Received: 27 July 2022 | Revised: 1 December 2022 | Accepted: 6 December 2022

DOI: 10.1002/ecy.3985

THE SCIENTIFIC NATURALIST

ECOLOGY
ECOLOGICAL SOCIETY OF AMERICA

A lifetime track of a griffon vulture: The moving story of Rehovot (Y64)

Marta Acácio[1] | **Nili Anglister**[1] | **Gideon Vaadia**[1] | **Roi Harel**[2] | **Ran Nathan**[3] | **Ohad Hatzofe**[4] | **Orr Spiegel**[1]

[1]School of Zoology, Faculty of Life Sciences, Tel Aviv University, Tel Aviv, Israel

[2]Department for the Ecology of Animal Societies, Max Planck Institute of Animal Behavior, Konstanz, Germany

[3]Department of Ecology, The Hebrew University of Jerusalem, Jerusalem, Israel

[4]Science Division, Israeli Nature and Parks Authority, Jerusalem, Israel

Correspondence
Marta Acácio
Email: martaoc@tauex.tau.ac.il

Funding information
Binational Science Foundation, Grant/Award Numbers: 255/2008, 822/2019; George S. Wise Postdoctoral Fellowship; Yad- Hanadiv

Handling Editor: John Pastor

KEYWORDS: conservation, GPS tracking, griffon vultures, *Gyps fulvus*, movement ecology

24th of August 2013. The day started as any other capture day in the Negev desert, Israel, with 36 griffon vultures (*Gyps fulvus*) waiting inside the capture trap operated by the Israeli Nature and Parks Authority (INPA). They were about to be released back to nature after receiving a wing tag, and, for a few chosen ones, also a GPS transmitter (Iezekiel et al., 2003). One of these vultures, later named Rehovot, was merely a few months old when he received his first nickname: Y64 (the number of the wing tag). Rehovot, a young male weighing 8.3 kg, was to become an important sentinel for his species. Rehovot was fitted with a 90 g GPS–GSM transmitter (by e-obs telemetry; https://e-obs.de/), attached using a Teflon ribbon harness, in a backpack configuration (Harel, Horvitz, et al., 2016). The transmitter Rehovot carried on his back provided 8 years of data (Figure 1; Acácio, Anglister, et al., 2022), contributing with crucial information for vulture conservation (Efrat et al., 2020; Spiegel et al., 2015) and, coincidently, also to his own survival. This case study highlights the importance of long-term movement research in understanding how animals explore and interact with their environment, and how this can be used for species conservation (Nathan et al., 2022).

Across the globe, vulture populations are collapsing, mostly due to poisoning (Green et al., 2004; Ogada et al., 2012). In Israel, griffons are critically endangered and have experienced a fast population decline. Records from the late-1800s to mid-1900s show that griffons were a common resident in the region (Hardy, 1946; Tristram, 1865), but the population declined to ~400 griffons two decades ago, and to only roughly 200 individuals today (Hatzofe, 2020). To prevent the local extinction of this species, the INPA runs an extensive management program, providing contaminant-free food in supplementary feeding stations, releasing captive-bred griffons, and individually tracking vultures with GPS transmitters (Harel et al., 2017; Spiegel et al., 2013). These transmitters typically last between 1 to 4 years, unlike griffon vultures who can live up to 30 years in the wild. Although the GPS transmitters only track a short period of the griffon's long life, they have been instrumental in studying vulture ecology, including their habitat use and foraging

