

OPHISAURUS VENTRALIS (EASTERN GLASS LIZARD):
A REVIEW OF ROAD-KILL MORTALITIES AND OCCUR-
RENCE IN FLORIDA WITH NOTES ON AN UNUSUAL EVENT.

Ophisaurus ventralis is a common, but frequently cryptic reptile of southeast Florida pine flatwoods interspersed with wet prairies and moist herbaceous areas. Although the species has been documented from most areas with this type of natural community managed by the Florida Park Service (FPS) in southeast Florida (FPS unpubl. data); it is infrequently encountered because of its secretive and semi-fossorial habits.

Road-kill of vertebrate wildlife resources in FPS state parks is a major problem and has been well-reported (Smith *et al.* 1994. Fla. Field. Nat. 22: 81–83; Bard *et al.* 2002. Wildlife Soc. Bull. 30: 603–605; Smith *et al.* 2003. Fla. Field Nat. 31: 53–58). Yet, road-killed *Ophisaurus ventralis* in state parks are rarely encountered (Smith *et al.* 2003, *op cit.*; H. T. Smith unpubl. data), even though Ashton and Ashton (1985. Handbook of Reptiles and Amphibians of Florida, Vol. Two. Windward Publ. Inc. Miami, Florida. 191 pp.) reported the species is frequently found on roadways during mid-morning and early evening. For example, a four year, daily (7 days/week), road-kill survey of 4,642 ha (11,471 acre) Jonathan Dickinson State Park in Martin County, Florida, conducted during 1995–1998, discovered 256 road-killed herpetofauna; however, only 5 of these were *O. ventralis* (H. T. Smith unpubl. data). An identical study conducted 1997 - 2000 at 126 ha (312 acre) urban John U. Lloyd State Park in Broward County resulted in the finding of 16 road-killed herpetofauna none of which were *O. ventralis* (Smith *et al.* 2003, *op. cit.*). During a 44-month survey of herpetofauna species around Lake Jackson in Leon County, Florida from 2000 – 2003, only 14 of the 10,229 species (0.13%) found were *O. ventralis* (Aresco 2005. Jour. Wildlife Mgmt. 69:549-560). In a 2 year survey of Paynes Prairie State Preserve in Alachua County, Florida, only 1 (0.05%) *O. ventralis* was discovered out of the 1,891 road-killed species encountered (Dodd *et al.* 2004. Biol. Conserv. 118:619-631). In this regard, our opportunistic concurrent finding of two road-killed *O. ventralis* individuals is very uncommon.

On 10 August 2006 at 1650 h, a muggy, partly sunny early evening with an air temperature ca. 80 - 85° F (27 - 29° C), HTS found two freshly road-killed *Ophisaurus ventralis* ca. 1 m apart on an unimproved dirt road in Savannas Preserve State Park (2,115 ha) (5,227 acres) located in St. Lucie County, Florida. Both lizards were about the same size (50 – 60 cm), and had apparently been hit at the same time on the east side of the road by the same vehicle. CAG and HTS had just previously been at this exact location at 1430 h conducting herpetofauna coverboard sampling

and the dead lizards were not then present. Immediately adjacent habitat to the road consisted of roller-chopped pine flatwoods interspersed with wet prairies and extensive grassy areas to the east, and rough pine flatwoods with wet prairies to the west. The dirt road surface was slightly damp from earlier rainfall.

It is very unlikely that these two individual Eastern Glass Lizards were engaged with each as a mating pair, as copulation for these lizards in our region occurs in the spring season from March to May (The Georgia Museum of Natural History and Georgia Department of Natural Resources. Glass Lizards. [Internet] 2000 Jun 1 [Cited 2006 Sep 6]). Available from:

<http://museum.nhm.uga.edu/gawildlife/reptiles/squamata/lacertilia/anguidae/ophisaurus.html>

Due to the similarity in size and the close distance between the two, we conjecture that one individual was scent-trailing the other or that they were exhibiting territorial behavior, although we could not find corroborating descriptions of these phenomena in the literature.

Other documented sources of mortality for *Ophisaurus* spp. include predation by various snakes, hawks, wading birds, and mammals (Means 1992. *In* Moler [ed.], Rare and Endangered Biota of Florida, Vol. 3, pp. 247-250, Univ. Press Florida, Gainesville; Beane 1995. Wildlife Profiles, NC Wildlife Resources Commission, Raleigh, North Carolina. 2 pp.; Moore *et al.* 2005. Herpetol. Rev. 36:182), and for *O. ventralis* wildfire and prescribed fire induced mortality (Kaufmann and Smith. *In* press. Herpetol. Rev.).

