

Green Iguana, *Iguana iguana* (Linnaeus, 1758) Disrupts the Nesting of Birds in Puerto Rico¹

Raúl A. Pérez-Rivera²

Abstract – Controversy exists regarding possible negative effects that the Common Green Iguana, *Iguana iguana*, may have on nesting birds and nest substrates in Puerto Rico. It also has been suggested that green iguanas feed on the eggs and chicks of nesting birds. Green iguanas may also flush birds from their nests as they clamber by. Flushed from their nests, birds are known to inadvertently eject nest contents (eggs and/or nestlings), thus unwillingly causing them to fall to the ground. There is a large number of *I. iguana* living in the Humacao Campus of the University of Puerto Rico. Herein, I provide evidence documenting the accidental destruction of birds' nests and their nesting vegetation by green iguanas as they move clumsily through the vegetation. However, biweekly surveys since 2014 have not provided evidence that *I. iguana* preys on eggs or nestlings of nesting birds on the campus. Green iguanas may occasionally and opportunistically prey on eggs and chicks, especially those of diminutive species. Nevertheless, more often adult *I. iguana* may be unintentionally disrupting avian reproduction by accidentally destroying nests while moving along tree branches or through other types of vegetation.

Resumen: Existe controversia con respecto a los posibles efectos negativos que la Iguana Verde Común, *Iguana iguana*, puede tener sobre las aves que anidan y los sustratos de nidos en Puerto Rico. También, se ha sugerido que las iguanas verdes se alimentan de huevos y polluelos de aves que anidan. Las iguanas verdes también pueden expulsar a las aves de sus nidos mientras trepan. Expulsados de sus nidos, se sabe que las aves expulsan inadvertidamente el contenido del nido (huevos y/o polluelos), lo que provoca que éstos caigan al suelo. Existe una gran cantidad de *I. iguana* viviendo en el Recinto Humacao de la Universidad de Puerto Rico. Proporciono evidencia que documenta la destrucción accidental de los nidos de aves y su vegetación de anidación por las iguanas verdes que se mueven incómodamente a través de la vegetación. No obstante, encuestas quincenales desde 2014 no han proporcionado evidencia de que *I. iguana* se alimenta de huevos o polluelos de aves que anidan en el campus. Las iguanas verdes pueden ocasionalmente y de manera oportunista depredar huevos y polluelos, especialmente los de especies diminutas. No obstante, con mayor frecuencia, la *I. iguana* adulta puede estar interrumpir involuntariamente la reproducción de las aves al destruir accidentalmente los nidos mientras se desplaza a lo largo de las ramas de los árboles o a través de otros tipos de vegetación.

Key Words: *Iguana iguana*, birds, nesting, nest disruption, Puerto Rico

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² Department of Biology, University of Puerto Rico, Humacao, PR 00792. Email: raul.perez8@upr.edu.

Introduction

Controversy exists regarding possible negative effects that the Green Iguana, *Iguana iguana* (Linnaeus, 1758), may be having on nesting birds and their nest substrates in Puerto Rico. Although the species spends most of its life in trees, descending mostly to move, mate, lay eggs, or change trees, some have considered the species a threat to Puerto Rico's biodiversity (Joglar 2005, López-Torres et al. 2012). Green Iguanas consume the leaves of young plants, affect the germination of some seeds and have been reported to prey on bird eggs, chicks and small mammals (Loftin and Tyson 1965, Schwartz and Henderson 1991, Rivero 1998, Savage 2002, Engemant et al. 2005, Krysko et al. 2007, López-Torres et al. 2012, Govender et al. 2012, Burgos-Rodríguez 2016). Conversely, Arendt (1986) suggested an alternative to direct depredation on nests and small mammals, advocating that Green Iguanas, especially inexperienced young, may scavenge nest contents, e.g., addled eggs and deceased nestlings, thus performing sanitary predation as shown by other reptilian predators (Jenni (1969).

Intentional predation on Puerto Rico's fauna by Green Iguanas has been challenged by Carlo and García-Quijano (2008) and Arce-Nazario and Carlo (2012). Moreover, Arce-Nazario and Carlo (op. cit.) questioned the methodology used by Lopez-Torres et al. (2012) and considered as anecdotal most of the historical predation reports on eggs and chicks attributed to the Green Iguana. Research conducted by Carlo and García-Quijano (2008) revealed no iguana predation of artificial nests containing fresh eggs placed in mangrove trees in areas exhibiting high Green Iguana densities and monitored with camera-traps activated by motion and/or heat. The 1,896 h of video recorded egrets, *I. iguana*, and rats visiting the artificial nests, but only rats were documented depredating the eggs (Carlo and García-Quijano, op. cit.).

