

## Feature Articles

# USE OF CAMERA TRAPS TO MONITOR MESO-MAMMALS IN AN URBAN PARK

TIMOTHY MCSWEENEY<sup>1</sup>, GABRIELA SOSA<sup>2,3</sup>, CHASE GRAVATT<sup>3</sup>, DANIEL BROOKS<sup>1</sup>

<sup>1</sup> VERTEBRATE ZOOLOGY, HOUSTON MUSEUM OF NATURAL SCIENCE, <sup>2</sup> NATURAL RESOURCES INSTITUTE, TEXAS A&M UNIVERSITY, <sup>3</sup> BUFFALO BAYOU PARTNERSHIP

Keywords: Meso-Mammals, Camera Trap, Urban Park, Urban Environment, Rodent, Coyote, River Otter, Beaver, Virginia Opossum, Raccoon, Swamp Rabbit

---

## The Southwestern Naturalist

---

**ABSTRACT**—Buffalo Bayou Park is a linear urban park located near downtown Houston, Texas. The park consists of a variety of gardens and native plant communities along the banks of the bayou, and flows from Addicks Reservoir to the Gulf of Mexico. We deployed camera traps within the park in 2022 to collect data on wildlife within the park. From the images collected we were able to identify and record data for 10 species of mammals living within the park, recording ecology, behavior, movements and other natural history information. Results are discussed by comparing our findings to prior related studies.

**RESUMEN**—Buffalo Bayou Park es un parque urbano lineal ubicado cerca del centro de Houston, Texas. El parque consta de una variedad de jardines y comunidades de plantas nativas a lo largo de las orillas del pantano y fluye desde el embalse de Addicks hasta el Golfo de México. Instalamos cámaras trampa dentro del parque en 2022 para recopilar datos sobre la vida silvestre dentro del parque. A partir de las imágenes recopiladas pudimos identificar y registrar datos de 10 especies de mamíferos que viven dentro del parque, registrando ecología, comportamiento, movimientos y otra información de historia natural. Los resultados se discuten comparando nuestros hallazgos con estudios relacionados anteriores.

Camera traps have been utilized for mammal surveys in both urban and wild environments, as they permit regular species monitoring in a variety of circumstances, including inclement weather (Wellington et al., 2014), terrain and habitats that are difficult to access regularly (Reed, 2011), and monitoring species that may pose hazards to direct human interactions (Noyce et al., 2001). This has been beneficial for collecting abundance, behavioral and distribution data for mammal species living in urban areas, where currently there is a limited amount of ecological information (Hegglin et al., 2004; Swanson et al., 2022). These data are essential for understanding how mammals adapt in behavior, habitat selection, and species interaction due to anthropogenic changes (Aya-Cuero et al., 2019; Harmsen et al., 2010; Nascimento et al., 2024). Parklands and greenspaces within urban areas can provide resources and cover that may be difficult to acquire in a developed habitat, allowing for mammals to maintain populations in regions that have been significantly altered through human activity (Lepczyk et al., 2017).

Monitoring wildlife in an urban greenspace is important for cities with significant wetland and marsh environments, as these serve a role in flood mitigation and as habitat for a wide variety of species (Hettiarachchi et al., 2014). These ecosystems are especially susceptible to anthropogenic change, and can be harmed by the presence of pollutants, which can have negative compounding effects on habitat quality and quantity, dampening species richness inhabiting these riparian areas (Steele & Heffernan, 2014). Wildlife that is present within an urban wetland system can serve as an important bioindicator of a given habitat's ability to support a variety of species, along with the overall health of the ecosystem (Mitsch et al., 1998). Camera traps are a

useful tool for collecting ecological and behavioral data on wildlife within an urban wetland, because they are placed in locations that could be difficult to monitor and can be left overnight for significant amounts of time (Kelly & Holub, 2008).