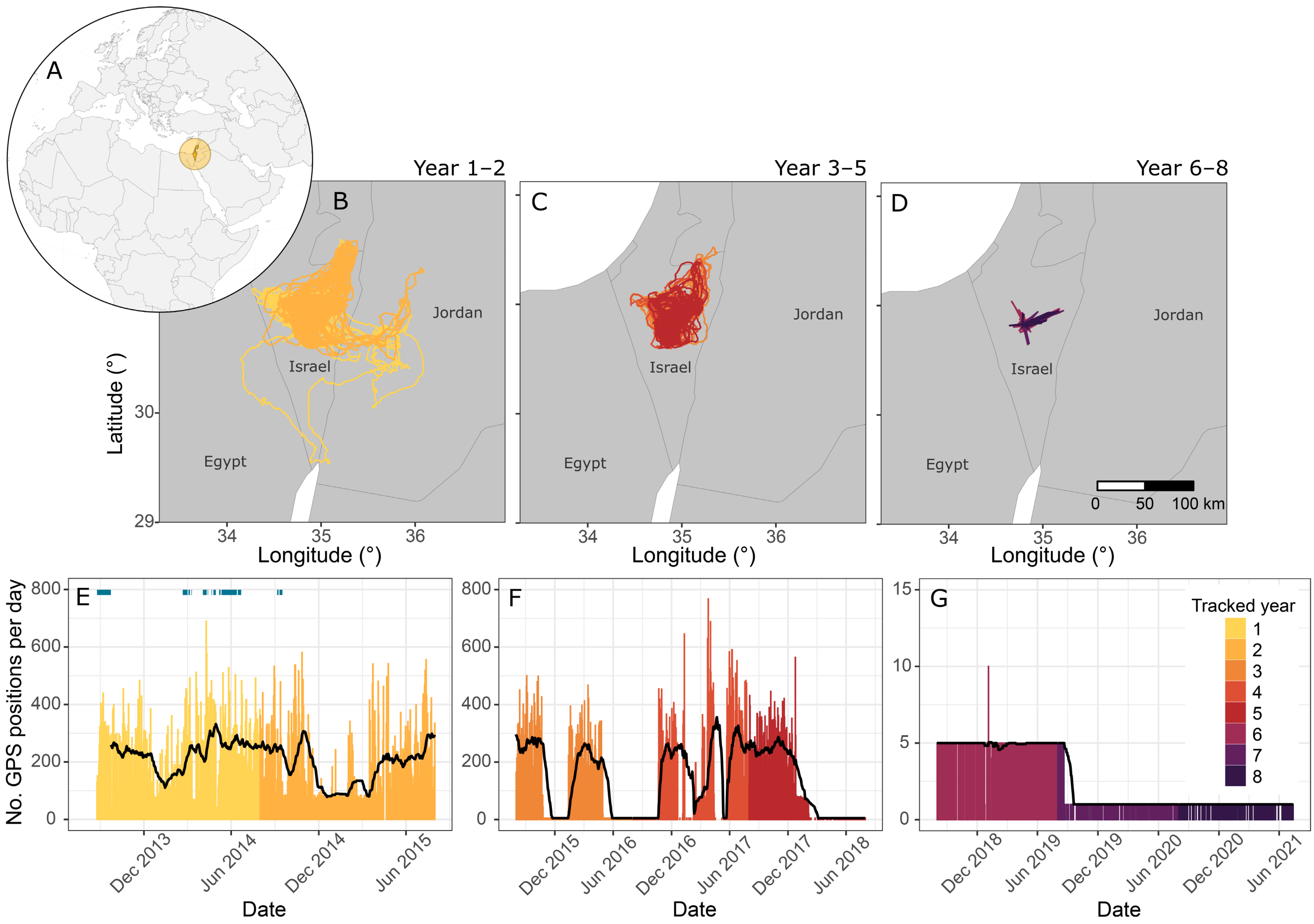

FIGURE 1 Movements of Rehovot, tracked for 8 years at variable temporal resolutions (a baseline of 1 GPS location per day with intermitted periods of intensive sampling, with a GPS location every 10 min or even every 1 s). (A) Location of the study area in Israel. (B–D) GPS tracks of Rehovot during years 1 and 2 (B), years 3–5 (C) and years 6–8 (D). (E–G) Bar plots of the number of GPS positions collected per day during years 1 and 2 (E), years 3–5 (F) and years 6–8 (G) of tracking (note different scales of the *y*-axis). Black lines show the running average over a 30-day period, and blue ticks at the top (E) indicate the periods of very-high-resolution tracking (1 GPS position per second). On all figures, colors indicate the tracking year.

requirements (Alarcón & Lambertucci, 2018; Duriez et al., 2019). Real-time GPS tracking is particularly crucial for the detection of poisoning events: whenever the GPS informs that a vulture is either moving very little or is suspected to be dead, an INPA ranger is immediately sent to the field to investigate (Hatzofe & Vine, 2019; Nemtzov et al., 2021). That is exactly what happened with Rehovot.

In his first year of life, Rehovot often moved more than 30 km away from the roost, and some days he even flew more than 100 km (Figure 2). Despite staying mostly in the Negev and Judean deserts, Rehovot also visited southern Israel (Eilat), the eastern Sinai (Egypt), and Jordan. But, on the 16th April 2015, 2 years after fledging, the GPS showed that Rehovot had not flown for more than 24 h. He was close to the ruins of an ancient Nabataean city (dated from the 1st century BCE to 5th century CE) known as "Rehovot in the Negev." Thanks to this proximity, the vulture was named after the ruins: "Rehovot." A ranger (Amiram Cohen) responded quickly, found Rehovot in a very poor condition and rushed him to the Israeli Wildlife Hospital (https://www.wildlife-hospital.org.il/en). An initial inspection revealed that Rehovot had lost weight (weighed 7.7 kg), had a very weak heart rate, and was vomiting and barely keeping his head up. Under the care of Dr. Nili Anglister, Roni Elias and, particularly, Shmulik Landau (who checked him every 15 min over the first, and most critical, night), Rehovot received the appropriate treatment. The following day, another GPS-tracked vulture, an adult female (at least 11 years old) named Faculta (currently T15 wing tag) was also collected from the same location and entered the hospital in a very weak state. Both vultures were diagnosed with methomyl poisoning, an insecticide used for a variety of crops as well as to deliberately poison wildlife (Plaza et al., 2019) and, in this case, used illegally to bait a carcass for culling feral dogs. As this