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ARTICLES

The Appearance of the Exotic Green Iguana as Road-kills in a Restored Urban Florida State Park: The Importance of an 11-Year Dataset

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Abstract: We examined 11 years of reptile road-kill data from Cape Florida State Park (CFSP), a vegetatively restored, urban state park in South Florida previously destroyed by Hurricane Andrew in August 1992. We found eight reptile species dead on park roads, three of which were exotic. The native Southern Black Racer and the exotic Green Iguana each comprised 30.4% of the total number of road-killed reptiles. The three exotic reptile species combined accounted for 36.3% of all reptiles recovered in this study. Our findings underscore the threat of shifting exotic species dominance faced by protected lands, such as CFSP, and also the importance of quantifying species abundance in various ways so as to provide the sorts of data necessary to make sound management decisions and evaluate their results.

INTRODUCTION

Road-kills of amphibians and reptiles are a major cause of mortality for a wide variety of taxa (Ashley and Robinson 1996, Haxton 2000, Trombulak and Frissell 2000, Hels and Buchwald 2001, Dodd *et al.* 2004, Engeman *et al.* 2004, Aresco 2005, Rossmannith and Smith 2006, Shwiff *et al.* in press). Furthermore, the issue of exotic amphibians and reptiles is a vexing problem in Florida (Meshaka *et al.* 2004a, Meshaka 2006), the United States (Meshaka 2007), and worldwide (Lever 2003).

This paper compares native and exotic reptile mortality due to collisions with vehicles during 1996 - 2006 at Bill Baggs Cape Florida State Park (CFSP), a small, urban park located in Miami-Dade County, Florida, USA, on Key Biscayne approximately seven miles southeast of metropolitan Miami.

STUDY SITE AND METHODS

Cape Florida State Park consists of 325 acres (131.5 ha) of uplands and 106 acres (42.9 ha) of tidal and freshwater wetlands for a combined total of 431 acres (174.4 ha) (Smith *et al.* 2007, FDEP 2001). CFSP is completely encapsulated by urban high-rise infrastructure to the North, the Atlantic Ocean to the South and East, and Biscayne Bay to the West. Terrestrial access is only at the Northern interface.

Hurricane Andrew completely devastated CFSP on 24 August 1992. Prior to the storm, the park had been dominated by a near monoculture of Australian-pines (*Casuarina equisetifolia*), a large exotic tree whose canopy rose to more than 30 meters. This forest was

destroyed, and the subsequent clearing of debris left the park almost barren of vegetation. An ecological restoration plan was developed for the park, with the goal of reestablishing, to the extent possible, the native plant communities that once existed on site. This plan was initiated in 1993, and multiple years of replanting followed.

By the time of the conclusion of our road-kill study in 2006, the park securely supported 10 restored natural plant communities in diverse stages of maturity (Smith *et al.* 2007, FDEP 2001). The upland habitat communities principally consisted of 1.2 miles (1.9 km) - 6 acres (2.4 ha) of beach dune, 152 acres (61.5 ha) of coastal strand, 88 acres (35.6 ha) of maritime hammock, and 11 acres (4.4 ha) of coastal grassland (FDEP 2001). Eleven acres (4.4 ha) of ruderal habitat and 54 developed acres (21.8 ha) composed the remaining uplands (Smith *et al.* 2007, FDEP 2001). There also are approximately 10 acres (4.0 ha) of freshwater in five interdunal swale ponds during the wet season which in some years go completely dry (FDEP 2001).

A road-kill survey was opportunistically conducted during 1996 - 2006 at CFSP along ca. 2 km of paved, two-lane road (with variable speed limits of 24.1 - 40.2 km/hr) by Park Rangers and other staff. This survey did not consist of the rigid protocol reported for other Florida state parks (see method reviews in Smith *et al.* 1994, Bard *et al.* 2002, Smith *et al.* 2003, Rossmannith and Smith 2006, Shwiff *et al.* in press) but data were instead opportunistically collected during various staff activities involving transit on park

roadways. Road-killed animals were identified to the species level whenever possible, and data were then compiled by years.

RESULTS AND DISCUSSION

During 1996 - 2006, 135 road-killed individuals were recovered at CFSP. Five native snake species, two exotic lizard species, and one exotic aquatic turtle were found (Figure 1). Forty-one Southern Black Racers (*Coluber constrictor priapus*) comprised 30.4% of all road-kills, and 22 Corn Snakes (*Elaphe guttata*) comprised 16.3% of all road-kills, and were the most common snakes road-killed. The dominance of the Southern Black Racer among road-killed snakes at our site is typical in rural and urban southeast Florida state parks (HTS pers. obs., Smith *et al.* 2003, Rossmannith and Smith 2006, Shwiff *et al.* in press). Among snakes, the Yellow Rat Snake (*E. obsoleta quadrivittata*), Scarlet Kingsnake (*Lampropeltis triangulum elapsoides*), Southern Ringneck Snake (*Diadophis punctatus punctatus*), and unidentified individuals were killed in lower frequencies (Figure 1). Collectively, the identified native species comprised 60.0% of all roadkills.

