CONSERVATION RESEARCH REPORTS

Conservation of the Indonesian Herpetofauna

Indonesia is an archipelagic nation composed of some 17,000 islands of varying sizes and geological origins, and with marked differences in flora and fauna. Indonesia is considered one of the Earth's megadiversity centers. According to the Biodiversity Action Plan for Indonesia, 16% of all amphibian and reptilian species occur in Indonesia, a total of over 1,100 species. New research activities, launched in the last few years, indicate that these figures may be significantly higher than generally assumed. Herpetological research in Indonesia, however, has not progressed at a rate comparable to that of neighboring countries. In the last 70 years, 762 new taxa have been described from southeastern Asia, of which only 262 were from Indonesia. In general, the herpetofauna of Indonesia is poorly understood compared to the herpetofauna of neighboring countries. Moreover, geographic distribution patterns for many species are poorly known. In view of the alarming rate of forest loss, measures for more effective protection of the herpetofauna of Indonesia are urgently required. The IUCN Red List status of virtually all Indonesian species remains unknown, and no action plans have been formulated. ISKANDAR AND ERDELEN (2006. *Amphibian and Reptile Conservation* 4:60–87) provided an overview of the herpetofauna as part of Indonesia's biodiversity, outlined the history of herpetological research in the region, and identified major gaps in our knowledge of the Indonesian herpetofauna. The latter addressed the contents and shortcomings of compilations of lists of protected or threatened species by national and international authorities and major threats to the Indonesian herpetofauna, and proposed measures for better long-term conservation.

CHRIS TABAKA, DVM

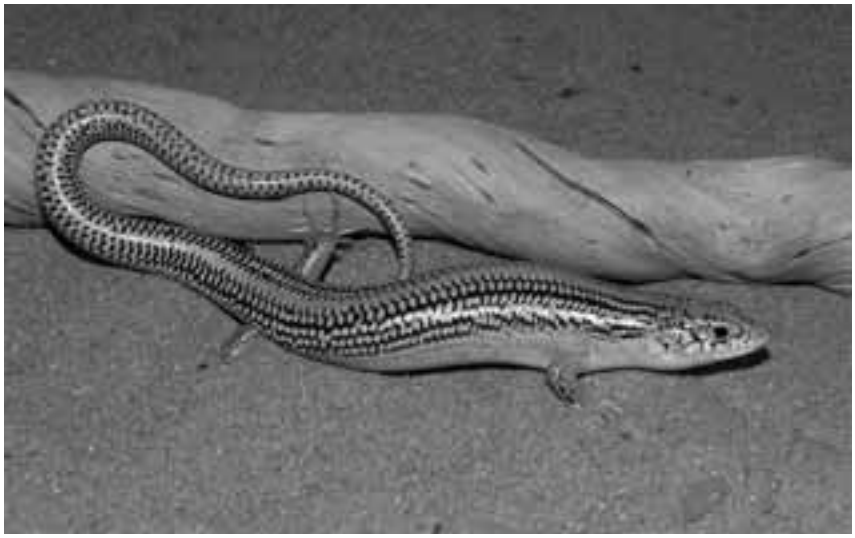
The endangered Giant River Terrapin (*Batagur baska*) is one of many Indonesian reptiles about which very little is known.

Rangeland Management and a Tallgrass Prairie Herpetofauna

The Flint Hills of Kansas and Oklahoma have changed dramatically in the past 30 years, largely due to conversion from natural tallgrass prairie to cattle rangeland. Because the effects of fire and grazing on the herpetofauna are poorly understood, WILGERS ET AL. (2006. *Herpetologica* 62:378–388) examined how different land management practices, such as cattle stocking rates and seasonal burning, affected amphibians and reptiles. Fourteen herpetofaunal surveys documented the number of individuals, environmental conditions, and community dynamics, including the probabilities of local extinction or permanent emigration. Land-use practices during the study were traditional season-long stocking during the first 10 years, burning pastures in alternate years. In 1999, land management practice changed to intensive early cattle stocking, combined with annual burning. Data suggested that burn frequencies and cattle stocking affected the herpetofauna, with rates of species loss higher during years of burning than in non-burn years.

