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animals) may raise doubt about this explanation, because the probability of such mutations is presumably low. The occurrence of cartilaginous regeneration of an injured tail can also lead tail bifurcation tails in chelonians (Kuchling 2005, op. cit.). However, we were unable to do X-ray examination of these turtles, preventing a more precise diagnosis. The regeneration pattern reported by Kuchling (2005, op. cit.) is similar to that found in lizards, wherein the missing part is replaced by fibrous or cartilaginous or calcified tissue (Zug et al. 2001. Herpetology: An Introductory Biology of Amphibians and Reptiles. Academic Press, New York. 630 pp.). If the cases reported here were confirmed to be based on regeneration, it would be the second record of this ability in a chelid turtle. Studies on tail bifurcation in turtles could someday reflect on questions of the phylogenetic history of tail autotomy and regeneration in amniotes.

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**STAurotypus TripORCATUS** (Giant Musk Turtle; Guao de Tres Filas). **PREDATION.** Staurotypus triporsatus is a large freshwater turtle that occurs on the Atlantic versant from central Veracruz, Mexico, to northwestern Honduras. Adults can reach 400 mm carapace length (Iverson 1983. Cat. Amer. Amphib. Rept. 328.1–328.2), and apparently have few documented natural predators. Pritchard (1979. Encyclopedia of Turtles. T.F.H. Publishing, Neptune, New Jersey. 895 pp.) wrote that the “massively constructed” shell of this species “lessens the likelihood of the turtle being cracked and eaten by the crocodiles with which it shares much of its habitat.” However, it is well known that humans use the meat of this turtle as a food source (Moll and Moll 2004. The Ecology, Exploitation, and Conservation of River Turtles, Oxford University Press, New York. 393 pp.). Here we provide evidence of natural predation on an adult *S. triporsatus* by a Jaguar (*Panthera onca*) in northwestern Honduras.

At 1431 h on 15 October 2011, a camera trap (Moultrie Game Spy 1-65s) set by Panthera staff at “Cerro Agua Caliente,” Jeannette Kawas National Park, Atlántida (15.8622°N, 87.6838°W; 30 m elev.) captured an image of an adult female *Panthera onca* carrying an adult *Staurotypus triporsatus* in its mouth (Fig. 1) in a seasonally flooded swamp forest. Jaguars can be individually identified by the shape and pattern of their marks (Silver 2004). Assessing Jaguar Abundance Using Remotely Triggered Cameras. Wildlife Conservation Society, Bronx, New York. 25 pp.). This female was first photographed during August 2010 and has been monitored in the park since then. During October 2011 she was again photographed several times in the “Cerro Agua Caliente” area in company with a cub of about 3 months age. It has been estimated that a jaguar can eat between 1.2 and 1.5 kg of meat per day (Sunquist and Sunquist 2002. Wild Cats of the World. University of Chicago Press, Chicago, Illinois. 452 pp.); a Giant Musk Turtle can weigh up to 10 kg, including the plastron and carapace (Vogt 1997. In González Soriano et al. [eds.], Historia Natural de Los Tuxtals, pp. 494–495). Universidad Nacional Autónoma de México, Ciudad de México), thus having the potential to be an important food item for Jaguars. Moreover, large prey species such as tapirs (*Tapirus bairdii*) and peccaries (*Pecari tajacu, Tayassu pecari*) have been extirpated from Jeannette Kawas National Park, and White-tailed Deer (*Odocoileus virginianus*) are severely declining; all due to human hunting pressure and deforestation. Jaguars are known to prey on turtles, with sea turtles, freshwater turtles, and terrestrial turtles having been documented as part of the Jaguar’s diet (Emmons 1989. J. Herpetol. 23:311–314; Wainwright 2002. The Mammals of Costa Rica, A Natural History and Field Guide. Cornell University Press, Ithaca, New York. 454 pp.). However, to the best of our knowledge, this is the first report of Jaguar predation on *S. triporsatus*. The presence of *S. triporsatus* in the Jeannette Kawas National Park has also been confirmed from two specimens collected there. The only other large freshwater turtle in the area is the snapping turtle, *Chelydra rossignonii*; we identified the turtle in the picture as *S. triporsatus* due to the lack of a long tail and the presence of strong carapacial keels.

