impact *C. a. alleganiensis* survival (Nickerson 2003. Southeast. Nat. 2:619–629; Souza et. al 2012. J. Wildl. Dis. 48:560–566). In this note we report how natural hazards, such as high water and flood events, may contribute to *C. alleganiensis* mortality.

On 16 July 2015, while conducting snorkel surveys for Hellbenders on a stretch of the Little River in the Great Smoky Mountains National Park, Tennessee, USA (precise locality withheld due to conservation concerns), we observed a single dead larva crushed between two cobble-sized rocks near the river-left bank. Both rocks were ca. 15 cm in length and not embedded. The larva was ca. 10 cm total length and it had crush marks around the abdomen. The head and tail were not crushed, but were decomposing. During the week the surveys took place, beginning 13 July 2015, the Tennessee portion of the Great Smoky Mountains National Park received approximately 6.35 to 12.7 cm of rain (www.noaa.gov). At the Little River gauge located above Townsend, Tennessee and downstream of our sampling site, the stream flow increased from ca. 2.83 m^3/s to 48.1 m^3/s and the water level increased from 0.45 to 1.29 m. The stream flow and water levels began to decrease between 15–17 July 2015 (www.usgs.gov). The increase in stream flow likely caused the cover rocks to move downstream, crushing the larva. The specimen was not collected due to significant damage and stage of decomposition. Previous research has shown that gilled or gill-sized larvae can compose 28–48% of all captures in the Little River (Nickerson et al. 2003, *op. cit.*; M. Freake, unpubl. data), while the next size class only composes up to 4% of captures (M. Freake, unpubl. data). Although no studies have been conducted to examine sources and/or extent of larval mortality at this site, the observed age structure suggests that larval mortality may be particularly high. Overall, high larval mortality can decrease recruitment, affect future population age class distribution, and is especially pertinent for long-lived and slow-growing species, such as *C. alleganiensis*.

JERONIMO G. D. S. NETO (e-mail: jgomesda@my.tnstate.edu), **WILLIAM B. SUTTON**, Department of Agricultural and Environmental Sciences, Tennessee State University, Nashville, Tennessee 37209, USA (e-mail: wsutton@tnstate.edu); **JESSICA B. GIACOMINI**, Department of Forestry, Wildlife, and Fisheries, University of Tennessee, Knoxville, Tennessee 37996, USA; RUTH E. FREEMON and **MICHAEL FREAKE**, Department of Mathematics and Natural Sciences, Lee University, Cleveland, Tennessee 37311, USA (e-mail: mfreake@leeuniversity.edu).

***CRYPTOBRANCHUS ALLEGANIENSIS ALLEGANIENSIS* (Eastern Hellbender). PERSISTENCE IN ALABAMA.** Graham et al. (2011. Herpetol. Conserv. Biol. 6:242–249), in an assessment of *Cryptobranchus alleganiensis alleganiensis* occurrence in Alabama, concluded after surveys of 45 historic and previously un-surveyed sites that the species had possibly been extirpated. From 2006 to 2010 Graham et al. (2011, *op. cit.*) conducted field activities to assess the status of the Eastern Hellbender as well as obtaining specimens known to have been collected or photographed yet remained unvouchered; three records—two specimens and one photo—were documented in this manner. Since 2011, one unverified observation based on a photo of a dead Hellbender was circulated in an email originally dated 19 June 2013. In the photo a large Hellbender is shown draped over the end of a canoe paddle and the location was given as the Flint River east of Huntsville near US Hwy 72. Attempts to obtain full data were unsuccessful.

On 27 March 2014 in Cypress Creek, Lauderdale Co., Alabama, USA, an individual Eastern Hellbender (total length = 48 cm) was captured by a team of fisheries biologists. Video and photographs

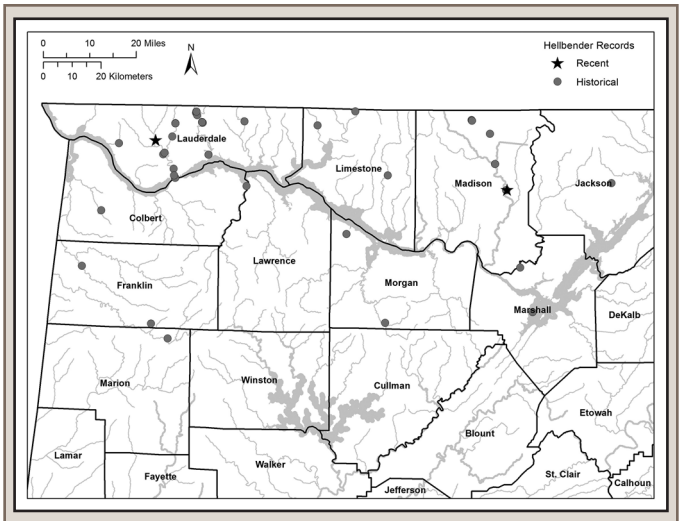

FIG. 1. Distribution of historical localities and most recent documentations of the Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*) in Alabama.

of the Hellbender were taken. On 18 September 2015, an adult non-gravid female (SVL = 32.7 cm; total length = 49 cm; 636 g) was captured in the Flint River, Madison Co., Alabama, USA, above US Hwy 72. This specimen was photo-vouchered in the Alabama Herp Atlas (AUM AHAP-D 1118), PIT tagged, and tissue sample obtained. The exact localities for both specimens are withheld here for conservation purposes.

