- Black-footed Cat Working Group -
Report on catching, monitoring, and censusing Black-footed cats (*Felis nigripes*) in central South Africa and Namibia in 2024

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Introduction:

The Black-footed Cat Working Group (BFCWG) aims to conserve this rare cat species by furthering awareness and conducting multidisciplinary research on the species biology. The BFCWG owns a research vehicle (Ford Ranger 2.6 l, with more than 250.000 km on the odometer) which is insured, and its running and maintenance costs being covered through a dedicated Non-Profit Company since 2019. The specialised equipment required for our research is stored at the McGregor Museum, Kimberley, Northern Cape Province.

In 2024 captures were performed to exchange the radio collar of one remaining black-footed cat (BFC) in the current long-term study area, Benfontein Farm (BFN), near Kimberley, South Africa and to capture and radio-collar further new individuals. We also report here, in abbreviated form, on the Black-Footed Cat Research Project Namibia, which is managed by Martina Küsters (wildlife specialist). This latter project uses a dedicated field vehicle, a Mitsubishi Triton, from funds received from the Cat Life Foundation. Further funds towards its running came from Pupkewitz Foundation and April Campbell.

Background and Study Areas

Background: This project is part of a multidisciplinary effort to study the distribution, ecology, health, and reproduction of *Felis nigripes* to collect long-term data. The aims are repeated captures of BFCs for biological sampling and radio-collaring for subsequent observation. Several methods like camera trapping, den monitoring, and focal animal surveys, were used to survey areas previously known to hold BFCs. From November 2005 until the present, almost annual capture operations have been conducted on BFN. From 2009 to 2018, yearly captures were also performed on two additional properties in the Upper Karoo, Northern Cape, close to the town of De Aar, before research ended on these properties in November 2018. In February 2020, we started with a new study area in southern Namibia, Grünau Farms (GR). Twenty reports detailing previous fieldwork are available for download as PDFs on the website https://www.blackfootedcat.com/publications/

1 - Benfontein Nature Reserve (BFN):
A private nature reserve owned by De Beers Consolidated Mines, located 10 km southeast of Kimberley on the border of the Northern Cape and Free State Provinces in central South Africa. Majority of the 11 400 ha consists of arid plant communities receiving an average annual precipitation of 450 mm. BFN has been the subject of the first field study on the species by A. Sliwa in the 1990s (1992-1998) (Sliwa 2004, Sliwa *et al.* 2010) and continues to be an important site for long-term monitoring.

2 – Grünau (GR) study areas in Namibia – discontinued: A private farmland comprising an extensive area of 70 000 ha with Dwarf Shrub Savannah vegetation in typical Nama Karoo habitat. The area receives low rainfall average of 80-120 mm on average and is lightly stocked with sheep (*Ovis aries*). We captured and radio-collared four female BFCs in February 2020 in the area (Sliwa et al. 2021). One of these females dispersed 25 km to the north two months later after capture but returned two years later to the area we captured her in in 2020. In June 2021 we captured and collared another two adult females in addition to exchanging the collars of the four. In November 2022 we exchanged the collars of five of those females

and captured an additional five new cats (Sliwa et al. 2023). As detailed in last year's report (Sliwa et al. 2024) we found several of our cats dead and were missing 4 individuals as lost to follow-up, despite both extensive ground and an aerial survey. In October 2023 we lost our last remaining female radio-collared black-footed cat and with this we stopped working in this area and any specific study site in Namibia. We have learned invaluable movement and biological data from BFCs in this site.

Methods:

(A) Spot-lamp searching: For a total of 9 nights (7 on BFN, 1 on Marrick Safari and 1 on Rooifontein) a 4x4 vehicle (Ford Ranger 2.6 l) drove a route of 30–90 km in length along dirt roads at a speed of 15–30 km/h whilst looking for the characteristic bright eye-shine of cats. A minimum of three people (four to five this trip) stood on the open back of the vehicle operating two spotlights (1 million candle power / Lightforce® SL240 mm) and landing nets, while two to four people were inside the vehicle.

(B) Catching via searching and pursuit: Once BFCs were located by their eye-shine in the spotlights, their species identity was swiftly confirmed. If positively identified, they were pursued quickly by vehicle for a short distance of between 100–600 m until the cat squatted low on the ground in front of the stopped vehicle (*n*=2). Two people with landing nets then netted the cats. On other occasions, the cats found a den system (dug by aardvarks, ground squirrels, or springhares) and were captured by exposing them after digging (n=0 this trip).

All captured cats were subsequently anaesthetised with an intramuscular injection of medetomidine, midazolam, and butorphanol and covered with a blanket to shield them from lights and sounds. During this entire trip, we processed the 2 captured cats in the field. All animals were given complete physical examinations, had biological samples collected for disease and genetic studies, morphometric measurements obtained and all but three (too small/young) had radio collars fitted. The anaesthetic drugs were reversed with an intramuscular injection of atipamezole, flumazenil, and naltrexone. The cats were then placed in a small plastic crate for awaiting full recovery (Eggers *et al.* 2020).

All BFCs were released back into a den close to their capture locations. A blanket was used to cover the den entrance, keeping them inside until they were fit to leave on their own accord. One or two digital camera traps were set close to the den entrance to record the cat leaving the den. There were no complications associated with these procedures and all radio-collared cats (n=2) were confirmed alive and well on subsequent nights using telemetry and visual verification.

(C) "Digging" of previously radio-collared cats: This method was employed once this year. The entrance of the den system, in which the radio-collared BFC was resting during the daytime, was quickly draped with a net and the cat either ran into the net or was extracted after only slight and careful digging. The still-functioning radio collar of male *Shongo* on BFN was exchanged.

The capture on BFN (South Africa) was staffed in May/June 2024 by:
Mrs. Beryl Wilson Hartmann, zoologist, Henties Bay, Namibia, berylwa@gmail.com
Dr. Alexander Sliwa, zoologist, Cologne (Kölner) Zoo, Germany, sliwa@koelnerzoo.de
Dr. Arne Lawrenz, director Wuppertal Zoo, Germany, felislaw@t-online.de
Ms. Michelle Schroeder, BFCWG, Kimberley, South Africa, MustelaMichellea@gmail.com
Ms. Michelle Swanepoel, field technician BFCWG, Kimberley, South Africa, swanepoelmichelle896@gmail.com
Byron Mannie, wildlife rehabilitator; Kimberley, South Africa
Ms. Odette Burger, veterinarian, Kimberley Veterinary Clinic, Kimberley, South Africa
Mr. Daniël Saayman; veterinarian, Kuruman, South Africa,

The following persons worked on GR (Namibia) in 2024:
Ms. Martina Küsters, Black-footed Cat Research Project Namibia, Swakopmund, bfootedcat@gmail.com

