



Namibia Giraffe Conservation Programme

YEAR IN REVIEW
October – December 2020



@giraffe_conservation



@giraffeconservationfoundation



@Save_Giraffe



At our home base in Namibia, the Giraffe Conservation Foundation (GCF) runs a comprehensive programme across the country with a focus on giraffe conservation research and environmental education. While this report focuses on the conservation side, you can read more about the environmental education programme in the regular KEEP Update reports online at <https://giraffeconservation.org/programmes/keep/>.

The past few months have seen some exciting developments in our Namibia Programme. If you follow our updates regularly, you might want to skip forward to the brand-new updates and give the background information a miss, but you might also find some interesting information that you were not aware of.



Background

GCF's Namibia programme focuses on monitoring and supporting the long-term conservation and research of Namibia's desert-dwelling giraffe. These giraffe roam throughout the northern Namib Desert in the country's northwest. In 2019 our study area expanded to cover a total area of approximately 30,000km². Our work primarily focuses on the area south of the ephemeral Ensengo, Nadas, Munutum and Khumib Rivers in the far north, down to the catchments of the Hoarusib and Hoanib Rivers. The area extends from communal conservancies (Marienfluss, Orupembe, Sanitatas, Okondjombo, Puros and Sesfontein Conservancies) in the east to the Skeleton Coast National Park bordering the Atlantic Ocean to the west.

Namibia is well-known for its successful community based natural resource management approach where local people gain management rights to their designated local land and natural resources including wildlife. Approximately 20% of Namibia is managed and protected in such communal conservancies and over 46% of the country is under some form of private, communal, or public conservation management. This collaborative conservation approach involving communal and private land as well as national parks has contributed to positive populations trends of most wildlife in the country.



With only a few millimetres of annual rainfall, the programme area is arid to hyper-arid and the wildlife is well adapted to this harsh environment. However, these conditions mean that many species survive at the very edge of their adaptive abilities and as such the ecosystem is fragile and easily disrupted. Grazing for cattle and other livestock, tourism and historical poaching have led to some degradation of the environment and its wildlife. Nevertheless, it remains one of the most beautiful and remote refuges for Africa's remaining mega-fauna.

In this stark landscape of dunes and dry riverbeds, along with elephant, black rhino, lion, cheetah, and numerous other species, live the desert-dwelling Angolan giraffe (*Giraffa giraffa angolensis*) – a subspecies of the Southern giraffe (*G. giraffa*). GCF's long-term giraffe conservation monitoring and research programme in this remote part of Namibia offers a unique and valuable opportunity to better understand this giraffe subspecies and, through what we learn, provide conservation and management support for other giraffe populations throughout Africa.

In addition to this long-term conservation programme, GCF also attempts to get a better idea of giraffe numbers throughout the country and we have embarked on a country-wide assessment of giraffe. In this exciting programme, we work closely with government and private landowners throughout Namibia to better understand the numbers and population dynamics of giraffe in the country. By collaborating with partners, we not only determine giraffe numbers, but also increase education and awareness of giraffe conservation in Namibia and Africa-wide.



News from the field

It is fair to say that like the rest of the world, we at GCF are holding our collective breath to see what 2021 has in store for us. 2020 was a year of challenges, compromise and adjustment for us all, but also an extremely positive and busy year for GCF – and the Namibia research team was no exception! In a 'normal' year, the team will conduct 8-10 giraffe surveys in Namibia's Northwest and we host up to 20 giraffe enthusiasts from around the world. Due to international travel restrictions and border regulations, we



were only able to take four Conservation Supporters into the field in 2020: two from Oklahoma City Zoo, a Canadian polar guide and our colleague Dr Janke from the Senckenberg Biodiversity and Climate Research Centre (BiK-F) in Germany. As per usual, these trips were action packed and our visitors were lucky enough to experience flooding rivers, collection DNA sample collection and of course many giraffe sightings.

As Covid-19 started to spread throughout the world we were fortunate to continue with regular and extended surveys. The Namibia research team spent an unprecedented six months in the field in 2020, including two six-week stints during regional lockdowns and travel bans. These extended surveys provided interesting observations of real time fission-fusion of giraffe herds, increased sightings of juveniles during early development and allowed our team to access more remote areas of the survey area without the worry of limited timelines. As a result of increased field time, our team recorded more giraffe sightings than ever during the second quarter of 2020, despite limited accessibility due to flooded rivers.

So, 2020 was not all negative and the best news for Namibia was higher-than-average rainfall for the first time in ten years. Dams filled up and the rain provided much needed relief to vegetation, animals, and people alike. Most of the ephemeral rivers in Northwest Namibia flowed, some more than once, and for several weeks at a time. The Hoarusib River ebbed and flowed with the rains throughout April and some local flow continued throughout the dry season until August which provided easily accessible water for people, livestock and wildlife in the area. Weather forecasts project above average rainfalls for 2021 and due to early rains in the North the Hoanib River already flooded once in November. This gives us hope for good rains and would help the giraffe population to continue to thrive and grow in size.