Methods

There are large, and often local, introduced populations of the green iguana living in Puerto Rico (Rodríguez Gómez et al. 2020). This paper is the result of nest surveys conducted since 2014 on the campus of the University of Puerto Rico-Humacao (UPRH, 18°8'57.59"N; 65°50'18.29"W, 30 m a.s.l.), coupled with incidental data collected at the Bairoa Park Urbanization, Caguas (Bairoa, 18°14'2.83"N; 66°02'54.68"W, 120 m a.s.l.) and at Pfizer Pharmaceutical at Guayama (17°95'96"N; 66°14'58" W, 89 m a.s.l.), collected in 2011. The vegetation of the Humacao campus was examined biweekly for nesting-birds. The birds incubating or attending a nest were used to identify the nesting species. Nests were followed until these failed or the nestlings fledge. Both, the Humacao and Bairoa, Caguas, localities are described in literature (Pérez-Rivera 2000, 2018, 2019). Guayama is a city in the south of Puerto Rico and the vegetation at Pfizer could be described as a lawn in which arboreal vegetation have been planted.

Results and Discussion

On 11 September 2011, while conducting bird surveys on the Pfizer, Inc. property on the outskirts of Guayama, I observed an adult Green Iguana in a Kikar tree, *Pithecellobium dulce* (Roxburgh) Bentham (Fabaceae), descending from a top branch to a lower one, apparently to better access young leaves. The upper branch supported an unattended nest of the Gray Kingbird, *Tyrannus dominicensis* (Gmelin, 1788). When the Green Iguana reached the lower branch and released the upper branch that it was still holding on to with one of its hind legs, the contents of the nest (two eggs) were catapulted to the ground. On 17 December 2011, I observed the same behavior by a different Green Iguana attempting to gain access to a lower branch. However, in this instance, the Green Iguana caused a displacement of a Bananaquit, *Coereba flaveola* (Linnaeus, 1758), nest, which was left hanging from the tip of the rustled branch, and consequently abandoned by its owners. A similar instance occurred on 13 June 2020, while the author was waiting in the drive-through lane at a bank in Caguas. He observed a massive male Green Iguana eating flowers of a White cedar tree, *Tabebuia heterophylla* (de Candolle) Britton (Bignoniaceae). The Green Iguana descended from a higher to a lower branch to forage on remaining flowers. During its descent, however, because of its large size, the lower branch vibrated enough to dislodge a Bananaquit nest, placing it precariously near the tip of the lower branch. The nest was left hanging from the branch by just a few of the many original vegetative strands used to securely anchor the nest during its construction.



On 24 April 2020, at Bairoa Park, Caguas, a Green Iguana climbed an Areca palm, *Dypsis lutescens* (Hermann Wendland) Henk Jaap Beentje and John Dransfield, while trying to escape from a pursuing dog. As the fleeing *I. iguana* scrambled over the fronds as it climbed, a White-winged Dove (WWDO), *Zenaida asiatica* (Linnaeus, 1758), was flushed from her nest, causing an egg to drop to the ground. In the afternoon of the same day, I also found the WWDO nest on the ground (Figure 1), probably dislodged from the branch by the sheer size and mass of the iguana, although I did not see the Green Iguana still in the palm.

Figure 1. Raceme of an Areca palm, *Dypsis lutescens*, cradling a White-winged Dove nest, in which both nest and eggs fell to the ground after the raceme was severed by a Green Iguana moving through the lower extremes of the palm's crown. Usually, the platform of the nest is approximately 7-9 inches (18-23 cm) diameter. This nest is larger as the *Z. asiatica* reused it adding more material.

On the campus of the University of Puerto Rico at Humacao, my students and I have observed eggs of the Common Ground-Dove, *Columbina passerina* (Linnaeus, 1758), White-winged Dove and Scaly-naped Pigeon, *Patagioenas squamosa* Bonnaterra, 1792, on the ground. In the case of the Common Ground-Dove, the egg was not broken, and the other eggs were void of the usual teeth marks left by rats or the punctures and peck marks of aerial predators. In addition, we have found an undamaged nest of the Common Ground-Dove on the ground, without any signs of predation, apparently catapulted from a branch. The only apparent common denominator ascribed to these trees is that they have been colonized by *I. iguana* while the nests of these birds were in still in the incubation stage.

In general, it is unusual to find bird nests in trees already occupied by Green Iguanas. At Guayama, of 23 Kikar trees occupied by the reptiles, birds used only three trees in which to nest. At the Humacao campus, although we do not have an exact count of trees of Amboyna, *Pterocarpus indicus* Willdenow (Fabaceae), those occupied by Green Iguanas are seldom used by birds as nest-trees, except occasionally used by nesting Bananaquits. Nevertheless, Kapok trees, *Ceiba pentandra* (Linnaeus) Gaertner (Fabaceae), also commonly used by the Green Iguana, are used occasionally by some avian species that are known to nest quite high (>8 m) in the upper story canopy, possibly to avoid foraging Green Iguanas or those basking to elevate body temperature. We have found nests of the Scaly-naped Pigeon (n = 4), WWDO (n = 4), Puerto Rican Spindalis, *Spindalis portoricensis* Bryant, 1866 (n = 2), and Red-legged Thrush, *Turdus plumbeus* Linnaeus, 1758 (n = 1) on Kapok trees. Pigeon and Spindalis nests failed during the incubation stage. Considering WWDO nests, two placed >7 m high failed, whereas two others placed at heights of 3–5 m were successful. The only successful nest >8 m above ground level was that of the thrush. Although its traditional, open-cup nest was securely placed in the basal split of three branches. Damage to other nests was most probably caused during the morning hours when the Green Iguanas move to the highest branches to bask in the sunshine.