Results:

Spot-lamp searching and catching/exchanging of radio collars: between 27.5.- 4.6.24, we went out on 9 nights, spending a total of 45 hours, while driving for 34 hours at an average speed of 20 km/h and covering a distance of 657 km (Map 1). We conducted the majority of the surveying on BFN (7 nights; 23.5 hours of driving, 461 km). The number of Black-backed jackals (*Lupulella mesomelas*) sightings was staggering, particularly on BFN, where we had between 7-26 sightings in 2 – 4.5 hours of driving per night, a total of 93 sightings, many of very bold individuals (Fig.17). We only saw one African wildcat (*Felis lybica cafra*) and three BFCs on BFN, including the male *Shongo* unaided by telemetry, and the new males *Fibo* and *Ultro*. So only 3 BFC sightings in 7 nights (43% chance of sighting a BFC/night on BFN), while we caught 2 BFCs out of two attempts (100% capture success). But we also spotted one night each on Marrick Safari (2 hours driving, 29 km), and Rooifontein (2.5 hrs driving, 43 km). In 2 hours driving on Marrick we saw 2 jackals and 1 caracal (*Caracal caracal*) and 1 African wildcat, no BFC. In 2.5 hours on Rooifontein we saw 1 jackal, 1 caracal, and 2 Cape foxes (*Vulpes chama*), no BFC. So, if counting all 9 nights we saw 3 BFCs coming to only 33% chance of sighting a BFC/night for all three properties combined. We exchanged the still-functioning radio collar of the single remaining male *Shongo*, by locating him in a favourable den. Careful extraction via slow digging exposed him for an anaesthetic injection and as the other cats, he was fit and showed no obvious aversive reaction when checked over the consecutive days. Thus, we had three radio-collared BFCs when leaving on 5 June 2024. We were hampered by rain on only two nights, but that didn't lead us to abandon the search. Other nocturnal mammals seen during our spot-lighting included high numbers of bat-eared fox (*Otocyon megalotis*), a small-spotted genet (*Genetta genetta*), and every night aardwolves (*Proteles cristatus*), aardvarks (*Orycteropus afer*), and Cape porcupines *(Hystrix africaeaustralis).*

Monitoring radio-collared cats on BFN*:*

BFN: Field technician Michelle Swanepoel tracked the four radio-collared BFCs in 2024 either in their dens during daylight or found them at night when active. Sufficient waypoints were acquired for none of the 4 cats, since *Kazi* died already in mid-March (3 months tracked), and the males *Shongo* (9 months tracked) and *Fibo* (3 months tracked) in mid- and late September, while the last male *Ultro* was only tracked for 7 months, to determine their overall annual home ranges (HR) accurately. A total of 1.117 waypoints were collected up until 30 December 2024. HR size estimates incorporating all collected waypoints for all the individual cats tracked in 2024 are provided in Table 1, and Minimum Convex Polygon (MCP100%) outlines are shown in Map 2 and Map 3.

GR: No work took place on Grünau since December 2023, we thus consider this field site as closed, also throughout the year 2024.

Ranging and survival of Black-footed cats in 2024:

BFN and surroundings: Altogether, four BFCs were monitored in 2024. Three cats died, thus we had a survival rate for adult cats of only 25%, which is truly concerning, despite the admittedly small sample size.

Female *Kazi*: A large adult, tracked since November 2018. She habituated to a degree that she was oblivious to the vehicle. When incorporating all waypoints collected in the first 2.5 months of 2024 her HR was only 5.1 km² (184 waypoints, Map 2), and naturally much smaller than in 2023 (17.61 km², N=796 waypoints, with outliers), however similar in size to the previous years' (5.8 km² - 7.2 km² in 2020-2022). On 17.3.24 she could not be found in her usual HR but then found dead on 20.3.24 (Fig.13), with the range of the signal much reduced due to the antenna lying flat on the ground. Despite her advanced decomposition, when skinning her, it was discovered that she was killed by a caracal. However, after sending preserved samples of her body for necropsy to Onderstepoort (South African Veterinary faculty close to Pretoria) the investigating histopathologist informed us that whilst amyloid was not detected in her kidneys, she had a significant lungworm (*Aelurostrongylus abstrusus*) infestation, likely linked to advanced age. A month earlier, a caracal at her den was captured by a monitoring camera trap (Fig.12)

Kazi provided us with a wealth of information over the more than 5 years of monitoring, part of which she was the only radio-collared cat on BFN.

Male *Shongo*: A small adult initially captured on central BFN in November 2022. He has habituated well to the camera traps set at his dens and provided valuable information on prey items, interaction with other species, and home range and microhabitat use after fires (see last year's report). We exchanged his radio-collar on 29.5.24, where he only weighed 1.52 kg and had fairly heavy tick and flea infestation. He was found freshly dead on 22.9., possibly killed just hours before by a caracal. There was plucking of his fur (Fig.3), a typical sign for this predator before initial feeding. His face was substantially chewed, untypical for the interspecific killing by these larger cats, which normally only kill and don't consume their smaller feline competitors. *Shongo*'s HR, with 9.30 km² in 2024 was small for a resident male, however well-defined despite the only 9 months of monitoring until his death (n=509 waypoints; Map 2).

Male *Fibo*: A young adult male, also given his weight, however in good condition with a low parasite load, we captured in eastern southcentral BFN on 2 June 2024. He immediately left BFN in a south-easterly direction. However, we managed to find him again, by listening from the Southeast BFN koppies towards the properties south, and later by checking for his signal along the N8 road. He moved to a HR on a private game reserve, 14 km southeast of BFN, which he at times left towards the West (Map 3), next to the N8. We received permission to track him on the reserve. He remained very shy over the 3.5 months of tracking, had mostly rested in scrubby vegetation and not been using dens, only finally leading to few camera trap photos at a den he finally used (Fig.7). Unfortunately, he died in a period when the field technician was away for a week and upon her return on 16.9.24 she only found his collar with fragments of his fur and teeth. Based on the evidence and the surrounding context, we believe he fell victim to a jackal or several of them. He was a young non-resident adult, still roaming, so he covered a large HR in the short monitoring time, with 28.49 km² (n=87 waypoints), not including his move from BFN. Such young adult males are exposed to the dangers of dispersal, avoiding larger male resident BFCs, staying in areas with higher meso-predator densities and having to endure thus higher mortality (Sliwa 2004).