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**Crocodylia — Crocodiles**


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Fig. 1. A camera trap image of a female *Panthera onca* carrying an adult *Staurotypus triporsatus*, Jeannette Kawas National Park, northwestern Honduras.
of the hind legs and also marked by tail notching (Elsey and Kinline 2011, op. cit.). The juvenile alligators (allowable size range of 91.4–152.4 cm total length [TL] at release) are then released back to the wetlands from which the eggs were collected one or two years earlier.

Over time, we have observed that many of the released juveniles grow to adult size and are subsequently caught by alligator trappers in the annual regulated harvest. On 7 September 2012, a tagged alligator was reported to our agency. The web tag was from a male alligator that was marked and released on 1 May 1992 (then 124 cm TL) and harvested over twenty years, four months later (7434 days, now 244 cm TL). To our knowledge this is the longest time interval for a recovery of a farm-released alligator from Louisiana’s egg ranching program, indicating long-term survival after release to the wild.

The interval growth was somewhat below average for this species (Elsey et al. 1992. Comp. Biochem. Physiol. 103A:667–672). However, coastal southeast Louisiana has been adversely affected by four major hurricanes in recent years (Hurricanes Katrina and Rita in 2005, and Hurricanes Gustav and Ike in 2009); thus high salinity conditions post-hurricanes could have stressed some alligators and slowed normal feeding and growth (Lance et al. 2010. J. Exp. Zool. 313A:106–113; Lauren 1985. Comp. Biochem. Physiol. 81A:217–223). Confirmation was obtained from the person reporting the harvest of the alligator that the alligator’s total length was accurate, and no portion of the tail was missing.

We have recovered farm-released alligators that have grown longer than the case herein; the largest recovery we have obtained that held the web tag over time was 381.0 cm when harvested on 10 September 2006 (Elsey 2006. Croc. Spec. Grp. News-ltr. 25:16–17). This male alligator had been tagged and released 4761 days earlier on 28 August 1993, at which point the TL was 111.8 cm. Many alligators lose the monel tags placed in the webbing of the rear feet as they grow, thus precluding knowledge of exact time intervals between release and recovery. Use of year-specific tail notches have been used in our program since 1994 to assist in providing some time interval data when marked alligators lose their foot/web tags.

The properties on which the alligator was released (Poverty Flats) in Terrebonne Parish, Louisiana and on which it was recovered (Rebecca) are in close proximity to each other, and are both irregularly shaped, thus the distance moved between release and recovery can only be estimated. Precise GPS locations are not available at either release or recovery sites, but the minimum distance between the two properties is approximately 0.4 km, while the maximum distance is approximately 12.1 km. Although instances of long-distance dispersal have been documented in alligators, in many cases alligators do not move long distances over time (Lance et al. 2011. Southeast. Nat. 10:389–398), and some females show evidence of strong nest site fidelity (Elsey et al. 2008. Southeast Nat. 7:737–743).

The egg ranching program in Louisiana, which allows for the collection of alligator eggs from privately owned wetlands began in 1986, with the first juvenile alligators being released to the wild in 1988 (Elsey et al. 1992, op. cit.). Thus it is possible that many alligators from that first cohort may still be surviving, and not yet recovered, as only a small portion of the population is harvested each year in the annual harvest. The recovery of a farm-released alligator having survived over twenty years (and presumably having fathered numerous clutches of eggs over that time interval, adding to population recruitment) lends support to the philosophy of sustained use management of this valuable resource.

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**ALLIGATOR MISSISSIPPIENSIS** (American Alligator). **INTERSTATE MOVEMENT OF ALLIGATORS.** The state of Louisiana has an alligator management program administered by the Louisiana Department of Wildlife and Fisheries (LDWF) that includes a regulated harvest of wild alligators, a nuisance alligator removal program, and a commercial alligator farming program (Elsey and Kinline 2004. In Crocodiles. Proceeding of the 17th Working Meeting Crocodile Specialist Group, pp. 92–101. IUCN—The World Conservation Union, Gland, Switzerland, and Environment Agency-Abu Dhabi, UAE). Many other southeastern states also have significant alligator populations, and most states conduct regulated harvests and nuisance control programs; some also allow commercial alligator farming. An integral facet of the commercial alligator farming program in Louisiana allows for the collection of eggs from the wild, with mandatory release of a portion of juvenile alligators hatched from collected eggs, as a “head-start” program to ensure recruitment of the species (Elsey and Kinline 2011. In P. S. Soorae [ed.], Global Re-introduction Perspectives: 2011. More Case Studies from Around the Globe, pp. 125–129. IUCN/SSC Re-introduction Specialist Group Gland, Switzerland, and Environment Agency-Abu Dhabi, UAE). Each of the juvenile alligators released from alligator farms in Louisiana are measured, the sex is determined and recorded, and marked with monel tags placed between the toes of the hind legs and also marked by tail notching (Elsey and Kinline 2011, op. cit.). The juvenile alligators (allowable size range at release of 91.4–152.4 cm total length) are then released back to the wetlands from which the eggs were collected one or two years earlier.

