

## CONSERVATION RESEARCH REPORTS

### Connectivity and Interpond Movements of Painted Turtles

Because of the importance of facilitating movement of plants and animals between habitats, protecting the connectivity of isolated habitat patches has become an essential component of conservation biology. For a corridor to be successful, it must allow for increased movement, compared to the unconnected state. BOWNE ET AL. (2006. *Conservation Biology* 20: 780–789) studied the relationship between connectivity and population density in Painted Turtles (*Chrysemys picta*) in northern Virginia. They examined movement rates and movement probabilities in an agricultural landscape in order to determine persistence over a four-year period. The study area consisted of nine ponds, with intervening distances ranging from 110–2300 m. On occasion, more distant surrounding ponds were sampled to check for emigrants from the focal area. Turtles were categorized into five classes: Adult male, adult female, subadult male, subadult female, and juvenile. Of those, adult females were the most sensitive to habitat quality, and would move to more distant ponds. Habitat patch quality was influenced by interpatch distance and patch size and shape. The authors found that connectivity is a function of the behavior of individuals in relation to landscape features and habitat quality. Thus, if the ecology of a species is not taken into account, structural connectivity by itself has little worth. For proper conservation planning, connectivity must consider known behavior of the target species as well as the quality of habitat.



JIM HARDING, WORLD CHELONIAN TRUST

Adult female Painted Turtles (*Chrysemys picta*) were more sensitive than adult males or subadults of either sex to habitat quality.

### Rat Eradications

Using New Zealand as a case study, TOWNS ET AL. (2006. *Biological Invasions* 8:863–891) examined the effects of invasive Pacific Rats (*Rattus exulans*), a small South-East Asian species spread by Polynesians throughout the Pacific, and more recently introduced Norway Rats (*R. norvegicus*) and Ship (Roof) Rats (*R. rattus*) on native species. Rats suppress some forest plants, and are associated with extinctions or declines of flightless invertebrates, ground-dwelling reptiles, land birds, and burrowing seabirds. Globally, Ship Rats were associated with declines or extinctions of the largest number of indigenous vertebrate species. Effects of rats on forest trees and seabird populations are sufficiently pervasive to affect ecosystem structure and function. However, data are patchy, and deficiencies would be reduced by documenting distribution and abundance of indigenous species before and after eradication of rats on islands.



Introduced rats (*Rattus* spp.) suppress some forest plants, and are associated with extinctions or declines of flightless invertebrates, ground-dwelling reptiles, land birds, and burrowing seabirds.

### Conservation Implications of Sea Turtle Nesting Beach Loss

Historically, Green (*Chelonia mydas*) and Hawksbill (*Eretmochelys imbricata*) turtles nested in high densities throughout the Caribbean. Because of hunting by humans, turtle populations have been decimated and populations continue to decline. Population declines and ecological changes have occurred over many centuries and historical and archeological data provide information that can be used to estimate early geographic ranges and population sizes of sea turtles. MCCLENACHAN ET AL. (2006. *Frontiers*

*in Ecology and the Environment* 4:290–296) used historical data on use of nesting beaches to determine changes in population sizes for both species in 20 regions of the Caribbean. Historic data show that nesting sites supported large populations in the past, but that those are now extremely depleted. Current Green and Hawksbill populations are 0.33% and 0.27% of their respective historic values, 20% of the historic nesting sites have been lost, and 50% of the remaining sites support very low populations. Because historic data have not been used previously, the magnitude of population declines has been underestimated. Protection efforts have resulted in increases in a few turtle populations, but long-term data are sparse. For successful conservation to occur, short-term data should not be used to infer long-term change. Without proper protection, the remaining nesting beaches could soon be lost. Protection and scientific research funding must be implemented in as many beaches as possible to help recover lost nesting beaches.



Historically, Green (*Chelonia mydas*; above) and Hawksbill (*Eretmochelys imbricata*) turtles nested in high densities throughout the Caribbean. Because of hunting by humans, turtle populations have been decimated and populations continue to decline.