In 2022 we deployed camera traps to collect wildlife video clips within Buffalo Bayou Park (Houston, Harris County, Texas). Herein we analyze the recordings to identify meso-mammals inhabiting the park, as well as provide natural history information related to these mammals. This information is valuable to understand how various species typically considered rural-dwelling can not only persist, but thrive in an urban environment approximately 1 km west of downtown Houston, a major metropolis (HUWP, 2023). Moreover, this information can serve as a basic species inventory of meso-mammals in Buffalo Bayou Park, and assist in identifying acceptable habitat parameters for wildlife within urban areas.

## MATERIALS AND METHODS

**Study Area:** Buffalo Bayou Park is a 160-acre park located near downtown Houston, and is built around the banks of Buffalo Bayou, which flows from prairies in Fort Bend County, through Harris County, and into the Gulf of Mexico. This linear urban park consists of natural and horticulturally managed areas that serve a variety of uses, including enhancing biodiversity, promoting visitor health and cultural value, assisting in flood mitigation, and atmospheric carbon sequestering (Yildirim et al., 2021). The natural areas serving as habitat for a variety of fauna and flora are managed by a non-governmental organization, Buffalo Bayou Partnership. The urban habitats within the park are



FIGURE 1. Green Tree Nature area (a, left) and McGovern Cascade area (b, right) of Buffalo Bayou Park.

comprised of manicured lawns, cultivated gardens, native meadows, wooded areas, tributaries and densely vegetated riparian zones.

Recently efforts have been made to restore native plant life (Wright, 2018) with the goals of preserving environments found along the Texas Coastal Prairie, while mitigating the effects of flooding. This is being accomplished with the removal of non-native plants, and cultivating native botany historically characterizing Texas Coastal Prairie and Coastal Oak Mottes. The Buffalo Bayou Partnership also works to monitor and remove pollutants from the bayou to maintain water quality.

**CAMERA TRAPS**—Two GardePro A3S Trail Camera traps (Shenzhen Zhuopu Digital Technology Company, Ltd., Shenzhen, Guangdong Province, China) were installed in the park to record animal data. The first was placed in the Green Tree Nature Area (Fig. 1a), a natural meandering tributary that feeds into the bayou, has limited access to the public and harbors various species of hardwood trees and shrubs. The camera was secured to a tree facing the water 2 m above the ground. The second camera was placed near the McGovern Cascade Area (Fig. 1b), a small stream that flows into the bayou, transitioning from a water feature to a less modified stream surrounded by hardwood shrubs, some trees and other plants. The camera was secured 2 m above the ground near the base of a woody shrub. The cameras were secured with heavy duty locks to prevent theft, and data were retrieved monthly for two years (January 2022 - December 2023). Recordings without accurate date and time stamps were not included in analyses. We followed O'Brien et al. (2003) to distinguish independent events, where any species caught on the same camera and day was counted as a second individual if there was > 30 min between images.

## RESULTS

**DIVERSITY**—A total of 10 mammal species were recorded and identified with the cameras: one species of marsupial (Virginia Opossum [*Didelphis virginiana*]), three carnivores (Coyote [*Canis latrans*], Northern Raccoon [*Procyon lotor*], North American River Otter [*Lontra canadensis*]), four rodents (Eastern Gray Squirrel [*Sciurus carolinensis*], North American Beaver [*Castor canadensis*], Black Rat [*Rattus rattus*], Nutria [*Myocastor coypus*]), and two lagomorphs (Swamp Rabbit [*Sylvilagus aquaticus*], Eastern Cottontail [*S. floridanus*]). Virginia Opossums, Northern Raccoons, Eastern Gray Squirrel, and Swamp Rabbits, were the most dominant species (>25 events), with North American River Otters, Eastern Cottontail, and Nutria documented only once or twice for each species.

**VIRGINIA OPOSSUM (*Didelphis virginiana*)**—A total of 109 independent recordings of opossums were taken by the camera traps, with 104 at Green Tree Nature Area and five at McGovern Cascade. Opossums were active nocturnally and at dawn (18:08 – 7:33 hrs), with limited activity afterwards. Single adult opossums were recorded in every event except for one, which contained one adult female with three juveniles (24 July 2022).