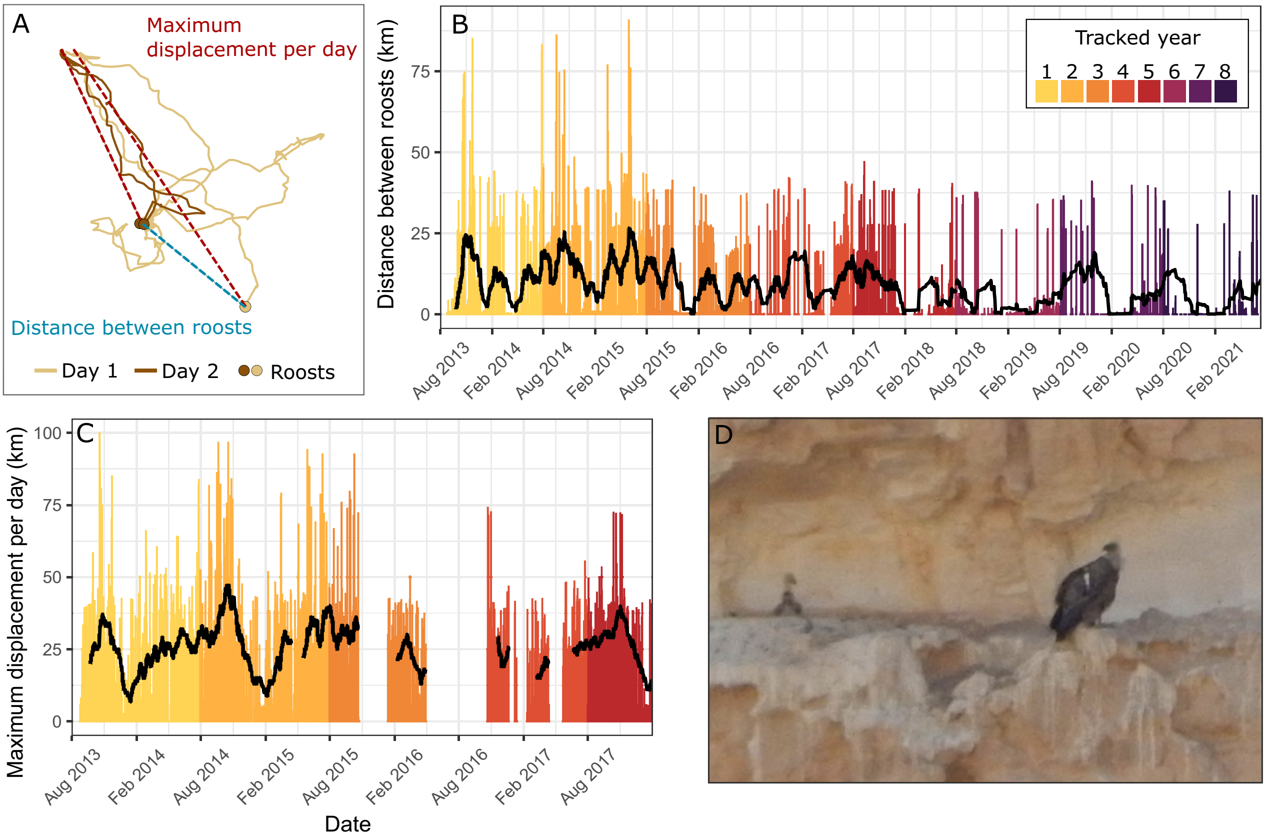

FIGURE 2 Daily distances moved by Rehovot during the 8 years of GPS tracking. (A) Diagram describing two movement metrics: maximum displacement per day (calculated as the distance between the night roost and the most distant GPS position of that day) and distance between consecutive roosts (an index that is insensitive to variation in sampling resolution). (B) Distance between consecutive roosts during 8 years of GPS tracking, showing a seasonal fluctuation and a diminishing trend with age: as Rehovot matured he tended to roost in the same or nearby roosts. Black lines show the running averages over a 30-day period. (C) Maximum displacement per day during the first 5 years of GPS tracking. Lower tracking resolution prevented the calculation for years 6–8 (and some intermediate periods for years 3–5). Colors indicate the tracking year. (D) Photograph of Faculta on her nest with her chick (credit: Shmulik Landau). Faculta was poisoned at the same time as Rehovot and, due to efficient hospital treatment, both Faculta and Rehovot were released only 3 days after the incident. Rehovot, Faculta, and Faculta's chick all survived the poisoning event. Video S1 shows an animation of the GPS tracks of Rehovot, before, during, and after the hospital visit.