Male *Ultro*: A fully-grown, seasoned adult captured on west-central BFN, on the last night of capturing 4 June 2024 (Fig.14), literally minutes before returning to our base. Due to this "ultimate" status we named him, the last of the trip and later, sadly the now last remaining radio-collared cat on BFN. His food pads were worn then, and he had a healing wound scab on his tail, that may have stemmed from a larger predator (jackal or caracal) trying to grab him. This already indicates that he is a seasoned traveller and survivor. He remains shy of the research vehicle, not letting it approach closely, before taking refuge in long grass or dens. He has not allowed for high quality photos to be taken by A. Lawrenz visiting in December 2024. However, we have good images from camera trapping at his various dens (Figs. 15, 16). In 2024, *Ultro* had a HR of 22.2 km² (n=337 waypoints, Map 2), which is average for an adult resident male (Sliwa 2004).

Looking at Map 2 and the HRs of the three cats who stayed there some time in 2024, female *Kazi* HR didn't overlap with the two males, while *Ultro*'s HR almost entirely contained that of male *Shongo*. However, there was little temporal overlap of the two males, as *Shongo* was killed 3.5 months after *Ultro*'s capture. *Kazi* was only tracked 2.5 months in 2024 before she died, but *Shongo* didn't range into her former area, neither *Ultro* within 2024, although we know that he does so in the current 2025.

Direct observations of Black-footed Cats: The 4 cats that were monitored via telemetry during 2024 provided valuable insights into the killing of various prey species. Additional information on spray-marking, and prey capture techniques were recorded.

Ultro was using termite mounds in a more targeted way than previously recorded in BFCs. He frequently climbed onto these, using them as vantage points to scan the area for potential prey. Also, he used the mounds to conceal his approach to prey animals, particularly small birds like larks, peering over them to track their movements, before, with a sudden burst of speed, pouncing to successfully capture his prey. Despite his fully adult size and extensive roaming *Ultro,* was not seen spray-marking in 2024. As *Fibo* was using the private game reserve, further away from BFN, Michelle Swanepoel was not able to spend as much time with him. He never spray-marked when being observed, which fits our assessment that he was

a non-resident male, still searching for a stable home range. In contrast, *Shongo* was well-habituated and spray-marked with urine, as in the previous year. No new prey species were recorded for the general diet list in 2024, due to early demise of the 2 cats and due to the fact they were in early stages of habituation leaving *Ultro* as the only hunting cat.

Camera Trapping: The field technician deployed digital camera traps (Browning Strike Force Pro XD, Secacam Pro, SpyPoint Force-11D) to obtain regular pictorial material of the monitored cats, and to check for the presence of kittens in the monitored female cat (Sliwa *et al*. 2018, Küsters 2024) at their subterranean dens (Fig. 11). Some of the images revealed riveting details on interactions with other species. Male *Shongo*'s tolerance to camera traps proved useful as the photos revealed that there were multiple visits by several other mammal and bird species to his den area. Most notable was an evening visit on 13.1.24 of an aardwolf family, a female with her 3 cubs. One photo revealed a youngster paste-marking at the den entrance (Fig.4) probably due to the interesting smells of the cat within it, who then emerged a mere 3 minutes later again. Other mammals recorded at Shongo's dens included all larger and smaller mammals present on BFN e.g.: springbok (*Antidorcas marsupialis*), hartebeest (*Alcelaphus busealphus*), blesbok (*Damaliscus phillipsi*), oryx (*Oryx gazella*), warthog (*Phacochoerus africanus*), yellow mongoose (*Cynictis penicillata*), jackal, caracal, porcupine, ground squirrel (*Xerus inauris*), springhare (*Pedetes capensis*), and birds like Common Ostrich (*Struthio camelus*), Desert Cisticola (*Cisticola aridula*), Southern Anteating Chat (*Myrmecocichla formicivora*), Capped Wheatear (*Oenanthe pileata*). Some species were not able to identified to species level, like a tiny shrew (likely *Crocidura cyanea*).

Reproduction:
Our single radio-collared female *Kazi* in 2024 was last seen with a kitten in January 2023. She sprayed urine and rolled on the ground in June 2023. These are signs of oestrus but no further kittens were observed in 2023. Also, during the first 2.5 months of 2024, the final months of her life, there were no signs of kittens. It would seem she didn't reproduce over the summer period of 2023/2024, maybe a sign of senescence.

Thus, like the year 2023, the early year 2024 was certainly not a successful breeding period for *Kazi*, despite slightly below average rains of 371 mm (long-term average for BFN is 450 mm). We have, however, one record with two independent sightings of an un-collared female seen with a kitten, that were recorded during the carnivore surveys.

Carnivore surveys: The objective was to conduct systematic driving transects on BFN with a primary focus on detecting BFCs, while concurrently implementing a broader carnivore survey to monitor population dynamics, spatial distribution, and species presence across the reserve. Spotlight surveys were conducted over nine non-consecutive nights between 29.10.2024 and 20.03.2025, when the region started experiencing rain almost every day. Surveys ran between 19:00 and 23:00, using the same methods as in captures, but with just one person on the loading platform of the field vehicle. A total of 104 independent carnivore detections were recorded. These detections comprised BFCs (6 times), caracal (3 times), and jackals (93 times). From the six BFC sightings, two visuals were of our VHF radio-collared male *Ultro*; two of the sightings on different nights consisted of a female with a kitten; and the other two sightings were of uncollared cats. The average detection rate per species per night was 0.67 for black-footed cats, 10.33 for black-backed jackals, and 0.33 for caracals.

Scat Detection Dogs Project and BFC Genomics: Scat detection dog surveys in the Soutpan study area in South Africa's central Free State were completed in August 2024 (Fig.19), tying up field survey requirements for Michelle Schroeder's final PhD research chapter investigating BFC habitat use in agro-ecosystems. Michelle's focus now is the analysis and write-up of her dissertation and associated publications. Scat detection rates in the Soutpan study area were nearly 4-fold lower than previously observed at the BFN and the Southern Namibia study sites (Grünau). While indicative that mixed agricultural landscapes are not ideal BFC habitat, the low number of detections reduces statistical power

and thus the scale of inference resulting from the study. The low detection rates were also challenging for the dogs, requiring extra effort allocated to preplacing scats along the transects to increase reward opportunities to help maintain drive and focus. Species ID of the 75 scat samples collected during the 2023 and 2024 field season will be confirmed through DNA metabarcoding analyses performed by Stanford University, USA, as part of collaborative research using next generation sequencing to investigate diet and endoparasite presence.

Whilst the detection dogs have proven their abilities to enhance the collection of valuable scat DNA, their utility for population monitoring is currently limited by the high laboratory costs of current microsatellite genotyping methods. To overcome this limitation, we have been collaborating with Stanford's Program for Conservation Genomics since 2020 to develop a reliable and robust SNP (Single Nucleotide Polymorphism) panel using whole genome sequencing of BFC cell lines and museum specimens and PhD candidate Victoria Grant is conducting intensive analysis to reveal species evolutionary genetic history and subpopulation structure. Map 4 shows the spread of samples across the distribution. Nearly 50 BFC genomes have been sequenced, filtered, and mapped to the species reference genome. Further intensive bioanalytical processing steps are required to accurately identify, filter, and validate the SNP before it is ready for use in conservation monitoring. Unfortunately, this takes a lot of time, especially in relation to PhD timelines and the working life of a conservation detection dog but we are pushing for completion to advance future scat detection dog surveys, enabling insights into genetic diversity, population health, and potentially disease susceptibility of BFCs.