**COYOTE (*Canis latrans*)**—All but one of the 13 independent recordings of coyotes were at Green Tree Nature Area (n = 1 at McGovern Cascade). With the exception of two days in April, coyotes were absent February through June, yet present during all four seasons. Coyotes were recorded nocturnally through early morning (19:27 – 9:05 hrs). All of the coyotes were adults. Of the 13 images collected, eight (62%) were individuals, four (30%) were pairs, and one (7%) had three individuals. Coyotes were recorded drinking water as well as moving along or across bayou streams.

**NORTHERN RACCOON (*Procyon lotor*)**—A total of 27 independent recordings of Northern Raccoons were taken by camera traps, with 25 at Green Tree Nature Area and two





FIGURE 2. River Otter entering water at Buffalo Bayou Park.

at McGovern Cascade. Raccoons are present through most of the year, but less active during the reproductive season (March – June), possibly due to the time required for gestation or weaning period of kits (Lotze & Anderson, 1979). Raccoons were primarily nocturnal in activity (20:26 – 5:30 hrs), with limited activity afterwards. A single adult was recorded in 25 of the 27 (93%) videos, and two (7%) of the videos involved two individual raccoons interacting with each other (first pair play-fighting, second pair standing in/near water).

**NORTHERN RIVER OTTER (*Lontra canadensis*)**—Two images of two adult otters were collected from the Green Tree Nature Area in November and December, at 20:49 and 2:31 hrs, respectively. Both videos were of the otters re-entering the water (Fig. 2).

**EASTERN GRAY SQUIRREL (*Sciurus carolinensis*)**—All 49 independent events of squirrels were taken by the camera trap at Green Tree Nature Area. Squirrels were recorded mid-summer through late fall (mid-July to early December), mostly diurnally (7:15 – 19:07 hrs). All of the squirrels recorded were adults. Squirrels were recorded moving toward and away from a stream, drinking from the water, and digging in the ground.

**AMERICAN BEAVER (*Castor canadensis*)**—Eight recordings of beavers were collected, all from the Green Tree Nature Area. Of the images, five (62.5%) were of individual adults, one was of a pair of adults, one was of an adult and a quarter-grown juvenile, and one was of two adults and one quarter-grown juvenile (12.5% for each single event). Beavers were recorded from late fall through mid-spring, and were nocturnal with hours of activity ranging from 19:42 – 4:00 hrs.

**SWAMP RABBIT (*Sylvilagus aquaticus*)**—A total of 37 independent recordings of Swamp Rabbits were recorded, with 29 at Green Tree Nature Area and eight at McGovern Cascade. Rabbits have some presence in the fall months but

were recorded mostly during winter. Rabbits were recorded during crepuscular and nocturnal hrs (17:14 – 6:18 hrs), with limited activity thereafter.

**EASTERN COTTONTAIL (*Sylvilagus floridanus*)**—Eastern Cottontails were also identified in the video clips, albeit much less frequently. They could be distinguished from Swamp Rabbits which have smaller, rounder ears (Fig. 3). There was a single image of an Eastern Cottontail, recorded at McGovern Cascade in January at 6:18 hrs, walking away from the water.

**OTHER MAMMALS**—Images of Nutria and Black Rat were also recorded, albeit in limited numbers. A single video of a nutria was recorded at Green Tree Nature Area on 22 May 2022 at 22:27 hrs, smelling its surroundings before entering the water. There were six images of rats recorded from Green Tree Nature Area, though only two had verifiable date and time (3 and 4 July 2022 at 21:48 and 3:15 hrs, respectively). The first rat recorded was observing its surroundings while walking away from water, while the latter rat was being eaten by a Black-Crowned Night Heron (Fig. 4). The four images that could not be verified contained individual rats moving alongside a stream.

## DISCUSSION

The different mammals recorded in this study have been previously accounted for in Harris County (Manning & Jones, 1998), and several species have been observed within urban habitats (Gallo et al., 2017). This is the first study to record observations for the majority of these species <1 km from a major metropolis (i.e., downtown Houston). Buffalo Bayou Park supports populations of meso-mammals, likely due to the abundance of essential resources (e.g., plant cover, fresh water, and food; Jones et al., 2003).