was the middle of the vulture breeding season and Faculta was known to be nesting, it was imperative that she would be released quickly: the longer Faculta was absent from the nest, the higher the probability her chick would perish. Thanks to the swift and efficient treatment of the hospital staff, both vultures were released on the 19th of April (i.e., within less than 3 days), and both Rehovot and Faculta, as well as her chick, were to survive this poisoning incident (Figure 2D shows Faculta on the nest with her chick, after recovery).

After the poisoning event, the movements of Rehovot were tracked for another 6 years (Figure 1). While on some days he was still moving as much as 70 km away from the roost, Rehovot became more and more local as he aged. This was also reflected in the distances moved between consecutive night roosts: in his first year of life, Rehovot moved on average 11 km between roosts (SD = 17 km, maximum = 85 km), while in his eighth year of life, Rehovot mostly occupied the same areas and only moved on average 5 km between consecutive night roosts (SD = 10 km, maximum = 38 km) (Figure 2). Occupying smaller ranges as an individual ages is a common trend in griffon vultures (and several other species; e.g., Kane et al., 2022). Food is plentiful in Israel thanks to the large quantities of contaminant-free food provided by the INPA in several supplementary feeding stations for vultures (Duriez et al., 2022), thus reducing the risk of poisoning and allowing vultures' foraging movements to be quite local (Spiegel et al., 2013). While such long-term tracks of free-ranging animals are still rare, they have the potential to show, on a broad scale, how space use changes seasonally and throughout an animal's lifetime (e.g., foraging or roosting behavior; Harel, Duriez, et al., 2016; Spiegel et al., 2015). In endangered species, the age structure of the population may change as the population decreases (Jackson et al., 2020), which, if combined with age-specific space use (Weimerskirch, 2018), may regulate the ecosystem services the species provides (e.g., nutrient transport; McInturf et al., 2019 or, in the case of vultures, sanitation services; Fernández-Gómez et al., 2022).

On a finer scale, Rehovot's data also allowed the study of age-related changes in flight behavior and their fitness implications. In fact, Rehovot was selected for GPS tracking exactly for this purpose, as a part of Roi Harel's PhD studies at the Movement Ecology Laboratory, at the Hebrew University of Jerusalem. Together with other