Over time, we have observed that many of the released juveniles grow to adult size and are subsequently caught by alligator trappers in the annual regulated harvest in Louisiana (Elsey et al. 2001. In Grigg et al. [eds.], Crocodilian Biology and Evolution, pp. 426–441. Surrey Beatty & Sons, Chipping Norton, NSW). Additionally, other farm-released alligators are captured occasionally as “nuisance” or problem alligators (Elsey 2007. Herpetol. Bull. 102:11–14) causing human safety concerns.

We herein report on five cases of alligators with interstate movement between Louisiana (LA) and Mississippi (MS), USA. The initial case involved a nuisance trapper in Mississippi harvesting an alligator released from a farm in Louisiana. On 17 July 2008, a Warren Co., MS conservation officer trapped a 348.0 cm male alligator (Fig. 1) in Halpino Lake (just south of Eagle Lake, MS); capture site coordinates were 32.46070°N, 91.00877°W. The foot/web tag (LDWF 222285) was from a juvenile alligator released from a Louisiana alligator farm almost 12 years earlier on 22 July 1996 at which time the total length was 116.8 cm; it was released at Lake St. Joseph in Tensas Parish, 48 km away.

On 11 April 2012, a tagged alligator caught by a licensed Louisiana nuisance alligator trapper was reported to LDWF. The web tag reported (07301) did not match any records of farm-released alligators in Louisiana; nor did the tag match any records of native wild alligators caught and marked/tagged for...
Prior studies have documented alligator movement patterns that can vary widely. Although instances of long-distance dispersal have been documented, in many cases adult alligators do not move long distances over time (Chabreck 1965. Proc. Southeast. Assoc. Fish Wildl. Agencies 19:102–110; Lance et al. 2011. Southeast. Nat. 10:389–398), and some females show evidence of strong nest site fidelity (Elsey et al. 2008. Southeast. Nat. 7:737–743). Indeed, in this report two alligators moved over 40 km; one moved approximately 23 km, while two others moved only 5–6 km.

Due to the magnitude of the farm-release program in Louisiana (often 40,000 or more alligators released each year), precise GPS locations are not available for each alligator at release sites. Also, oftentimes the properties on which the alligators are released are irregularly shaped, thus the distance moved between release and recovery can only be estimated, thus distances discussed herein are minimum estimated dispersal distances.

The relatively long time interval for several of the recoveries of farm-released alligators from Louisiana’s egg ranching program described above (8, 9, and 12 years) indicates good survival after release to the wild. We recently described a case with an alligator recovered over 20 years after release to the wild from a farm in Mississippi. On 7 September, a 308 cm male alligator was harvested on the Big Black River near Grand Gulf/Port Gibson, MS with LDWF web tag 597115 in the foot. This alligator had been tagged at an alligator farm and released on Sunflower Plantation in Tensas Parish, LA on 17 August 2004 at which point the total length was 132.1 cm. The distance moved over the eight- year interval was approximately 23 km.

On 7 September 2012, two Louisiana farm-released alligators were caught in Mississippi, north of Port Gibson (north of where the Big Black River enters the Mississippi River); both had been released by a Louisiana alligator farmer in nearby Tensas Parish. The alligators were harvested by a trapping team in the same location. The first alligator caught that evening was a 304.8 cm male that had been released on Somerset Plantation at 172.7 cm TL on 29 May 2003 (LDWF tag 529134). The alligator caught later that night was a female that measured 180.0 cm TL, and which had been released on Sunflower Plantation on 13 April 2010 at 129.5 cm TL (LDWF tag 853250). The male was caught approximately 6–7 km from the release site in Louisiana, while the female was recovered some 5 km from the release location.