The data collected provides support for the presence of coyote populations in an urban environment that has un-

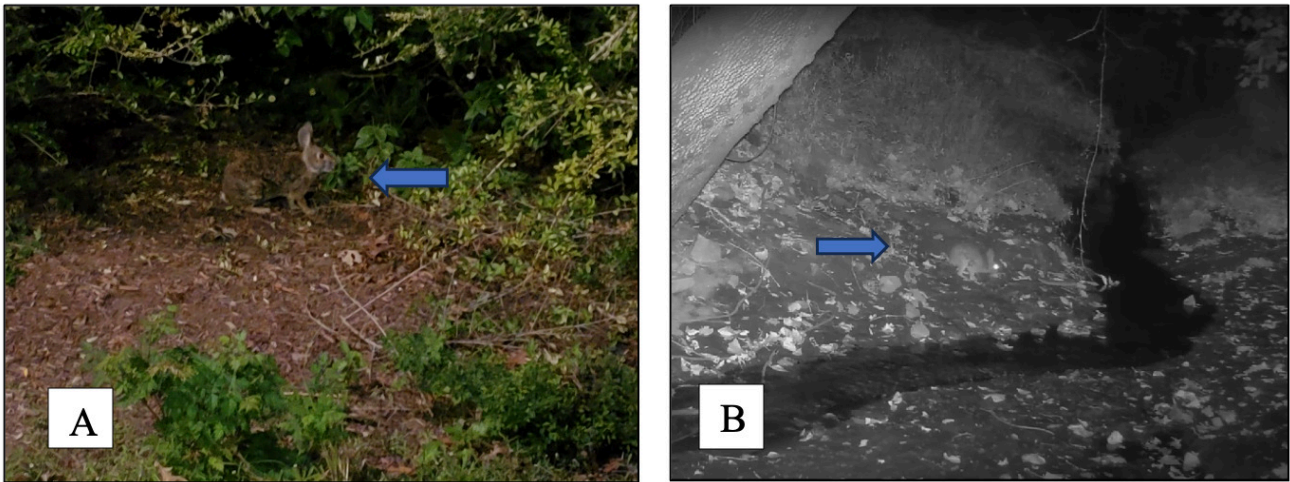


FIGURE 3. Image of a Swamp Rabbit (left, a), identified by its shorter, more rounded ears, compared to an image of an Eastern Cottontail (right, b).



FIGURE 4. Black-Crowned Night Heron with Black Rat in its mandibles.

dergone human development, and redevelopment of property into parkland (Gehrt et al., 2009; Poessel et al., 2016). Additionally, some visual observations were made of coyotes in the study region during late February 2024 (CG, pers. obs. 27 February 2024) and early March 2024 (L. Brooks, pers. obs., 4 March 2024). Considering the repeated observation of two adults moving together, it is likely that the recordings reflect a single small group that moves around the park, covering a minimum distance of 1.5 km between the two sites. Recordings of coyotes drinking from and moving along and across a bayou stream along with one of the recordings showing a coyote rubbing against another (assumed to be a social gesture), provides information on coyote behavior within the park (Carlson & Gese, 2008; Fig. 5). While the park can provide the necessary food and shelter

to support this small group, larger packs may not be able to successfully inhabit the park, considering carrying capacity has likely reached its maximum threshold (Kenaga et al., 2013).

Though the number of otter events was low when compared to other mammals, the two records may support the use of Buffalo Bayou Park as a suitable environment for the species (Mericas, 2021). The park provides wooded areas near water, which is ideal habitat for otters (Hanrahan et al., 2019) and could continue to serve as a long-term habitat for otters within the urban environment, where such habitats may be limited due to human development. Further observations are required to determine if otters are present year-round in the bayou, or if the waterway is serving as a corridor to less modified habitats (Douglas & Sadler, 2011).





FIGURE 5. Image of Coyotes rubbing against each other.