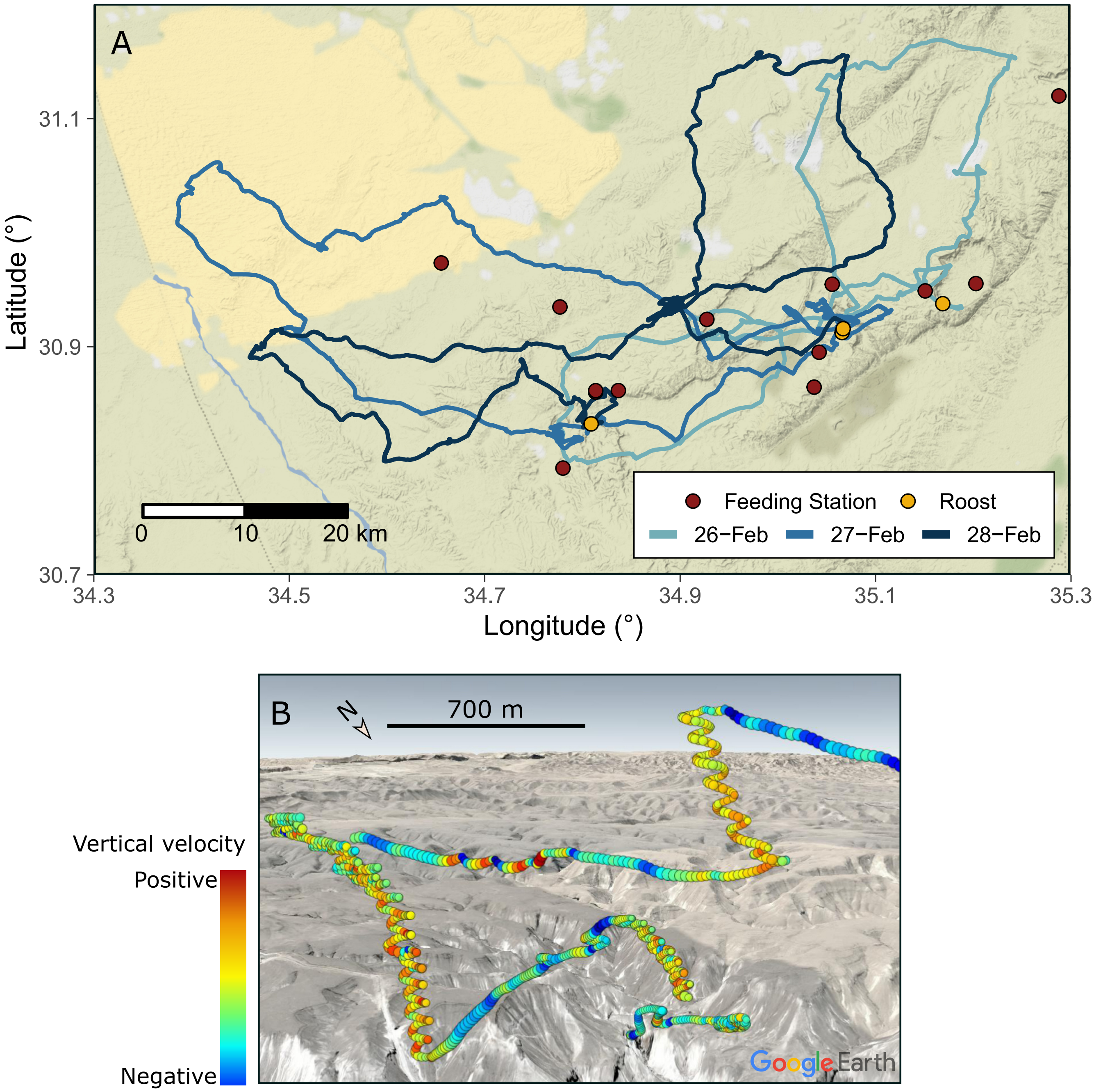

FIGURE 3 An example of high-resolution GPS tracking of Rehovot. (A) Map showing the GPS tracks of Rehovot (in shades of blue) collected consecutively over 3 days, every 1 s. Red circles show the location of the feeding stations, and yellow circles show the roosts used during those 3 days. (B) Details of a high-resolution track, showing the soaring behavior of Rehovot through a few thermal updrafts. Red colors show positive vertical velocities (i.e., gaining altitude in a thermal) and blue colors show negative vertical velocities (i.e., gliding and losing altitude).

vultures, Rehovot's flights were tracked at high resolution, recording GPS position and altitude every 1 s for a few consecutive days (Figure 3). Harel's study revealed that adult vultures outperform juveniles (including Rehovot) in utilizing rising air currents (commonly named thermals), as juveniles are yet to learn how to efficiently circle in the thermals when drifted by the winds (Harel, Horvitz, et al., 2016). This study provided a unique example of how detailed movement data can be used to identify specific tasks that young animals need to learn to improve their functional performance. Furthermore, understanding how animals utilize the atmospheric conditions to sustain flight allows the estimation of the energetic costs of movement (Harel, Horvitz, et al., 2016), and can also provide information on the risks of collision with human infrastructures, such as wind turbines (Péron et al., 2017). Nevertheless, such high-resolution tracking may come at a price. High temporal GPS tracking data increases the accuracy of the locations (Acácio, Atkinson, et al., 2022), but it may also fatigue the battery and overall decrease the lifespan of the transmitter. Thus, selecting the correct GPS schedule to fit the study's objectives is crucial. For example, in order to quickly identify vulture poisoning events is essential to have GPS locations at an intermediate temporal resolution (e.g., at least a GPS location every 10 min) and frequent GSM transmissions per day (Hatzofe & Vine, 2019; Nemtzov et al., 2021).

The moving story of Rehovot came to an end on 14 July 2021, when the GPS showed no movement for several days. Due to the inaccessibility of the area, it was not possible to confirm if Rehovot had perished or if he had only lost his GPS transmitter. Overall, Rehovot was followed for 8 years and provided more than 1 million GPS positions. In the end, as it was not possible to confirm if Rehovot had died, one can still hope to find him someday soaring on the strong desert thermals, or even to recapture him and continue to follow his movements throughout the rest of his life.

