



*A Study of Bobcats Living Along
the Urban/ Wildlands Interface*

Public Report

February 2025

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With Margaret Mercer, Jesse Allston, and Alexandra Diane Burnette**



BC #40, Braeden's footprint made on his release
Photo Courtesy of BIT Team, Gale Sherman

ACKNOWLEDGEMENTS & MANY SPECIAL THANKS

Artist and former Tucson resident Rick Wheeler generously donated the stunning bobcat scratchcard artwork for the BIT logo and report cover.

Key financial support came from Tucson Vice Mayor Kevin Dahl, Safari Club International of Arizona, the Southwest Wildlife Conservation Center, and Marleigh Fletcher.

Charlie Turner, Jennifer Turner, and Karen Dotson played a vital role in our success. John R. Gentile and Katie Iverson generously allowed the use of their bobcat photos that became the “face” of the Project.

Joan Watson provided the layout of this report.

Many Tucsonans (in no particular order) made the BIT Project stronger through their support and/or participation: Dan Weisz, John R. Gentile and Katie Iverson, Jerry Rowlette, Pete Pfeiffe, Doris Evans, Mary Nichols, Chris Wesselman, Alice Roe, Henry Brean, Tony Paniagua, Hans and Anne Huth, Charlotte Ackerman, Sherri Ferguson, Carol Sullivan, Valerie Greenhill, Colleen Lienhard, Larry Venable, Gregg Townsend, Terry Lutrick, Michael Virnig, Charles Schultz, Lizzy Weeks, Shaye Ericksen, Diane Shifflett, Natalie Georgalas, Kom Loh, John O’Hanlon, Lucy Sampogna, Eric Aldrich, Lynn and Marty Badegian, Kristin Terpening and Shannon Breslin, Michael and Priscilla Baldwin, Elizabeth Taylor, Tracy Carstensen, David Chipman, Diane Huntsinger, Gay Gilbert, Doug Engelbert and Dahlia Lee, Romy Fouad, Cathy and Lance Wilson, Terry Hyer, Ade and Butch Hughes, Jan and Kevin Hyneman, Mary Mays, Eileen Ericksen, Pam and Wiley Hampton, Julian P. and Katharine Donahue, Jamie Haas, Sarah Davis, Ian Milliken, Joan Watson and Katie Ray, Judy Constantine, Roni Bader-Tables, Doris Northrop, Nancy and Fe Tom, Alex Brinker and Sue Engle, Kathy and Terry McLean, and Pam Parrish, Aaron Arzoumanian and Agnes Maina.

Many additional citizen scientists and Tucson residents also contributed by sharing over 1,300 bobcat activity reports, granting property access for bobcat captures, engaging on social media, and writing letters of support.

THE STUDY

The Bobcats in Tucson Project (BIT) was launched by a team of five Arizona Game and Fish retirees—Cheryl Mollohan, Kerry Baldwin, Al LeCount, Ron Day, and Dave Brown—who together brought over 150 years of experience in wildlife research, management, and education to the project. The project was sponsored by the Southwest Wildlife Conservation Center under Linda Searles' leadership, with mapping and GIS support and analysis from Robert Davis of Arizona GIS, and veterinary services from the Arizona Exotic Animal Hospital owned by Drs. Ericka Johnson and Jay Johnson. Other veterinarians, including Drs. Erica Giles, Lacey Klein, and Greg Walth, also contributed their expertise. Dr. Suzie Prange provided statistical support, and Gale Sherman was the project photographer and website manager.

The team, all volunteers, secured a \$34,000 grant from the Arizona Game and Fish Heritage Urban Wildlife Grant Program in 2019. By November 2020, we had captured and radio-collared our first Tucson bobcats. Over four years, we captured 56 bobcats (some multiple times) and fitted 38 with satellite collars, using custom-designed cages by Ron Day. Those 38 radio collared bobcats provided us with over 50,000 accurate GPS locations upon which to base our analysis.

During the study, almost \$82,000 was donated by other organizations and individuals, and near that amount was donated in-kind by Project staff who volunteered hours, expertise, and miles.

Collaborations with graduate students expanded the project's impact. Dr. Natalie Payne, then a doctoral degree student, and Dr. Melanie Culver conducted genetic kinship and virus analyses; then doctoral student Alexandra Burnette (now Dr. Burnette) and Dr. Michael Bogan completed the food habits analysis; and Master student Margaret Mercer and Dr. Jesse Allston explored bobcats' interactions with roads for their analysis. Together, these efforts deepened our understanding of Tucson's urban bobcat population and advanced wildlife science.

To read/download the 111 page Final Report with the scientific research and statistical analysis please go here: [BIT Final Report Submitted to AZGFD November 2024.docx](#)

THE STUDY AREA

Greater Tucson, Arizona, with a population of 900,000 human residents, is the state's second-largest city, covering 227 square miles (587 km²) in a Sonoran Desert basin surrounded by five mountain ranges: the Santa Catalinas, Tortolitas, Santa Ritas, Rincons, and Tucson Mountains. Its landscape features washes flowing into the Santa Cruz River, with desert vegetation including cacti, mesquites, and palo verde trees

The original study area for the capture part of the project focused on a 31sq. mile (81 km²) region east of the Tucson Mountains and Saguaro National Park. It was bordered by 36th Street (south), El Camino del Cerro (north), Tucson Mountain Park and Saguaro National Park (west), and Silverbell Road (east). In 2023, the study area expanded north to Sunset Road and east to include the Santa Cruz River drainage (Figure 1).

