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An Incipient Population of Argentine Black and White Tegus (*Salvator merianae*) in Charlotte County, Florida, USA

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Abstract.—**Argentine Black and White Tegus (*Salvator merianae*) are a popular lizard species in the live animal pet trade, which has led to two established, breeding populations in Florida, USA, prior to this study. Tegus are a threat to native ecosystems through direct depredation of native wildlife and competition for resources making them a high priority for management action. In June 2018, the Florida Fish and Wildlife Conservation Commission (FWC) discovered a third novel, distinct population of Argentine Black and White Tegus emerging in Charlotte County, described herein. We initiated an intensive trapping effort in Charlotte County to learn more about the Tegu population, mitigate their spread, and reduce the number of individuals in the impacted area. We set baited live traps during the Tegu active season from 2018-2020, resulting in the capture and removal of 170 Tegus from the population. We also used *post hoc* land cover class associations with trapping locations to provide descriptions of habitat and trapping success. Our average catch per unit effort (CPUE) was 0.021 Tegus per trap day with the highest percentage (42.3%) of captures occurring in the rural land classification. Although the Tegus in Charlotte County seem to be spatially distributed within a much smaller geographic area than the larger, established population in Miami-Dade County, the CPUE for both populations are similar, which may suggest comparable densities between the populations. Future management and research efforts should focus on strategies aimed at obtaining reports from an engaged public, containing the population, and removing as many Tegus as possible, especially in nearby ecologically sensitive areas.**

Key Words.—emergent; introduction; invasive; lizard; nonnative; trapping

Introduction

Invasive species are a well-known threat to native ecosystems and can impact biodiversity in multiple ways, including direct depredation of native species (Doherty et al. 2016) or indirectly through competition (e.g., Wardle et al. 1994; Shinen and Morgan 2009), disease transmission (e.g., Hanselmann et al. 2004), and ecosystem function disruption (e.g., Miehls et al. 2009). Consequently, invasive species are often considered to be the second largest threat to global biodiversity after habitat destruction (Wilcove et al. 1998), and invasives cost countries like the USA hundreds of millions, if not billions, of dollars annually (Pimentel et al. 2005; U.S. Fish and Wildlife Service 2012; Diagne et al. 2020). Introduction pathways for nonnative species typically occur via intentional releases, accidental escapes from containment, or unintentional introductions (e.g., transportation in shipping containers as stowaways; Saul et al. 2017). While prevention of introductions is clearly the most cost-effective management option (Harvey and Mazzotti 2016), it is often impossible or impractical to prevent all introductions and many places throughout the world have now experienced significant biodiversity loss due to nonnative species invasions (Engbring and Fritts 1988; Ricciardi et al. 1998; Dorcas et al. 2012).

Florida (USA) faces one of the most significant invasive fish and wildlife issues of any place in the world. To date, Florida has had over 500 recorded nonnative fish and wildlife species introductions, approximately 150 of which are breeding in the wild (Florida Fish and Wildlife Conservation Commission [FWC], unpubl. data). With approximately 67 species (45%; Krysko et al. 2016), nonnative herpetofauna make up the largest taxonomic portion of established invasive wildlife species in the state. The large percentage of established nonnative herpetofauna in Florida is likely due in part to the many major ports of entry (15 public seaports) that enable purposeful or incidental importation of nonnative species. The subtropical climate of southern Florida also acts as both an ideal location for cost-effective husbandry (i.e.,

outdoor enclosures are generally cheaper than indoor) creating a hotspot for the commercial reptile industry while also enabling many released/escaped nonnative herpetofauna to survive and thrive (Meshaka et al. 2004; Engeman et al. 2011). Not all invasive species pose the same threat to the environment, however, and not all species can be controlled as effectively as others. Management agencies must determine risk of a species and triage responses to focus on species where control strategies are the most effective at mitigating damage.