We are not aware of other cases documenting natural inter-state movement of alligators; although in September 2008, Hurricane Ike displaced an alligator released from a farm in southwest Louisiana 489 km to Padre Island National Seashore in lower Texas (Elsey and Aldrich 2009. Southeast. Nat. 8:746–749). It may be that many alligator tag and release studies conducted by state or federal government employees are conducted within the confines of their state property; possibly within a given National Wildlife Refuge or Wildlife Management Area, and thus the opportunities to live capture alligators that have moved off the study site are limited. It was fortunate that we were aware of alligator tagging programs in the adjacent state and could advise accordingly when an alligator from the other state was recovered.

Unusually high snowfall in the United States in 2010–2011 and very high water levels in the Mississippi River during spring 2011 may have allowed for increased movement of alligators over floodplains between Louisiana and Mississippi that year. Also, gradual expansion of Mississippi’s wild alligator harvest program from 30 alligators harvested in 2005 to 617 alligators harvested in 2012 has allowed additional opportunity for harvest and recovery of alligators that have dispersed from adjacent Louisiana.

Due to the magnitude of the farm-release program in Louisiana (often 40,000 or more alligators released each year), precise GPS locations are not available for each alligator at release sites. Also, oftentimes the properties on which the alligators are released are irregularly shaped, thus the distance moved between release and recovery can only be estimated, thus distances discussed herein are minimum estimated dispersal distances.

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At ca. 1730 h on 23 July 2011 at a lake adjoining our field camp in the Matsedroy Forest (15.48772°S, 46.64752°E, WGS 84; elev. 19.4 m), a 1.5–2 m Crocodylus niloticus was observed pre-dating a Malagasy Jacana (Actophilornis albinucha). The crocodile attacked from below in a relatively shallow (<3 m) part of the lake that was densely covered by water hyacinth (Eichornia sp.). It took approximately five minutes for the crocodile to seize, drown, and consume the Jacana.

While it stands to reason that Malagasy jacias and other species of wading birds present at these lakes should comprise part of the diet of the crocodiles that inhabit them, as far as we are aware this is the first record of C. niloticus predation on a Malagasy Jacana. Interestingly, this is also the first positive identification of a predator of Actophilornis albinucha. A. albinucha is a member of Madagascar’s endemic avifauna and therefore this observation also contributes to the known literature on predator-prey interactions of endemic fauna in this highly threatened landscape.

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CROCODYLUS POROSUS (Saltwater Crocodile). FISHING BEHAVIOR. A form of fishing behavior not previously described for Crocodylus porosus was observed repeatedly on separate occasions at Cahill’s Crossing on the East Alligator River in Kakadu National Park, Northern Territory of Australia (12.4844°S, 131.7240°E) from August to October 2012. The behavior was witnessed most frequently around high springs tides, when incoming and then outgoing tidal flow crossed an artificial road barrage that fords the river. A number of fish species, primarily Diamond-scale Mullet (Liza vaigiensis) take the opportunity to cross this barrier in relatively high densities, and crocodiles mass both upstream and downstream of the barrage to feed upon them. During our observations, many crocodiles adopted a distinctive body posture while floating at the surface: the back legs extended outwards in a loose R-shape on the same plane as the body; the front legs held out perpendicular to the body, with palms facing outwards and toes projecting upwards out of the water (Fig. 1); the jaws held partially open, with the upper jaw resting on the surface and the lower jaw hanging below the water. This posture could be clearly seen with sufficient water clarity, which is the case immediately prior to the incoming tide flowing over the barrage. The primary mechanism of the posture appeared to be improved detection and capture of fish within striking range that were detected by sensitive mechanoreceptors (integumentary sense organs; ISOs). Fish that swam close to the crocodile's head and touched the front legs or feet were immediately seized by a sideswipe of the head towards the touch. The small, tightly packed scales on the feet provide a high density of ISOs (Leitch and Catania 2012. J. Exp. Biol. 215:4217–4230), which perhaps explains the outward extension of the feet and toes to maximize detection of fish passing within range or breaking the surface. This behavior has only previously been described in the Paraguayan Caiman (Caiman yacare) (Olmos and Sazima 1990. Copeia 1990:875–877) and is a fishing strategy that is particularly effective with higher densities of fish.

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SQUAMATA — LIZARDS

ANADIA BOGOTENSIS (Bogota Anadia Lizard). NESTING. Anadia bogotensis is a common lizard endemic to Colombia and is distributed in areas of highland Andean scrubland and paramo throughout Cundinamarca, Boyacá, and Santander in Colombia, between 2500–3900 m altitude. Despite being common, little is...