

1989. Mar. Turt. Newsl. 1989:7–8; Engeman et al. 2003. Biol. Cons. 113:171–178; Foote et al. 2000. Proc. Sea Turtle Symp. 18:189–190; Helmstetter and Atencio 1997. Endangered Species Update 14:3–5; Lewis et al. 1996. Proc. Sea Turtle Symp. 15:162–164; Mroziak et al. 2000. Chel. Cons. Biol. 3:693–698; Rusenko et al. 2000. Proc. Sea Turtle Symp. 18:209–211; Woolard et al. Herpetol. Rev. *in press*; Wright et al. 2000. Proc. Sea Turtle Symp. 12:210–212). Here we provide the first observations of Bobcat (*Felis rufus*) acting as a primary predator (excavator) of marine turtle nests.

We have made observations since 1997 on the beach at Hobe Sound National Wildlife Refuge (HSNWR), Jupiter Island, Florida. HSNWR offers undeveloped and protected beach habitat for nesting by loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), and green (*Chelonia mydas*) turtles, each of which is listed as threatened or endangered. Our first observation of bobcat excavation and predation of a turtle nest occurred in 2001. In that year 251 of the 1259 loggerhead nests, all 16 green turtle nests, and all 58 leatherback nests were marked for observation, for a total of 325 marked nests. On 10 September, a loggerhead nest was depredated by a bobcat. This was the only bobcat-predated nest during the 2001 nesting season, and it is the first observation of which we are aware where a bobcat excavated and predated the eggs of a marine turtle nest. The destruction of a single nest represented 0.4% of marked loggerhead nests and 0.3% of total marked nests for all marine turtle species.

In 2002, a total of 307 turtle nests were marked for observation; 132 of the 1062 loggerhead nests, all 142 green turtle nests, and all 33 leatherback nests. Two of the marked loggerhead nests were excavated and depredated by bobcats. This represented 1.5% of loggerhead nests and 0.7% of total marked nests on the refuge. Bobcat predation occurred on 29 and 30 July, which is when the maximal number of nests would be expected to be in this beach (e.g., Engeman et al., *op. cit.*).

Raccoons and armadillos are removed at HSNWR in an ongoing effort to protect turtle nests from these most destructive nest predators (Engeman et al., *op. cit.*). A predation rate around 1% by bobcats is negligible, especially when compared to depredation by raccoons and armadillos. While bobcat predation on turtle nests at its current level does not merit remediation, their populations and predation should be simultaneously monitored each year along with those for raccoons and armadillos in case their predation increases (for methodology see Engeman et al., *op. cit.*). On the other hand, if bobcat depredation remains at very low levels, then their presence on the beach may have the beneficial effect of deterring other, potentially more destructive, nest predators.

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Ave., Gainesville, Florida 32641, USA. *Corresponding author.

GOPHERUS POLYPHEMUS (Gopher Tortoise). **PREDATION.** *Gopherus polyphemus* is eaten by numerous native predators throughout its range (Ernst et al. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington. 578 pp.). Here, we document a non-native reptile species, the Savannah Monitor (*Varanus exanthematicus*), preying upon a juvenile *G. polyphemus* in Florida.

On 22 September 2002, an adult male (37.3 cm SVL, 1.2 kg) *V. exanthematicus* was collected by residents at 1212 Alhambra Way S., St. Petersburg, Pinellas Co., Florida (27°43.39'N, 82°39.10'W), and brought to a staff member at nearby Boyd Hill Nature Park. On 24 September 2002, this *V. exanthematicus* defecated scutes and all four legs of a juvenile *G. polyphemus* (ca. 50 mm CL), as well as body parts of two adult ox beetles (*Strategus antaeus*). The *V. exanthematicus* and prey items were deposited in the Florida Museum of Natural History (UF 135537).

This *V. exanthematicus* was collected in a residential area ca. 335 m SSE of the largest remaining *G. polyphemus* population on the southern Pinellas County peninsula (pers. obs.). *Gopherus polyphemus* is a protected species throughout its range and is listed as a species of special concern in Florida (Moler 1992. Rare and Endangered Biota of Florida, Vol. III. Amphibians and Reptiles, Univ. Press of Florida, Gainesville, 291 pp.). Major threats to the Gopher Tortoise include habitat loss and degradation (Diemer 1986. Herpetologica 42:125–133), but heavy predation on *G. polyphemus* nests and juveniles is also a threat, due to the species' deferred sexual maturity and low fecundity (Diemer 1992. *In* Moler [ed.], Rare and Endangered Biota of Florida, Vol. III. Amphibians and Reptiles, Univ. Press of Florida, Gainesville, pp. 123–127).

Presently, more than 40 non-native herpetofaunal species are reported to be established in Florida (Townsend et al. 2003. Iguana 10:111–118), including three large lizards, the Mexican Black Spiny-tailed Iguana (*Ctenosaura pectinata*), Black Spiny-tailed Iguana (*C. similis*), and Nile Monitor (*Varanus niloticus*) (Campbell 2003. Iguana 10:119–120; Enge et al. 2004, unpubl.; Krysko et al. 2003. Florida Sci. 66:74–79; Townsend et al. 2003. Herpetozoa 16:67–72) that can potentially prey on *G. polyphemus*. Although there is presently no evidence that *V. exanthematicus* has established itself in Florida, this note documents the first predation of a protected reptile species in Florida by a non-native reptile species. Although it is illegal to release nonindigenous animals without a permit from the Florida Fish and Wildlife Conservation Commission (FWC), enforcement difficulties and inadequate regulatory control suggest that the release of non-native fauna will continue to be a major contributor to the state's battle with invasive non-native species.

