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A population estimate for *Phoenicopterus ruber* (American Flamingo) for the Turks and Caicos Islands with an assessment of current breeding status

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Photo: Agile LeVin



A population estimate for *Phoenicopterus ruber* (American Flamingo) for the Turks and Caicos Islands with an assessment of current breeding status

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Cover Page: *Phoenicopterus ruber* over sea near the north shore of Grand Turk in February 2024. Photo by Agile LeVin.

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Abstract

A small fixed-wing aircraft was used to carry out two full aerial surveys to assess the population of *Phoenicopterus ruber* (American Flamingo) in the Turks and Caicos Islands in February and May 2024. A pre-survey assessment identified 49 sites, covering some 17,000 ha, as having supported flocks of flamingos in the past 20 years. These 49 sites were surveyed over four days in February. A sub-set of these 49 sites were identified as potential breeding sites and were surveyed again during one day in May using the same method. All suitable habitat across both the Turks and Caicos Banks was comprehensively surveyed. A total of 5,303 individuals were counted in February, and 4,448 were counted in May. The February survey was undertaken as part of the Caribbean-wide census of the species. The May survey was undertaken to search for signs of breeding in the Turks and Caicos Islands. No evidence of breeding was observed.

Keywords

American Flamingo, *Phoenicopterus ruber*, population estimate, Turks and Caicos Islands

Resumen

Estimación poblacional de *Phoenicopterus ruber* (Flamenco americano) en las Islas Turcas y Caicos, con una evaluación del estado reproductivo actual • En febrero y mayo de 2024 se utilizó una aeronave ligera para realizar dos censos aéreos completos en las Islas Turcas y Caicos con el objetivo de evaluar la población de *Phoenicopterus ruber* (Flamenco americano). Una evaluación previa al estudio identificó 49 sitios, con una superficie aproximada de 17 000 ha, que han albergado bandadas de flamencos en los últimos 20 años. Estos 49 sitios se muestrearon durante cuatro días en febrero. Además, un subconjunto de los mismos se identificó como posibles sitios de reproducción y se censaron nuevamente durante un día en mayo utilizando el mismo método. Se muestrearon exhaustivamente todos los hábitats adecuados en los bancos de las Islas Turcas y Caicos. En total se contabilizaron 5303 individuos en febrero y 4448 en mayo. El muestro de febrero se realizó como parte del censo de la especie en todo el Caribe, mientras que el de mayo tuvo como finalidad la búsqueda de evidencias de reproducción en las islas. No se observó actividad reproductiva.

Palabras clave

estimación poblacional, Flamenco americano, Islas Turcas y Caicos, *Phoenicopterus ruber*

Résumé

Estimation de la population de *Phoenicopterus ruber* (Flamant des Caraïbes) dans les Îles Turques et Caïques et évaluation du statut actuel de reproduction • Un petit avion a été utilisé pour effectuer deux dénombrements aériens complets afin d'évaluer la population de *Phoenicopterus ruber* (Flamant des Caraïbes) dans les Îles Turques et Caïques en février et mai 2024. Une évaluation préalable au comptage a permis d'identifier 49 sites, couvrant environ 17 000 ha, ayant accueilli des groupes de flamants au cours des 20 dernières années. Ces 49 sites ont été couverts en quatre jours en février. Un sous-ensemble de ces 49 sites a été identifié comme des sites de reproduction potentiels et a fait l'objet d'un nouveau dénombrement pendant une

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journée en mai en utilisant la même méthode. Tous les habitats appropriés des deux bancs des Îles Turques et Caïques ont été couverts de manière approfondie. Au total, 5 303 individus ont été dénombrés en février et 4 448 en mai. Le dénombrement de février a été entrepris dans le cadre du recensement de l'espèce à l'échelle de la Caraïbe. Le dénombrement de mai a été entrepris pour rechercher des signes de reproduction dans les Îles Turques et Caïques. Aucune preuve de reproduction n'a été observée.