### Invasion and Displacement in Pacific Island Geckos

Growing international travel and trade have amplified the spread of invasive species, which causes significant ecological and economic damage. Invasives can alter successional patterns, mutualistic relationships, community dynamics, ecosystem function, and resource distributions. The Common House Gecko (*Hemidactylus frenatus*) continues to expand its range and is displacing many

other species, such as the ecologically similar but all-female Indo-Pacific Gecko (*H. garnotii*) on a global scale. DAME AND PETREN (2006. *Animal Behaviour* 71:1165–1173) predicted that the presence of *H. frenatus* will cause *H. garnotii* to consume fewer resources and tested whether *H. frenatus* would respond to *H. garnotii* as they would to conspecific males or to conspecific females. The hypothesis that resource competition is the mechanism of displacement of *H. garnotii* received no support from the experiments. Although geckos consumed fewer resources when they were in pairs, resource consumption of *H. garnotii* was not negatively affected by *H. frenatus*. The hypothesis that male aggression toward *H. garnotii* is the primary mechanism of invasion of *H. frenatus* was also rejected. Male *H. frenatus* responded to *H. garnotii* as they did to conspecific females, and courted and copulated with them. However, male *H. frenatus* showed a preference for larger female *H. garnotii*, which suggested that sexual interference could be a mechanism for displacement of *H. garnotii*.



SUZANNE L. COLLINS, CIMAH

The last known Maryland population of Eastern Tiger Salamanders (*Ambystoma tigrinum*) has disappeared from a site that is owned and managed by the Maryland Department of Natural Resources.

with the stipulation that this salamander be managed in perpetuity. The last breeding pond was not monitored, and, over time, silted in, pH and water depth changed, surrounding vegetation shaded the pond, and Bluegills were introduced. Despite warnings from people familiar with the needs of these salamanders and a decline documented by a private individual, the state refused to take action or listen to advice from local herpetologists.

An agency boasting “everything we do is based on the best available science” failed to maintain a viable population under their stewardship since the early 1970s. An agency with a forestry division, wetland specialists, wetland restoration teams, a legal mandate to protect state endangered species, and a state herpetologist, was unable to oversee the

wellbeing of a forest-dwelling creature on lands it owns and manages. One can only imagine how well other locally rare and endangered reptiles, turtles, and amphibians are doing under their care. The article raises the obvious question as to how other states oversee non-game species of conservation concern.

**Survival and Growth of Artificially Incubated American Alligators**

TEMSIRIPONG ET AL. (2006. *Journal of Herpetology* 40:415–423) compared artificially incubated and repatriated American Alligator (*Alligator mississippiensis*) hatchlings released within and outside the maternal alligator’s home range with naturally incubated hatchlings released within and outside the maternal alligator’s home range at three lakes in central Florida. Artificially incubated hatchlings released outside the maternal alligator’s home range had lower recapture probabilities than all other treatments, none of which differed significantly. Artificially incubated hatchlings were about 6% shorter than naturally incubated hatchlings at about nine months of age. The authors concluded that repatriation of hatchlings might be an economical alternative to repatriation of older juveniles in efforts to restore populations, but that location of release may affect subsequent survival and growth.



ROBERT POWELL

The Common House Gecko (*Hemidactylus frenatus*; above) continues to expand its range and is displacing many other species, such as the ecologically similar but all-female Indo-Pacific Gecko (*H. garnotii*) on a global scale.

**Tiger Salamanders Disappear in Maryland:**

**Is This the Fate of Other Non-game Species of Conservation Concern?**

LEE (2006. *Bulletin of the Chicago Herpetological Society* 41:217–224) documented the demise of the last Maryland population of Eastern Tiger Salamanders (*Ambystoma tigrinum*) from a site that is owned and managed by the Maryland DNR. This site was purchased by The Nature Conservancy specifically to protect this species and was sold to the state



Repatriation of American Alligator (*Alligator mississippiensis*) hatchlings might be an economical alternative to repatriation of older juveniles in efforts to restore populations, but the location of release may affect subsequent survival and growth.