Forty-one exotic Green Iguanas (*Iguana iguana*) comprised 30.4% of all road-kills, and together with seven Giant Ameivas (*Ameiva ameiva*), and one Red-eared Slider (*Trachemys scripta elegans*), these three exotic species collectively comprised an astounding 36.3% of all road-kills. The Green Iguana did not appear as a road-kill until 2001 (Figure 2), at which time the Florida Park Service initiated a program to remove this species from the park (Smith *et al.* 2007). Soon thereafter, the Green Iguana became more prevalent in the road-kill survey (Figure 2), and the peak number of road-killed Green Iguanas during 2003 coincided with the highest density of Green Iguanas calculated for the park of 626.6 iguanas/km² (Smith *et al.* 2007). The Green Iguana has reached very high densities in CFSP (Meshaka *et al.* 2004b, Smith *et al.* 2007, Meshaka *et al.* in prep.) as it has in several other Florida parks (Townsend *et al.* 2003, Meshaka *et al.* 2004b, Smith *et al.* 2006). We were, therefore, not surprised at the frequency of its occurrence as a road-kill, the values of which are all the more remark-

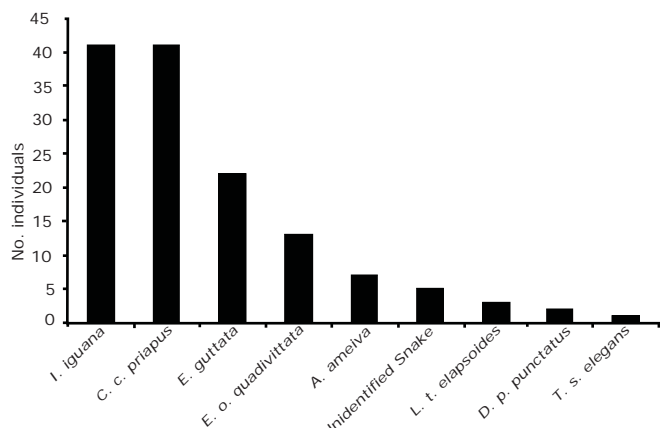


Figure 1. Numbers of reptile species in descending frequency recovered as road-kills during 1996–2006 at Cape Florida State Park, Miami-Dade County, Florida.

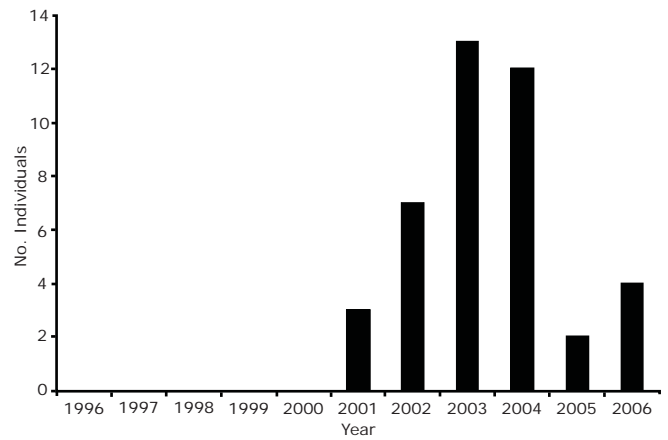


Figure 2. Number of Green Iguanas (*Iguana iguana*) recovered as road-kills during 1996–2006 at Cape Florida State Park, Miami-Dade County, Florida.

able in light of the opportunistic nature of this study. Our results underscore the susceptibility to herpetofaunal community restructuring by exotic species in protected lands such as CFSP. Our results also provide the quantitative data that can prove useful when formulating management plans and measuring results of those plans to bring a system and its various components closer to historical norms as has been the case at CFSP.

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In 2009, five-year-old Daisy Morris discovered the remains of an undiscovered species on the beach, which has been named after her – the Vectidraco (Dragon of the Wight) *Daisymorrisae*! G. The correct spelling of the island’s name is Wight not White. Wight is a Middle English word that was used to describe a creature or living being. The Green House Effect. (A) Saving the world begins at home. The energy we use to power our daily domestic lives and drive our cars produces almost half of our output of carbon dioxide, the gas which is the main contributor to the problem of global warming. 6. Which of the following statements is the author most likely to agree with? A. In the future, houses will be much healthier. B. In the future, people will produce much less waste. C. In the future, very few people will own their own car.

â€¢ The appearance of the exotic green iguana as road-kills in a restored urban Florida state park: the importance of an 11-year dataset more. by Walter Meshaka. mortality due to collisions with vehicles during 1996 - 2006 at Bill Baggs Cape Florida State Park (CFSP), a small, urban park located in Miami-Dade County, Florida, USA, on Key Biscayne approximately seven miles southeast of 3*, more.Â

â€¢ green iguanas (*Iguana iguana*): the unintended consequence of sound wildlife management practices in a south florida park more. by Jon Moore. and Walter Meshaka.