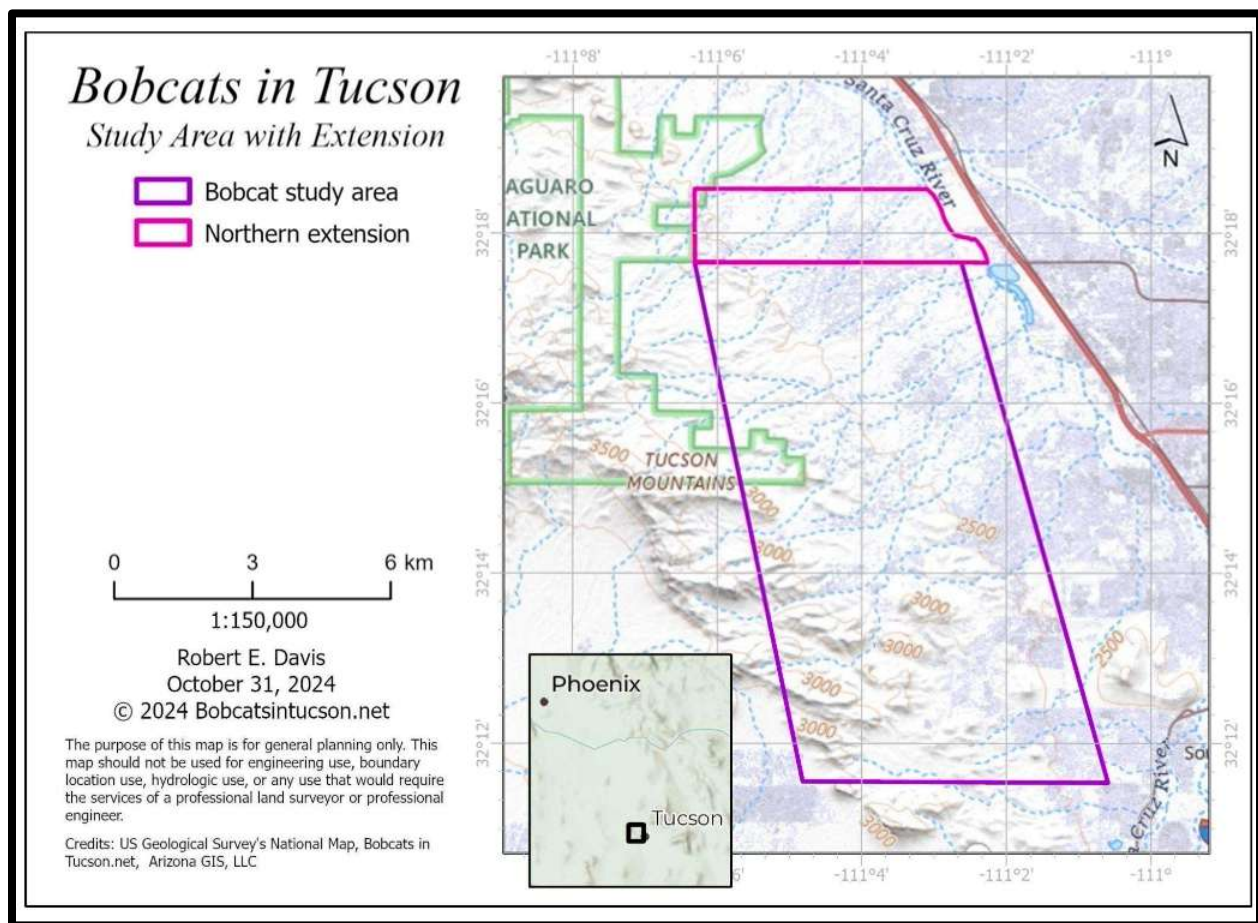
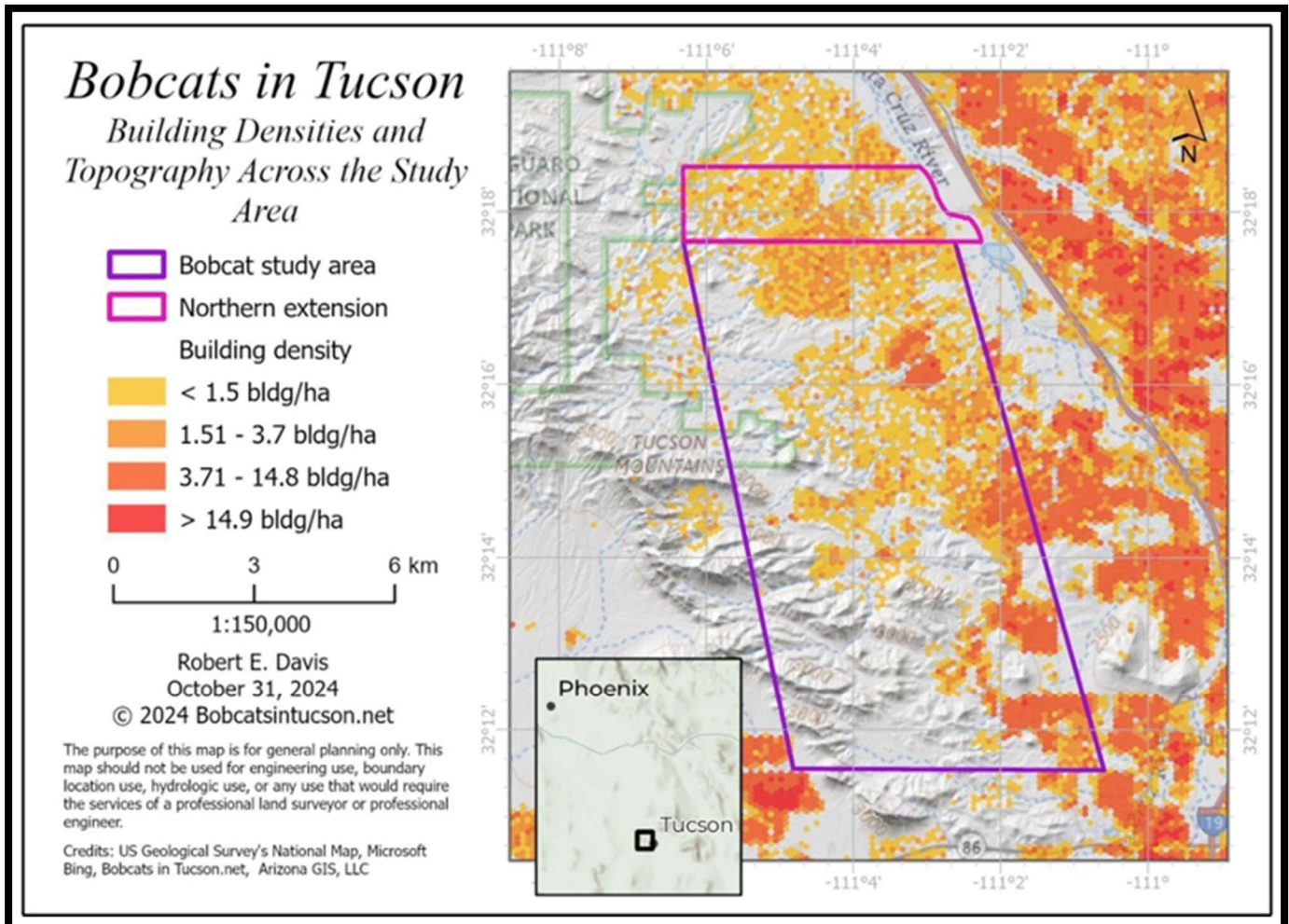