In summary, Rehovot's story illustrates how lifetime tracks can advance ecological research while directly promoting species conservation. Nonetheless, these long-term studies are challenging to maintain, partly due to technical difficulties (e.g., the lifespan of the GPS transmitters), and to the difficulty of obtaining uninterrupted funding, as these studies usually exceed the duration of research grants. Yet, only such individual and lifelong studies can unravel how behavioral and life-history patterns emerge in the wild, shaping species evolution and adaptation to their environment (Caspi et al., 2022; Wild et al., 2021; Wolf et al., 2007). For example, several studies have shown that adults differ from juveniles in a number of traits, from flying to socializing (Albery et al., 2022; Harel, Horvitz, et al., 2016). Yet, these comparisons often fail to identify the mechanisms through which the observed age-dependent patterns evolve. These differences can result from changes in individual behavior, either via learning, improvement, or senescence (Albery et al., 2022; Mueller et al., 2013; Sergio et al., 2014). In addition, differences can also reflect the selective mortality of individuals with particular traits (Sergio et al., 2014, 2022), emphasizing the value of individual long-term tracking. As the environment is changing faster than ever before, lifelong research is therefore fundamental to understanding if and how individuals adapt (or fail to adapt) to the challenges arising from human-induced environmental change (Caspi et al., 2022; Clutton-Brock & Sheldon, 2010).

ACKNOWLEDGMENTS

We dedicate this article to Shmulik Landau who was an inspirational caregiver at the Wildlife Hospital and is much missed. We also thank all volunteers and workers of the Wildlife Hospital for their dedication. We thank workers and rangers of the INPA for their work in the field, members of the Movement Ecology Laboratory at the Hebrew University of Jerusalem, and members of the Movement Ecology and Individual Behavior Laboratory at Tel Aviv University, particularly Assaf Uzan for logistic support. We thank Dr. Noa Pinter-Wollman, Dr. Nitika Sharma and Kaija Gahm for their feedback on the first version of the manuscript. Finally, we thank the editor, Professor John Pastor, Dr. Olivier Duriez, and two anonymous reviewers for the valuable feedback on the previous versions of the manuscript. Funding for this work was provided by the Binational Science Foundation (BSF) 822/2019 grant to Orr Spiegel, as well as BSF 255/2008 to Ran Nathan. Marta Acácio was supported by the George S. Wise Postdoctoral Fellowship (Tel Aviv University). Nili Anglister was supported by a stipend from Yad-Hanadiv.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data supporting this research are sensitive and not available publicly due to the endangered status of the focal species in the study region; these data contain GPS locations of the focal individual and are available to qualified researchers via the Movebank study "E-obs GSM Vultures Israel" (Movebank ID 7359070; https://www.movebank.org/cms/webapp?gwt_fragment=page=studies,path=study7359070). An anonymized version of the dataset (Acácio, Anglister, et al., 2022) is available in Zenodo at https://doi.org/10.5281/zenodo.7413086 in which data were shifted a few kilometers from original locations to ensure the species safety, but maintains all the other geometrical attributes needed for reconstructing the analysis.

ORCID

Marta Acácio https://orcid.org/0000-0002-9947-1181
Ran Nathan https://orcid.org/0000-0002-5733-6715
Orr Spiegel https://orcid.org/0000-0001-8941-3175

REFERENCES

Acácio, M., N. Anglister, G. Vaadia, R. Harel, R. Nathan, O. Hatzofe, and O. Spiegel. 2022. "Data for "A Lifetime Track of a Griffon Vulture: The Moving Story of Rehovot (Y64)" (v1.0.0)." Zenodo. https://doi.org/10.5281/zenodo.7413086.

Acácio, M., P. W. Atkinson, J. P. Silva, and A. M. A. Franco. 2022. "Performance of GPS/GPRS Tracking Devices Improves with Increased Fix Interval and Is Not Affected by Animal Deployment." *PLoS One* 17(3): e0265541. https://doi.org/10.1371/journal.pone.0265541.

Alarcón, P. A. E., and S. A. Lambertucci. 2018. "A Three-Decade Review of Telemetry Studies on Vultures and Condors." *Movement Ecology* 6(1): 13. https://doi.org/10.1186/s40462-018-0133-5.

Albery, G. F., T. H. Clutton-Brock, A. Morris, S. Morris, J. M. Pemberton, D. H. Nussey, and J. A. Firth. 2022. "Ageing Red Deer Alter their Spatial Behaviour and Become Less Social." *Nature Ecology and Evolution* 6(8): 1231–8. https://doi.org/10.1038/s41559-022-01817-9.

Caspi, T., J. R. Johnson, M. R. Lambert, C. J. Schell, and A. Sih. 2022. "Behavioral Plasticity Can Facilitate Evolution in Urban Environments." *Trends in Ecology & Evolution* 20: 1092–103. https://doi.org/10.1016/j.tree.2022.08.002.

Clutton-Brock, T., and B. C. Sheldon. 2010. "Individuals and Populations: The Role of Long-Term, Individual-Based Studies of Animals in Ecology and Evolutionary Biology." *Trends in Ecology and Evolution* 25(10): 562–73. https://doi.org/10.1016/j.tree.2010.08.002.