Tegus (Squamata: Teiidae) are the largest terrestrial lizards native to the Western hemisphere and occur naturally within several South American countries (Enge 2007). In their native range, Argentine Black and White Tegus (*Salvator merianae,* previously *Tupinambis merianae*) are considered habitat generalists and can be found around human settlements and in a variety of disturbed and undisturbed forest types (Fitzgerald et al. 1991). Argentine Black and White Tegus (henceforth simply Tegu when referring to *S. merianae*) are not native to Florida, but are one of the most commercially exploited reptiles in the world (Fitzgerald 1989) and are relatively common in the pet trade throughout the U.S. There is little doubt that the high propagule pressure (Lockwood et al. 2005) created by the commercial pet trade is responsible for the establishment of these current invasive Tegu populations in Florida (Enge 2007; Krysko et al. 2016; Wood et al. 2018). Two distinct, independent, and established Tegu populations have been formally identified in Hillsborough/Polk County (Enge 2007) and Miami-Dade County (Pernas et al. 2012) in Florida. In addition to the Argentine Black and White Tegus, there have also been 19 Gold Tegus (*Tupinambis teguixin*) and 13 Red Tegus (*Salvator rufescens*) reported in Florida as of 1 January 2021, the former of which may have a breeding population in Miami-Dade County (Edwards et al. 2017).

Tegus are generalist omnivores, eating a varied diet of plant matter, fruits, invertebrates, eggs, and small vertebrates (Mercolli and Yanosky 1994; Kiefer and Sazima 2002) and they have already been documented consuming a wide variety of native Florida fauna, including hatchlings of the state listed as Threatened Gopher Tortoise (*Gopherus polyphemus*) and eggs of the American Alligator (*Alligator mississippiensis*; Mazzotti et al. 2015; Offner et al. 2021). Egg consumption by Tegus (Achaval 1977; Escalona and Fa 1998) suggest they are a considerable threat to other native ground nesting species in Florida, including native reptiles and ground nesting birds. The persistence of the already established populations demonstrates that Tegus can thrive in Florida, and species distribution models (Jarnevich et al. 2018) and experiments using semi-natural enclosures in Alabama (Goetz et al. 2021) suggest they could survive throughout much of the Southeastern U.S., and possibly beyond. An incipient population has already been recognized in Georgia, and overwinter survival of that population has been documented (Haro et al. 2020). The impact of Tegus on native fauna and their ability to spread and survive throughout the Southeastern U.S. makes this species a high priority for management action.

The FWC and their partners have taken steps to increase reporting of nonnative fish and wildlife from the public through several outreach and education tools (press releases, public workshops, incentive programs, and social media posts). The FWC and partner organizations coordinate efforts to respond rapidly to new sightings by monitoring web-based reports provided by the Early Detection and Distribution Mapping System of the University of Georgia (www.IveGot1.org) and by taking direct calls from the public through the Exotic Species Hotline of FWC (1-888-Ive-Got1). Through these reporting tools, we detected and began management efforts on a seemingly novel, emergent Tegu population located in Punta Gorda, Florida, Charlotte County, USA.

We report on this newly discovered population of Tegus and a summary of our work to trap and remove as many as possible from the environment. Our efforts were aimed at evaluating the extent of the population using reports from the public and by trapping and capturing as many Tegus as possible to mitigate dispersal and minimize adverse impacts to native wildlife. Herein, we provide a descriptive report of the results of trapping efforts through 2020. Specifically, we report: (1) morphometric data; (2) catch per unit effort (CPUE); and (3) land cover associations of trapping locations and captured Tegus in the impacted area of Charlotte County. We compare our results with those from other Tegu populations in Florida and provide recommendations on future management and research needs.

Materials and Methods

The FWC received a verified report of a live Tegu on 21 April 2018, crossing a street in a rural area in Punta Gorda, Florida. Soon after, the FWC received a follow-up report from a citizen in the area stating that they had seen multiple tegus and provided photographic proof of one that was deceased on the road prior to the live observation on 21 April 2018 confirming that there were multiple tegus in the area. Agency staff immediately began mobilizing equipment, determined the best areas to deploy traps, and began working to increase reports from members of the public. To increase reports, we increased public awareness using mailers (n = 1,756 addresses), signs along major thoroughfares, press releases, outreach presentations to nearby communities, and door-to-door knocking. In addition to outreach, we began working