Figure 1: Study Area

BOBCAT CAPTURE & HANDLING

Traps were set in areas frequented by bobcats, such as wash bottoms, culverts, travel routes, golf courses, and private properties (with homeowner permission). Early efforts focused on the western edge of the study area, with low-density housing (<10–100 buildings per sq. km). Later years expanded eastward into more urbanized areas (100–1,000 buildings per sq. km) with less rugged terrain. In 2023, capture efforts included the Santa Cruz River drainage (Figure 2).



During the cooler desert months (November–April) of 2020–2023, bobcats were captured using cage traps baited with rabbit parts, sight attractants, commercial lures and, occasionally, a stuffed toy rabbit (Figures 3 and 4).

Bobcat Capture



Figure 3: Cage with Stuffed Toy Rabbit



Figure 4: Capture, BC #12, Margaret



Figure 5: Dr. Ericka Johnson Injecting, BC #4, Dave

Each bobcat was assigned a unique number, and radio-collared individuals were given nicknames chosen by project staff, contributors, or property owners. Captured bobcats were chemically immobilized (Figure 5), blindfolded, and treated with optical lubricant for eye protection. Data collection included weight, sex, estimated age (via tooth wear), blood and fecal samples, cheek swabs, hair samples, and photographs of fur patterns.

Radio collars weighing 140–280 grams were programmed for GPS tracking at 2-, 6-, or 13-hour intervals, with VHF

signals available 1–2 hours daily for locating den sites, investigating mortalities, or retrieving dropped collars. Collars also contained a mortality switch which sent an alert via email if the collar did not move for 4 hours. Since bobcats rarely stay

immobile for 4 hours at a time this alert was either for mortality, or the bobcat had removed its collar. The size of the collar used was determined by the weight of the bobcat and was custom fitted (Figure 6). After handling, bobcats were placed in recovery cages near their capture sites. Reversal agents were administered to counteract immobilizing drugs, and cages were shaded with cloth and vegetation to ensure a quiet environment until the bobcat is fully recovered (Figure 7).



Figure 6: Collar Fitting, BC # 21, Steve



Figure 7: Release, BC #48, Tippy

FINDINGS

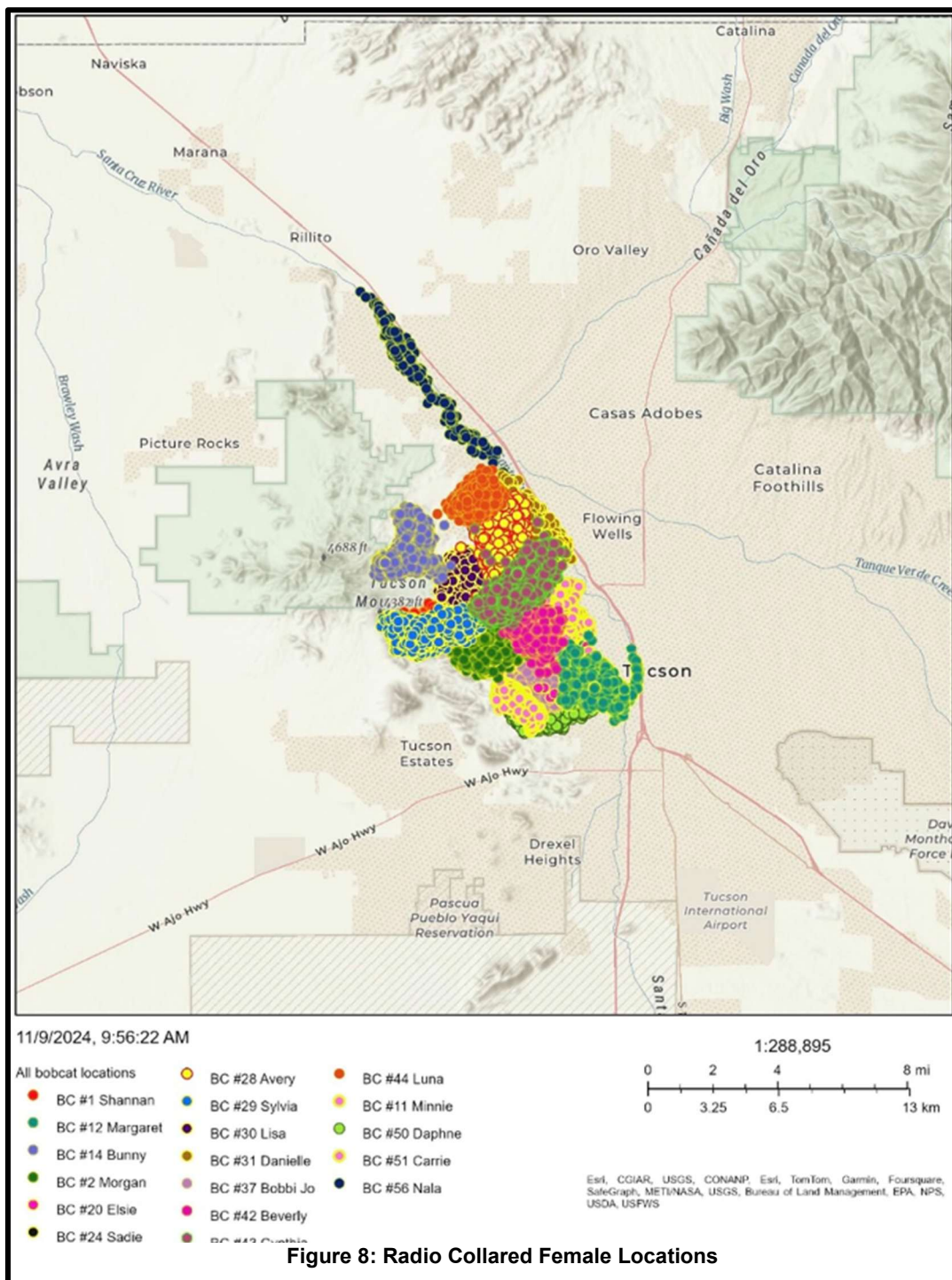
Tucson's urban bobcat population appears to be thriving overall. Most females successfully raised young, with at least 28 kittens surviving to leave their den and begin travelling with their mother from 2021 to 2024. The population appears stable, with annual survival rates of 84% and 85% in the second and third years of the study. However, the study of first-year survival rate of 36% is concerning, as half of the documented deaths (6 of 12) occurred during that time. The two primary causes of mortality, direct human caused, and vehicle strikes, declined as the study progressed. It's unclear if the initial high mortality rate was typical before the study or an anomaly. Increased awareness of bobcats during the study might have influenced human behavior, reducing risks to bobcats. Further research is needed to confirm these trends.

