

NATURAL HISTORY RESEARCH REPORTS

Pitvipers in the Sea

Envisioning how terrestrial vertebrates could invade the sea is difficult, and little is known about the transitional evolutionary processes that produce secondarily marine animals. The utilization of marine resources in the intertidal zone is likely to be an important first step for invasion. LILLYWHITE ET AL. (2008. *BioScience* 58:947–955) described marine scavenging by the Florida Cottonmouths (*Aegistrodon piscivorus conanti*) that inhabit Gulf Coast islands. These snakes principally consume dead fish that are dropped from colonial nesting bird rookeries, but they also scavenge beaches for intertidal carrion, consuming dead fish and marine plants, and occasionally enter seawater. Thus, allochthonous marine productivity supports the insular Cottonmouth population through two pathways, and one of these pathways connects the snakes directly to the sea. The trophic ecology and behaviors of this unusual snake population suggest a requisite evolutionary scenario for the successful transition of vertebrates from a terrestrial to a marine existence.



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Florida Cottonmouths (*Aegistrodon piscivorus conanti*) on Gulf Coast islands feed on dead fish dropped from colonial nesting bird rookeries and scavenged intertidal carrion, and occasionally enter seawater.

Female Promiscuity Insures Against Nest Failure

Female Bibron's Toadlets (*Pseudophryne bibronii*) distribute their eggs between the nests of as many as eight different males. Such sequential polyandry may have evolved as an insurance mechanism to reduce the risk of choosing a mate that is infertile, closely related, genetically inferior, or genetically incompatible, but polyandry also might insure against nest failure in unpredictable environments.



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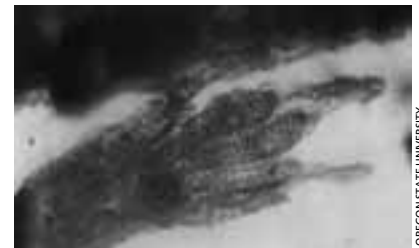
Female Bibron's Toadlets (*Pseudophryne bibronii*) distribute their eggs between the nests of up to eight different males.

Most animals are oviparous, and in species where males provide nest sites with substantial and unpredictable variations in quality, polyandrous females might insure offspring success by distributing their eggs across multiple nests. BYRNE AND KEOGH (2008. *Proceedings of the Royal Society B Biological Sciences* 276: 115–120) tested this hypothesis in a wild population of an Australian terrestrial toadlet, a polyandrous species in which males construct nests and remain with broods. The authors found that females partitioned their eggs across the nests of two to eight males and that more polyandrous females gained a significant increase in mean offspring survivorship. These results provide evidence for the most extreme case of sequential polyandry yet discovered in a vertebrate and also suggest that insurance against nest failure might favor the evolution of polyandry. The authors proposed that insurance against nest failure might be widespread among oviparous taxa and might provide an important explanation for the prevalence of sequential polyandry in nature.

A 100-million Year-old Gecko Preserved in Amber

ARNOLDI AND POINAR (2008. *Zootaxa* 1847: 62–68) described a new genus and species of gecko from a posterior lower limb and foot and a partial tail preserved in Lower Cretaceous amber from Myanmar that is 97–110 million years old. It appears to be the oldest unequivocal fossil gecko, predating fragmentary skeletal remains from the Upper Cretaceous and being 43–56 million years older than *Yanatarogekko* from the

Lower Eocene, previously the oldest known gecko preserved in amber. It also provides firm evidence that gekkotans and possibly gekkonids were in Asia at this time. The Myanmar specimen shows that the distinctive foot proportions and sophisticated adhesive mechanism involving pads on the toes with transverse lamellae, probably bearing numerous hairlike setae found in many modern geckos, had already evolved around 100 million years ago. The specimen is very small, even compared with juveniles of the smallest living geckos. However, the high numbers of lamellae on its toe pads suggest it is from a juvenile of a species with relatively large adult body size.



OREGON STATE UNIVERSITY

An amber fossil, from 97–110 million years ago in the tropical forests of Myanmar, contained the foot and partial tail of the world's oldest known gecko: *Cretaceogekko burmae*, named for its age (Cretaceous) and origin (Burma is the traditional name for Myanmar).