In other news, we would like to congratulate Dr. Vimbai Siziba for her Conservation Genetics PhD at the University of KwaZulu-Natal. Her dissertation was titled "Carnivore ecology and diet assessment using DNA-based approaches: the elusive black-footed cat (*Felis nigripes*) as a case study". This concludes the initial University lab collaboration trailing DNA analysis of scat samples found by Detection dog *Dougal* during the 2020 pilot study. In addition to filed surveys, detection dogs *Lyka, Sebala*, and their handler M. Schroeder passed their performance evaluation, including a field assessment conducted by Cape Nature, making them the first conservation detection dog team to qualify for ecological research under the new special permit conditions (Fig.18).

IUCN Red List Assessment for *Felis nigripes*: The update to the 2016 species assessment started in 2023 has continued throughout the entire year of 2024, including multiple online meetings with Tabea Lanz, the Redlist authority of the Cats Specialist Group. We have updated and revised the document to reflect the latest relevant research and records. Sufficient verified records from South Africa and Namibia combined with landscape features and habitat characteristics enabled more detailed range mapping by Michelle Schroeder and Martina Küsters to inform population demographics. Despite known historical presence, verified records for Botswana remain scant, and whether this reflects population status or under-reporting remains an important knowledge gap. While the BFCWG has made substantial progress towards understanding the species' ecology and threats, insufficient survey and monitoring data across the species range poses challenges in meeting evidentiary thresholds to support assessment criteria.

Outreach and social media coverage of BFCs and the BFCWG: Throughout 2024, several members of the BFCWG have spread information about the species through interviews, popular press items and presentations about our joint research. Scientific tourists and interested laypersons were occasionally allowed the opportunity to join in tracking sessions of the radio-collared BFCs.

Beryl Wilson Hartmann and Alex Sliwa have regularly updated the Facebook Page "Black-footed Cat Working Group" https://www.facebook.com/groups/black.footed.cat/ with publicly visible posts. These are shared from the public Instagram page "blackfootedcat.life" https://www.instagram.com/blackfootedcat.life/ by Alex Sliwa with posts every 4-7 days using pictures of black-footed cats and other topics of the species' biology and the research endeavours taken over the past decades, with a few sentences of informative text to each post.

Alex Sliwa gave an interview for a Mongabay news piece by journalist Ruth Kamnitzer on black-footed cats: Inbreeding adds to growing threats to Africa's smallest wildcat, study finds.

https://news.mongabay.com/2024/10/inbreeding-threats-africa-wildcat-study/ published online on 28.10.2024. Michelle Swanepoel provided regular updates on the monitored cats on BFN and wrote four field reports for sponsors, leading to excellent support in 2024.

Publications, reports, conference papers, and presentations by BFCWG group members and associates on *Felis nigripes* in 2024:

- Brindley, H., O'Riain, M.J. & Sliwa, A. 2024. The underground cat: burrow use by female black-footed cats (*Felis nigripes*), African Zoology, DOI:10.1080/15627020.2024.2402249.
- Küsters, M. 2024. Black-footed cat research Project Namibia. Project update March 2024. Unpublished report, 16 pp.
- Küsters, M., Schroeder, M. M. & Sliwa, A. (2024, 7 October 2024) Using landscape and habitat characteristics to delineate distribution of black-footed cats Felis nigripes in southern Africa [Conference presentation]. Southern African Wildlife Management Association, Windhoek, Namibia. http://sawmalive.co.za/2024-windhoek/day1/session4.
- Küsters, M., Schroeder, M. M. & Sliwa, A. (in press) Using landscape and habitat characteristics to delineate distribution of black-footed cats (Felis nigripes) in southern Africa. In publication. African Journal of Wildlife Research.
- Lai, S., Warret Rodrigues, C., O'Donnell, H., Küsters, M., Herrick, J., Lawrenz, A., Lamberski, N., Schroeder., Wilson, B. & Sliwa, A. (2024) Assessing the Effect of Predator Control on Black-Footed Cat Survival in Central South. African Journal of Ecology 62, e13316. https://onlinelibrary.wiley.com/doi/10.1111/aje.13316
- Siziba, V. I., Schroeder, M. M., Wilson, B., Sliwa, A. & Willows-Munro, S. A method for noninvasive individual genotyping of black-footed cat (*Felis nigripes*). Ecology and Evolution 14, e11315 (2024).
- Swanepoel, M. 2024a. Update from the field: Black-footed Cat Working Group, South Africa. April 2024, 8 p.
- Swanepoel, M. 2024b. Update from the field: Black-footed Cat Working Group, South Africa. August 2024, 6 p.
- Swanepoel, M. 2024c. Update from the field: Black-footed Cat Working Group, South Africa. November 2024, 9 p.
- Swanepoel, M. 2024d. Update from the field: Black-footed Cat Working Group, South Africa. January 2025. 4 p.
- Sliwa, A., Küsters, M., Swanepoel, M., Shipala, N., Schroeder, M. & Wilson-Hartmann, B. 2024. Black-footed Cat Working Group - Report on monitoring Black-footed cats (*Felis nigripes*) on Benfontein Nature Reserve, South Africa and Grünau Farms, Namibia in 2023.
- Sliwa, A., Wilson Hartmann, B., Küsters, M., Schroeder, M. M. & Drouilly, M. (in review) Felis nigripes. The IUCN Red List of Threatened Species 2025.

Non-Profit Company (NPC) South Africa: The Working Group continues to be solvent and funding for fieldwork is still possible for the financial year 2025, however funds are ever-dwindling with the high vehicle maintenance costs (see below). There are no outstanding debts or stipends owed.

Vehicle Maintenance and running costs South Africa: The field vehicle of the BFCWG is aging with heavy use, now at 270.000 km, and looking back on 2024 we spent 73.167 R (~4077 US$) on repairs, vehicle maintenance and purchases. This included a set of new back tyres, payment for towing, shocks replacement (control arms, tie rods, stabilizer links), engine mounting, a new steering rack (which led to 3 weeks of only careful driving before replacement, another single back tyre, new door hinge, vehicle service, a new front tyre, new air-conditioning pump and reverse light switch. We spent running costs of almost 50.000 R (~2800 US$) for diesel fuel in 2024.