An annual survival rate of 84.5% over the last two years suggests most bobcats are living long enough to have and raise multiple litters of kittens. Every collared adult female attempted to reproduce each year which is typical for bobcats.

We observed five females sharing their home range with adult daughters. This has been reported before but never documented to this extent. Two of three daughters (BC #29 Sylvia, and BC #20 Elsie) raised kittens while sharing their respective mothers' home ranges (BC #1 Shannan, and BC #12 Margaret). BC #24 Sadie attempted but did not successfully raise kittens before her death in the home range she shared with her mother BC #42 Beverly. BC #37 Bobbie Jo, living in a neighboring home range to her mother, BC #42 Beverly, also raised kittens during the study, while her sister BC #30 Lisa, whose home range also adjoined her mother's, likely did not.

BC #45 Emma Claire, who was radio collared as a subadult, and shared the home range of her mother BC #51 Carrie, transitioned to adulthood in spring 2024 but didn't live long enough to have kittens. BC #56 Nala and her daughter BC #57 Karen were captured in the same cage days apart in fall 2023. Unfortunately, BC #57 Karen's collar malfunctioned and released prematurely after three days. It is likely that more females in the study also had daughters sharing their home ranges. We found daughters in 2 of the 3 home ranges where we tried to re-capture mothers (BC #1 Shannan and BC #12 Margaret). Interestingly, shared home ranges weren't significantly different in size than other female ranges, suggesting factors like population stability and social interactions also influence home range size, not just habitat quality.

Additional research where all members of a given area are radio collared is needed to truly understand how prevalent home range sharing among mothers and adult daughters is in bobcat populations. We found no empty home ranges in our study area suggesting that this population is near its capacity (Figure 8). Open areas on the home range map are areas where we did not attempt to capture bobcats because of safety concerns, or where a female was released because we did not have a radio collar for her. Female home ranges fit together like “puzzle pieces,” with little overlap between unrelated females (Figure 8). Female home ranges varied in size from 1.35 to 8.2 square miles and averaged 3.13 square miles.



Male home ranges were larger, with much more overlap, ranging from 4.4 to 13.67 square miles and averaged 7.57 square miles (Figure 9). Most males encountered 2-3 females in their home range. BC #40 Braeden, the largest male we captured, at 27 pounds, came in contact with 7 radio collared females in his home range and utilized all habitat types on the study area, from pristine Sonoran Desert to high density housing areas.