Duriez, O., J. Andevski, C. G. R. Bowden, A. Camiña-Cardenal, H. Frey, F. Genero, O. Hatzofe, et al. 2022. "Commentary: Not All Vulture Feeding Stations Are Supplementary-Proposed Terminology for Carcass Provisioning with Reference to Management Goals and Food Sources." *Journal of Raptor Research* 56(1): 131–7. https://doi.org/10.3356/JRR-20-19.

Duriez, O., R. Harel, and O. Hatzofe. 2019. "Studying Movement of Avian Scavengers to Understand Carrion Ecology." In *Carrion Ecology and Management*, Wildlife Research Monographs, edited by P. Olea, P. Mateo-Tomás, and J. Sánchez-Zapata, Vol. 2. Cham: Springer. https://doi.org/10.1007/978-3-030-16501-7_11.

Efrat, R., O. Hatzofe, Y. Miller, and O. Berger-Tal. 2020. "Determinants of Survival in Captive-Bred Griffon Vultures *Gyps fulvus* after their Release to the Wild." *Conservation Science and Practice* 2(12): 1–9. https://doi.org/10.1111/csp2.308.

Fernández-Gómez, L., A. Cortés-Avizanda, E. Arrondo, M. García-Alfonso, O. Ceballos, E. Montelío, and J. A. Donázar. 2022. "Vultures Feeding on the Dark Side: Current Sanitary Regulations May Not Be Enough." *Bird Conservation International* 1–19: 590–608. https://doi.org/10.1017/S0959270921000575.

Green, R. E., I. Newton, S. Shultz, A. A. Cunningham, M. Gilbert, D. J. Pain, and V. I. Prakash. 2004. "Diclofenac Poisoning as a Cause of Vulture Population Declines across the Indian Subcontinent." *Journal of Applied Ecology* 41(5): 793–800. https://doi.org/10.1111/j.0021-8901.2004.00954.x.

Hardy, E. 1946. *A Handbook of the Birds of Palestine*. Education Officer-in-Chief, G.H.Q. Middle East Forces.

Harel, R., O. Duriez, O. Spiegel, J. Fluhr, N. Horvitz, W. M. Getz, W. Bouten, F. Sarrazin, O. Hatzofe, and R. Nathan. 2016. "Decision-Making by a Soaring Bird: Time, Energy and Risk Considerations at Different Spatio-Temporal Scales." *Philosophical Transactions of the Royal Society B: Biological Sciences* 371(1704): 20150397. https://doi.org/10.1098/rstb.2015.0397.

Harel, R., N. Horvitz, and R. Nathan. 2016. "Adult Vultures Outperform Juveniles in Challenging Thermal Soaring Conditions." *Scientific Reports* 6(May): 27865. https://doi.org/10.1038/srep27865.

Harel, R., O. Spiegel, W. M. Getz, and R. Nathan. 2017. "Social Foraging and Individual Consistency in Following Behaviour: Testing the Information Centre Hypothesis in Free-Ranging Vultures." *Proceedings of the Royal Society B: Biological Sciences* 284(1852): 20162654. https://doi.org/10.1098/rspb.2016.2654.

Hatzofe, O. 2020. "Summary of the Griffon Vulture Counts in Israel." Israeli Nature and Parks Authority Internal Report, pp. 1–5.

Hatzofe, O., and G. Vine. 2019. "Location-Aware Alert System for Wildlife Poisoning Using GPS Tagged." In *European Vulture Conference*, Portugal.

Iezekiel, S., B. Woodley, and O. Hatzofe. 2003. "Cage Trap for *Gyps fulvus*." *Vulture News* 49: 14–6.

Jackson, J., K. U. Mar, W. Htut, D. Z. Childs, and V. Lummaa. 2020. "Changes in Age-Structure over Four Decades were a Key Determinant of Population Growth Rate in a Long-Lived Mammal." *Journal of Animal Ecology* 89(10): 2268–78. https://doi.org/10.1111/1365-2656.13290.

Kane, A., H. K. Ara Monadjem, O. Aschenborn, K. Bildstein, A. Botha, C. Bracebridge, E. R. Buechley, et al. 2022. "Understanding Continent-Wide Variation in Vulture Ranging Behavior to Assess Feasibility of Vulture Safe Zones in Africa: Challenges and Possibilities." *Biological Conservation* 268: 109516. https://doi.org/10.1016/j.biocon.2022.109516.

McInturf, A. G., L. Pollack, L. H. Yang, and O. Spiegel. 2019. "Vectors with Autonomy: What Distinguishes Animal-Mediated Nutrient Transport from Abiotic Vectors?" *Biological Reviews* 94(5): 1761–73. https://doi.org/10.1111/brv.12525.