Forest Fragmentation and Community Structure in Costa Rica

Habitat fragmentation is one of the most serious threats to biodiversity. The increasing conversion of land to agricultural uses in Costa Rica has greatly reduced forested area, and has more than doubled the number of forest fragments in some areas. Reptiles and amphibians occur at high densities in the Neotropics, but we know little about their responses to land-use changes. BELL AND DONNELLY (2006. *Conservation Biology* 20:1750–1760) examined community and population structure of frogs and lizards in the fragmented landscape surrounding La Selva Biological Station, Costa Rica to better understand the effects of forest fragmentation. Nine fragments, ranging in area from 1–7 ha, were compared to an 1,100-ha area in the preserve. Community structure of frogs and lizards in forest fragments differed significantly from that of the intact forest community. Lizard density was higher and frog density was lower in forest fragments than in continuous forest, and 25% of species found in continuous forest were not observed in fragmented forest. Species composition and relative abundance varied among sites according to fragment size. The extent of isolation and habitat variables did not affect species richness, composition, or nesting. The authors concluded that small populations



SUZANNE L. COLLINS, CNAH

The Great Plains Skink (*Eumeces obsoletus*) is one of many prairie-dwelling species affected by land management practices.

GAD PERRY

Costa Rican lizards, such as this Black Iguana (*Ctenosaura similis*), which benefit from breaks in forest canopies that provide effective basking sites, often increase in numbers in response to forest fragmentation.

are threatened by edge effects, and that preservation of large reserves is crucial for the preservation of reptiles and amphibians in La Selva and in other fragmented habitats.

The Pigeon Paradox

Conservation of urban nature is rarely discussed, yet, as ecosystems continue to shrink and change due to urbanization, conservation will increasingly rely on urban habitats to preserve natural communities. DUNN ET AL. (2006. *Conservation Biology* 20:1814–1816) refer to this phenomenon as the "pigeon paradox." Based on assertions that current conservation action is insufficient, people are more likely to take conservation action when they have direct experiences with the natural world, and humans in the future will experience nature primarily through contact with urban wildlife, the authors concluded that providing opportunities for children living in cities to experience nature is essential, as the future of conservation will depend largely on the urban culture. To meet this need, societies must restore urban ecosystems, improve access to urban nature, and carefully consider the costs and benefits linked to how we portray non-native and "pestiferous" urban species (such as "pigeons").

Climate Change and Herpetofaunal Declines

ARAÚJO ET AL. (2006. *Journal of Biogeography* 33:1712–1728) explored the relationship between current European distributions of amphibian and reptilian species and potential impacts of climatic warming by asking what proportion of species are projected to lose and gain suitable climate space; whether species projections vary according to taxonomic, spatial, or environmental properties; and what climate factors might be driving projections of loss or gain in suitable environments. Distributions were projected into the future using five climate-change scenarios for 2050, and projections were made according to two extreme assumptions: species have unlimited dispersal ability or species have no dispersal ability. Many species were projected to expand distributions if dispersal is unlimited, mainly because warming in the cooler northern ranges of species creates new opportunities for colonization. If species are unable to disperse, then most species were projected to lose range, mainly in southwestern Europe, where dry conditions were projected to increase. The authors suggested that the impact of increasing temperatures on amphibian and reptilian species might be less deleterious than previously postulated. However, the ability of species to cope with climatic warming may be offset by projected decreases in the availability of water, particularly for amphibians. Limited dispersal ability may further increase the vulnerability of amphibians and reptiles to changes in climate.

GUNTHER KÖHLER

Many European reptiles, such as this Slow Worm (*Anguis fragilis*) are expected to expand their ranges in response to global warming.

Island Differences in Komodo Dragons

Species inhabiting archipelagos are often characterized by high levels of interpopulation divergence (e.g., size-related traits). This divergence may, in turn, influence life history. To facilitate better management and conservation of the Komodo Dragon (*Varanus komodoensis*), JESSOP ET AL. (2007. *Biological Conservation* 135:247–255) identified demographic differences between two island populations in Komodo National Park, Indonesia. Comparison of data collected from dragon populations inhabiting Rinca Island and the much smaller Gili Motang Island indicated that between 1994 and 2004, the Komodo Dragon population on Gili Motang significantly decreased its mean body mass, body condition, and relative abundance. These results suggest that the numerically small Gili Motang population was oscillating downward; in contrast, the Rinca Island population had been relatively stable. These results emphasize the necessity for managers of this priority conservation species to understand further the inherent functional differences among dragon populations to develop island-specific management units. Current management practices instigated by Komodo National Park management ignore small-

ALBERTO LOPEZ

Green Iguanas (*Iguana iguana*) are common urban species both where the species is native and in areas, such as southern Florida, where it has been introduced.

JOE WASILEWSKI

Demographic differences between two island populations of Komodo Dragons (*Varanus komodoensis*) in Komodo National Park, Indonesia emphasize the necessity for managers of this priority conservation species to develop island-specific management units.

island dragon populations and thus run the risk of being unable to detect adverse effects for populations that are potentially most prone to decline.