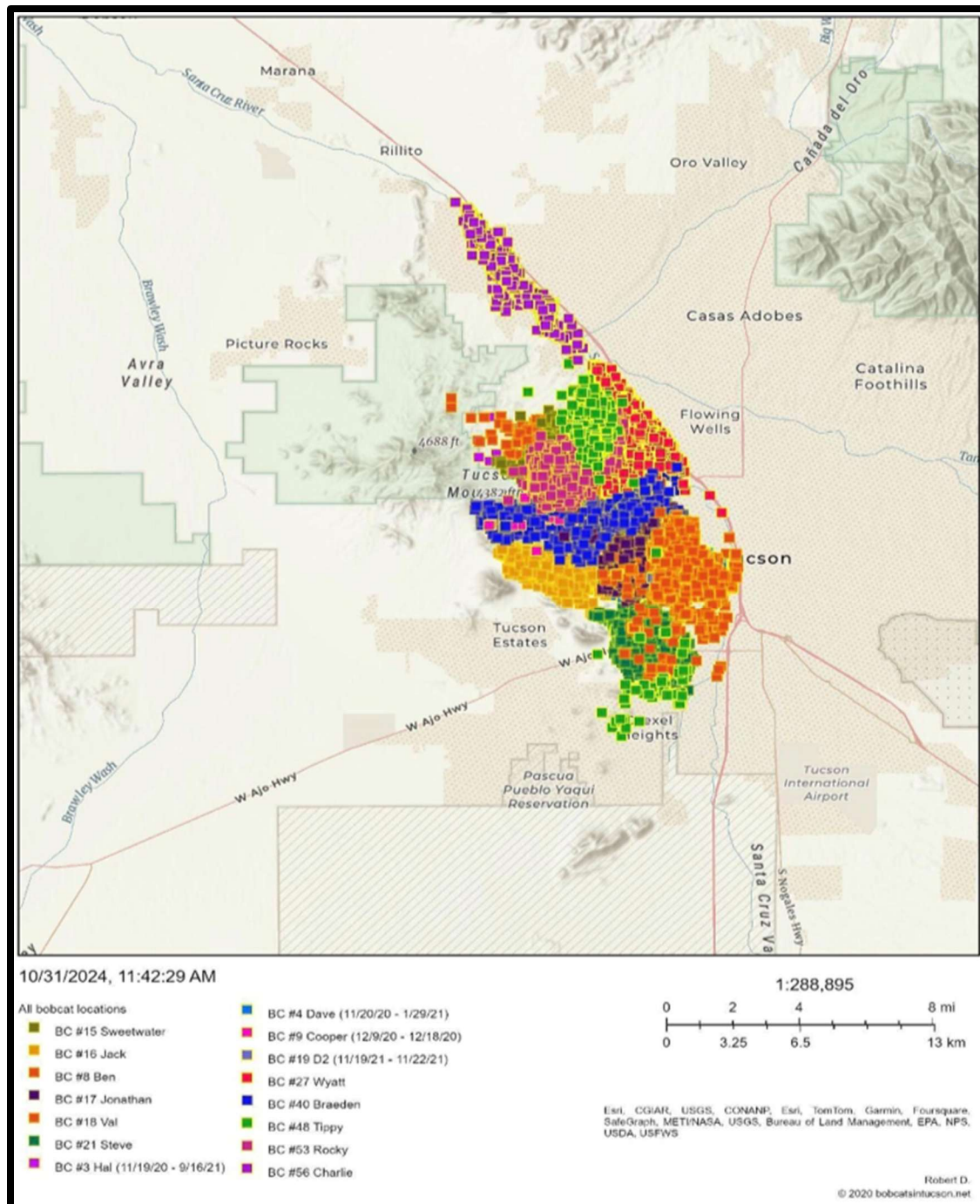


Figure 9: Radio Collared Male Locations

The area used by radio-collared bobcats included a mix of habitats, from pristine Sonoran Desert to housing densities up to 1,000 buildings per square kilometer (Figure 10). Densities above 1,000 buildings per square kilometer, mostly east of I-10, were underrepresented on our study area, though Citizen Scientist reports confirmed bobcats in Tucson do use such highly urbanized areas.



Figure 10: BC #37, Bobbi Jo with unidentified male during mating season.



Figure 11: Mature riparian vegetation in the northern reaches of the Santa Cruz River drainage.

Bobcats that live in the northern reaches of the Santa Cruz River in Tucson where mature riparian vegetation occurs due to years of high-quality effluent water releases, had much more linear home ranges than other bobcats in the study area (Figures 8, 9, and 11) since they primarily moved up and down the river drainage.

They were able to meet their needs without often crossing Silverbell Road to access urban habitats in neighborhoods, while those that lived to the south where riparian vegetation is not well developed routinely crossed Silverbell Road to the west into neighborhoods. One radio collared bobcat, possibly two, were struck by vehicles and later died while attempting to cross Silverbell Road. Further development of riparian vegetation and continuous flow areas can only benefit Tucson's bobcat population by providing additional habitat and a safe travel way since bobcats living in the Santa Cruz River drainage can safely pass under elevated roads which bisect the river.

The smallest male and female home ranges were at the Starr Pass Golf Resort, where native vegetation, intact washes, and the golf course itself offer abundant food, water, and cover. Mitigation efforts during hotel planning created wildlife corridors, further improving habitat quality. Backyard water sources, bird feeders, and wildlife-friendly landscaping in nearby homes also attract prey like rabbits and doves. Residents frequently reported bobcats hunting under bird feeders and by swimming pools (Figures 12a, 12b). The golf course, certified as an Audubon Cooperative Sanctuary, focuses on sustainable practices and wildlife-friendly management, showing how golf courses can enhance urban wildlife diversity.



Figure 12a: BC #50, Daphne



Figure 12b: BC #50, Daphne

Much of Greater Tucson, with low to medium building density (10–500 buildings per square km), native vegetation, and intact washes, offers excellent bobcat habitat. Backyard water sources and bird feeders attract prey like ground-feeding doves, creating prime hunting spots.

Over 1,250 bobcat activity reports to the BIT website show that bobcats have integrated well into many Tucson neighborhoods (Figure 13). Citizen Scientist reports documented bobcats in areas of the highest building densities (>1000 to <1500 structures/sq. km.) in Central Tucson. These areas warrant more study since those building densities were under-represented on our study area.