There is a high-density of *I. iguana* at the UPR-Humacao campus. We have observed up to five adults in a single tree. Nevertheless, since 2014, during biweekly nesting bird surveys, my students and I have not observed a single case of intentional egg or chick predation by Green Iguanas.

In conclusion, sporadically, young *I. iguana* may prey on eggs and young of open nests birds, particularly of small species. Nevertheless, more often adult green iguanas may be unintentionally disrupting avian reproduction by recklessly destroying nests while moving along tree branches or through other types of vegetation.

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Literature Cited

- Arendt, W. 1986. An observation of *Iguana iguana* feeding on eggs of the Cattle Egret (*Bubulcus ibis*) at Fox's Bay, Montserrat, West Indies: a case of predation or scavenging? *Caribbean Journal of Science* 22:221–222.
- Arce-Nazario, J. and T. Carlo. 2012. *Iguana iguana* invasion in Puerto Rico: facing the evidence. *Biological Invasions* 14(9):1981–1984. <https://doi.org/10.1007/s10530-012-0196-y>
- Burgos-Rodríguez, J.A., K. J. Avilés-Rodríguez, and J. J. Kolbe. 2016. Effects of invasive Green Iguanas (*Iguana iguana*) on seed germination and seed dispersal in southeastern Puerto Rico. *Biological Invasions* 18:2775–2782. <https://doi.org/10.1007/s10530-016-1190-6>
- Carlo, T. and C. G. García-Quijano. 2008 (30 September). Assessing ecosystem and cultural impacts of the green iguana (*Iguana iguana*) invasion in the San Juan Bay Estuary (SJBE) in Puerto Rico. Unpublished final report.
- Engeman, R. M., E. M. Sweet, and H. T. Smith. 2005. *Iguana iguana* (Green Iguana): predation. *Herpetological Review* 36: 320.
- Govender, Y., M. C. Muñoz, L. A. Ramírez-Camejo, A. R. Puente-Rolón, E. Cuevas, and L. Sternberg. 2012. An isotopic study of diet and muscles of the green iguana (*Iguana iguana*) in Puerto Rico. *Journal of Herpetology* 46(2):167–170. <https://doi.org/10.1670/11-004>
- Jenni, D. A. 1969. A study of the ecology of four species of herons during the breeding season at Lake Alice, Alachua County, Florida. *Ecological Monographs* 39:245–270. <https://doi.org/10.2307/1948546>
- Joglar, R. L. (Editor). 2005. *Biodiversidad de Puerto Rico. Vertebrados Terrestres y Ecosistemas: Serie de Historia Natural*. Editorial Instituto de Cultura Puertorriqueña. San Juan, PR. 563 pp.
- Krysko, K. L., K. M. Enge, E. M. Donlan, J. C. Seitz, and E. A. Golden. 2007. Distribution, natural history, and impacts of the introduced green iguana (*Iguana iguana*) in Florida. *Iguana* 3: 2–17.
- Loflin, H. and E. L. Tyson. 1965. Iguanas as carrion eaters. *Copeia* 1965:515. <https://doi.org/10.2307/1441007>
- López-Torres, A. L., H. J. Claudio-Hernández, C. A. Rodríguez-Gómez, A. V. Longo, and R. L. Joglar. 2012. Green iguanas (*Iguana iguana*) in Puerto Rico: Is it time for management? *Biological Invasions* 14(1):35–45. <https://doi.org/10.1007/s10530-011-0057-0>
- Pérez-Rivera, R. A. 2000. Alimento y conducta alimentaria, no informada del Mozambique de Puerto Rico (*Quiscalus niger brachypterus*). *El Pitirre* (USA) 13:40–41.
- Pérez-Rivera, R. A. 2018. Important plants for urban birds in Puerto Rico after the impact of a severe hurricane. *Equilibrium* (Humacao, PR) 2:20–34.
- Pérez-Rivera, R. A. 2019. Use of millipedes as food and for self-anointing by the Puerto Rican Grackle (*Quiscalus niger brachypterus*). *Ornitología Neotropical* 30:69–71.
- Rivero, J. A. 1998. The amphibians and reptiles of Puerto Rico, 2nd ed. Editorial de la Universidad de Puerto Rico. San Juan, PR. 510 pp.
- Rodríguez Gómez, C. A., R. L. Joglar, M. Solórzano, and W.A. Gould. 2020. A distribution model for the Green Iguana, *Iguana iguana* (Linnaeus, 1758) (Reptilia: Iguanidae), in Puerto Rico. *Life: The Excitement of Biology* 7(4):181–196.
- Savage, J. M. 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas. University of Chicago Press. Chicago, Illinois, USA. 934 pp.
- Schwartz, A and R. W. Henderson. 1991. Amphibians and Reptiles of the West Indies – Descriptions, Distributions, and Natural History. University of Florida Press. Gainesville, Florida, USA. 720 pp.