Black-footed Cat Research Project Namibia, a project by the BFCWG: This project is run my Martina Küsters. No captures or fieldwork was done in Namibia in 2024. After the drought had adversely affected the population of study animals in the Grünau farms in the Karas Region in southern Namibia, and after the death and unknown fate of all the study animals in 2023, it was decided to abandon this site. Spotlight surveys need to be conducted to find a new study site in Namibia. In 2024, no captures or fieldwork were done. Important activities were the distribution and habitat mapping for the IUCN Red List assessment, collating additional distribution records, compiling budget and workplans and funding proposals, communication and information gathering with landowners and identifying potential new study sites for scouting trips and surveys. In early 2025, two scouting trips were made to meet landowners in the southern Kalahari in east Namibia and to assess habitat suitability. These new contacts enable conservation awareness for black-footed cats and facilitates information sharing for new potential study sites.

Discussion and Conclusions:

Highly valuable data on the monitoring and behaviour of black-footed cats was collected again by the BFCWG and the Black-footed cat Research Project Namibia in 2024. Despite putting in a good effort of 9 nights spotting in the Kimberley area we only managed to exchange the collar of one cat and capture two new males on BFN, with sighting frequencies much lower (33% total, 43% on BFN) than previously. The population density of BFC is highly likely much lower than in the previous years. In addition, we had high mortality of the previously collared cats and one of the two newly captured males, resulting in 3 out of 4 BFCs dying, with an adult survival of only 25% in 2024.

As we only had a single female (*Kazi*) radio-collared over the first 2.5 months of 2024, after which she died, we can't really say much about reproduction on BFN. However, during this summer of 2023/2024 she didn't have a kitten. We only recorded an un-collared female with a single kitten in the central part of BFN in late 2024 twice during the carnivore spot-lighting surveys.

Adult mortality and emigration on BFN and beyond on a private nature reserve with three out of four (75%) adult monitored cats was even higher than in 2023 with 60%, compared to the average of 44 % mortality in 2022 and previously published (Lai et al. 2024). All three deaths in 2024 had either caracal (2) or jackal(s) (1) involved, although a physical weakening, due to disease and older age, as well as high parasite infestation could have played a role in making these three cats more susceptible to predation. We suspect that the high frequency of predator sightings, particularly jackals both on BFN, but also on the other properties, during both our own 9 nights of capture operation and later carnivore spotlight censusing is linked to this.

HR sizes of cats on BFN and the private property were average or even partly on the low side (Table 1, Map 1), except for the young dispersing adult *Fibo* (Map 2) as recorded for BFN from the 1990s (Sliwa 2004). One has to also consider that no entirely complete HRs were described for any cat in 2024, but only for 2.5 – 9 months for the individual cats.

Systematic camera trapping at dens has opened further topics for study on the BFCs on BFN. It is remarkable how many mammal and bird species are visiting the dens that BFCs use, some even scent marking there, as recorded with the aardwolf family.

The BFCWG will return to BFN and potential other study sites for capturing and sampling of wild black-footed cats in April 2025, to capture additional study cats, as only one male (*Ultro*) is remaining. We hope that the currently low population number will recover in 2025.