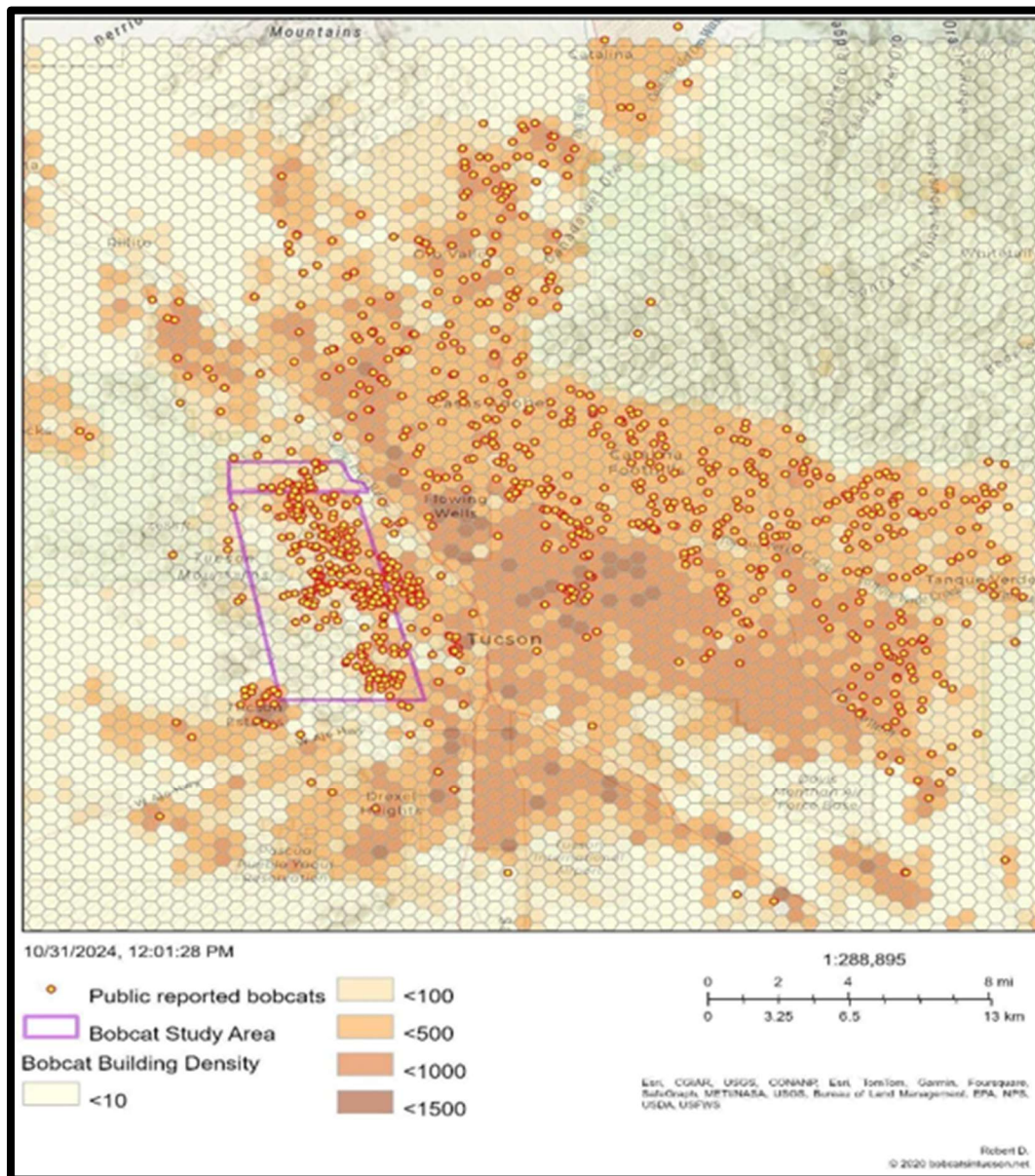


Figure 13: Citizen Science Reports of Bobcat Activity with Building Density

Nearly 90% of 1,500 respondents to the "Living with Bobcats" survey available on the Bobcats in Tucson website, view the experience of encountering bobcats in Tucson positively. The strong participation from Citizen Scientists highlights Tucsonans' appreciation for bobcats as part of their urban environment. Many residents regularly see bobcats nearby, with some even observing them raising kittens in their backyards. Concerns that were highlighted as part of the survey primarily focused on fear

of bobcats harming pets or children. Food habits results showed that bobcats in Tucson eat primarily rabbits and birds, with less than 2% of the diet being made up of domestic dogs or cats. We rarely found radio collared bobcats (especially females) at houses with a dog in residence.

Even in higher-density areas (500–1,000 buildings per square km) in the study area, two females thrived, successfully raising kittens over multiple years. In 2022, 2023, and 2024, BC #28 Avery successfully raised kittens in her highly urbanized home range (Figures 14a, 14b, 14c). Her range included the Sweetwater in the Wetlands Agua Dulce housing development in west Tucson, bordered by Camino de Oeste, El Morago, and Sweetwater Roads. This community, certified by the National Wildlife Federation as Wildlife Habitat, preserves native



Figure 14b: BC #28 Avery & Kittens (2023)

vegetation and wildlife corridors. Its design, guided by Pima County’s Sonoran Desert Conservation Plan, serves as a model for low-impact urban development, allowing bobcats and other wildlife to navigate through dense areas.



Figure 14a: BC #28 Avery & Kittens (2022)

Vehicle strikes killed 5 bobcats (13% of radio-collared bobcats) during the study. On average, radio-collared bobcats in Tucson crossed roads of all types 7.4 times daily, totaling over 3,000 crossings per collaring period. Of the 5 fatalities, 2 occurred on low-speed secondary roads (Trail’s End and Starr Pass Boulevard), and 2 on major roads (Ironwood Hills and Silverbell).

Installing “Watch for Bobcats” signs, especially near wash crossings like Ironwood Hills Road, could help reduce collisions. Poor visibility at washes puts wildlife at high risk, and signage could alert drivers, many of whom value and are aware of Tucson’s bobcat population. Figure 15 is a case study of road use by BC #3 Hal, an adult



Figure 14c: BC #28 Avery & Kittens (2024)

male who was radio collared for 10 months before dying from a vehicle strike while trying to cross Ironwood Hills Road for the 76th time.

Analysis of road use showed that bobcats avoided major roads (such as Silverbell Road) but crossed other roads as they came to them. They did not select for culverts or under or overpasses when crossing roads.

