

= 0.05,  $p = 0.90$ ) and mouth width was not correlated with prey volume ( $r^2 = 0.53$ ,  $p = 0.21$ ).

*Phrynohyas venulosa* is an arboreal frog with low mobility. Based on diet and observed behavior of the specimens examined in this study it should be considered a generalized predator with a "sit-and-wait" strategy for obtaining prey.

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**RANA HECKSCHERI** (River Frog). **PREDATION.** Few predators have been reported for *Rana heckscheri*. Allen (1938, Copeia 1938:50), Fogarty and Hetrick (1973, Auk 90:268–280), and Brown (1979, Brimleyana 1:113–124) reported Banded Water Snakes (*Nerodia fasciata*), Cattle Egrets (*Bubulcus ibis*), and a Rainbow Snake (*Farancia e. erythrogramma*) as predators of *R. heckscheri* tadpoles. Juvenile and adult *R. heckscheri* are reported to have toxic skin secretions (Ashton and Ashton 1988, Handbook of Reptiles and Amphibians of Florida—Part Three: The Amphibians, Windward Publishing, Inc., Miami, Florida, 191 pp.; Bartlett and Bartlett 1999, A Field Guide to Florida Reptiles and Amphibians, Gulf Publishing Co., Houston, Texas, 280 pp.), and Behler and King (1985, The Audubon Society Field Guide to North American Reptiles and Amphibians, Alfred A. Knopf, New York, 743 pp.) reported that "water snakes and indigo snakes become violently ill" after ingesting recent metamorphs.

On 3 Sept. 2005, we observed an adult female *N. fasciata* (ca. 850 mm TL) exhibiting what might best be described as a combination of active foraging and ambush behavior in the shallows of Old Levi Mill Lake (Poinsett State Park, ca. 10.6 km WNW of Pinewood, Sumter Co., South Carolina, USA). Recently transformed juvenile *R. heckscheri* were abundant along the lake's edges, and we saw several in the snake's immediate vicinity. We observed the snake for several minutes on multiple occasions during mid-day and early afternoon, but did not see it capture prey. At 1554 h, we captured and handled the snake, and it regurgitated a juvenile *R. heckscheri* (52 mm SVL, 14.0 g). We released the snake and deposited the frog in the North Carolina State Museum of Natural Sciences (NCSM 68547). To our knowledge, this represents the first report of natural predation on non-larval *R. heckscheri*.

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## TESTUDINES

**ACTINEMYS MARMORATA** (Pacific Pond Turtle). **SIZE.** To date the largest *Actinemys marmorata* reported was a male from Marin County, California, with a straight-line carapace length (SCL) of 223 mm and a plastron length (PL) of 193 mm (Fidenci 2005, Herpetol. Rev. 36:440). Here we report the measurements

of three large *A. marmorata* captured from California Central Valley slough habitats adjacent to the Sacramento River, near Hamilton City (California, USA). Male #1: SCL = 241 mm; PL = 216 mm; carapace width at 8th marginal (CW) = 176 mm; shell height (SH) = 90 mm; mass = 1923 g. Male #2: SCL = 226 mm; PL = 210 mm; CW = 175 mm; SH = 74 mm; mass = 1402 g. Male #3: SCL = 223; PL = 209 mm; CW = 170 mm; SH = 83 mm; mass = 1564 g. All turtles were individually marked with filed notches in the marginal scutes and released at their capture sites. These captures represent the largest *A. marmorata* yet recorded within their range. All measurements were confirmed by John S. Campbell.

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## **ACTINEMYS MARMORATA** (Pacific Pond Turtle). **REFUGIA.**

Pacific Pond Turtles are known to be shy and to escape quickly into deep pools when disturbed (Ernst et al. 1994, Turtles of the United States and Canada, Smithsonian Institution Press, Washington D.C. 578 pp.). They are reported to utilize undercut banks and submerged structures (i.e., rocks, logs, vegetation, etc.) as refugia (Holland 1996, Herpetol. Rev. 27:198–199; Reese and Welsh 1998, J. Wildl. Manage. 62:842–853). Holland (*op. cit.*) also reported an atypical instance of refugia use in an upland habitat. However, little else has been reported about upland or aquatic refugia by this species. Here I report the use of rodent burrows and aquatic silt loads as refugia by *A. marmorata*.