We agree with Graham et al. (2011, *op. cit.*) that Eastern Hellbender sightings likely represent relict populations and that eventual extirpation in Alabama is a possibility. Our observations gathered during recent field sampling in which we surveyed approximately 90 km over six streams support the opinion of Graham et al. (2011, *op. cit.*) that water quality degradation is the underlying cause of the decline of the Eastern Hellbender in Alabama.

JAMES C. GODWIN, 1090 S. Donahue Drive, Alabama Natural Heritage Program, Museum of Natural History, Auburn University, Alabama 36849, USA (e-mail: jcg0001@auburn.edu); **LESLEY DE SOUZA**, S415 Turner Hall, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, Illinois 61801, USA (e-mail: lesleydesouza4@gmail.com); **THOMAS FLOYD**, Georgia Department of Natural Resources, Nongame Conservation Section, 116 Rum Creek Drive, Forsyth, Georgia 31029, USA (e-mail: Thomas.Floyd@dnr.ga.gov); **CODY EWERS** (e-mail: cody.m.ewers@gmail.com), **LACY RUCKER** (e-mail: ruckerlacy@gmail.com), **IWO GROSS**, Alabama A&M University, 100 Drake Drive, Normal, Alabama 35762, USA (e-mail: iwogross@gmail.com); **CAL C. JOHNSON**, Alabama Department of Environmental Management, 2715 Sandlin Road, S.W., Decatur, Alabama 35603-9359, USA (e-mail: cal.johnson@adem.state.al.us).

***CRYPTOBRANCHUS ALLEGANIENSIS ALLEGANIENSIS* (Eastern Hellbender). TERRESTRIAL MOVEMENT.** *Cryptobranchus alleganiensis alleganiensis* is a large salamander that is often associated with cold, well-oxygenated streams from Missouri to southern New York and northern Georgia (Smith 1907. Biol. Bull. 13:5–39; Nickerson and Mays 1973. The Hellbenders: North American "Giant Salamanders." Milwaukee Public Museum, Milwaukee, Wisconsin. 106 pp.). Hellbenders are considered fully aquatic salamanders; all life stages inhabit lotic habitats. Hellbenders primarily respire through their skin, known to be highly vascularized to facilitate cutaneous respiration. In addition,

longitudinal skin folding along the lateral line increases surface area for cutaneous gas exchange. Adult Hellbenders also possess poorly vascularized, non-septate internal lungs, which are thought to contribute little to overall gas exchange (Guimond and Hutchison 1973. Science 182:1263–1265), but may play an important role in regulating buoyancy. Although these primitive lungs are thought to usually have a trivial respiratory role (Lenfant and Johansen 1967. Resp. Physiol. 2:247–260; Guimond and Hutchison 1976. *In* G. M. Hughes [ed.], Respiration of Amphibious Vertebrates, pp. 313–338. Academic Press, New York), individuals can use pulmonary respiration when needed. For example, Ultsch and Duke (1990. Oecologia 83:250–258) reported that Hellbenders under laboratory-simulated hypoxic conditions were able to survive at least 5–11 days by surfacing to breathe air, utilizing pulmonary respiration. To our knowledge, no study has reported the extended voluntary use of pulmonary respiration or terrestrial movement by Hellbenders in a natural setting; however, anecdotal evidence suggests they may be capable of leaving the water (Barton 1812. A Memoir Concerning an Animal of the Class of Reptilian, or Amphibian, Alligator and Hell-bender. Griggs and Dickenson Printers. 25 pp.).

On the afternoon of 7 September 2012, we witnessed two adult Hellbenders exhibiting terrestrial movements at the base of a waterfall in Washington Co., Virginia, USA (precise locality withheld due to conservation concerns). The waterfall area is ca. 15 m wide (full stream width) and consists of three rock tiers that have a total elevational gradient of ca. 10.25 m. Starting at the most downstream aspect of the waterfall, the first tier rises from the water at a vertical angle ranging between 35–45° and then levels to a horizontal platform at the top, 2.05 m from the water line below. The second tier rises directly from a small pool located ca.1.4 m back from the top of the first tier. Finally, the third tier is located 8.85 m upstream of the second tier. We did not observe any Hellbenders attempting to scale the second and third tier. The surrounding terrestrial habitat is mostly forested, containing *Kalmia latifolia* (Mountain Laurel), *Rhododendron*, and large boulders. The immediate vicinity is a site known to harbor a very high population density of Hellbenders, with an estimated density of approximately 2.29 (1.89–2.63, 95% CI) adult/subadult Hellbenders per 100 m^2 of wetted river channel in the reach leading up to the waterfall (Jachowski et al., unpubl.).

