ing summer at night; SCNU 26116 and SCNU 26117 were caught among rubble on the cave floor in winter during daytime (we returned later at night but failed to find more geckos). Although the sample size is very small, these data might be suggestive of seasonal behavior.

The two adults are among the dullest in color of all known *Goniurosaurus*. In life, our female (SCNU 26116) had a gray-brown dorsal ground color with dull yellow tints; the five transverse dorsal bands are sooty to near black, bold, and in pairs; each pair has a pale gray-brown band with a dull yellow tint at center; these light center bands are immaculate. The dorsal zones between the bands and the top of the head were spotted and marbled with near-black. The venter was pale, immaculate, lavender to gray-brown. The iris was brick-red. The male (SCNU 26115) is a drab version of the female when preserved and was similar to her in life; its stomach contained fragments of a cave cricket's femur and tibia. Sexual size dimorphism in *Goniurosaurus* typically is female-biased (females are larger), probably because males do not engage in combat behavior, which would favor large male size (Kratochvíl and Frynta 2002).

Immature *Goniurosaurus* typically have brighter coloration than adults (Grismer et al. 1994, 1999). Our juvenile (SCNU 26117) was strongly contrasting red and yellow, and, except for its smaller size, resembles the most colorful adults of *G. bawanglingensis* and *G. luii*, as figured by Blair et al. (2009) and as described by Grismer et al. (1999, 2002) and Vu et al. (2006). The dorsal ground color was light red; the venter was pale yellow; the transverse dorsal bands were bright yellow edged by the near-black paired dorsal bands. The iris was bright red. Dark spotting on the head and in the dorsal ground color was sparse, indicating that increased spotting is a function of age. The two adults differ most notably from members of the *G. luii* group in duller coloration and pattern, smaller size, and fewer precloacal pores (Table 1). Because the taxonomic status of *Goniurosaurus* indet. might require a genetic assessment, our specimens have been preserved in ethanol to facilitate DNA extraction for such comparisons.

Literature Cited

Blair, C., N.L. Orlov, H.-T. Shi, and R.W. Murphy. 2009. A taxonomic re-evaluation of *Goniurosaurus hainanensis* (Squamata: Eublepharidae) from Hainan Island, China. *Russian Journal of Herpetology* 16:35–40.

Grismer, L.L. 1988. Phylogeny, taxonomy, classification, and biogeography of eublepharid geckos, pp. 369–469. In: R. Estes and J. Pregill (eds.), *Phylogenetic Relationships of the Lizard Families*. Stanford University Press, Stanford, California.

Grismer, L.L., H. Ota, and S. Tanaka. 1994. Phylogeny, classification, and biogeography of *Goniurosaurus kuroiwae* (Squamata: Eublepharidae) from the Ryu-Kyu Archipelago, Japan, with description of a new subspecies. *Zoological Science* 11:319–335.

Grismer, L.L., B.E. Viets, and L.J. Boyle. 1999. Two new continental species of *Goniurosaurus* (Squamata: Eublepharidae) with a phylogeny and evolutionary classification of the genus. *Journal of Herpetology* 33:382–393.

Grismer, L.L., H. Shi, N.L. Orlov, and N.B. Ananjeva. 2002. A new species of *Goniurosaurus* (Squamata: Eublepharidae) from Hainan Island, China. *Journal of Herpetology* 36:217–224.

Kratochvíl, L.S. and D. Frynta. 2002. Body size, male combat and the evolution of sexual dimorphism in eublepharid geckos (Squamata: Eublepharidae). *Biological Journal of the Linnean Society* 76:303–314.

Orlov, N.L., S.A. Ryabov, N.T. Tao, N.Q. Truong, and H.T. Cuc. 2008. A new species of *Goniurosaurus* (Sauria: Gekkota: Eublepharidae) from North Vietnam. *Russian Journal of Herpetology* 15:229–244.

Stuart, B.L., A.G.J. Rhodin, L.L. Grismer, and T. Hansell. 2006. Scientific description can imperil species. *Science* 312:1137.

Vu, N.T., Q.T. Nguyen, L.L. Grismer, and T. Ziegler. 2006. First record of the Chinese Leopard Gecko, *Goniurosaurus luii* (Reptilia: Eublepharidae) from Vietnam. *Current Herpetology* 25:93–95.

Ziegler, T., Q.T. Nguyen, A. Schmitz, R. Stenke, and H. Rösler. 2008. A new species of *Goniurosaurus* from Cat Ba Island, Hai Phong, northern Vietnam (Squamata: Eublepharidae). *Zootaxa* 1771:16–30.

Zhao, E. and K. Adler. 1993. *Herpetology of China*. Contributions to Herpetology 10. Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA.

Snakes Using Stumpholes and Windfall Tree-associated Subterranean Structures in Longleaf Pine Forests

David A. Steen[1,2], Amanda D. Steen[1], Scott Pokswinski[1], Sean P. Graham[2], and Lora L. Smith[1]

[1]Joseph W. Jones Ecological Research Center, Newton, Georgia 39870, USA (DavidASteen@gmail.com)
[2]Department of Biological Sciences, Auburn University, Auburn, Alabama 36849, USA

Stumpholes are a common habitat feature of fire-maintained Longleaf Pine ecosystems in the southeastern United States. These stumpholes and associated subterranean tunnels that form as stumps decay or are consumed by fire have been identified as important refugia for numerous vertebrate species (Means 2005; Steen et al., in press). Trees downed by wind, such as those seen after major storm events (Gresham et al. 1991), may create subterranean depressions or cavities near their bases as roots are exposed. These represent potential microhabitats for animals that do not construct their own burrows. Herein we report on five observations of snakes using refugia associated with stumphole tunnels or root cavities of downed trees in Longleaf Pine forests.