Mots clés

estimation de la population, Flamant d'Amérique, Îles Turques-et-Caïques, *Phoenicopter ruber*

Phoenicopter ruber, the American Flamingo, has generally been considered a resident breeding species in the Turks and Caicos Islands (TCI) and has long been a prominent feature of the country's avifauna and heritage, evidenced by at least four of the Caicos islands having a "Flamingo Pond" or "Flamingo Lake" (ALV pers. obs.). *Phoenicopter ruber* is widely distributed across Turks and Caicos, with records throughout the year from West Caicos, Providenciales, North, Middle, East and South Caicos, Big Ambergris Cay, Grand Turk, Salt Cay, and occasionally smaller islands such as Little Water and Pine Cays (eBird 2021). There is no formal evidence that either population numbers or their distribution have changed historically, though there is a strong local view that with the rapid development of Providenciales, the species is being seen less often across sites over the past twenty years. Whilst the species can be easily seen in small numbers on salinas and in the smaller wetlands around TCI, many areas supporting *Phoenicopter ruber* are huge, complex, and hydrologically dynamic wetlands making access difficult and expensive without specialist equipment and knowledge. This has prevented an overall population assessment of this species in TCI. Previously no coordinated count of this species has been carried out across TCI, although regular full counts of Flamingo Pond on North Caicos have been conducted from the Turks and Caicos National Trust viewpoint at the north end of the wetland (SB pers. obs., eBird 2021). Flamingo Pond has regularly been reported to support up to 5,500 birds (Table 1).

The Birds of Turks and Caicos Official Checklist (Bradley 1985) considered *Phoenicopter ruber* a common breeding species in TCI, although *The Birds of the Southern Bahamas* (Buden 1987) does not mention a breeding population. Earlier, Allen (1956) stated that there had formerly been breeding colonies in the Caicos Islands. Norton and Clarke (1989) reported 6,000–7,000 old breeding mounds on Pumpkin Bluff Pond on North Caicos and dated these from the 1970s. This record formed the basis of the inclusion of TCI as a potentially important historical breeding area for the species by Torres-Cristiani (2020), though the authors described the species' status in the islands as unclear. Like Walsh-McGhee et al. (1998), Torres-Cristiani (2020) thought that the documented presence of young birds in the country supported the view that they were breeding. The only fully documented recent record of breeding in TCI is a single bird photographed on a nest in the salinas on Grand Turk in April 2019 (Melnikovych 2021).

To improve our knowledge of the total population, distribution, and breeding status of *Phoenicopter ruber* in TCI, we carried out two surveys in February and May 2024. The February survey was part of the American Flamingo Conservation Group population census carried out in conjunction with surveys

elsewhere in the region such as Haiti (Timyan et al. 2024). The follow-up survey in May was designed specifically to look for evidence of breeding by *Phoenicopter ruber* in TCI.

Methods

We identified 49 sites across the Turks and Caicos Islands, covering ~17,000 ha with sites ranging in size between 3 ha to 6,500 ha, in a pre-survey assessment as having supported flocks of *Phoenicopter ruber* in the past 20 years. This assessment was based on eBird records (eBird 2021) and was supplemented by our observations and knowledge. Sites where only single or very small numbers of *Phoenicopter ruber* had been recorded were excluded from the survey design though in practice, all suitable wetlands were searched.

As part of the pre-survey assessment, we identified a sub-set of the 49 sites as potential breeding sites based on features such as area, lack of disturbance, and likely suitable water regime. All 49 sites were visited in the first survey, between 18–22 February 2024. The sub-set of identified potential breeding sites were surveyed on 9 May 2024. Routes were chosen to cover wetlands en route which were not initially identified among the priority sites, and any flamingos spotted at these additional sites were similarly counted and recorded. In practice therefore, almost all other potentially suitable sites were covered whilst moving between targeted sites, and coverage of all wetlands was near total.

We used a fixed-wing aircraft to fly the most efficient path between proximate groups of the 49 sites. As well as being efficient in terms of time and fuel, this method reduced the possibility of duplicate or missed counts as geographically close sites were counted in a block. Whilst flying, we were continually mindful that *Phoenicopter ruber* might be present in other areas. This was particularly true of the large, complex mosaic of banks and small cays off the northern shore of both the Turks and Caicos banks; the extensive cays and wetlands between North and Middle Caicos, and between Middle and East Caicos; and the very extensive wetlands on the south side of the same three islands (Figs. 1, 3). Where we observed potentially suitable habitat, we would deviate from our planned route to fly over the site.

A local pilot with expert knowledge of local conditions and geography flew the small four-seat light aircraft (Diamond Star DA40), facilitating a safe and efficient survey. One surveyor in the front passenger seat operated a Nikon D810 camera with a 70–200 mm f2.8 lens. The second surveyor in a rear seat acting as a "spotter" and recorder with a pair of Swarovski 10 × 42 EL binoculars and a Garmin Etrex 22 GPS. The surveyors and pilot were able to communicate via an on-board radio system. Flights took place from 0730 onwards and all were completed by 1100,



Fig. 1. Extensive wetlands on south side of North Caicos, looking north towards Flamingo Pond. February 2024. Photograph by Agile LeVin.

including flight times from the airport on Providenciales.