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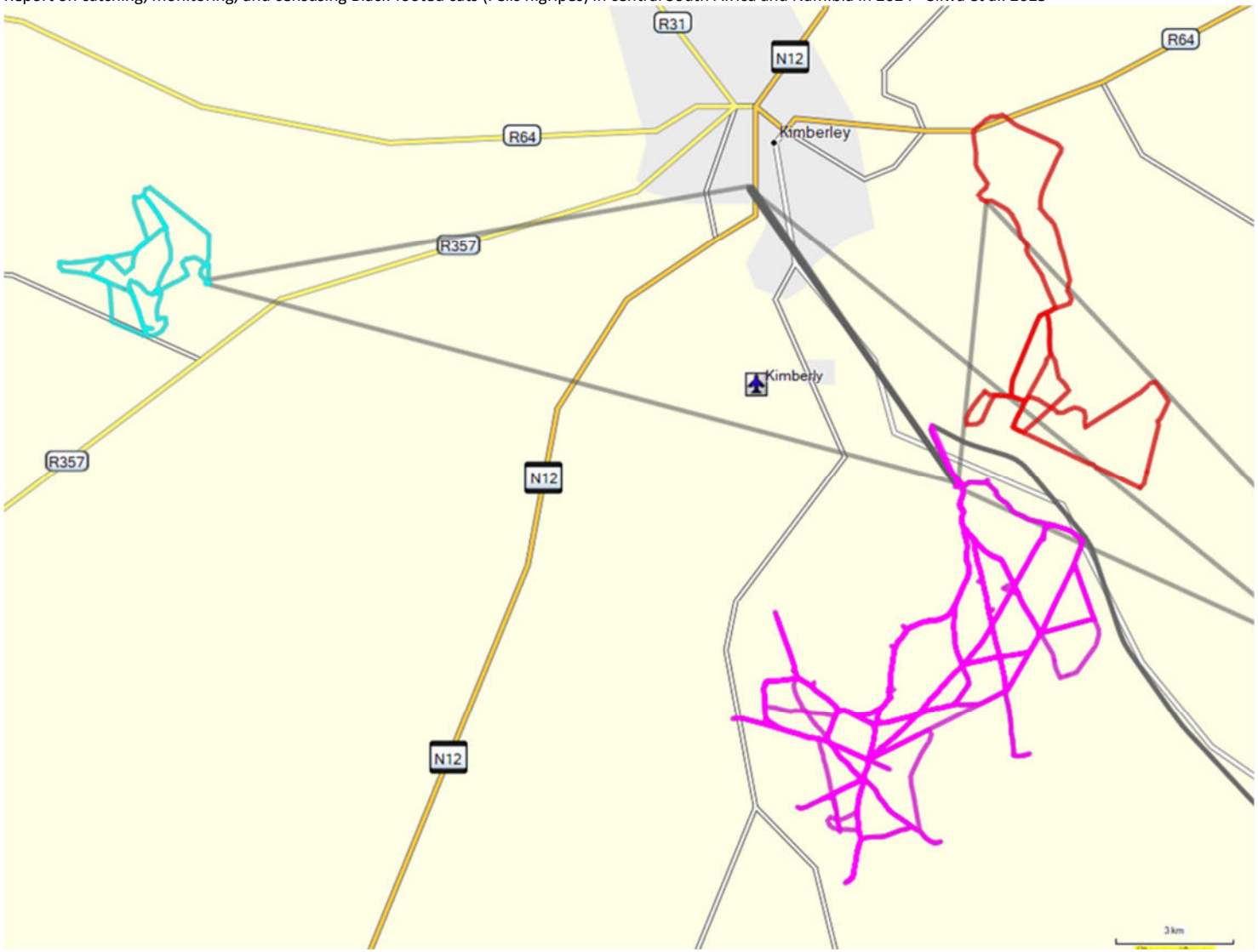
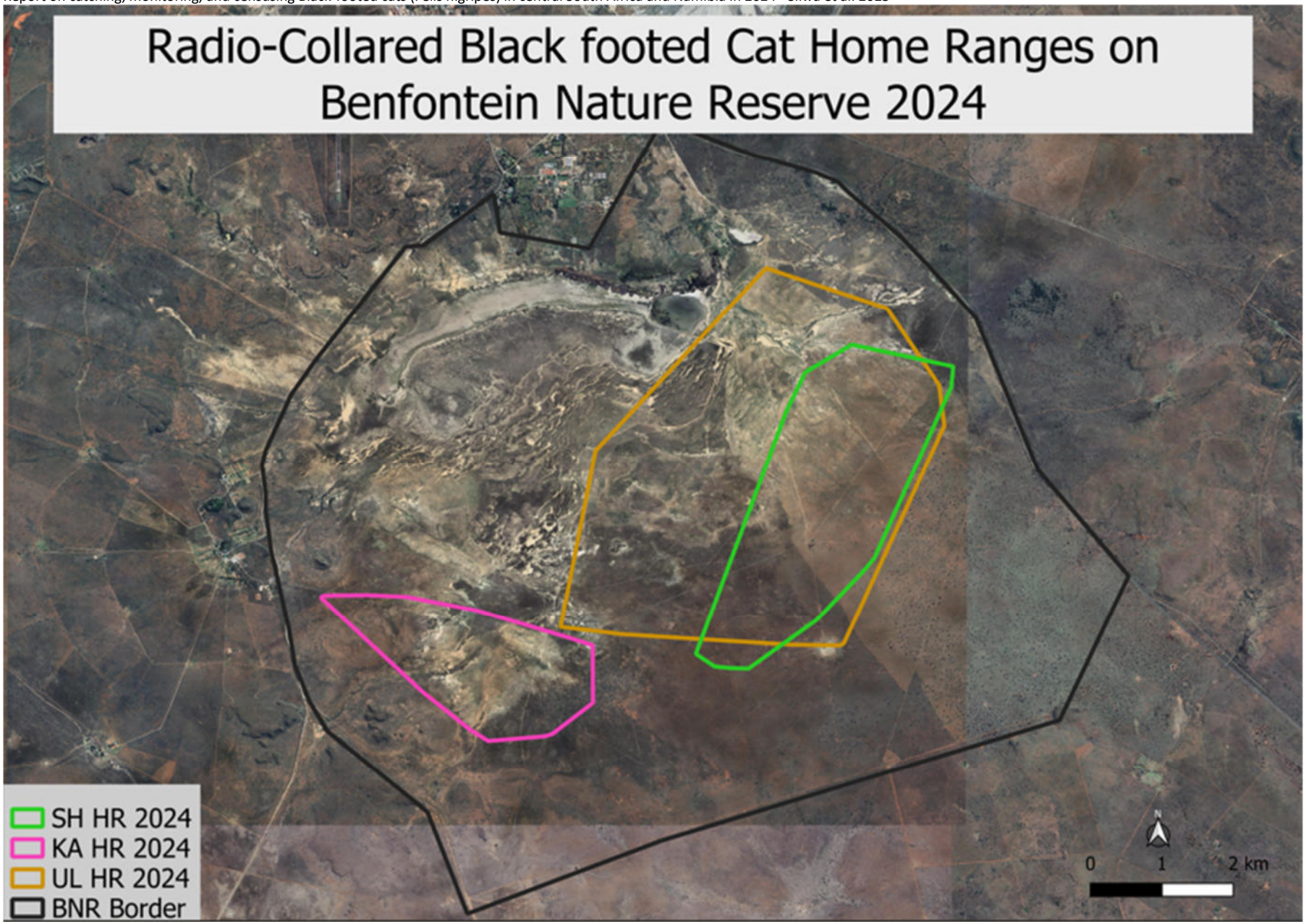
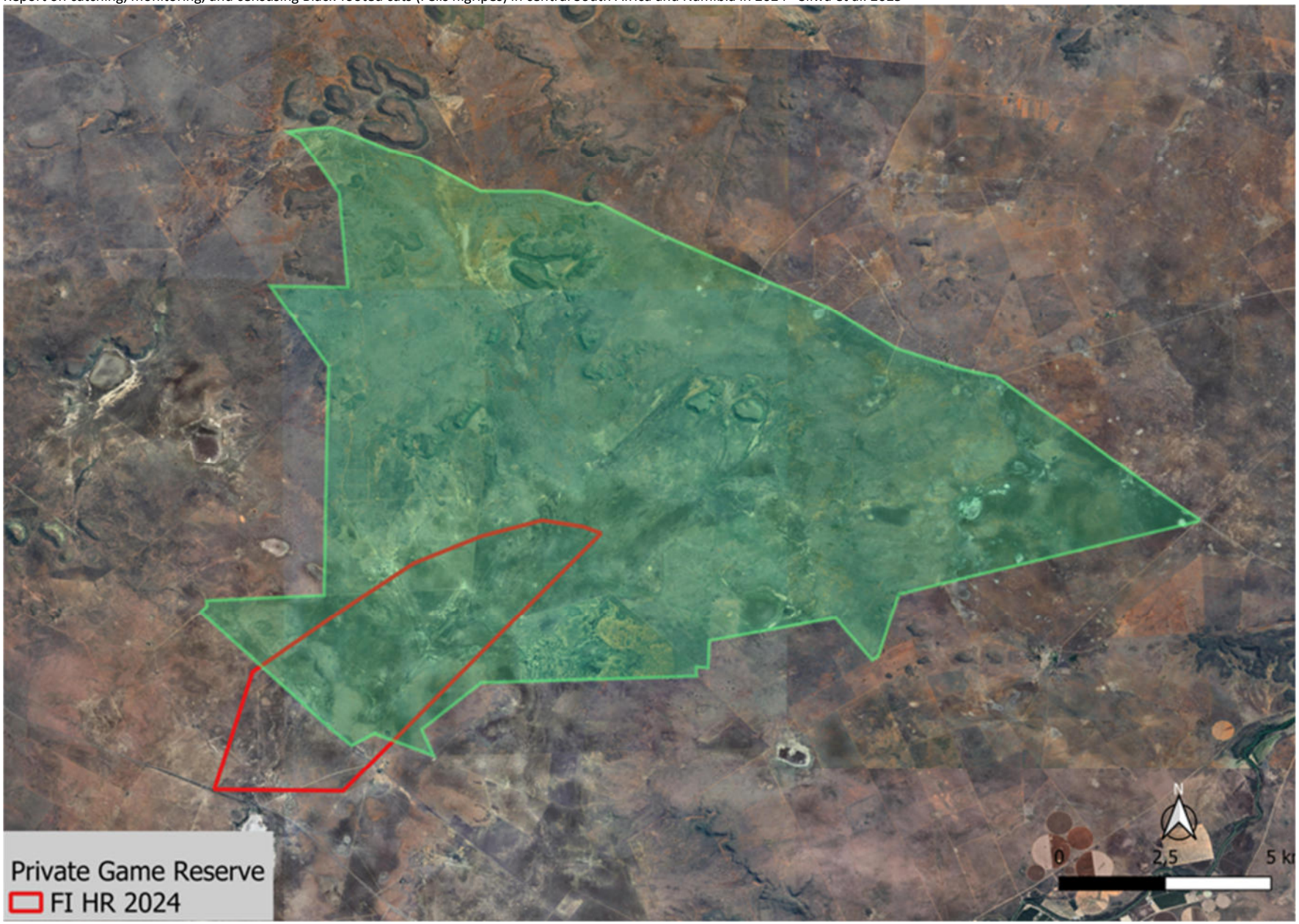