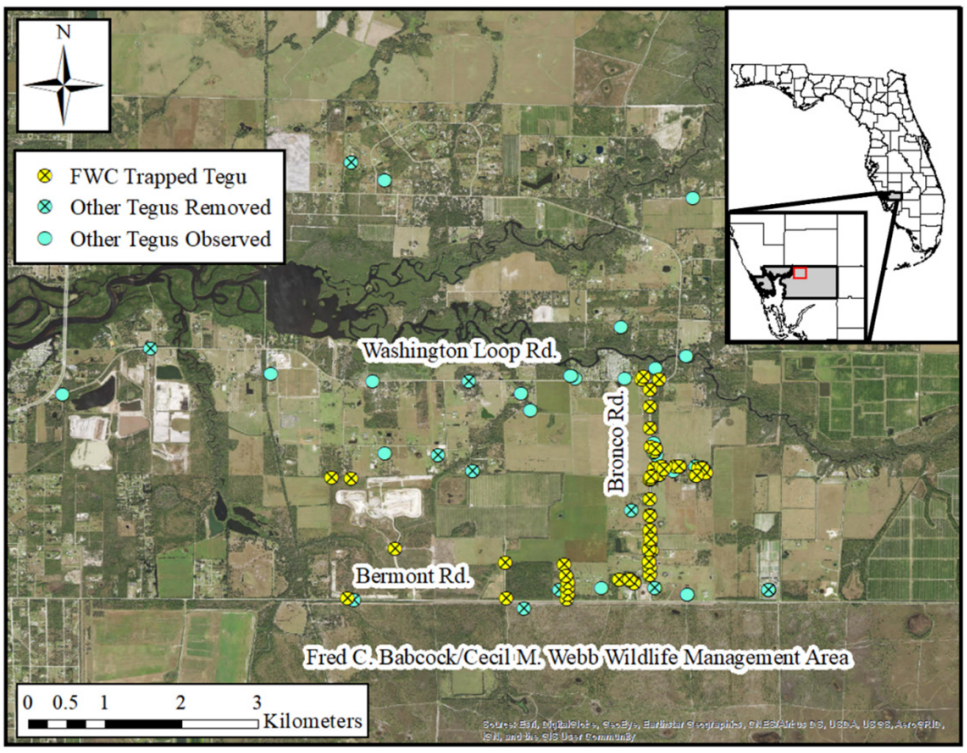

Figure 1. All locations of Argentine Black and White Tegus (*Salvator merianae*) trapped by staff of the Florida Fish and Wildlife Conservation Commission (FWC) from 2018–2020, other tegus removed not part of the FWC trapping project, and credible or verified observations of tegus in Punta Gorda, Charlotte County, Florida, USA. Note that many FWC trap locations had more than one capture (range, 1–14 tegus per successful trap location).

with private landowners in the area to gain access to property for placing traps near reported sightings.

From 19 June to 17 October 2018, 12 February to 18 October 2019, and 3 March to 16 October 2020, we set a combination of Havahart 1079 (Woodstream Corporation, Inc., Lancaster, Pennsylvania, USA) and Tomahawk S90 (Tomahawk Live Trap, Hazelhurst, Wisconsin, USA) live traps in the eastern, rural portion of the city of Punta Gorda, Florida, around Bermont, Bronco, and Washington Loop roads (Fig 1). We baited traps with raw chicken eggs by placing a whole egg in the back of the trap past the trigger plate and cracking one egg open at the entrance of the trap to help increase scent and thereby attraction to the trap. We did not trap tegus on weekends, public holidays, or on days when other work requirements precluded it. Additionally, we did not trap from November-January because Tegus in Florida exhibit brumation during those months (McEachern et al. 2015).

We determined the extent of our trapping area through public reports of Tegus, or lack thereof, and through information gained during our own trapping efforts. Few reports existed of Tegus in the area when our trapping efforts began, so while we placed traps near reported sightings (i.e., within 0.5 km), we also placed traps in other areas outside these sightings to further evaluate and understand the spatial extent of the population. We placed traps opportunistically on private property with landowner permission, on public lands, and next to public thoroughfares. Because Tegus prefer shrub or tree habitat in South Florida (Klug et al. 2015), and have been noted moving along natural (i.e., vegetative) or artificial barriers/fencerows (pers. obs.), we typically placed traps just inside of, or alongside, vegetation or human structures. When possible, we chose vegetative cover to also help camouflage traps to presumably help increase capture rates and decrease theft of traps. To ensure humane conditions of trapped wildlife, we always placed traps in such a way as to limit exposure to the elements, particularly sunlight/heat and inundation due to rain fall/water flow, both of which can be especially dangerous during a South Florida summer. Specifically, we provided shade to the trap by either placing it in an area that had natural shade or provided shade using fallen foliage (e.g., palm fronds). If areas were known to be inundated or showed signs of inundation, then traps were moved immediately.

