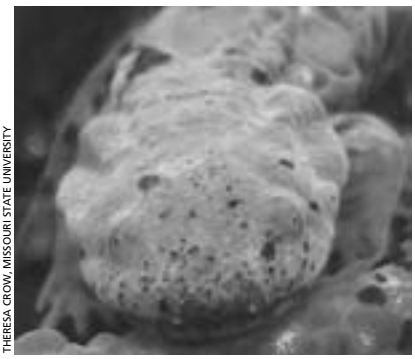
CONSERVATION RESEARCH REPORTS

ROBERT POWELL

Ameiva undulata (illustrated) and *Sceloporus utiformis* were the only two sampled species of lizards that were disturbance-sensitive. Both are terrestrial and forage in the leaf litter. Reduction of the litter may be responsible for the decline of these species in disturbed forests.

Non-native Fishes Threatening Hellbenders in Missouri

The introduction of non-native fishes often results in the local extinction of native amphibians due to a lack of evolutionary history and resultant minimally-adapted antipredator behaviors toward the introduced fishes. Populations of Hellbenders (*Cryptobranchus alleganiensis*) in Missouri have declined considerably since the 1980s, coinciding with a rapid increase in non-native trout introductions for recreational angling. GALL (2008. Unpubl. M.S. Thesis, Missouri State University, Springfield) examined Hellbender and fish predator-prey interactions by: (1) examining the foraging behavior of predatory fishes in response to a Hellbender secretion; (2) comparing the number of secretion and control-soaked food pellets consumed by trout; and (3) comparing the response of larval Hellbenders to chemical stimuli from introduced (trout) and native fish predators. Brown Trout, Walleye, and large Banded Sculpins responded to Hellbender secretions with increased activity, whereas small Banded Sculpins responded by decreasing activity. In addition, Brown Trout ingested more Hellbender secretion-soaked food pellets than control pellets, whereas Rainbow Trout expelled secretion-soaked food pellets. Finally, larval Hellbenders exhibited weak fright behavior in response to chemical stimuli from nonnative trout relative to their responses to native predatory fish stimuli. These combinations of responses indicate that predation by non-native fishes may be a plausible hypothesis for the decline of Hellbender populations in Missouri.



THERESA CROW, MISSOURI STATE UNIVERSITY

Populations of Hellbenders (*Cryptobranchus alleganiensis*) in Missouri have declined considerably since the 1980s, coinciding with a rapid increase in non-native trout introductions for recreational angling.

Effects of Converting Dry Tropical Forest to Agricultural Mosaics

SUAZO-ORTUÑO ET AL. (2008. *Conservation Biology* 22: 362–374) explored the impact of forest conversion to agricultural mosaic on anuran, lizard, snake, and turtle assemblages in Neotropical dry forests. Over two years, the authors sampled six small watersheds on the western coast of Mexico, three conserved and three disturbed. The disturbed watersheds were characterized by a mosaic of pastures and cultivated fields (corn, beans, squash) intermingled with patches of different successional stages of dry forest. In each watershed, they conducted 11 diurnal and nocturnal time-constrained searches in ten randomly established plots. We considered vulnerability traits of species in relation to habitat modification. Eighteen anuran, 18 lizard, 23 snake, and three turtle species were recorded. Thirty-six species (58%) occurred in both forest conditions, and 14 (22%) and 12 species (19%) occurred only in the conserved and disturbed sites, respectively. Assemblages responded differently to disturbance. Species richness, diversity, and abundance of lizards were higher in disturbed forests. Anuran diversity and species richness were lower in disturbed forest, but abundance was similar in both forest conditions. Diversity, richness, and abundance of turtles were lower in disturbed forest. The structure and composition of snake assemblages did not differ between forest conditions. Species were considered disturbance-sensitive if their abundance was significantly less in disturbed areas. Four anuran (22%), two lizard (11%), and three turtle (100%) species were sensitive to disturbance. No snake species was sensitive. The decline in abundance of disturbance-sensitive species was associated with the reduction of forest canopy cover, woody stem cover, roots, and litter-layer ground cover. Anuran species with small body size and direct embryonic development were especially sensitive to forest disturbance. An important goal for the conservation of herpetofauna should be the determination of species traits associated with extinction or persistence in agricultural mosaics.