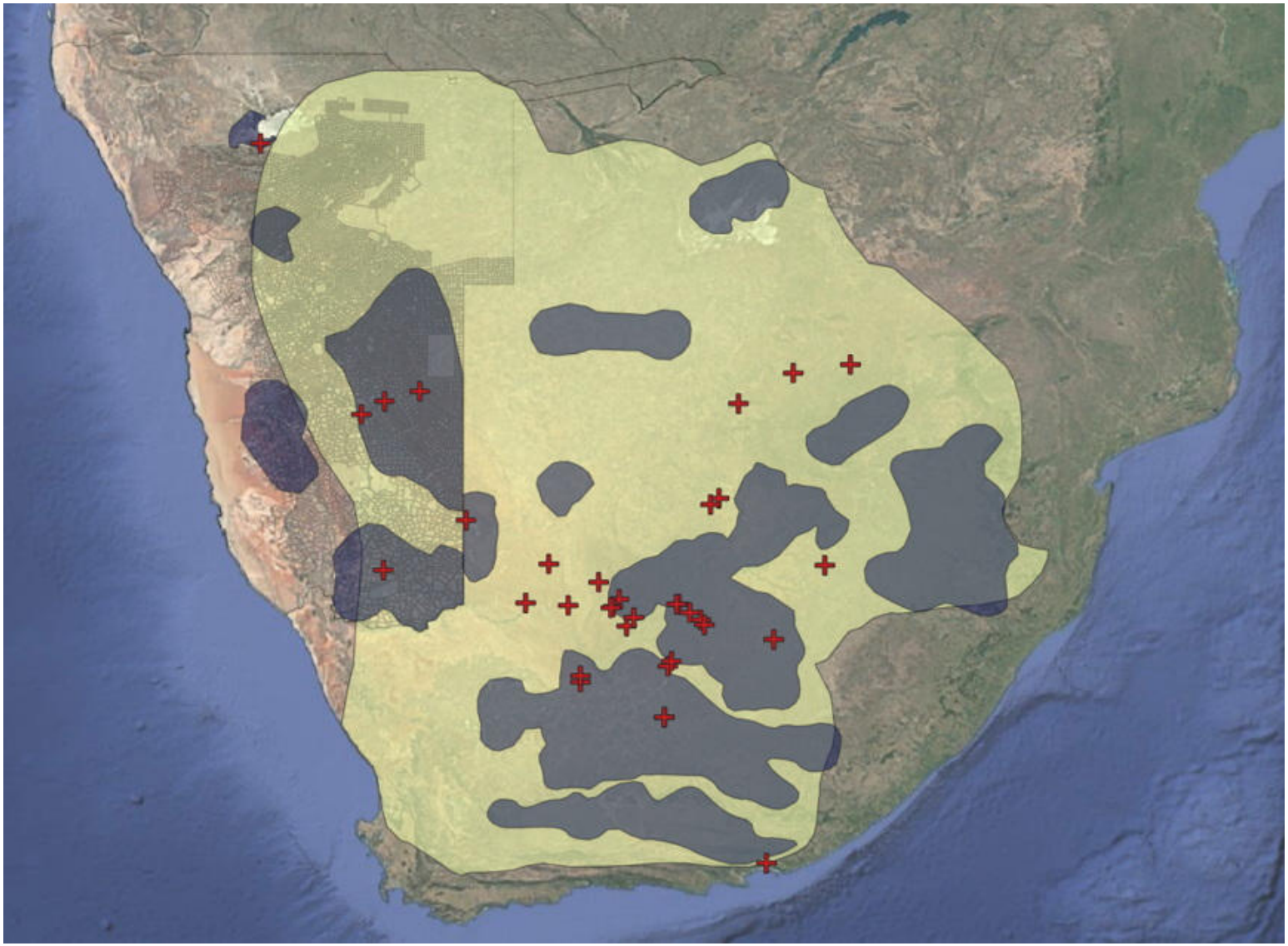
Map 1: Routes driven in the Kimberley area, on Benfontein Farm (magenta tracks), Marrick Safari (light blue tracks) and Rooifontein (red tracks), while spotlight-searching for black-footed cats.



Map 2: Map of Benfontein (BNR; black polygon) with HRs of 3 BFCs in 2024, minimum convex polygons (100% MCP) encompassing the locations (*n* = 1.030) of three radio-collared black-footed cats monitored between January – December 2024. Female *Kaz*i (KA) died in March 2024 and male *Shongo* (SH) in late September 2024. Male *Ultro*= UL.



Map 3: Map of HR (red polygon) of male Fibo (FI) on private property (green shape) and outside for the months June- September 2024, located southeast of Benfontein Game Farm, where he was captured. The minimum convex polygon (100% MCP) encompassed his locations (n = 87) only in this area. He probably died on 11.9. 24 and his remains were found on 16.9.24.



Map. 4: Map indicating the locations of samples for the Whole Genome Sequencing at the Stanford's Program for Conservation Genomics. The extant distribution of *Felis nigripes* as proposed in the latest IUCN Red List Assessment (Sliwa et al. in review) is in purple (gray) and the area highlighted in yellow is the 2016 IUCN distribution map.