We used Garmin GPSMAP® 64 (Garmin Ltd., Lenexa, Kansas, USA) units to document trap coordinates. We deployed up to 38 traps at a time, but because our goals were management focused, we altered trapping numbers and locations adaptively and

opportunistically to increase trapping success. While not quantified, we altered trap numbers and changed trap locations based on staff availability, trap procurement, trap location success (i.e., increase traps in and around areas with high success and decrease in areas with low or no Tegu captures), and land access changes (i.e., either given new access or access was taken away due to land development). We placed traps in 164 locations among all 3 y, although some locations were effectively the same among years (closer than our GPS error rate of ± 3 m).

We checked set traps at least once every 24 h and recorded bycatch, trap bypass, and Tegu capture data. We determined catch per unit effort (CPUE) by dividing the number of Tegus captured by the number of days traps were set and open (trap days), excluding the first day they were opened. To account for trap days being impacted by bycatch/bypass (i.e., if the trap door was triggered but no Tegu was captured), we recorded 0.5 trap days if the trap door was closed the following day without a Tegu present. We compared numbers of Tegus captured and trap days per year (i.e., annual CPUE) using a Chi-square test. We released all native bycatch unharmed at the point of capture and humanely killed all Tegus using a captive bolt gun to destroy the brain tissue quickly and thoroughly. For most captured Tegus, we recorded total length (TL; cm), snout-vent length (SVL; cm), and mass (g) and compared these measurements among adult males, adult females, and non-adult Tegus using Analysis of Variance (ANOVA) with Tukey HSD post-hoc analyses for any significant differences. We determined sex of adult Tegus using the presence or absence of enlarged cloacal pores, colloquially referred to as buttons, on either side of the cloaca; males have these enlarged cloacal pores (Chamut et al. 2009; Sprackland 2009). While we would have ideally documented sex for all individuals, enlarged cloacal pores are not present in juveniles and we did not have the capacity in this study to dissect most captured Tegus to determine sex via gonad observation. Therefore, we were not able to determine sex for non-adult age classes. While we could rely on cloacal pores to determine sex for adults, we are not aware of any currently established size/age-class designations available for Tegus. Subsequently, we chose a conservative SVL of 30.0 cm as a threshold for the adult size class to be able to confidently determine their sex. This 30.0 cm SVL adult size class threshold aligns with the size/age class estimation for adult Tegus used by Frank Mazzotti at the University of Florida (pers. comm.). We summarized data by finding the mean (± standard deviation and range of values) for adult male, adult female, and for non-adult (i.e., juvenile and hatchling age classes) Tegus.

We used the Florida Natural Areas Inventory Cooperative Land Cover (ver 3.2; https://www.fnai.org/services/coop-land-cover) to determine land cover of trapping locations to help describe associated trapping success. Land cover classification descriptions can be found in Kawula and Render (2018). We provide a *post hoc* descriptive analysis of the habitat in our trapping areas and make inferences regarding possible relationships between habitat and trapping success to help inform future efforts. Specifically, we evaluated the number of trap locations, number of Tegus captured, average trap nights, and average CPUE for each land cover classification.

Finally, we gathered data on any other observations or removals (i.e., not a part of our trapping efforts) to better describe the scope of the invasion in Charlotte County. These additional observations and removals were made either by FWC staff in the field or were public reports that we deemed credible by description (i.e., accurate description of morphology and behavior) or verified through photographs. We also queried internal databases for other Tegu reports prior to 2018 (when trapping began) to determine any historic sightings in the area that occurred prior to our work.

Results

Over the course of 7,950 trap days, we captured and removed 170 Tegus yielding an average CPUE of 0.021 Tegus per trap day for the entire study period. We captured 36, 68, and 66 Tegus in 2018, 2019, and 2020, respectively, for a respective CPUE of 0.021, 0.020, and 0.023 (Table 1). These capture rates were not significantly different ($\chi^2 = 0.787$, df = 2, $P = 0.674$). Of the 164 trapping locations combined among years, we captured at least one Tegu at 67 locations (40.9%).