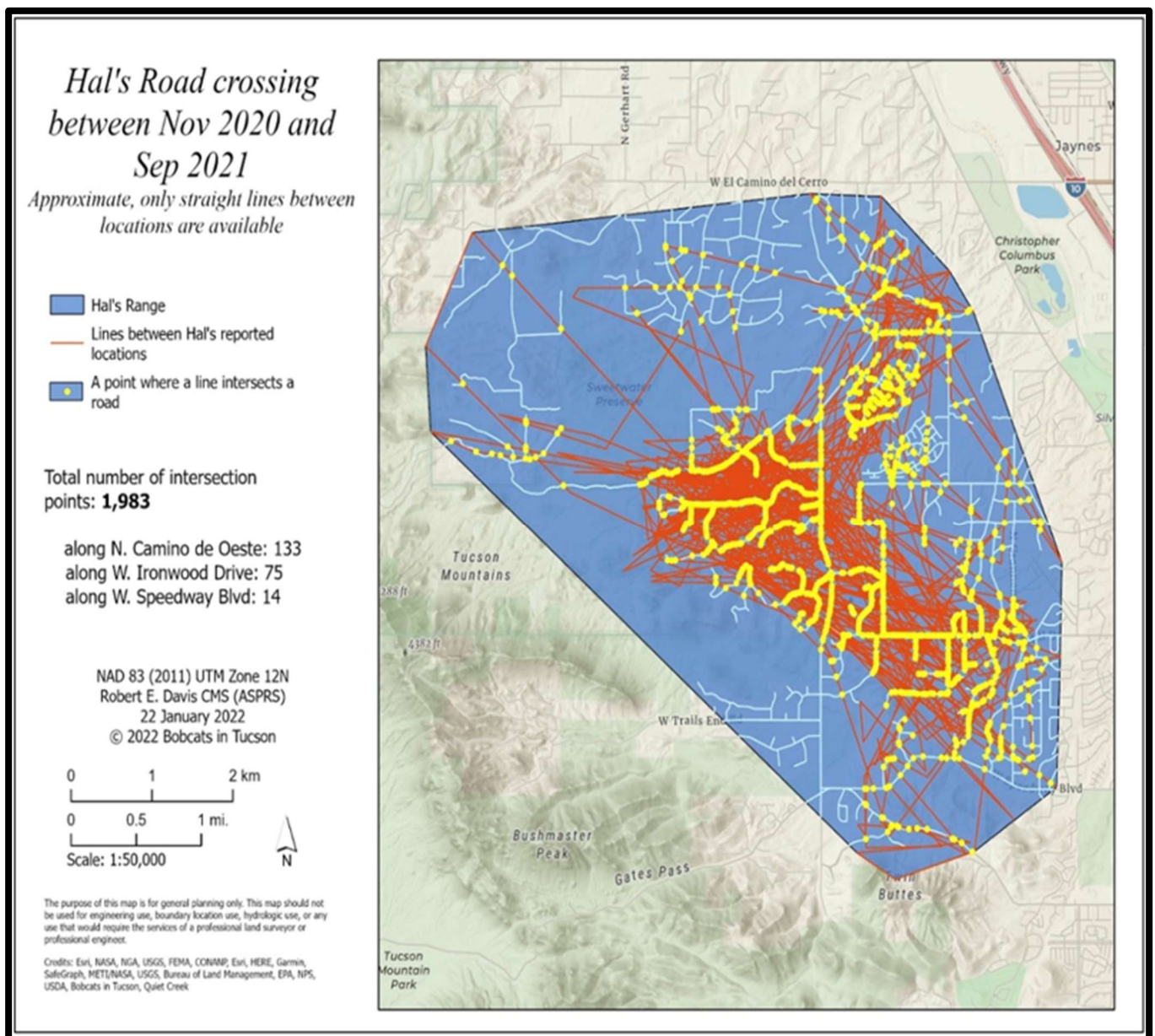


Figure 15: BC #3 Hal Case Study of Road Use

It was unsettling to find that as many bobcats were killed by people (5) as by vehicles during the study. Only one incident was reported to Arizona Game and Fish: a homeowner shot BC #17 Jonathan (Figure 16) because he was stalking free-range chickens on his property. The individual was *not* prosecuted.

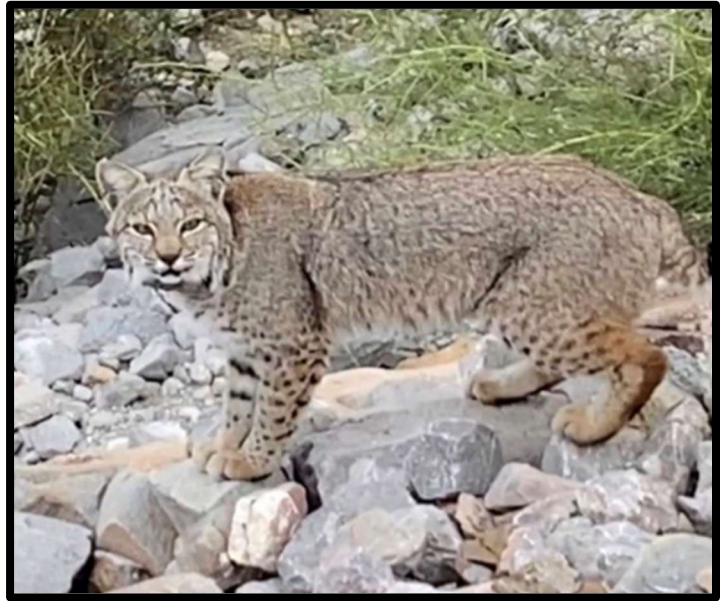


Figure 16: BC #17 Jonathan

Another bobcat, BC #4 Dave, likely died while trying to hunt free-ranging chickens at a property. His body was never found, but his collar was cut off and tossed in a dumpster. Location data showed he was at the property of someone who had previously warned neighbors he'd shoot any dogs threatening his chickens. Expecting bobcats, highly specialized carnivores, not to hunt free-ranging chickens or urban livestock as prey is unrealistic—they can't distinguish between wild prey and domestic animals. People who keep livestock should use predator-proof coops and runs, and killing bobcats for preying on uncontained poultry should be illegal. Humans can adapt their behaviors and environments to live more peacefully with bobcats and other carnivores who share their environment; bobcats cannot.

Bobcats stay in their home ranges for life and can't just "move elsewhere." Relocating them doesn't work in areas like Tucson or surrounding areas, where home ranges are likely already occupied. A relocated bobcat will either try to return home or clash with a resident bobcat. Neither of these are positive outcomes. Newborn or young kittens will not survive such a move. In our study, all home ranges were occupied, and 28 kittens survived to travel with their mothers and eventually either share her home range or occupy another home range. If a bobcat is killed, its range will quickly be taken over by another, potentially leading to more conflict and eventually another dead bobcat.