Fig. 1: Capture team with *Shongo* (self-release)

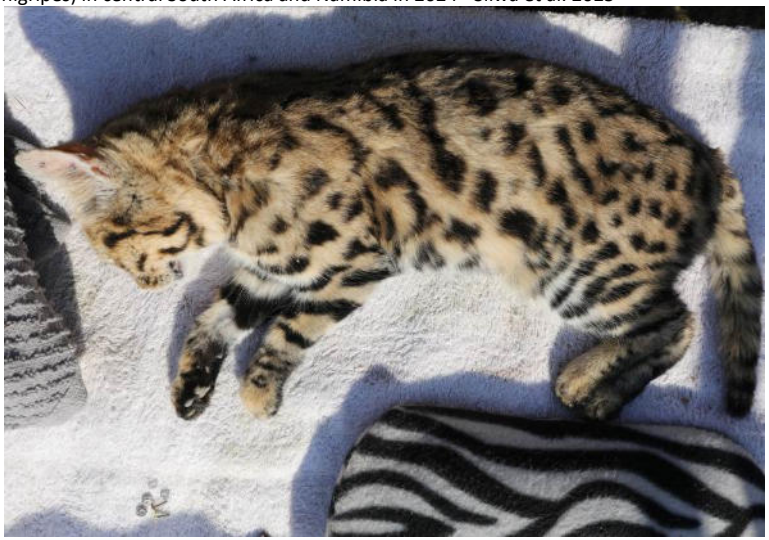


Fig. 2: *Shongo*'s on 29.5.24, under anaesthesia (A. Sliwa)

Fig. 3: Shongo freshly killed, face chewed and fur plucked by a caracal on 23.9.24 (M. Swanepoel)

Fig. 4: Aardwolf (*Proteles cristatus*) cub, paste marking in Shongo's den entrance, with family walking on (camera trap set by M. Swanepoel)

Fig. 5: Team with male *Fibo* (self release)

Fig. 6: Daniel Saayman and Arne Lawrenz working on *Fibo* (A. Sliwa)

Fieldwork and cats on Benfontein (BFN), South Africa, in 2024 – page 2.

Fig. 7: *Fibo* in his den entrance, one of only a few photos of him (CT set by M. Swanepoel).

Fig. 8: Alex Sliwa collaring *Fibo* (B. Wilson).

Fig. 9: Michelle Swanepoel tracking *Fibo* (A.Sliwa).

Fig. 10: Beryl Wilson and Arne Lawrenz preparing the anesthesia drugs for the night captures (A. Sliwa).

Fig. 11: *Kazi* shaking out the dust, after emerging from her den (CT by M. Swanepoel).

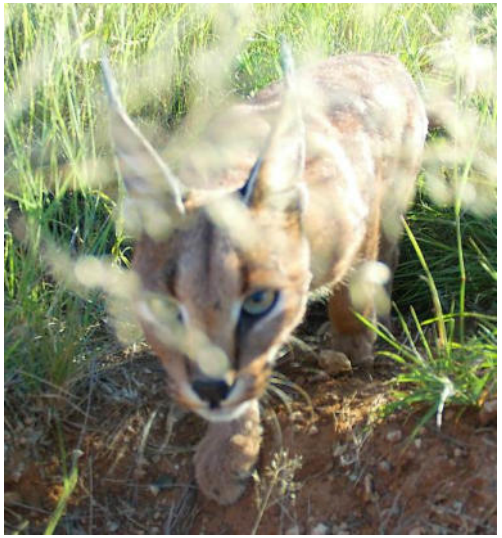


Fig. 12: Caracal (*C. caracal*) at Kazi's den on 16.2.24 (CT by M. Swanepoel)

Fig.13: Kazi's body on 20.3.24, found 3 days after gone missing, killed by caracal (M. Swanepoel)

Fieldwork and cats on Benfontein (BFN), and scat detection dog work in South Africa, in 2024 – page 3.

Fig. 14: Male *Ultro* under anesthesia (A. Sliwa).

Fig. 15: *Ultro* in front of his den (CT by M. Swanepoel).

Fig. 16: *Ultro* at another den (CT by M. Swanepoel).

Fig. 17: One of the many bold black-backed jackals on BFN (A. Lawrenz & A. Sliwa).

Fig. 18: Scat detection dog handler M. Schroeder with *Sebala* searching for preplaced BFC scat during their Cape Nature field assessment, October 2024 (Vicki Hudson).

Fig. 19: *Lyka* and Sebala next to an important hominid fossil site after completing surveys in the Free State study area where the team was based at the Florisbad Archaeological Site in 2024 (M. Schroeder).

Table 1: Calculation of (all incomplete) range sizes (km²) and remarks on 4 black-footed either captured in June 2024 or tracked for part of 2024 on Benfontein Game Farm (BFN), South Africa. Shaded animal columns indicate individuals that died in 2024.

Capture Date	29.5.24	-	2.6.24	4.6.24
Name (also on Map)	***Shongo***	***Kazi***	***Fibo***	***Ultro***
No. captured (last)	Cat 1 24	Cat 2 24	Cat 3 24	Cat 4 24
Sex	M	F	M	M
Age (judged by teeth)	Adult	Adult	Adult	Adult
No. captured	Cat 1 22	Cat 2 24	Cat 3 22	Cat 4 22
Microchip #.	9920030000130398	9450000018 08148	992003000422788	992003000422786
Mass (kg)	1.52		1.71	1.87
Ear (cm)	4.9		5.0	5.2
Shoulder (cm)	24		24	26
Total Length (cm)	59		59	62
Hind foot (cm)	8.8		9.1	9.5
Front foot (cm) (L x W)	2.1x1.8		2.2 x 1.8	2.0 x 1.8
Tail (cm)	17		17	18
Neck (cm)	12		12	13
Canine UR (cm)	0.94		1.14	1.0
Canine LR (cm)	0.80		0.97	0.93
Canine UL (cm)	0.92		1.12	1.0
Canine LL (cm)	0.78		0.98	0.97
Testes (cm) / condition of nipples	1.5 x 1.0		1.6 x 1.2	2.0 x 1.8
No. fixes collected in 2024	509	184	87	337
Range (100MCP) 2024 (km²)	9.30	5.10	28.49	22.20

Total fixes collected in 2024 for 4 BFCs, n = 1.117

Remarks:

1) *Shongo* (Cat 1 24): adult male, captured first in November 2022; has habituated well to vehicle and camera trap setting at his dens, recaptured and exchanged radio-collar where he had fairly heavy flea and tick infestation; small bodied for his age; found freshly dead with plucking due to predation by caracal on **23.9.24**. **DEAD**
2) *Kazi* (Cat 2 24): adult female, was monitored in stable home range since November 2018. probably killed by caracal already on **17.3.24, found 20.3.24, DEAD**
3) *Fibo* (Cat 3 24): adult male caught on BFN; good condition, low parasite load; lost contact first days, then he moved to private game reserve further south, found collar with only bone fragments on **16.9.24**, presumed predation by jackals. **DEAD.**
4) *Ultro* (Cat 4 24): adult seasoned male, bite wounds on tail, foot pads worn, so must be traveling a lot, captured in west central part of BFN, home range calculation incomplete.