Collecting otter records also provides more data on their current distribution in Texas, since the otter's range in the state has been reduced due to human development. Monitoring of the species has provided evidence that populations are recovering but remain uncommon in the state (Schmidly & Bradley, 2016).

Heat dumping behavior was observed in squirrels, as a strategy to maintain a stable temperature during times of intense heat (Thorington & Ferrell, 2006). Recordings of this behavior were collected during the summer months when Houston was undergoing consistent high temperatures (National Oceanic and Atmospheric Administration, 2024). In 41 (83%) events squirrels were recorded walking with their belly off the ground, and in eight (16%) of the videos squirrels were recorded crawling with their belly on the ground. Continued observations of this behavior would provide a better understanding of how the species adapts to living in a habitat with severe heat.

While it is likely that a variety of urban predators consume Black Rats, the recording of a Black-crowned Night Heron preying on this species of rodent is likely novel. Although Black-crowned Night Herons have been reported aggressively foraging upon other species of small mammals along Buffalo Bayou (e.g., *Tadarida brasiliensis*; McSweeney & Brooks, 2020), Black Rats have not been reported in the diet of this species of heron (Hothem et al., 2020).

In contrast to our results, prior researchers suggested that Swamp Rabbits do not inhabit urban habitats (Chapman & Feldhamer, 1981). This species is also present around McGovern Lake and the Houston Zoo, located within Hermann Park (DMB, pers. obs., 23 August 2024), an equally partially modified urban area. Additionally, visual observations were made of rabbits in the study region (TEM, pers. obs., 14 March 2024). A recently killed rabbit with the head cleanly removed (GS pers. obs. 29 January 2024) is characteristic of predation by a Great Horned Owl (*Bubo vir-*

*ginianus*), especially in light of the more nocturnal hours of rabbit activity overlapping when these owls are also active (Artuso et al., 2022). This large nocturnal raptor has also been observed near the study site (DMB pers. obs., 8 April 2022).

Although it is unknown if the rabbits are found in more developed areas of the city, the presence of parks, such as Buffalo Bayou Park, allows for populations of Swamp Rabbits to exist within Houston. This is relevant, as this species was recently considered of special conservation concern in the state prior to its recent downlisting (Bender et al., 2005). Artificial biodegradable coir logs placed around the park to assist with preventing erosion from hillsides were used as latrines by rabbits, simulating the use of natural logs used as specific latrines, which is concordant with Schaubert et al. (2008; Figure 6). Other forms of behavior, including rabbits moving through habitat, observing their surroundings before or during their movements, smelling or nibbling plants before moving on, and crossing and swimming in bayou streams, were collected during this study. These data provide ecological information about the behavior of the species within the boundaries of the park.

The behaviors of other mammal species were recorded during the study. Opossums were recorded walking toward, away from or across bayou streams, with two images of opossums sniffing and/or drinking the water, and a single image of an opossum sitting on a fallen tree grooming its head and rostrum. Raccoons were recorded walking toward, across, or parallel to the bayou streams, with some sniffing the surface of the water or the ground near the water. Four of the images showed beavers swimming or wading through water, and three images (one single adult, one pair, and one group) exiting the water to smell nearby plants. In the images with the adult and juvenile, the adult was carrying the juvenile in its mouth and placed it on the ground so that the adult could sniff the surrounding plants (Patenaude, 1983;



FIGURE 6. Seed bank log used as a latrine site by Swamp Rabbits.



FIGURE 7. Beavers exiting the water, with an adult on right carrying a juvenile in its mouth.

Fig. 7), representing an under-reported behavior. There was one image of an adult beaver chasing a Black-Crowned Night Heron (*Nycticorax nycticorax*) away from the water.

Continued monitoring of the park may yield more mammalian data for the city and Buffalo Bayou, including species that are present but either not recorded currently or recorded in low numbers. Species, such as Nine-banded Armadillo (*Dasypus novemcinctus*), Bobcat (*Lynx rufus*), Striped Skunk (*Mephitis mephitis*) and Fox Squirrel (*Sciurus niger*) have been reported in Harris County and the greater Hous-

ton area but were not recorded during this study (VertNet search, <https://vertnet.org> 12 July 2024). Collecting contemporary records of species with historical presence in the region would serve as confirmation of their continued presence in the region.