Of the 170 Tegus captured, we collected morphometric data on 163. Of these, 29 were adults and 134 were juveniles or hatchlings (hereafter non-adult age classes are referred to simply as juveniles). Though there was no formal way to determine exact age of juveniles, we noted several small individuals with the characteristic green head of young of the year hatchlings (Enge 2007). Of the 29 adults, 14 were

Table 1. Summary of Florida Fish and Wildlife Conservation Commission trapping data for Argentine Black and White Tegus (*Salvator merianae*) from 2018–2020 in Charlotte County, Florida, USA.

	Year		
	2018	2019	2020
Unique Trapping Locations	41	70	53
Number of Tegus Captured	36	68	66
Number of Trap Days	1,698.5	3,412.5	2,839.0
Average Trap Nights per Location	41.4	48.8	53.6
Catch per Unit Effort (CPUE)	0.021	0.020	0.023

Table 2. Mean (± standard deviations and ranges) total length (TL), snout-vent length (SVL), and mass of 163 Argentine Black and White Tegus (*Salvator merianae*) captured in Charlotte County, Florida, USA, from 2018–2020. Only adult animals > 30 cm were placed into the adult category and for which sex was determined.

	n	Mean TL (cm)	Mean SVL (cm)	Mean Mass (g)
Males	14	93.1 ± 17.2	36.2 ± 4.5	1,840 ± 799
		(58.0–113.3)	(30.2–45.5)	(1,049–3,554)
Females	15	91.0 ± 8.3	35.7 ± 2.5	1,648 ± 387
		(75.6–102.0)	(31.0–39.6)	(1,002–2,500)
Juveniles	134	63.8 ± 11.5	22.6 ± 3.8	436 ± 204
		(34.5–89.1)	(16.0–29.6)	(144–915)

male and 15 were female. Mean TL was significantly different among groups ($F_{2,160}$ = 66.2, P < 0.001), as was mean SVL ($F_{2,160}$ = 148.3, P < 0.001) and mean mass ($F_{2,160}$ = 195.2, P < 0.001). Neither TL (Tukey HSD, P = 0.875), SVL (Tukey HSD, P = 0.900), or mass (Tukey HSD, P = 0.250) differed significantly between males and females, but both males and females metrics were significantly different than those metrics of juveniles (Tukey HSD, P < 0.001 for all comparisons). Although the size ranges and sheer number of Tegus we captured strongly suggests reproduction has been occurring in the wild, we also dissected one large female and observed approximately 30 fully formed eggs in her oviducts, although we could not determine if the eggs were fertilized.

Our *post hoc* land cover analysis showed that we had placed traps in seven land cover classifications, which included Rural, Transportation, Mesic Flatwoods, Improved Pasture, Mixed Hardwood-Coniferous, Scrubby Flatwoods, and Shrub and Brushland (Table 3). The Rural land cover class had the highest percentage of locations (34.1%) where we placed traps, had the highest number (n = 78) of Tegu captures, but had only the third highest CPUE (0.022). While Improved Pasture had only the fourth highest number of Tegus captured (n = 28), it had the highest average CPUE (0.028) of all land cover classifications (Table 3). Conversely, Mesic Flatwoods had the second highest number of trapping locations (n = 34) but had the second lowest average CPUE (0.006 Tegus per trap day). Both Rural and Transportation land classes combined made up 72.9% of all Tegus we removed.

In addition to the Tegus captured in traps, we also received 27 observation reports that were either credible (n = 14) or verified (n = 13) from members of the public. Only one Tegu report was received in both 2016 and 2017 respectively, with no other Tegu reports in the immediate area prior to 2016. It is impossible to say whether any of the observed and reported Tegus were later the same as the individuals captured and removed; however, we also recorded four Tegus found dead and 14 opportunistically removed by either members of the public or FWC staff using means other than traps (e.g., by pellet rifle). In total, as of the end of the 2020 Tegu trapping season, at least 188 Tegus were removed from the impacted area in Charlotte County, resulting in 215 verified or credible Tegu reports (captured, found dead, or observed). Of all the known Tegus in the area, the furthest distance between two confirmed reports was 7.8 km but 211 of total reports (97.2%) were within a 3 km radius (Fig. 1).