All 49 sites were surveyed and counted from an altitude of c. 180 m, at an airspeed of approximately 180 km/hr. The altitude was set as the minimum flight height condition of our Turks and Caicos Islands Civil Aviation Authority license.

One or more passes were made over sites depending on their size. When groups of *Phoenicopterus ruber* were spotted, the birds were photographed and GPS coordinates were recorded, both manually on a Garmin handset and automatically through each photograph. In most cases more than one pass was needed to ensure all birds were seen and photographed (Fig. 2). A simple assessment of how quickly the birds flushed was also made for each site.

Over the following two weeks the photographs were sorted by site and flock. Each flock had been photographed several times, often from slightly different angles as they moved in relation to the aircraft. Careful counting of individual birds using enlarged photographs when necessary and combining the information from the various angles allowed for extremely accurate counting.

Results

Of the 49 sites identified in the pre-February survey assessment, 14 (28.6%) were found to be supporting *Phoenicopterus ruber* during the survey.

Between 18 and 21 February, a total of 4 hrs 20 mins was spent actively looking for *Phoenicopterus ruber*, excluding pure flight travel times when the species would not be seen due to unsuitable habitat (e.g., open water and forest). The whole of Turks and Caicos was surveyed except for small offshore cays where no suitable wetland habitat exist and where there was no previous evidence of flamingo use. The main islands of West, North, Middle, East and South Caicos, Providenciales, Grand Turk, Salt Cay, and the Ambergris Cays, together with their associated wetlands, were surveyed, as were all the smaller cays associated with the larger islands (e.g., Hog, Pine, Dellis, and Water Cays) (Fig. 3). A total of 5,303 *Phoenicopterus ruber* were counted across the territory in February (Appendices 1, 2). Of these, 1,166 (21%) were counted on East Caicos which was the most data-deficient area in TCI and where it had been hypothesized that

Table 1. Maximum annual counts from Flamingo Pond, North Caicos. All counts taken from eBird 2021 (accessed 8 July 2025)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Month	June	September	n/c	October	June	March	September	February	April
Max. Count	2,910	2,200	n/c	2,910	4,850	300	500	2,000	5,500



Fig. 2. *Phoenicopterus ruber* in flight over Flamingo Pond, North Caicos, Turks and Caicos, February 2024. Photograph by Agile LeVin.

significant populations might be present.

The May aerial survey, using the same methods as in February, took place over four hours on 9 May and was not designed to be a full territory population count. All sites on North, Middle and East Caicos identified as being most likely to support breeding *Phoenicopterus ruber* were visited. All had held birds in the February survey. Sites on Providenciales, West Caicos, South Caicos, Grand Turk, and Salt Cay were not covered in the May aerial survey; however, local on-the-ground reports from readily accessible sites over the previous fortnight concluded that no significant numbers of *Phoenicopterus ruber* were present, and that breeding was not taking place. Thus, whilst not having the coverage of the February count, May's coverage was still extensive. The accuracy of the count was high and accounted for most, if not effectively all, *Phoenicopterus ruber* in TCI at the time. A total of 4,448 *Phoenicopterus ruber* was recorded in May (Appendices 1, 3).

No significant technical or logistical difficulties arose from using the methods employed. Coverage of the country was total, and accuracy of the counts was high. We do not believe that there was significant movement between sites that would lead either to double- or under-counting.

Discussion

Numbers and distribution

No coordinated counts of *Phoenicopterus ruber* have been carried out in TCI previously, so this exercise represents the first

population estimate for the territory. Regular counts have been carried out at Flamingo Pond, North Caicos (Table 1), which has a slightly elevated viewing platform and is relatively easy to access. The average of the maximum counts from eight years between 2015 and 2023 for which data is available is 2,646 individuals; however, some of these counts are eBird records from visiting birdwatchers, and not necessarily full counts. Therefore, they are likely to be on the low side as birdwatchers are usually not striving for a maximum count. Furthermore, due to overlap between birds, live counting on a horizontal plane is likely to underestimate numbers compared to when counting from aerial photographs. Our aerial surveys showed the North Caicos Flamingo Pond site to be, not unexpectedly, the most important site in TCI, supporting 53% of the total population in February and 67% of that present in May.