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GOPHERUS POLYPHEMUS (Gopher Tortoise). **JUVENILE**

BURROW COHABITATION. Hatchling and neonate chelonians have received little attention from field biologists (Morafka et al. 2000. Herpetol. Monogr. 14:353–370); thus most aspects of their ecology, including social behavior, are not well understood. In *Gopherus polyphemus*, adults often cohabit burrows with other conspecifics (see review in Smith et al. 1997. Chel. Cons. Biol. 2:358–362), or may usurp and enlarge burrows formerly inhabited by juveniles (Diemer 1992. J. Herpetol. 26:158–165); and juvenile tortoises occasionally occupy adult burrows (Douglass 1978. J. Herpetol. 12:413–415; Smith et al., *op. cit.*). Burrow sharing by juveniles has been previously reported (McRae et al. 1981. Am. Midl. Nat. 106:165–179; Diemer, *op. cit.*); however, the authors make no reference to the sizes of the animals nor do they provide descriptions of the sharing events. Herein we provide the first descriptive documentation of burrow cohabitation involving two juveniles, as well as another event involving two sibling hatchlings at the Kennedy Space Center, Brevard County, Florida.

From 9 July–10 August 2003 a juvenile tortoise (Juvenile 1; carapace length = 9.8 cm) was monitored at a burrow (burrow width = 13.1 cm) using a motion-triggered digital camera. On 1 August 2003 at 1023 h a Peeper video camera system (Sandpiper Technologies, Manteca, California, USA) was also placed outside of the same burrow. Analysis of the videotape revealed another juvenile using the same burrow. The following is a description of the events recorded on the videotape. (Prior to this, Juvenile 1 was recorded entering the burrow on 30 July at 1431 h).

At 1053 h a juvenile tortoise (Juvenile 2; approximately the same CL as Juvenile 1, inferred from the videotape) walked directly up to the burrow and began digging at the entrance until it entered the burrow at 1054 h. At three separate times (from 1147–1150 h, 1154–1155 h, and 1255–1259 h) Juvenile 2 emerged from the burrow headfirst, turned around to face the entrance, and worked at enlarging it. Between these events it was inside the burrow. At 1504 h Juvenile 2 exited the burrow and was not seen again on the videotape.

At 1519 h on the same day an adult tortoise (> 25 cm CL) approached and attempted to force itself into the juvenile burrow. When the adult was unsuccessful, it turned around, briefly pulled inside its shell as if disturbed by an unknown source, and left the area at 1521 h.

At 1706 h a sand-covered Juvenile 1 emerged from the burrow, bit at some vegetation, began digging in the burrow entrance, and reentered the burrow at 1709 h. No further tortoise activity was observed on the videotape, which ended at 1833 h. Logistical constraints did not allow further videotaping of this burrow, and digital camera data did not reveal further co-occupation of juveniles

within the burrow. Juvenile 1 left the burrow on 10 August 2003 and no tortoises have used it since.

At the same site, the burrow cohabitation of two hatchling tortoises hatched from the same nest (on 9 October 2003) was also observed. Both animals were given a unique mark and Hatchling 1 was outfitted with a radiotransmitter. Hatchling 1 was tracked daily from release until the present observation took place. During this time Hatchling 1 never dug a burrow, but instead used multiple short pallets. Hatchling 2 was recaptured on 8 March 2004 outside of its burrow (6.5 cm wide), fitted with a radiotransmitter, and released in the same location on 9 March. At the time we recaptured Hatchling 2 the tortoises were within 1.0 m of each other and both had dispersed 9.0 m from the nest since hatching.

After 9 March, Hatchling 2 was always in its burrow and Hatchling 1 was located 1.6 m away in its pallet. On 29 March Hatchling 1 was seen walking 1.8 m from the burrow of Hatchling 2. On 30 March both animals were found inside the burrow of Hatchling 2. Hatchling 2 was deeper inside the burrow and Hatchling 1 had about 20% of its body sticking out of the burrow. Over the next several days the tortoises remained in the same relative positions, but by 5 April both were completely inside the burrow. By 14 April Hatchling 2 had moved from the original burrow and dug another burrow 2.3 m away. Hatchling 1 was still using the original burrow.

Burrow takeover by tortoises has been reported elsewhere (Diemer, *op. cit.*). Little is known about the significance of social interactions between immature turtles and tortoises and even less is known about sibling interactions. Research into the behavioral interactions of Gopher Tortoises and other species, especially juveniles and siblings, should be a focus of future research.

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LEPIDOCHELYS KEMPII (Kemp's Ridley Seaturtle). **DIET.**

Dietary studies on post-pelagic *Lepidochelys kempii* document that crabs are a primary food source (Bjorndal 1997. *In* Lutz and Musick [eds.], *The Biology of Sea Turtles*, pp. 206–207. CRC Press, Boca Raton, Florida). Trawl fishery discards (fish or shrimp) may also be a supplemental food source in some regions. Portunid crabs are emphasized as a predominate prey item, but spider crabs, rock crabs, and lady crabs are also common in gut contents of live and stranded turtles. Here we report an attempted ingestion of a *Limulus polyphemus* (Horseshoe Crab) by a *L. kempii* in the Gulf of Mexico.

In September 2003, line transect surveys were conducted by the Sarasota Dolphin Research Program throughout Charlotte Harbor National Estuary along Florida's southwest coast. A survey on 8 Sept. encountered a *L. kempii* at 1329 h near the mouth of Alligator Creek (26.86555°N, -82.06394°W; depth 2.5 m, sandy-mud bottom adjacent to seagrasses composed of *Halodule*, *Syringodium*, and sparse *Thalassia*). The turtle swam at the surface with its head