Beginning in Fall 2002, an effort was made to remove Bullfrogs (*Rana catesbeiana*) from a portion of Kellogg Creek in the Los Vaqueros watershed, in eastern Contra Costa County, ca. 57 km E of San Francisco, California (USA). Bullfrog removal was conducted to increase habitat suitability for the California Red-legged Frog (*R. draytonii*) and *A. marmorata*. Portions of the creek were isolated using sand bags and wire mesh fencing. These sections were then drained. Native fauna was removed during draining and placed in adjacent sections of creek—upstream of the area being drained.

Fifty-six *A. marmorata* were encountered during the draining phase of the project. Turtles were found free-swimming in shallow pools, attempting to move upstream or downstream, or were found buried in the bottom sediment of drained pools. **On three separate days, turtles were also found within the burrows of Beaver (*Castor canadensis*) and Muskrat (*Ondatra zibethicus*) located in the bank of the creek.**

We frequently observed turtles (ca. 30% of captures) utilizing bottom silt as refugia from our capture. As water levels were lowered, turtles moved to the bottom of pools where they appeared to "swim" into loose bottom silt. Although turtles were not visually detectable, they could be located by raking through the silt with both hands. Frequently turtles were found < 0.5 m into the silt. **On one occasion 3 turtles were found deep (ca. 0.7–0.9 m) within an inactive earthen burrow made by a Beaver. A fourth was found ca. 0.3 m within a different Beaver burrow, and a fifth turtle was found ca. 0.3 m within a potentially active Muskrat burrow.**

Holland (*op. cit.*) reported that *A. marmorata* typically use inaccessible microsites as refugia, including under logs, rocks, cut banks, within vegetation, and occasionally in substrate. During the work on Kellogg Creek, it appeared that turtles regularly sought refuge in bottom silt loads of natural pools and those created by Beavers. They also utilized large-rodent burrows, perhaps in response to the draining of pools where turtles were present.

Beavers provide suitable open-water habitat for *A. marmorata* when the two species are sympatric. However, Beavers might also provide refugia within their abandoned burrows, and also by piling loose silt at the base of their dams.

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**CARETTA CARETTA** (Loggerhead Seaturtle). **PREDATION.** Hatchling seaturtles have a large number of documented predators (Dodd 1988. U.S. Fish. Wildl. Serv., Biol. Rep. 88 [14], 110 pp.; Stancick 1995. In Bjørndal [ed.], *Biology and Conservation of Sea Turtles*, 2nd ed., pp. 139–152. Smithsonian Institution Press). However, seaturtle predation by anuran amphibians is apparently unreported. Here, we document the predation of *Caretta caretta* hatchlings by the Cururu Toad (*Bufo jimi* Steveaux 2002), observed on two different occasions at the District of Arembépe, City of Camaçari, Bahia, Northeast Brazil (12°45'42.8"S, 38°10'05.5"W). Projeto TAMAR-IBAMA (the Brazilian National Sea Turtle Conservation Program) maintains a field station in this area. Some seaturtle nests are transferred to an open hatchery, which consists of a 130 m<sup>2</sup> area, surrounded by a fence, fully exposed to sun and rain, and located at the suprashore zone, at the vegetation line. Extensive wetlands are located very close to the sandy beach. Inside the fence, each nest receives an individual screen fence, where recently emerged hatchlings are temporarily retained and then released after data collection. Occasionally some of the hatchlings escape from the protective screens. On several occasions the presence of *Bufo jimi* inside the hatchery was noted, never more than one specimen at a time. In February 2003, attempted predation on *C. caretta* hatchlings by *B. jimi* was observed, when over 20 hatchlings of *C. caretta* and *Eretmochelys imbricata* escaped from the protective screens and dispersed through the hatchery. A toad, using a sit-and-wait strategy, was observed attempting to capture several turtle hatchlings. It initially appeared to have no success in swallowing them; all the captured hatchlings were released after the ingestion attempts and no successful predation was observed. However, the *B. jimi* specimen was then captured and sacrificed; necropsy and examination of stomach contents revealed a *C. caretta* hatchling with a straight-line carapace length of 46 mm. In January 2004, another *B. jimi* specimen was found inside the hatchery, beside one of the nests, where there was a retained *C. caretta* hatchling. This time there were no dispersed turtle hatchlings in the hatchery. This toad was also captured and sacrificed and necropsy revealed one *C. caretta* hatchling in the stomach (no measurements were possible due to carapace damage caused by digestion).