We anticipated recording large numbers of birds on the uninhabited and rarely visited island of East Caicos. Of the 5,303 *Phoenicopterus ruber* counted in February, 1,166 (22%) were on East Caicos spread across five sites, representing the largest count for this species on that island. The highest previous record cites 250 at one site in 2013 (DECR 2021), with recent anecdotal evidence suggesting similar numbers being seen there more recently.

Whilst the presence of flamingos on the salinas of South Caicos, Grand Turk and, to a lesser extent, Salt Cay, is often highlighted as a feature of birdwatching in the country (e.g., visitci.com/nature-and-history/fauna/flamingos), fewer than 3%

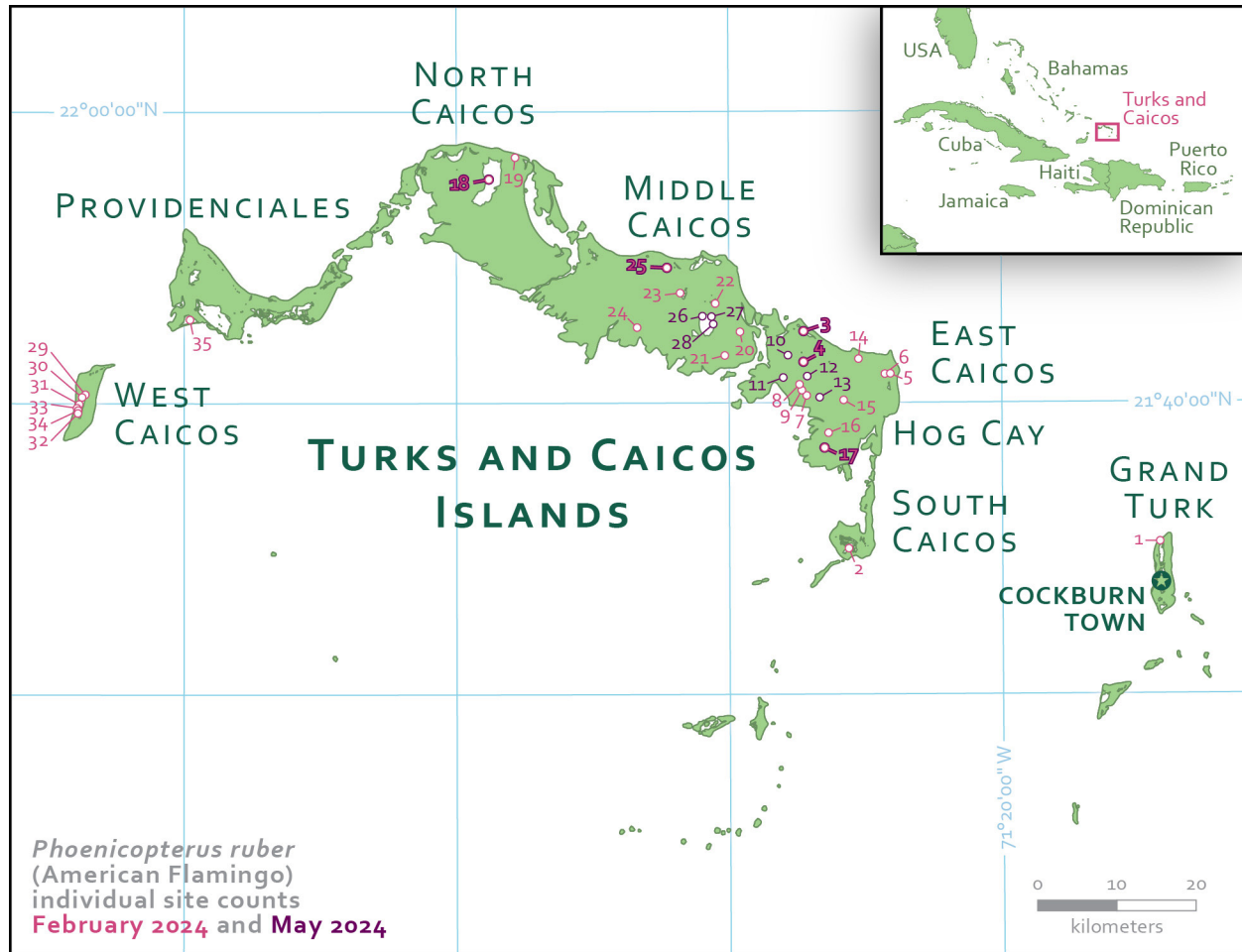


Fig. 3. Map of the Turks and Caicos Islands with the location of count sites supporting flamingos in February 2024 (pink), May 2024 (purple), and both February and May (in bold). See Appendix 1 for location names. Map by Alison DeGraff Ollivierre.

of the birds present in February and 0% in May were found in these significantly anthropogenically modified habitats during our surveys. Effectively, on both surveys the whole population was using natural habitats (though it should be noted that some of these natural habitats have been subject to minor historic anthropogenic modification, such as sub-division using stone walls). We do not know whether this is a regular pattern or is seasonally related.