The first individual was spotted at ca. 1645 h on the northern aspect of the waterfall area, ca. 1 m from the edge of the stream, climbing at an angle of ca. 43° on the rock outcropping. During this time, the Hellbender was completely out of the water and made several attempts to scale the rock, climbing vertically and along horizontal fissures in the rock. At one point, the individual successfully climbed near vertically for 0.5 m before falling backwards. After ca. 1 h, the individual was 8.4 m from the water's edge, reversed direction, and started to return to the stream. Within this time frame, a second individual was observed leaving the water and attempting to scale the first tier of the waterfall. The second individual made two unsuccessful attempts and fell backwards into the water. The first two attempts were made at an approximate vertical angle of 35°. The individual ultimately successfully scaled the first tier using an alternate route on the tier that had a vertical angle of ca. 40°, after which it collapsed on top of the flat rock platform and sat motionless for ca. 5 min. before crawling into the small pool at the base of the second tier. Both individuals were observed gulping air and moving in 30–60 sec bursts while attempting to scale the barriers. From visual inspection, both of the Hellbenders were adults. Although we did not disturb the animals during these movements, we captured the first individual just as it returned to the water at the base of the falls and determined it was an adult male ca. 30 cm in total length.

Our observations suggest that Hellbenders may utilize their ability to breath out of water in order to scale in-stream habitat barriers. Such instances have been reported for *Andrias japonicas* (Japanese Giant Salamander) in which terrestrial movement over small dams can occur during breeding migrations (Taguchi and Natuhara 2009. Jpn. J. Conserv. Ecol. 14:165–172). Similarly, the capacity to scale these obstacles may be important for Hellbenders during the breeding season (August–September in this population) when movement and conflict among individuals are common. Alternatively, this characteristic could be important in juvenile dispersal, especially in streams with steep gradients. Understanding Hellbenders' capacity for terrestrial movement could ultimately prove useful to conservation-related research such as genetic isolation due to in-stream structural barriers.

B. HOPKINS COE (e-mail: bchop@vt.edu), **DAVID V. DREWETT** (e-mail: ddrewett@blm.gov), **C. BODINOF JACHOWSKI** (e-mail: cjachowski@vt.edu), and **W. A. HOPKINS**, 106 Cheatham Hall, Virginia Tech, Blacksburg, Virginia 24061, USA (e-mail: hopkinsw@vt.edu).

***DESMOGNATHUS APALACHICOLAE* (Apalachicola Dusky Salamander) and *AGKISTRODON CONTORTRIX CONTORTRIX* (Southern Copperhead). PREY/PREDATOR.** The prey species of the Southern Copperhead includes so many different vertebrates and invertebrates that its diet has been called "catholic" (Fitch 1960. Autecology of the Copperhead. Univ. Kansas Publ. Mus. Nat. Hist. 13:85–288). Although frogs are commonly reported in Copperhead diets, only a few salamanders have been documented (Gloyd and Conant 1990. Snakes of the *Agkistrodon* Complex, a Monographic Review. Contributions to Herpetology No. 6. Society for the Study of Amphibians and Reptiles, Oxford, Ohio. 614 pp.).

Copperheads range into the Florida panhandle across the northern parts of Escambia, Santa Rosa, and Okaloosa counties but penetrate farther south along both sides of the Apalachicola River in Jackson, Calhoun, Gadsden and Liberty counties (Means 1992. *In* P. E. Moler [ed.], Vol. III, Amphibians and Reptiles, Rare and Endangered Biota of Florida, pp. 242–246. University Press of Florida, Gainesville, Florida). Ravines are common along the east side of the Apalachicola River and upstream along both sides of the Chattahoochee and Flint rivers whose confluence becomes the Apalachicola River. These ravines all contain populations of *D. apalachicolae* and *A. c. contortrix*, so it is likely that young Copperheads commonly feed on the former. Populations of *Eurycea cirrigera* (Two-lined Salamander), *Pseudotriton ruber* (Red Salamander), and *Plethodon grobmani* (Slimy Salamander) are syntopic with *D. apalachicolae* in these ravines (Means 2000.. *In* Bruce et al. [eds.], The Biology of Plethodontid Salamanders, pp. 287–302. Plenum Publishing Corporation, New York) and probably are also part of the diet of at least young copperheads.

D. BRUCE MEANS, Coastal Plains Institute and Land Conservancy, 1313 Milton St., Tallahassee, Florida 32303, USA; e-mail: means@bio.fsu.edu.

***DESMOGNATHUS ORGANI* (Northern Pygmy Salamander). NEST.** On 26 August 2015 we discovered a female *Desmognathus organi* with a nest of four eggs under a small rock (Fig. 1). The rock was approximately 1 m from a small spring located along the Appalachian Trail on Hurricane Mountain, Smyth Co., Virginia, USA (36.7090°N, 81.5180°W, WGS84; 1310 m elev.). Under the same rock were two male *D. organi* and two *D. orestes*. The only previously recorded nest of *D. organi* was discovered on 16