One person was prosecuted and convicted in a high-profile case involving BC #24 Sadie. Two other deaths were likely illegal: BC #13 Cathrine was found decapitated and buried with her collar, while BC #21 Steve's collar was cut off and dumped by a road. It's unfortunate some people don't appreciate the unique presence of urban bobcats in Tucson and instead act out of fear or malice.

Even though 5 radio-collared bobcats out of 38 total were killed by people, most Tucson residents we met appreciated having bobcats in their neighborhoods. The study received overwhelmingly positive support, with over 2,000 people participating through donations, surveys, activity reports, or allowing us to capture bobcats on their property.

Tucson bobcats aren't habituated to humans, except possibly at Sweetwater Wetlands Park, where photographers often and repeatedly follow them closely. Bobcats rely on camouflage and stealth, but in urban areas like Tucson, they can't "disappear" as they do in the wild. With daily exposure to people, houses, walls, and roads, they've adapted to monitor human activity closely while continuing to live in their urban home range.

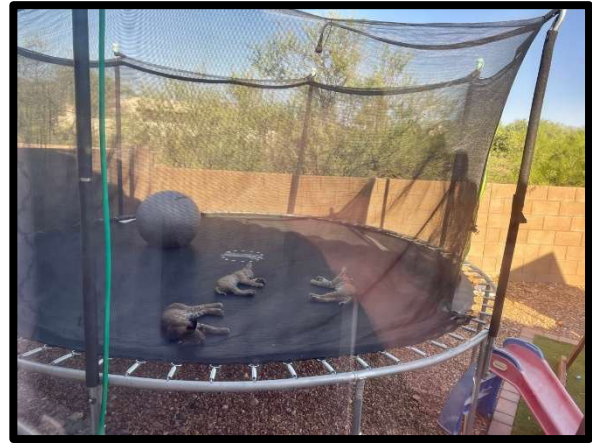


Figure 17a: BC #28, Avery's Kittens (2023)



Figure 17b: BC #15, Sweetwater

Female bobcats raising kittens in Tucson often return to the same "bobcat-friendly" backyards year after year (Figures 17a, 17b, 17c, 17d). Residents willing to share their space are rewarded with rare, up-close views of a mother caring for her kittens—behavior seldom seen in the wild.

Witnessing this is a humble reminder of how alike we are; like us, she's just doing her best to raise her family in a potentially dangerous environment.

Female bobcats raising kittens near unfriendly homes are often trapped and relocated, which can lead to the loss of the kittens and even the death of the female. Instead, homeowners can try making loud noises or maintaining direct eye contact to encourage the bobcat to move her family elsewhere. Or they can just wait. Except when raising kittens, bobcats do not repeatedly return to the same place day after day. Even if left undisturbed, the

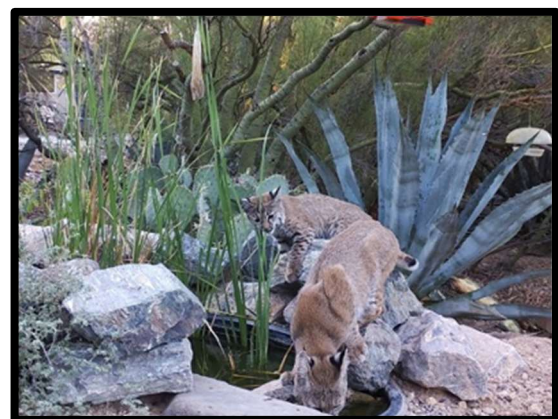


Figure 17c: Tucson Female Bobcat with Kitten



Figure 17d: Tucson Female Bobcat with Kitten

female bobcat raising kittens will not take up permanent residence in a backyard, instead moving kittens in a few days or a couple weeks to a different location. Even in wildlands settings, bobcat females typically move kittens a number of times to different locations.

Tucson’s relatively seamless coexistence with bobcats is unique and should be a point of pride for the city. Unlike other cities, bobcats thrive across the urban area, offering

residents a rare glimpse into the lives of these wild native animals. We are unaware of another community where bobcats live across the urban area as they do in Tucson, rather than just on the “edge” at the wildlands/urban interface.

Bobcats are not hunted or trapped locally and should be appreciated as a valuable “Watchable Wildlife” resource. They are a unique and vital part of the Tucson landscape and should be acknowledged and celebrated as such (Figure 18).

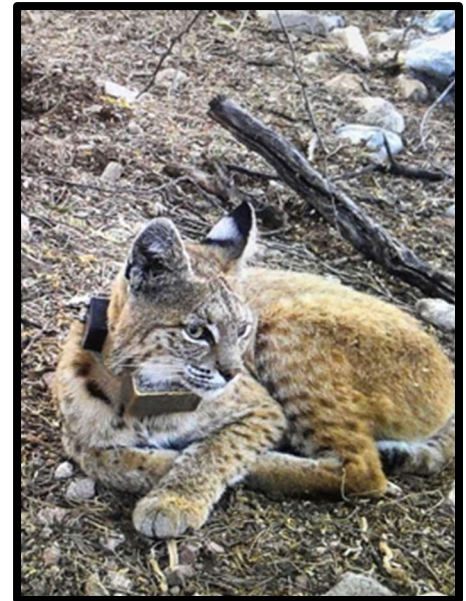


Figure 18: BC #2 Morgan



Figure 19: BC #50 Daphne

Additional research is warranted in Central Tucson where bobcats have successfully integrated into the densest of neighborhoods, and in the Santa Cruz River Basin, especially as riparian habitats continue to expand in the Heritage Corridor and elsewhere.



Figure 20: Female Bobcat Nursing her Kitten in a Tucson Backyard

It has been an honor for us to work with this remarkable animal and the people of Tucson who so graciously assisted our efforts on behalf of the Bobcats in Tucson Project and our amazing urban bobcat population. Please visit our website: www.BobcatsInTucson.net

This report is dedicated to the residents (2 and 4-legged) of Tucson...and to the two invaluable team members we lost during the study...Dave Brown and Kerry Baldwin.

-The Bobcats in Tucson Team



Figure 21: BC #28 Avery & Kitten (2022)

Maps and Photos Credits

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