Survey and its impact

Flamingos are generally considered prone to disturbance, particularly when breeding, though there is little quantitative data. This survey's method did not require flamingo flocks to be flushed, and neither did we intend to purposely flush flamingos, as the quality of photographs taken from the flight height at which we were operating (180 m) was sufficient to make accurate counts. In practice, almost all birds flushed when surveyed, either on the first flyover by the survey aircraft or when subsequent flyovers were needed to get sufficient photographs for accurate bird counts.

During the February survey, we attempted to quantify how easily the flocks flushed when disturbed by our flights. We deduced that this species is susceptible to flushing by a small

aircraft flying over them at a height of 180 m. Further quantitative assessment proved methodologically difficult, but we did glean qualitative insights. We observed that larger flocks were more readily flushed than small groups and that the small number of flamingos on wetlands adjacent to the active runways at airports on South Caicos and Providenciales did not flush during our overflight of those sites, apparently demonstrating (perhaps unsurprisingly) a degree of habituation to low flying aircraft. We did not repeat flushing assessments for the May survey. No assessment of any other type of disturbance was made.

With the exception of the two groups of flamingos on wetlands immediately adjacent to the airports on Providenciales and South Caicos, all groups took flight in response to our presence. This did not affect the accuracy of the counts. Most flocks, particularly large ones, resettled on the same wetland, even if the flocks subdivided in flight and settled in more than one location. All flocks were isolated by distance from other groups thus allowing the two observers to note direction of travel and often, landing and resettling. We experienced no uncertainty over whether large numbers of birds were double counted. The large numbers of photographs taken also indicated group subdivision on taking flight and often reconfiguration.

Our survey method was particularly suitable for the dispersed

nature of the local *Phoenicopterus ruber* population which is found either in discrete groups across very large wetland areas, or across much smaller, clearly separated wetlands. It is suspected that this method would not work well for large flocks concentrated at one large site as it would be more difficult, or even impossible, to track flocks as they move, divide, and re-configure in response to disturbance. Where such surveys have been carried out, flights have generally taken place at a greater height (Yang *et al.* 2024). Orthographically corrected imaging and automated counting are also increasingly used for counting large numbers of birds either in concentrations (including flamingos) or when spread over a wide area (Yang *et al.* 2024).

Our method is efficient and cost-effective for surveying populations dispersed in discrete groups across a large wetland landscape, particularly where conservation resources are limited. This survey was carried out by volunteers and the only cost was that of fuel for the aircraft which totaled below USD\$1,500.

Breeding

Flamingo breeding is known to be temporally variable in response to climatic and physical conditions (Koczur *et al.* 2022). The closest confirmed breeding population (c. 145 km away in Bahamas at effectively same latitude) breeds chiefly between March and May (Koczur *et al.* 2022) and thus if flamingos were breeding in TCI, it is reasonable to expect a similar timing. We timed our breeding survey towards the end of this period to minimize the risk of disturbance, based on the assumption that if breeding had occurred, eggs would have hatched, and birds would be more robust to disturbance. Birds had laid eggs, both in captivity and in the wild, some two weeks prior in nearby Dominican Republic (E.M. Fernandez pers. comm.), so we believe that our timing was suitable to find any signs of breeding.

We found no evidence that breeding was taking or had recently taken place. Firstly, no signs of any breeding mounds were observed. Breeding mounds are known to be visible from aerial surveys of this type and have been recorded in other surveys (Wiley and Wiley 1979). We examined aerial photographs of nesting mounds from surveys elsewhere in the Caribbean (E.M. Fernandez pers. comm.) to ensure we knew what to look for and believe that any nesting mounds, active or inactive, would have been visible had they been present, if not by eye, then through later examination of the photographs. Secondly, no breeding behaviors were observed. All birds not flying when first observed, were standing in water (i.e., feeding or roosting rather than breeding), and their behavior was the same as all other birds seen throughout both the surveys—an immediate flight response, largely as a flock.