Additional camera-trapping will also help determine whether species are present year-round, and whether spatio-temporal allocation occurs among species occupying similar niches. For example, beavers exhibit seasonal behaviors, being more active in summer months than during

winter (Jenkins & Busher, 1979). However, all the records of beavers in this study were collected between fall and spring, with no records during summer. Collecting more records on the presence and activity of this species and other mammals throughout the year would aid in interpreting seasonal behaviors. Additionally, there have been studies of niche partitioning by different mammal species in urban environments, such as the partitioning of habitats by gray and fox squirrels to avoid direct competition (Larson & Sander, 2022). Assessing spatio-temporal allocation of var-

ious species of mammals within the park would inform how mammals with shared niches are able to coexist in the park.

We would like to thank Joe Rodriguez and Anne Olson from the Buffalo Bayou Partnership for supporting our work in this endeavor. We are also grateful to Houston Wilderness for providing the video traps used in this study.

Submitted: October 09, 2024 CDT. Accepted: March 18, 2025 CDT.



## REFERENCES

- Artuso, C., Houston, C. S., Smith, D. G., & Rohner, C. (2022). Great Horned Owl (*Bubo virginianus*). In S. M. Billerman (Ed.), *Birds of the World*. Cornell Lab of Ornithology. <https://doi.org/10.2173/bow.grhowl.01.1>
- Aya-Cuero, C. A., Mosquera-Guerra, F., Trujillo, F., Esquivel, D. A., & Brooks, D. M. (2019). Meso- and large mammals of non-protected areas in the Planas River Basin floodplains, Columbia. *Biota Columbiana*, 20, 26–92.
- Bender, S., Shelton, S., Bender, K. C., & Kalmbach, A. (2005). *Texas comprehensive wildlife conservation strategy: 2005–2010*. Texas Parks and Wildlife Department, Austin, Texas, TPWD-TWAP 1:54.
- Carlson, D. A., & Gese, E. M. (2008). Reproductive biology of the coyote (*Canis latrans*): integration of mating behavior, reproductive hormones, and vaginal cytology. *Journal of Mammalogy*, 89, 654–664. <https://doi.org/10.1644/06-MAMM-A-436R1.1>
- Chapman, J. A., & Feldhamer, G. A. (1981). *Sylvilagus aquaticus*. *Mammalian Species*, 151, 1–4. <https://doi.org/10.2307/3504012>
- Douglas, I., & Sadler, J. P. (2011). Urban wildlife corridors: conduits for movement or linear habitat? In I. Douglas, D. Goode, M. C. Houck, & R. Wang (Eds.), *The Routledge Handbook of Urban Ecology* (pp. 274–288). Routledge.
- Gallo, T., Fidino, M., Lehrer, E. W., & Magle, S. B. (2017). Mammal diversity and metacommunity dynamics in urban green spaces: implications for urban wildlife conservation. *Ecological Applications*, 27, 2330–2341. <https://doi.org/10.1002/eap.1611>
- Gehrt, S. D., Anchor, C., & White, L. A. (2009). Home range and landscape use in a metropolitan landscape: conflict or coexistence? *Journal of Mammalogy*, 90, 1045–1057. <https://doi.org/10.1644/08-MAMM-A-277.1>
- Hanrahan, A. T., Rutter, A. U., Nielson, C. K., & Schaubert, E. M. (2019). Spatial ecology of river otters in a human-modified landscape. *Journal of Mammalogy*, 100, 1327–1339. <https://doi.org/10.1093/jmammal/gyz095>
- Harmsen, B. J., Foster, R. J., Silver, S., Ostro, L., & Doncaster, C. P. (2010). Differential use of trails by forest mammals and the implications for camera-trap studies: a case study from Belize. *Biotropica*, 42, 126–133. <https://doi.org/10.1111/j.1744-7429.2009.00544.x>