Table 3. Land cover associations with trapping efforts for Argentine Black and White Tegus (*Salvator merianae*) in Charlotte County, Florida, USA, from 2018–2020. Land cover classes were obtained from the Florida Natural Areas Inventory Cooperative Land Cover database (ver 3.2). Descriptions of land cover classes can be found in Kawula and Render (2018). For Mesic Flatwoods, traps were removed from any area when it was likely to be inundated.

Land Cover	Number of Trap Locations	Number of Tegus Captured	Average Trap Nights	Average Catch per Unit Effort (CPUE)
Rural	56 (34.1%)	78 (42.3%)	2,924.5 (36.8%)	0.022 (19.8%)
Mesic Flatwoods*	34 (20.7%)	14 (8.2%)	1,339.5 (16.8%)	0.006 (5.7%)
Transportation	28 (17.1%)	46 (17.1%)	1,701.5 (21.4%)	0.025 (22.5%)
Improved Pasture	25 (15.2%)	28 (16.5%)	1,335.5 (16.8%)	0.028 (24.6%)
Mixed Hardwood-Coniferous	14 (11.0%)	1 (0.6%)	400.0 (5.0%)	0.001 (1.2%)
Scrubby Flatwoods	6 (3.7%)	2 (1.2%)	203 (2.6%)	0.008 (6.7%)
Shrub and Brushland	1 (0.6%)	6 (0.6%)	46.0 (0.6%)	0.022 (19.4%)

Discussion

Based on the number of Tegus captured, presence of reproductively active females, presence of reproductive size males, presence of juveniles of various sizes, and distance to the next closest identified population (i.e., the Hillsborough County population about 100 km to the north/northwest), we suggest we have documented another distinct population of Tegus in Florida. Currently, the Tegu population herein appears to be relatively small, but relatively dense based on the identified population extent and CPUE respectively. Although no verified Tegu reports existed in our trapping area prior to 2016, anecdotal observations made by local landowners suggest that some Tegus may have been present in the area as early as 2013, which suggests the population may have been establishing by this time. As of the end of this study, the furthest verified reports from the population were separated by 7.8 km, but 97.2% of observed and removed Tegus occurred within a 3-km radius suggesting that the population was still relatively small (i.e., compared to other populations in the state). The fact that our extensive canvassing efforts resulted in only four additional Tegu reports outside this 3-km radius (FWC, unpubl. data) reinforced our suspicion that the Tegu population in the area had not yet spread substantially. While the Charlotte County population described herein is breeding in the wild and can therefore be defined as established (Colautii and MacIsaac 2004), the small area of the known population and lack of any obvious barriers to movement likely means that the population is incipient and still in a colonizing process.

It is probable that the Tegus from this population were introduced, either by intentional releases or accidental escape, by a large, established commercial reptile breeding facility in the area. The facility is located within 3 km of 198 of the total 217 (91.2%) Tegu reports and captures. The facility is also within just 7 km of all 217 observations and captures. The breeding facility has previously documented Tegu inventory and there are no other known commercial reptile-breeding establishments in the vicinity. Furthermore, eight additional large, nonnative, and rarely reported species, have also been captured or photographed outside of captivity within 1 km of this same breeding facility since 2017. These additional species include: (1) a Red Tegu (*Tupinambis rufescens*); (2) a Savannah Monitor (*Varanus exanthematicus*); (3) four Asian Water Monitors (*Varanus salvator*); (4) two Chinese Water Dragons (*Physignathus cocincinus*); (5) a Crocodile Monitor (*Varanus salvadorii*); (6) several spiny-tailed iguanas (*Ctenosaura* spp.); (7) two rock iguanas (*Cyclura* spp.); and (8) a Hog-Island Boa Constrictor (*Boa constrictor*). While no current evidence suggests these other nonnative reptile species are breeding in the area, it is concerning that so many uncommonly reported nonnative species (FWC, unpubl. data) would occur in such a small area. The FWC continues to manage the situation by working with local landowners to trap and remove any nonnative wildlife reported, and including, but not limited to, taking any necessary legal action to mitigate or prevent further issues.