On 26 May 2009 at 1300 h, we observed an adult Pigmy Rattlesnake (*Sistrurus miliarius)* alongside a burnt stump; the rattlesnake retreated into a tunnel within the stumphole shortly after being observed. On 13 July 2009 at 0640 h, we observed an adult Coral Snake (*Micrurus fulvius*) on the forest floor. After ~30 sec of observation, the snake was disturbed and made its way to a stump approximately 70 cm from its original location. The snake retreated into a tunnel associated with the stump. Both observations occurred in Okaloosa County, Florida. To our knowledge, they represent the first accounts of these species using this type of refuge. On 8 April 2005 in Upson County, Georgia, we observed a large adult Eastern Kingsnake (*Lampropeltis getula getula*) coiled and partially visible at about 1400 h within the leaf litter of a Longleaf Pine stump.

On 16 June 2009 at 0730 h, we observed an adult Eastern Diamondback Rattlesnake (*Crotalus adamanteus)* within a cavity under the root system of a large downed Sand Live Oak Tree. On 23 July 2009 at 1950 h, we observed an adult Cottonmouth (*Agkistrodon piscivorus*) within a cavity associated with the base of a downed tree on the bank of a small clear-water stream. Both observations occurred in Okaloosa County, Florida.

DAVID A. STEEN

The sunrise illuminates the understory of a Longleaf Pine forest in Okaloosa County, Florida. Although herpetologists typically are not active at dawn, avian sampling obligations in the spring of 2009 enabled me to take advantage of the morning light — and to find the Coral Snake and Eastern Diamondback Rattlesnake described in the text.

DAVID A. STEEN

The Eastern Diamondback Rattlesnake (*Crotalus adamanteus*) uses subterranean refuges associated with downed trees. However, one may have to fruitlessly examine scores of such structures before a snake is encountered. The observation of this individual is described in the text.

These observations indicate that many species of southeastern snakes may be influenced by forest management strategies that affect the presence of stumpholes and cavities associated with windfall trees within Longleaf Pine forests. These refugia may be especially important in areas of low Gopher Tortoise (*Gopherus polyphemus*) burrow densities, such as in Okaloosa County, Florida, where four of these observations occurred, as tortoise burrows are documented shelters for all aforementioned snake species (Jackson and Milstrey 1989). Forest management practices including the harvesting of stumps and fire suppression have reduced stumphole habitat in many southeastern forests (Means 2006). In addition, harvesting trees downed by wind may reduce available subterranean shelter for forest-associated wildlife species, although large-scale experimental manipulations of coarse woody debris in the southeastern Coastal Plain did not document compelling trends that suggest that amphibians and reptiles generally responded on a population level (Owens et al. 2008).

Literature Cited

Gresham, C.A., T.M. Williams, and D.J. Lipscomb. 1991. Hurricane Hugo wind damage to southeastern U.S. coastal forest tree species. *Biotropica* 23:420–426.

Jackson, D.R. and E.G. Milstrey. 1989. The fauna of Gopher Tortoise burrows, pp. 86–98. In: J.E. Diemer, D.R. Jackson, J.L. Landers, J.N. Layne, and D.A. Wood (eds.), *Gopher Tortoise Relocation Symposium Proceedings*. Florida Game and Fresh Water Fish Commission Nongame Wildlife Program Technical Report No. 5, Tallahassee.

Means, D.B. 2005. The value of dead tree bases and stumpholes as habitat for wildlife, pp. 74–78. In: W.E. Meshaka and K. Babbitt (eds.), *Status and Conservation of Florida Amphibians and Reptiles*. University Press of Florida, Gainesville.

Means, D.B. 2006. Vertebrate 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.

Owens, A.K., K.R. Moseley, T.S. McCay, S.B. Castleberry, J.C. Kilgo, and W.M. Ford. 2008. Amphibian and reptile community response to coarse woody debris manipulations in upland Loblolly Pine (*Pinus taeda*) forests. *Forest Ecology and Management* 256:2078–2083.

Steen, D.A., J.M. Linehan, and L.L. Smith. Multiscale habitat selection and refuge use of Common Kingsnakes, *Lampropeltis getula*, in southwestern Georgia. *Copeia*: In press.

GREG SIEVERT

By the time Dr. Fitch's study of the Ringneck Snake (*Diadophis punctatus*) was published in 1975, he had already established himself as the "father of snake ecology" (Fitch, H.S. 1975. A demographic study of the Ring-neck Snake (*Diadophis punctatus*) in Kansas. *University of Kansas Museum of Natural History Miscellaneous Publication* (62):1–53). This was the single most frequently encountered species of snake in his 50-year study of reptiles on the University of Kansas (now Fitch) Natural History Reservation (Fitch, H.S. 1999. *A Kansas Snake Community: Composition and Changes Over 50 Years*. Krieger Publishing Co., Malabar, Florida).

SUZANNE L. COLLINS, CNAH

Many of the same techniques used to study snakes applied as well to another reptilian species native to northeastern Kansas. The Slender Glass Lizard (*Ophisaurus attenuatus*), although very snake-like in many ways, is quite lizard-like in its insectivorous diet (Fitch, H.S. 1989. A field Study of the Slender Glass Lizard, *Ophisaurus attenuatus*, in northeastern Kansas. *Occasional Papers of the Museum of Natural History, The University of Kansas* (125):1–50).