Juvenile *Phoenicopterus ruber* are a regular feature of flocks in TCI, and the occurrence of these birds underpins the common premise that flamingos breed locally. All these juvenile birds appear fully feathered with no trace of down (pers. obs.) and are thus likely capable of flight, immigrating from a breeding colony elsewhere. Flocks of flamingos are regularly seen arriving from the west and moving eastwards across the islands and these flocks include sub-adults as evidenced by grey-brown plumage (pers. obs.). In the absence of evidence to the contrary, a reasonable hypothesis is that these birds are dispersing from the globally significant Inagua National Park population estimated

at 70,000 birds (Bahamas National Trust 2025) some 190 km to the west (Inagua to Providenciales). This distance is well within what the species has been known to cover (e.g., 740 km between Yucatan and Florida; Whitfield *et al.* 2018).

The Birds of Turks and Caicos Official Checklist (Bradley 1985) considered *Phoenicopterus ruber* to be common breeding residents; however, Patricia Bradley's assessment was based on conversations with residents even though she herself had doubts that breeding was occurring at that time (P. Bradley pers. comm.). She later revised her opinion (Bradley 1990). The management plan for the North, Middle, and East Caicos Ramsar site (Pienkowski 2002) carried out extensive consultation with communities, and the plan mentions "signs of breeding" reported by local people at several ponds on North and Middle Caicos. No mention of breeding appears in *The Birds of the Southern Bahamas* (Buden 1987); however, Buden (1987) also quotes Allen (1956), citing previous colonies in the Caicos Islands. Allen's (1956) evidence appears to be a verbal correspondence with A.L. Lorentsen, which dates (with a question mark) the year of observed breeding as 1941. A map that Allen provides indicates abandoned colonies on West Caicos and Providenciales but not North Caicos. Allen also does not mark up the Caicos Islands as a "major" nesting site and another comment suggests he was not certain that the species bred in the Caicos Islands at all. Thus, a significant lack of consistency and certainty exists surrounding dates, locations, and scales to base any assertion that flamingos bred in TCI during the above outlined periods.

Norton and Clarke (1989) reported 6,000–7,000 old breeding mounds on Pumpkin Bluff Pond on North Caicos. Based on local conversations, they surmised that the building of the airport on North Caicos, which occurred in the mid-1970s, caused significant disturbance at the species' main feeding area at nearby Flamingo Pond, and that this disturbance led to the abandonment of the nesting colony. This timetable, however, is at odds with Bradley's later opinion (Bradley 1990) which places the date for the Pumpkin Bluff nests at approximately 1940 (also, see comment about location as noted by Allen 1956, above). Bradley's dating was also based on conversations with local people (P. Bradley pers. comm.), and Norton and Clarke's (1989) paper fails to detail the condition or appearance of the "old" breeding mounds. It is unlikely that flamingo nests could last for 40 years between the 1940s and Norton and Clarke's observations in 1989, and doubtful that nests would even have survived from the 1970s, (E.M. Fernandez pers. comm.) which Norton and Clarke cite as a possible date of abandonment. Low mounds caused by lugworm *Arenicola* spp. create significant circular undulations in the substrate of some inter-tidal areas and saline pools in TCI (SB pers. obs.). These have been mistaken locally for signs of old flamingo nest mounds by even experienced ecologists (pers. obs.); however, notably no eggs or nesting behaviors have ever been recorded.

Allen's (1956) analysis of the regional population suggests that had several thousand flamingos been breeding at Pumpkin Bluff between the 1940s and the 1970s, as suggested by Norton and Clarke (1989), this would have equated to an extremely high proportion of the world population of this species at the time—second only to Inagua, the largest colony in the Caribbean. Pumpkin Bluff is an accessible, relatively small wetland

close to the inhabited settlement of Whitby on North Caicos; therefore, the lack of records or other evidence, such as any letters, notes, or reports of consumption of eggs or chicks from that period, is noteworthy. Over several years, multiple projects in TCI have interviewed local community members to elicit information about species and their uses (e.g., the Darwin Plus DPLUS181 East Caicos Wilderness Project). These conversations have revealed, unsurprisingly, that historic and relatively recent, terrestrial food sources have included (amongst other items) rock iguanas and seabirds' eggs and young. Allen (1956) reports the communal harvesting of a breeding flamingo colony on Inagua, its success being determined by the target birds being flightless. Adult flamingos have certainly been a part of the local diet at times in TCI (Hutchings 1914), but extensive structured interviews have elicited no reports of flightless flamingos (i.e., juveniles) or flamingo eggs having been harvested. This glaring lack of anecdotal information supports our conclusion that flamingo young and/or eggs have not been harvested in TCI and further suggests that flamingos have not been breeding in TCI in any significant numbers, if at all.