Mueller, T., R. B. O'Hara, S. J. Converse, R. P. Urbanek, and W. F. Fagan. 2013. "Social Learning of Migratory Performance." *Science* 341: 999–1002. https://doi.org/10.1126/science.1237139.

Nathan, R., C. T. Monk, R. Arlinghaus, T. Adam, J. Alós, M. Assaf, H. Baktoft, et al. 2022. "Big-Data Approaches Lead to an Increased Understanding of the Ecology of Animal Movement." *Science* 375(6582): eabg1780. https://doi.org/10.1126/science.abg1780.

Nemtzov, S., O. Hatzofe, O. Steinitz, and G. Vine. 2021. "An Innovative Automatic Location-Based Real-Time Alert System to Prevent Wildlife Poisoning Using GPS-Tagged Griffon Vultures has Led to Better Conservation of Endangered Species in Protected Areas." https://panorama.solutions/en/solution/innovative-automatic-location-based-real-time-alert-system-prevent-wildlife-poisoning-using.

Ogada, D. L., F. Keesing, and M. Z. Virani. 2012. "Dropping Dead: Causes and Consequences of Vulture Population Declines Worldwide." *Annals of the New York Academy of Sciences* 1249(1): 57–71. https://doi.org/10.1111/j.1749-6632.2011.06293.x.

Péron, G., C. H. Fleming, O. Duriez, J. Fluhr, C. Itty, S. Lambertucci, K. Safi, E. L. C. Shepard, and J. M. Calabrese. 2017. "The Energy Landscape Predicts Flight Height and Wind Turbine Collision Hazard in Three Species of Large Soaring Raptor." *Journal of Applied Ecology* 54(6): 1895–906. https://doi.org/10.1111/1365-2664.12909.

Plaza, P. I., E. Martínez-López, and S. A. Lambertucci. 2019. "The Perfect Threat: Pesticides and Vultures." *Science of the Total Environment* 687: 1207–18. https://doi.org/10.1016/j.scitotenv.2019.06.160.

Sergio, F., J. M. Barbosa, A. Tanferna, R. Silva, J. Blas, and F. Hiraldo. 2022. "Compensation for Wind Drift during Raptor Migration Improves with Age through Mortality Selection." *Nature Ecology and Evolution* 6(7): 989–97. https://doi.org/10.1038/s41559-022-01776-1.

Sergio, F., A. Tanferna, R. De Stephanis, L. L. Jiménez, J. Blas, G. Tavecchia, D. Preatoni, and F. Hiraldo. 2014. "Individual Improvements and Selective Mortality Shape Lifelong Migratory Performance." *Nature* 515(7527): 410–3. https://doi.org/10.1038/nature13696.

Spiegel, O., R. Harel, A. Centeno-Cuadros, O. Hatzofe, W. M. Getz, and R. Nathan. 2015. "Moving beyond Curve Fitting: Using Complementary Data to Assess Alternative Explanations for Long Movements of Three Vulture Species." *The American Naturalist* 185(2): E44–54. https://doi.org/10.1086/679314.

Spiegel, O., R. Harel, W. M. Getz, and R. Nathan. 2013. "Mixed Strategies of Griffon Vultures' (*Gyps fulvus*) Response to Food Deprivation Lead to a Hump-Shaped Movement Pattern." *Movement Ecology* 1(1): 1–12. https://doi.org/10.1186/2051-3933-1-5.

Tristram, H. B. 1865. *The Land of Israel: A Journal of Travels in Palestine, Undertaken with Special Reference, to its Physical Character*. London: Society for Promoting Christian Knowledge.

Weimerskirch, H. 2018. "Linking Demographic Processes and Foraging Ecology in Wandering Albatross-Conservation Implications." *Journal of Animal Ecology* 87(4): 945–55. https://doi.org/10.1111/1365-2656.12817.

Wild, B., D. M. Dormagen, A. Zachariae, M. L. Smith, K. S. Traynor, D. Brockmann, I. D. Couzin, and T. Landgraf. 2021. "Social Networks Predict the Life and Death of Honey Bees." *Nature Communications* 12(1): 1–12. https://doi.org/10.1038/s41467-021-21212-5.

Wolf, M., G. Sander Van Doorn, O. Leimar, and F. J. Weissing. 2007. "Life-History Trade-Offs Favour the Evolution of Animal Personalities." *Nature* 447(7144): 581–4. https://doi.org/10.1038/nature05835.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Acácio, Marta, Nili Anglister, Gideon Vaadia, Roi Harel, Ran Nathan, Ohad Hatzofe, and Orr Spiegel. 2023. "A Lifetime Track of a Griffon Vulture: The Moving Story of Rehovot (Y64)." *Ecology* 104(4): e3985. https://doi.org/10.1002/ecy.3985