- Hegglin, D., Bontadina, F., Gloor, S., Romer, J., Müller, U., Breitenmoser, U., & Deplazes, P. (2004). Baiting red foxes in an urban area: a camera trap study. *The Journal of Wildlife Management*, 68, 1010–1017. [https://doi.org/10.2193/0022-541X\(2004\)068](https://doi.org/10.2193/0022-541X(2004)068)
- Hettiarachchi, M., McAlpine, C., & Morrison, T. H. (2014). Governing the wetlands: a multi-case study of policy, institutions, and reference points. *Environmental Conservation*, 41, 276–289. <https://doi.org/10.1017/S0376892913000519>
- Hothem, R. L., Brussee, B. E., Davis, W. E., Jr., Martínez-Vilalta, A., Motis, A., & Kirwan, G. M. (2020). Black-crowned Night Heron (*Nycticorax nycticorax*). In S. M. Billerman (Ed.), *Birds of the World*. Cornell Lab of Ornithology. <https://doi.org/10.2173/bow.bcnher.01>
- HUWP. (2023). *Houston Urban Wildlife Project*. <http://hmns.org/huwp>
- Jenkins, S. H., & Busher, P. E. (1979). *Castor canadensis*. *Mammalian Species*, 120, 1–8. <https://doi.org/10.2307/3503787>
- Jones, C. A., Beane, R. D., & Dickerson, E. A. (2003). Habitat use by birds and mammals along the urban South Platte River in Denver, Colorado. *Occasional Papers of the Museum of Texas Tech University*, 221, 1–16. <https://doi.org/10.5962/bhl.title.156823>
- Kelly, M. J., & Holub, E. L. (2008). Camera Trapping of Carnivores: Trap success among camera types and across species, and habitat selection by species, on Salt Pond Mountain, Giles County, Virginia. *Northeastern Naturalist*, 15, 249–262. [https://doi.org/10.1656/1092-6194\(2008\)15](https://doi.org/10.1656/1092-6194(2008)15)
- Kenaga, B. A., Krebs, R. A., & Clapham, W. B., Jr. (2013). Coyote land use inside and outside urban parks. *The American Midland Naturalist*, 170, 298–310. <https://doi.org/10.1674/0003-0031-170.2.298>
- Larson, R. N., & Sander, H. A. (2022). Seasonal activity patterns of sympatric eastern gray squirrels (*Sciurus carolinensis*) and fox squirrels (*Sciurus niger*) in a Midwestern metropolitan region. *Urban Ecosystems*, 25, 1527–1539. <https://doi.org/10.1007/s11252-022-01245-4>
- Lepczyk, C. A., Aronson, M. F. J., Evans, K. L., Goddard, M. A., Lerman, S. B., & Macivor, J. S. (2017). Biodiversity in the city: fundamental questions for understanding the ecology of urban green spaces for biodiversity conservation. *BioScience*, 67, 799–807. <https://doi.org/10.1093/biosci/bix079>
- Lotze, J. H., & Anderson, S. (1979). *Procyon lotor*. *Mammalian Species*, 119, 1–8. <https://doi.org/10.2307/3503959>
- Manning, R. W., & Jones, C. (1998). Annotated checklist of recent land mammals of Texas, 1998. *Occasional Papers of the Museum of Texas Tech University*, 182, 1–20. <https://doi.org/10.5962/bhl.title.143227>
- McSweeney, T., & Brooks, D. M. (2020). Night heron predation on free-tailed bats (*Tadarida brasiliensis*). *Southwestern Naturalist*, 64, 60–63. <https://doi.org/10.1894/0038-4909-64-1-60>
- Mericas, L. F. (2021). *River otters are on the rise in Texas*. Texas Monthly. <http://www.texasmonthly.com/travel/river-otters-on-the-rise-in-texas>
- Mitsch, W. J., Wu, X., Nairn, R. W., Weihe, P. E., Wang, N., Deal, R., & Boucher, C. E. (1998). Creating and restoring wetlands. *BioScience*, 48, 1019–1030. <https://doi.org/10.2307/1313458>