The world population of *Phoenicopter ruber* is currently estimated to be over 200,000 individuals (Koczur et al. 2022). Our surveys in 2024, together with other supporting observations such as the count of 5,500 at Flamingo Pond, North Caicos in March 2023 (Amoroso 2021), suggest that TCI has a fluctuating population of around 2.5% of the world population. Torres-Christiani (2020:1) identified Turks and Caicos as "a potential important breeding area for this species for which more field observations are necessary to support this possibility". This remains the case; however, our study supports the hypothesis that flamingos have not bred in any significant numbers in TCI, at least since the 1940s.

Acknowledgments

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Author Contributions

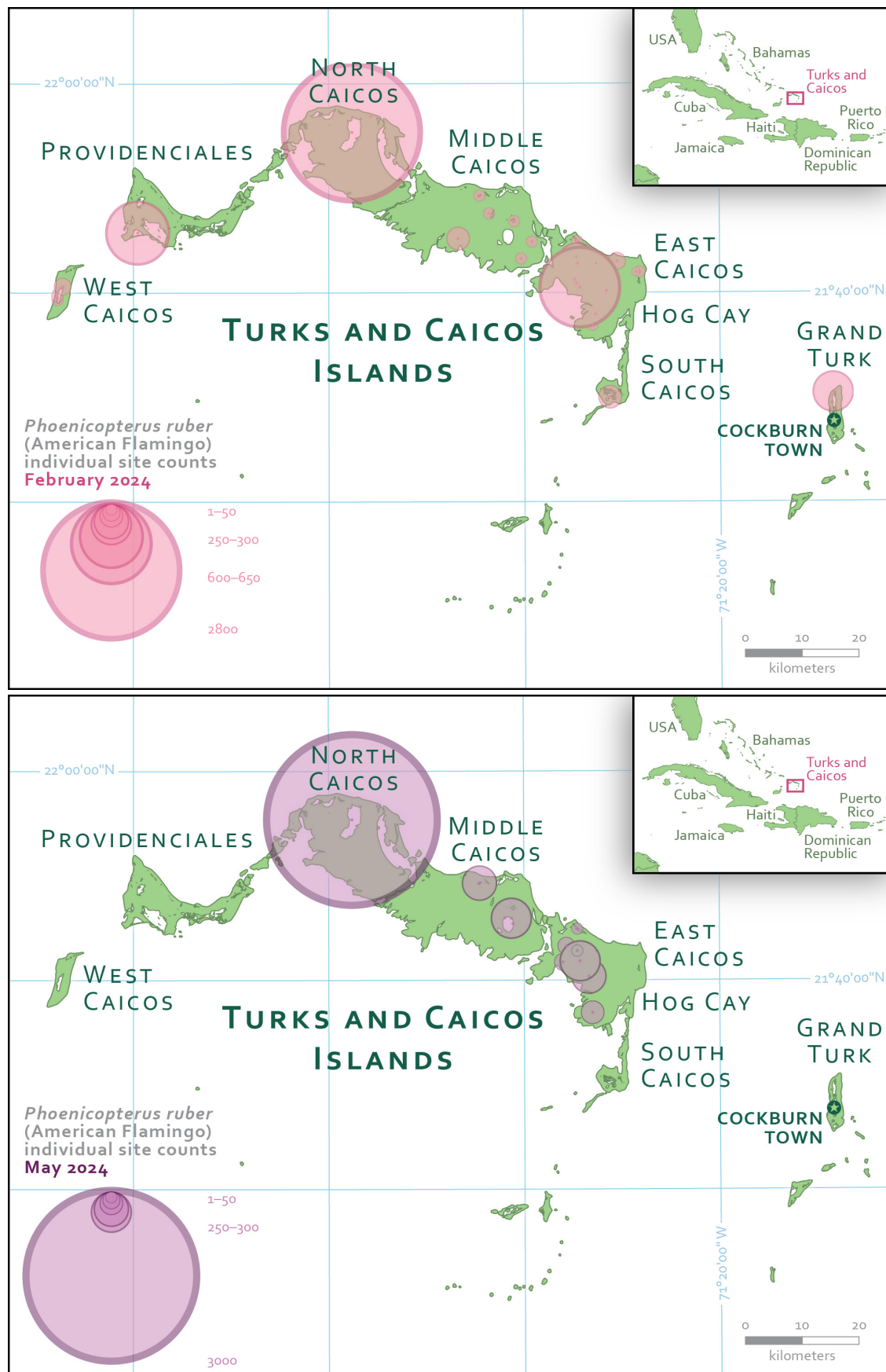
SB conceived of the survey and wrote the paper. ALV contributed his considerable experience and knowledge of flamingos and Turks and Caicos, took the photographs, and analyzed the data. LW safely flew the aircraft. All authors reviewed drafts of the manuscript.