In comparison to the results of this study, the Tegu population in Miami-Dade County is clearly larger in both distribution and abundance. In Miami-Dade County, over 300 trapping locations are run by multiple entities annually (FWC, the University of Florida, the U.S. Geological Survey, and the U.S. National Park Service) with 2,330 Tegus removed between 2018–2019 (FWC, unpubl. data). The farthest locations between confirmed Tegus in Miami-Dade is 20.4 km if looking only at the trap line distances with successful captures (i.e., a highly conservative estimate of distribution). While our efforts in this study were not designed to compare trapping results among populations (i.e., many variables are different between the populations, including population age/structure, habitat, trapping protocols, etc.), we feel it is noteworthy that our average CPUE in this study (0.02 Tegus/trap day) was very similar to the Tegu trap lines in Miami-Dade County from 2016–2018, which had average annual CPUE ranges of 0.01–0.04 Tegus per trap day (Brad Udell, pers. comm.). The CPUE results between Miami-Dade and Charlotte counties may suggest that the populations are similar in density, even though the Charlotte County population is clearly smaller in extent and abundance currently. Due to the current spread and density of Tegus present in Miami-Dade, the goals of managers and researchers are focused on population containment and/or resource protection of sensitive natural ecological systems like those in Everglades and Biscayne national parks in Florida, USA. If indeed the population density in Charlotte County is comparable to Miami-Dade, it may indicate that the resources enabling survival and reproduction are also similar and, if left unchecked, the population in Charlotte County could become just as expansive and intractable. Any chance of eradication and/or containment in Charlotte County may be quickly fleeting. Now, increased and immediate action are likely necessary to prevent significant impacts to the native fauna in the area.

Our morphometric data and land cover capture data are being disseminated here primarily for their descriptive value. That is, we aim to help those who would continue or expand efforts to manage or study this incipient Tegu population by providing them with noteworthy data that may inform their efforts. It is no surprise that adult Tegus were larger than juveniles; however, it was somewhat surprising to see that male and female sizes in this population were not significantly

different. Though we cannot explain exactly why we did not document any sexual dimorphism in a species known for it (Enge 2007), our findings may simply be due to low sample size of adult Tegus or even the relatively young nature of the entire population (i.e., adult males have not had the time to grow to even larger sizes). Regarding our trap locations and land cover analysis, it may be tempting to conclude that certain land cover types will more readily enable discovery and capture of Tegus. Our trap placements were not designed to answer questions relating to Tegu land cover or habitat preferences, however. Furthermore, many of our traps were placed near or directly on land cover classification boundaries, potentially skewing results. Nonetheless, we hope that these results may assist future efforts if the correlations we documented after conducting our trapping efforts are indeed causal.

We believe this relatively small, yet seemingly dense, Tegu population in Charlotte County warrants continued control efforts and management-focused research before it expands further. Specific research efforts should be focused on determining current population extent, potential travel corridors, trapping hotspots, methods to increase trapping efficiency, and evaluation of ongoing removal efforts. To date, no other academic literature exists on this novel Tegu population in Charlotte County, Florida. While we focused our trapping efforts in areas immediately around reported sightings, Klug et al. (2015) documented Tegu activity ranges in a single season in Florida up to 58.6 ha and range lengths (i.e., Euclidean distance between the two most divergent points) up to 2.86 km. The area around our trapping effort is primarily rural, and human population in the area is sparse relative to nearby towns on the coast. Given the seasonal movements of Tegus documented in other parts of Florida and the limited presence of members of the public to observe and report additional individuals, there is little doubt that Tegus in Charlotte County have been spreading and establishing home ranges outside our current trapping area. Continued private land access for surveillance and removal is critical, as is protecting nearby sensitive ecological resources. The Fred C. Babcock/Cecil M. Webb Wildlife Management Area (WMA) managed by the FWC contains sensitive natural habitat and exists directly south of Bermont Road from the ongoing Tegu trapping efforts. This WMA is home to several imperiled species, including Gopher Tortoises, Indigo Snakes (*Drymarchon couperi*), and Red-cockaded Woodpeckers (*Picoides borealis*). As of November 2020, only one Tegu has been spotted and opportunistically removed from this property, but more work needs to be done to determine if Tegus exist within this WMA boundary. Moving forward, Tegu management and research efforts should consider this WMA to be an area of significant ecological concern and a focus for future Tegu management efforts.

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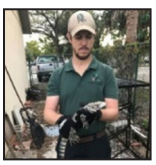

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