Chuckwallas in Metropolitan Phoenix

Understanding the responses of reptilian populations to habitat fragmentation and degradation due to urbanization has generated considerable interest. SULLIVAN AND SULLIVAN (2008. *Herpetological Conservation and Biology* 3:149–154) surveyed populations of the Common Chuckwalla (*Sauromalus ater*) in preserves of the Phoenix Mountains and adjacent areas near the Phoenix Metropolitan region during the spring of 2008. Fecal dropping counts were used to assess the current populations in relation to those sampled in 1995. The results revealed a strong correlation between estimates gathered in 1995 and 2008. Additionally, one intensively sampled site established that, although estimates could vary somewhat in relation to the number of individuals conducting



Common Chuckwalla (*Sauromalus ater*) populations appear to be stable in islands of suitable habitat in a “sea” of urban development.

the survey, they were stable over a 13-year period. The survey results suggest that Common Chuckwalla populations are stable in these island preserves in a sea of urban development.

Hurricane Katrina and Mississippi Turtles

The Yellow-blotched Sawback (*Graptemys flavimaculata*) is a riverine turtle that is endemic to the Pascagoula River system of southern Mississippi. Population declines led to Federal listing as a threatened species in 1991, with the most robust population inhabiting the Lower Pascagoula River near Vancleave

(~24 river km from the Pascagoula River mouth). SELMANI AND QUALLS (2008. *Herpetological Conservation and Biology* 3:224–230) conducted a mark-resight survey of this population during the spring and summer of 2005–2006. On 29 August 2005, Hurricane Katrina entered the Mississippi Gulf Coast, the location of their study site. On 13 October 2005, they conducted a one-hour preliminary visual survey by boat through the study area and identified eight individuals that had been marked prior to Katrina’s landfall, demonstrating that at least some of the 49 previously marked individuals remained in the study area. In October 2005–2006, the

authors conducted more extensive mark-resight surveys within the same section of river. The population estimate for 2006 was significantly lower than the 2005 population estimate for the same stretch of river, suggesting that numbers substantially decreased during the year following the hurricane. Of the plausible explanations for this pattern, the available evidence most strongly supports a real decline in population, presumably due to the long-term impact of Hurricane Katrina. Possible reasons for such a long-term effect include hurricane induced saltwater intrusion and low levels of dissolved oxygen with direct effects on individuals or indirect effects on the prey populations (e.g., gastropods and other aquatic macroinvertebrates).



Population sizes of Yellow-blotched Sawbacks (*Graptemyis flavimaculata*) dropped during the year following Hurricane Katrina, probably due to saltwater intrusions and low dissolved oxygen levels affecting turtles directly or their prey.

NEWS BRIEFS

California Tiger Salamander Moves Closer to Protection

The California state appeals court ruled that the California Fish and Game Commission must consider a petition to list the California Tiger Salamander (*Ambystoma californiense*) as an endangered species under the California Endangered Species Act. In a decision with potential implications for other poorly monitored species, the court ruled that the Fish and Game Commission must consider a listing petition if the information would “lead a reasonable person to conclude there is a substantial possibility” that the species could be listed. “The Fish and Game Commission ignored the multitude of known threats to the Tiger Salamander and dismissed the petition, falsely claiming it did not contain all of the data necessary to prove

the salamander population may deserve protection,” said Brian Nowicki of the Center for Biological Diversity. “Today’s ruling should set the listing process back on the right track and ultimately result in the Tiger Salamander getting the state-protected status it deserves.”



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The California Tiger Salamander is now set to advance to the status of candidate for state listing. The Santa Barbara County salamander population has been listed as Endangered under the federal Endangered Species Act since 2000, as has the Sonoma County population since 2003. The central California population has been federally listed as Threatened since 2004. The California Tiger Salamander depends on ephemeral vernal pools for breeding, but in recent decades, 95% of California’s vernal pools have already been lost, and at least 75% of the salamander’s habitat throughout the state has been eliminated. In Sonoma County, 95% of the fragmented and minimal remaining salamander habitat is threatened by development; the Santa Barbara population also is on the verge of extinction.