is probably the most unusual of the 54 reptilian species known to occur in longleaf pine savannas.

Large Snakes in North-Central Florida

Little is known concerning home range and activity of large terrestrial snakes. During the course of an inventory of a large biological preserve in north-central Florida, DODD AND BARICHIVICH (2007. *Florida Scientist* 70: 83–94) tracked five snakes (Eastern Indigo Snakes, *Drymarchon couperi*, and Coachwhips, *Masticophis flagellum*) for periods of 49–322 days. A single Eastern Indigo Snake had a home range of 100–185 ha, depending on estimator, whereas the Coachwhips used smaller home ranges that varied individually and by season. The authors provided information on ecdysis, feeding activity, and retreat sites for the five tracked individuals, which includes the first such data on free-ranging Coachwhips. Gopher Tortoise and small mammal burrows were important retreat sites for both species, particularly during ecdysis. Both species frequented upland habitats, with Coachwhips using longleaf pine and xeric oak sandhills and former pastures, and the Eastern Indigo Snake preferring upland mixed pine and hardwoods. Although sample sizes are small, these results, coupled with data on the movements of other upland species, suggest that large terrestrial snakes require substantial amounts of contiguous habitat in order to maintain populations.

KENNETH L. KRYSKO

Eastern Indigo Snakes (*Drymarchon couperi*) in Florida had a home range of 100–185 ha and preferred upland mixed pine and hardwoods.

Movements and Home Ranges of Otago Skinks

Otago Skinks (*Oligosoma otagense*) are among New Zealand's largest and rarest lizards. GERMANO (2007. *Journal of Herpetology* 41: 179–186) examined movements and home ranges using

JENNIFER M. GERMANO

Otago Skinks (*Oligosoma otagense*) are among New Zealand's largest and rarest lizards. These individuals, bearing radio-transmitters, were part of a study to determine movements and home ranges.

radio-telemetry at the Redbank Reserve near Macraes Flat, Central Otago. She tracked 13 skinks from December 2003–April 2004 for 26–111 days. Neither distances moved nor frequencies of movements differed significantly between males and females. Home range estimates (using the 100% minimum convex polygon method) ranged from 200–5,400 m^2, with male home ranges significantly larger than those of females, and those of non-gravid females significantly larger than those of gravid females. Home range overlap was substantive and interactions between individuals occurred frequently. Capturing animals increased frequency of movements, especially on days immediately following capture. Data generated by this study will be incorporated into a management plan for the species.

NATURAL HISTORY RESEARCH REPORTS

Desert Tortoise Hibernation

NUSSEAR ET AL. (2007. *Copeia* 2007: 378–386) examined the onset, duration, and termination of hibernation in Desert Tortoises (*Gopherus agassizii*) over several years at multiple sites in the northeastern part of their geographic range in Utah, Arizona, and Nevada, and recorded the temperatures experienced by tortoises during winter hibernation. The timing of hibernation by Desert Tortoises differed among sites and years. Environmental cues acting over the short-term did not appear to influence the timing of the hibernation period. Different individual tortoises entered hibernation over as many as 44 days in the fall and emerged from hibernation over as many as 49 days in the spring. This range of variation in the timing of hibernation indicated a weak influence at best of exogenous cues hypothesized to trigger and terminate hibernation. Regional trends do appear, as hibernation tended to begin earlier and continue longer at sites that were higher in elevation and generally cooler. The emergence date was generally more similar among study sites than the date of onset. While the climate and the subsequent timing of hibernation differed among sites, the average temperatures experienced by tortoises while hibernating differed by only about five degrees from the coldest to the warmest site.

THOMAS WIEWANT, WILD HORIZONS

Local climate affected timing of hibernation, but average temperatures experienced by hibernating Desert Tortoises (*Gopherus agassizii*) differed very little.

Feeding Ecology of Rattleless Rattlesnakes

Crotalus catalinensis is a rattleless rattlesnake endemic to Santa Catalina Island, in the Gulf of California, Mexico. Some authorities have hypothesized that the lack of a rattle in this species is a stealth adaptation for hunting birds in vegetation. AVILA-VILLEGAS ET AL. (2007. *Copeia* 2007: 80–84) provided detailed data on the diet of these snakes from samples obtained during nine trips to the island in 2002–2004. Over two-thirds (70%) of the diet was composed of the Santa Catalina Deer Mouse (*Peromyscus slevini*). The remaining prey were lizards (*Dipsosaurus catalinensis*, *Uta squamata*, and *Sceloporus lineatulus*). The diet shifted ontogenetically, and feeding activity was greater during the dry season. The diet of this species is only a small subset of the diet of its supposed closest relative, *C. ruber*, probably as a result of limited prey diversity on the island. The lack of birds in the diet argues against the hypothesis relating the lack of a rattle with a stealth hunting technique for birds in vegetation. However, because *P. slevini* is partially arboreal, the lack of a rattle might be an adaptation for stealth hunting for mice in vegetation.

L. LEE GRISMER

Rattleless Santa Catalina Island Rattlesnakes (*Crotalus catalinensis*) feed primarily on mice and lizards, arguing against the hypothesis that the lack of a rattle facilitates stealthy hunting for birds in vegetation.

Habitat Affects Predator Attack Frequencies

Predators use characteristics such as pattern and shape in forming search images of prey, thereby influencing the evolution of prey morphology. In lizards, sit-and-wait foraging species are thought to have body shapes that enhance their ability to remain cryptic to predators. Structurally complex habitats provide more opportunities for prey to avoid detection, thus predator foraging efficiency is predicted to be higher in structurally simple habitats. SHEPARD (2007. *Herpetologica* 63: 193–202) used clay lizard models to test whether predation varies among lizards with different body shapes and whether predation varies among habitats in the Brazilian Cerrado with different structural characteristics. Predator attack frequency was highest in the most structurally complex habitat, but the probability of being attacked was higher in more open microhabitats. Attack frequencies did not differ significantly among the four lizard model shapes. Lizards and birds were the main attackers of models, and attacks were primarily directed toward the models' heads. Results demonstrated that predator-prey interactions are largely influenced by the environmental context and scale, and that body shape alone does not efficiently promote crypsis.