- Nascimento, L. L. S., Tenorio, M. G. B., Santana, F. C., Silva, V. L., & Alessio, F. M. (2024). Activity of the white-eared opossum *Didelphis albiventris* (Lund, 1840), and its interaction with the yellow-crowned night heron *Nyctanassa violacea* (Linnaeus, 1758) in an urban mangrove in northeastern Brazil. *Notas Sobre Mamíferos Sudamericanos*, 6, 1–7. <https://doi.org/10.31687/SaremNMS24.01.3>
- National Oceanic and Atmospheric Administration. (2024). *Houston Hobby temperatura and precipitation climate graphs*. [https://www.weather.gov/hgx/climate\\_graphs\\_hou#2024](https://www.weather.gov/hgx/climate_graphs_hou#2024)
- Noyce, K. V., Garshelis, D. L., & Coy, P. L. (2001). Differential vulnerability of black bears to trap and camera sampling and resulting biases in mark-recapture estimates. *Ursus*, 12, 211–225.
- O'Brien, T. G., Kinnaird, M. F., & Wibisono, H. T. (2003). Crouching tigers, hidden prey: Sumatran tiger and prey populations in a tropical forest landscape. *Animal Conservation*, 6, 131–139. <https://doi.org/10.1017/S1367943003003172>
- Patenaude, F. (1983). Care of the young in a family of wild beavers. *Acta Zoologica Fennica*, 174, 121–122.
- Poessel, S. A., Breck, S. W., & Gese, E. M. (2016). Spatial ecology of coyotes in the Denver metropolitan area: influence of the urban matrix. *Journal of Mammalogy*, 97, 1414–1427. <https://doi.org/10.1093/jmammal/gyw090>
- Reed, S. E. (2011). Non-invasive methods to assess co-occurrence of mammalian carnivores. *Southwestern Naturalist*, 56, 231–240. <https://doi.org/10.1894/F13-JKF-14.1>
- Schauber, E. M., Scharine, P. D., Nielson, C. K., & Rubert, L. (2008). An artificial log for swamp rabbit studies. *The Journal of Wildlife Management*, 72, 561–563. <https://doi.org/10.2193/2007-234>
- Schmidly, D. J., & Bradley, R. D. (2016). *Lontra canadensis*, Northern River Otter. In *The Mammals of Texas* (7th ed., pp. 262–266). The University of Texas Press.
- Steele, M. K., & Heffernan, J. B. (2014). Morphological characteristics of urban water bodies: mechanisms of change and implications for ecosystem function. *Ecological Applications*, 24, 1070–1084. <https://doi.org/10.1890/13-0983.1>
- Swanson, A. C., Conn, Swanson, A. J., & Brooks, D. M. (2022). Record of an urban ringtail (*Bassariscus astutus*) outside its typical geographical range. *Urban Naturalist Notes*, 9, 1–6.
- Thorington, R. W., Jr., & Ferrell, K. (2006). Squirrel Ecology. In *Squirrels: The Animal Answer Guide* (pp. 69–88). John Hopkins University Press.
- Wellington, K., Bottom, C., Merrill, C., & Litvaitis, J. A. (2014). Identifying performance differences among trail cameras used to monitor forest mammals. *Wildlife Society Bulletin*, 38, 634–638. <https://doi.org/10.1002/wsb.425>
- Wright, S. (2018). Restoring native habitat, helping to mitigate flooding in Houston. *Parks and Recreation*, 53. <https://link.gale.com/apps/doc/A557300699/AONE?u=anon~5f75037&sid=googleScholar&xid=00dfe046>
- Yildirim, Y., Keshavarzihaghighi, G., & Aman, A. R. (2021). Sustainable responses of an urban park for disaster resilience: a case study of Hurricane Harvey. *International Journal of Sustainable Development & World Ecology*, 28, 720–732. <https://doi.org/10.1080/13504509.2020.1870249>