Reptilian Road Mortality in Illinois

Roads have numerous negative ecological effects on terrestrial fauna, and vehicular mortality can have significant demographic consequences for some species. SHEPARD ET AL. (2008. *Copeia* 2008: 350–359) studied road mortality of reptiles around Carlyle Lake, Clinton County, Illinois, USA, from April 2000 through November 2002, to assess the impact of vehicular traffic and identify


DON SHEPARD

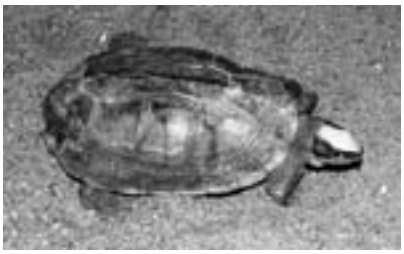

MICHAEL REDMER

Road mortality of the endangered Eastern Massasauga (*Sistrurus catenatus*) was biased toward adult males, which show an increase in movement in August, coinciding with the peak of the mating season and a period of high tourist visitation.

influential factors. Carlyle Lake, a popular tourism/recreation area, is situated in a larger agricultural landscape and is home to the largest Illinois population of the endangered Eastern Massasauga (*Sistrurus catenatus*). The authors documented 321 cases of reptilian road mortality (84 individuals of six turtle species and 237 individuals of nine snake species) while driving the approx. 46-km study route roundtrip daily. Turtle road mortality was highest in May and June, and positively associated with precipitation and minimum daily temperature. Colubrid snake road mortality was highest in April and October, and positively associated with minimum daily temperature. We recorded 42 cases of road mortality of *S. catenatus*, with the highest number occurring from mid-August to mid-September. Road mortality in *S. catenatus* was biased toward adult males, which show an increase in movement in August, coinciding with the peak of the mating season and a period of high tourist visitation. The traffic intensity on a road segment did not significantly affect the level of road mortality, but segments through high-quality habitats had higher levels of mortality than segments through lower quality habitats.

Refutation of Traditional Chinese Medicine Claims about Turtles

The Chinese turtle trade is the primary threat to endangered turtle populations throughout Asia, primarily because of the long tradition of consuming turtles in China. Practitioners of Traditional Chinese Medicine (TCM) promote nutritional and medicinal benefits from eating turtles, especially hardshell species. **MEILING ET AL.** (2008. *Applied Herpetology* 5: 173–187) tested these claims by determining the nutritional value of turtle products (meat, fat and shell) in five species of geoemydid turtle, *Cuora trifasciata*, *C. mouhotii*, *Mauremys mutica*, *M. sinensis*, and *Geoemyda spengleri*. The authors analyzed nutritional variables such as the composition of amino acids, fatty acids, and mineral elements to determine the relative nutritional quality of turtle products. Their study refutes TCM claims about products made from hardshell turtles. Alternative animal products should be substituted to obtain similar minerals, amino acids and fatty acids. Balancing the cultural use of turtles with their conservation status remains a major challenge.


TORSTEN BLANCK_VIKI.TIF

Analysis of turtle meat from five species of Chinese turtles, including *Cuora trifasciata,* refuted claims about the nutritional value of eating hardshell turtles.

A Sixth Mass Extinction?

Many scientists argue that we are either entering or in the midst of the sixth great mass extinction. Intense human pressure, both direct and indirect, is having profound effects on natural environments. The amphibians — frogs, salamanders, and caecilians — may be the only major group currently at risk globally. A detailed worldwide assessment and subsequent updates show that one-third or more of the 6,300 species are threatened with extinction. This trend is likely to accelerate because most amphibians occur in the tropics and have small geographic ranges that make them susceptible to extinction. The increasing pressure from habitat destruction and climate change is likely to have major impacts on narrowly adapted and distributed species. **WAKE AND VREDENBURG** (2008. *Proceedings of the National Academy of Sciences* 105: 11466–11473) showed that salamanders on tropical mountains are particularly at risk. A new and significant threat to amphibians is a virulent, emerging infectious disease, chytridiomycosis, which appears to be globally distributed, and its effects may be exacerbated by global warming. This disease, which is caused by a fungal pathogen and implicated in serious declines and extinctions of >200 species of amphibians, poses the greatest threat to biodiversity of any known disease. The authors' data for frogs in the Sierra Nevada of California show that the fungus is having a devastating impact on native species, already weakened by the effects of pollution and introduced predators. A general message from amphibians is that we may have little time to stave off a potential mass extinction.


JEFF LEMM

Amphibian population declines, extirpations, and extinctions may be the first sign of an impending mass extinction. The status of the critically endangered Mountain Yellow-legged Frog (*Rana muscosa*) may be a harbinger of other declines in the United States.