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Appendix 1. *Phoenicopiterus ruber* counts at individual sites on Turks and Caicos Islands, February and May 2024. Sites where no flamingos were counted are not shown.

Island and Site No.	Site	Coordinates	No. Counted in February	No. Counted in May
<i>Grand Turk</i>				
1	Little Bluff Pt	21°30'24.8"N 71°08'28.1"W	279	
<i>South Caicos</i>				
2	Central salt salinas	21°30'00.0"N 71°31'15.9"W	139	
<i>East Caicos</i>				
3	Lorimer's Point Pond (Flamingo Pond)	21°44'54.2"N 71°34'33.7"W	36	36
4	Drum Point Pond	21°42'48.0"N 71°34'33.7"W	260	48
5	Central East Coast Pond (i)	21°41'58.7"N 71°28'12.1"W	18	
6	Central East Coast Pond (ii)	21°41'57.6"N 71°28'34.5"W	25	
7	Central wetland (west side, southeast corner)	21°40'29.6"N 71°34'18.9"W	620	
8	Central wetland (west side, center)	21°41'14.8"N 71°34'50.5"W	51	
9	Central wetland (west side, center south)	21°40'51.3"N 71°34'40.2"W	42	
10	Central wetland (west side, northeast corner)	21°43'15.7"N 71°35'40.8"W		81
11	Central wetland (west side, west center)	21°41'43.7"N 71°36'01.9"W		67
12	Central wetland (west side, north center)	21°41'49.0"N 71°34'16.2"W		274
13	Central wetland (west side, southeast corner)	21°40'21.0"N 71°33'22.8"W		248
14	Breezy Point Pond	21°42'59.5"N 71°30'30.4"W	50	
<i>Hog Cay</i>				
15	West Salina Pond	21°40'10.4"N 71°31'36.4"W	7	
16	White Salina Bank	21°37'55.6"N 71°32'43.3"W	49	
17	Southern White Salina Bank	21°36'53.7"N 71°33'01.0"W	8	108
<i>North Caicos</i>				
18	Flamingo Pond	21°55'22.0"N 71°57'36.2"W	2,832	3,018
19	Horsestable Beach	21°56'52.7"N 71°55'41.2"W	1	
<i>Middle Caicos</i>				
20	Eel Pond (Increase Plantation)	21°44'52.5"N 71°39'11.7"W	49	
21	Joseph Cays Creek	21°43'15.3"N 71°40'18.7"W	21	
22	Daddy Long Pond	21°46'49.4"N 71°41'00.2"W	6	
23	Wetland adjacent to Armstrong Pond	21°47'34.7"N 71°43'34.6"W	45	
24	Ocean Hole Creek	21°45'11.2"N 71°46'44.7"W	115	
25	Flamingo Pond (Ferguson)	21°49'17.0"N 71°44'32.5"W	44	246
26	Big Pond (northwest corner)	21°45'57.2"N 71°41'56.7"W		35
27	Big Pond (northeast corner)	21°45'55.3"N 71°41'17.9"W		265
28	Big Pond (east side)	21°45'24.6"N 71°41'09.1"W		22
<i>West Caicos</i>				
29	Lake Catherine (north)	21°40'37.2"N 72°27'15.3"W	79	
30	Lake Catherine (northwest)	21°40'26.4"N 72°27'29.5"W	29	
31	Lake Catherine (central west)	21°39'57.4"N 72°27'43.4"W	7	
32	Lake Catherine (south)	21°39'20.7"N 72°27'47.2"W	5	
33	North side of Yankee Town causeway	21°39'42.8"N 72°27'49.1"W	17	
34	South side of Yankee Town causeway	21°39'36.7"N 72°27'46.5"W	12	
<i>Providenciales</i>				
35	Proggins' Bay Salt Pond	21°45'45.4"N 72°19'34.3"W	457	
Total			5,303	4,448



Appendix 2. Maps of the Turks and Caicos Islands, visualizing *Phoenicopterus ruber* counts at locations during the February (above) and May 2024 surveys (below). Circle size is proportionate to count number; locations within circles are indicated by dots (see Fig. 3 and Appendix 1). Map by Alison DeGraff Ollivierre.