The *B. jimi* specimens were deposited at Museu Nacional do Rio de Janeiro (MNRJ 30804) and Museu de Biologia Mello Leitão (MBML 3670); the ingested *C. caretta* were deposited at Museu de Biologia Mello Leitão (MBML 1706-07). We are grateful to Ulisses Caramaschi for the identification of MNRJ 3804 specimens, and Célio F. B. Haddad, Luciano S. Soares, and Gustavo G. Lopez for reviewing the manuscript. Projeto TAMAR-IBAMA is co-managed by Fundação Pró-TAMAR and is officially sponsored by PETROBRAS.

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**CHELONIA MYDAS AGASSIZII** (East Pacific Green Seaturtle). **MALE NESTING.** The Green Seaturtle is the most common marine turtle species in the Galapagos Islands and the only species that nests in the archipelago. Nesting activity is concentrated between the months of December and May (Green 1994. In Schroeder and Wilheingon [compilers], *Proc. of the 13<sup>th</sup> Symp. on Sea Turtle Biology and Conservation*. NOAA Tech. Mem. NMFS - SEFSC - 314:65–68; Zárte and Dutton 2002. In Danulat and Edgar [eds.], *Reserva Marina de Galápagos. Línea Base de la Biodiversidad*, pp. 305–323. Fundación Charles Darwin/Servicio Parque Nacional Galápagos, Santa Cruz, Galápagos, Ecuador). The most important nesting beaches are Quinta Playa (Isabela Island), Bahía Barahona (Isabela Island), Las Bachas (Santa Cruz Island), and Las Salinas (Seymour Island). A monitoring program at these sites was established during nesting seasons during 2002–2003 and recorded 2756, 1913, 1569, and 724 nesting females, respectively ((Zárte et al. 2003. In Seminoff [compiler], *Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation*, pp. 70–73. NOAA Tech. Memo. NMFS-SEFSC - 503 [Quinta Playa]; and Zárte, unpubl. data).

On 16 December 2004 and 21 February 2005 I observed apparent nesting behavior by male turtles, one at Bahía Barahona (Turtle 1, ID: GF497/GF440) and one at Las Salinas (Turtle 2, ID: LB772/LB773), respectively. These individuals were classified as males based on their tail length (TL: measured from the tip of the tail to the trailing edge of the carapace) and its prehensile character (Ernst et al. 1994. *Turtles of the United States and Canada*. Smithsonian Inst. Press, Washington, DC. 578 pp.). Both had tails longer than 20 cm, a male character (Wibbels 1999. In Eckert et al. [eds.], *Research and Management Techniques for the Conservation of Sea Turtles*, pp. 139–143. IUCN/SSC Marine Turtle Specialist Group Publ. No. 4). Turtle 1 was observed for about 1 h and 10 min; turtle 2 was observed for 45 min before it returned to the sea. Curved carapace lengths of Turtle 1 and Turtle 2 were 87.3 cm and 100.0 cm, respectively, whereas the TLs were 31.0 cm and 24.0 cm.