Dim Future for Fiji's Endemic Crested Iguana

The Fijian Crested Iguana (*Brachylophus vitiensis*) was not described until 1981, but it appears to be secure on only one small island sanctuary. HARLOW ET AL. (2007. *Oryx* 41:44–50) surveyed 17 islands in western Fiji with historical records of Crested Iguanas, and found that iguanas were "extremely rare or extinct" on all of those islands. Iguanas were recorded on four of the surveyed islands, but the authors suggested that all of these populations are small and continuing to decline, primarily due to ongoing forest habitat destruction by fire and goat grazing and the introduction of feral cats. Most distressing were the repeated surveys of the cat-free, uninhabited island of Monuriki, where a population estimate of 40–80 iguanas in 1998 had decreased by a factor of four in 2003 — so low that an estimate was no longer possible. The authors indicated that these data should spur the government of Fiji to instigate immediate conservation action on behalf of the nation's most famous wildlife icon.

Effects of Agricultural Practices on Wood Turtles

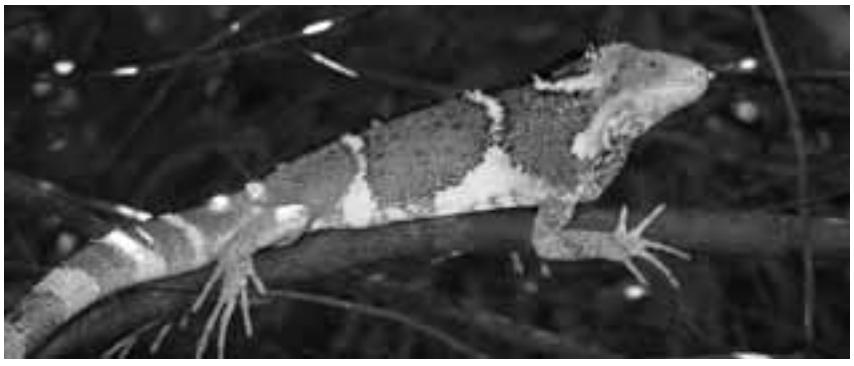
In North America, the spatio-temporal scale of deforestation has resulted in a 94% decrease in temperate forests within 360 years. Despite the enormous scale of this disturbance, agriculture is so pervasive in modern society that its impacts are highly underappreciated. SAUMURE ET AL. (2007. *Biological Conservation* 135:581–591) investigated the impact of current agricultural practices on a disturbance-dependent species in southern Québec, Canada. Of 30 Wood Turtles (*Glyptemys insculpta*) followed via radiotelemetry, 20% died as a result of agricultural activities. Anthropogenic mortality estimates for adults and juveniles in 1998 were 0.10 and 0.18, respectively. For 1999, these values were 0.13 and 0.17, respectively. Of those turtles that survived, many had injuries inflicted by agricultural machinery. Sub-lethal mutilation rates for adults were 90 ± 3% in both years, whereas the maximum frequency for juveniles was 57%. The cutting height of disc mowers increased to 100 mm increases harvest yields, reduces wear on machinery, and decreases soil erosion. A by-product of such a change in cutting height is that turtle mortality and injury rates should be reduced, as Wood Turtle carapace height is < 87 mm. Without changes in agricultural practices, this population will be extirpated.

SUZANNE L. COLLINS, CNAH

Wood Turtles (*Glyptemys insculpta*) are vulnerable to common agricultural practices.

Conserving New Zealand's Diurnal Geckos

Visually cryptic, long-lived, diurnal Green Geckos (*Naultinus*) were a significant component of natural ecosystems throughout much of New Zealand prior to human settlement about 1800 years ago. Since then, habitat modification and introduced mammalian predators have threatened many populations, making their survival a conservation priority. HARE ET AL. (2007. *Journal of Herpetology* 41:81–93) pooled data collected over a 25-year period on the population of *N. manukanus* on mammal-free Stephens Island and determined that it is female-biased (1:1.7), a trend evident from birth, that sexual maturity occurs at approximately four years of age, and that 71% of females reproduce annually. These geckos are strictly diurnal, arboreal, and opportunistic thermoregulators. Movements are limited, averaging 0.6 m per day, characteristic of a sit-and-wait foraging strategy. These data provide a context for developing conservation management plans for increasingly threatened populations of geckos in the genus *Naultinus*.



PETER S. HARLOW

Populations of the Fijian Crested Iguana (*Brachylophus vitiensis*) were found on only four of 17 islands in western Fiji on which iguanas had been documented in the past.

JENNIFER GERMANO

Marlborough Green Geckos (*Naultinus manukanus*) on mammal-free Stephens Island off New Zealand are visually cryptic, long-lived, strictly diurnal, arboreal, and opportunistic thermoregulators.