Technology upgrades in the field

GCF is a science-based organisation and by combining advanced technology with ground-level understandings of giraffe ecology, we are turning science into meaningful conservation outcomes. One such technological advance in 2020 is Vulcan's EarthRanger app. This online tool helps our team to track our GPS satellite tagged giraffe online in real time. The new app provides all our Twiga Tracker data as a real-time visualization, including alerts and some basic analysis telemetry data – as long as our team has cell service, which can be an issue in part of our survey area. However, whenever they have cell service they can check out the latest locations of all tracked giraffe, check historical trajectories, generate basic heatmaps showing where a specific giraffe spends more time, animate movements, change base map layers, and measure features in the landscape.



Figure 1: Giraffe home ranges in November 2020 (left) and 'Ceratops' (right).



Our team tested these features in the last quarter and found it particularly helpful to locate giraffe as well as find new routes to explore within the 30,000km² survey area. While giraffe will often use established wildlife trails to negotiate their way through a mountain pass, it is also quite common for them to utilize roads, which are often softer on their feet and easier to navigate. While using the EarthRanger app in November, the team explored some new roads in the survey area that are not found on any maps and also spotted one of our tracked giraffe ('Ceratops' #2959) that had not been spotted in the field for almost a year by focusing on heatmap data points. While female giraffe tend to have smaller home ranges than males, Ceratops is an exception. With an estimated home range of 837.7 km² in November and walking 302.4 km through several river systems, valleys and mountains, this highly elusive giraffe well and truly exceeds her 10,000 daily step goal. Table 1 shows distance travelled and home ranges of five female giraffe in October and November 2020; for a graphic visualization see Figure 1.

Table 1: Distance travelled by five GPS satellite tagged female giraffe in October & November 2020.

ID/Date	October 2020		November 2020	
	Distance travelled (km)	Home ranges (km ²)	Distance travelled (km)	Home ranges (km ²)
Marble IRI2016-3218	242.8	287.2	185.5	72.7
Supergirl IRI2016-3220	177	160	192.2	49.8
Dorothy IRI2016-3222	184.2	50.5	166.4	23
Tisa ST2010-2958	140.5	74.9	124.8	92
Ceratops ST2010-2959	360.8	979.7	302.4	837.7

In addition to tracking giraffe, we recently connected one of the team's mobile phones into the network, which enabled our team in the Windhoek office to monitor all movements in the field online. This is particularly useful to monitor travel distances and analyse where our routes intersect with giraffe. The maps give us a bird-eye view of the terrain and help us to understand where giraffe (and possibly a vehicle) can traverse a mountain pass or valley. We can also easily generate maps of our survey routes and get a clearer picture of gaps in our survey routes. See Figure 2 to identify where our team's phone overlapped with the routes of tracked giraffe.



Figure 2: Map highlighting tracked phone route (Emma W) and overlaps with tracked giraffe.



By following these new tracks, our team encountered new giraffe not previously observed in the study area, thus increasing the known population and our understanding of giraffe movements. Over a two-day period in October, our team encountered 112 giraffe, which is the highest number so far recorded during these transects. In a single day, we observed 51 giraffe in the Hoarusib River followed by a staggering 61 in the Khumib River and the neighboring Sanitatas River. Of those 61 giraffe, six were new, and several others had not been encountered for a few years. Many of these new sightings were aided using the EarthRanger phone app.

SCIONA Update

As part of his ongoing studies, MSc student Jackson Hamutenya from the Namibia University of Science and Technology (NUST) as part of the Skeleton Coast Iona (SCIONA) project, analyses the monthly movements of the five giraffe with ossi-units in the northern most reaches of the study area. Each unit transmits hourly location and temperature data by satellite. The data is then analysed to assess giraffe's habitat use and spatial ecology in the arid to hyper-arid Kunene Region.

In November 2020, the five tracked giraffe roamed between the four main riverbeds: the Munutum, Nadas, Sechomib, and Khumib Rivers. Table 1 shows that four of these females maintain relatively small home ranges and travel between 120-240 km per month. As mentioned earlier, 'Ceratops' is the exception to this trend and routinely travels large distances each month, often over 350 km per month.

Recent analysis of all tracked giraffe throughout Africa as part of our Twiga Tracker Initiative showed that 'Ceratops' travelled 3,244.9 km in 2020 – this is the longest distance any tracked giraffe walked during the year. Another female giraffe in Northwest Namibia holds the record for maximum distance travelled in 24 hours: 58.4 km. For some statistics, in 2020 our Twiga Tracker Initiative recorded a total of 530,251 data points/coordinate fixes and combined all tracked giraffe travelled a staggering distance of 155,180.6 km. Figure 3 shows the movements of five female giraffe in Northwest Namibia in November 2020.

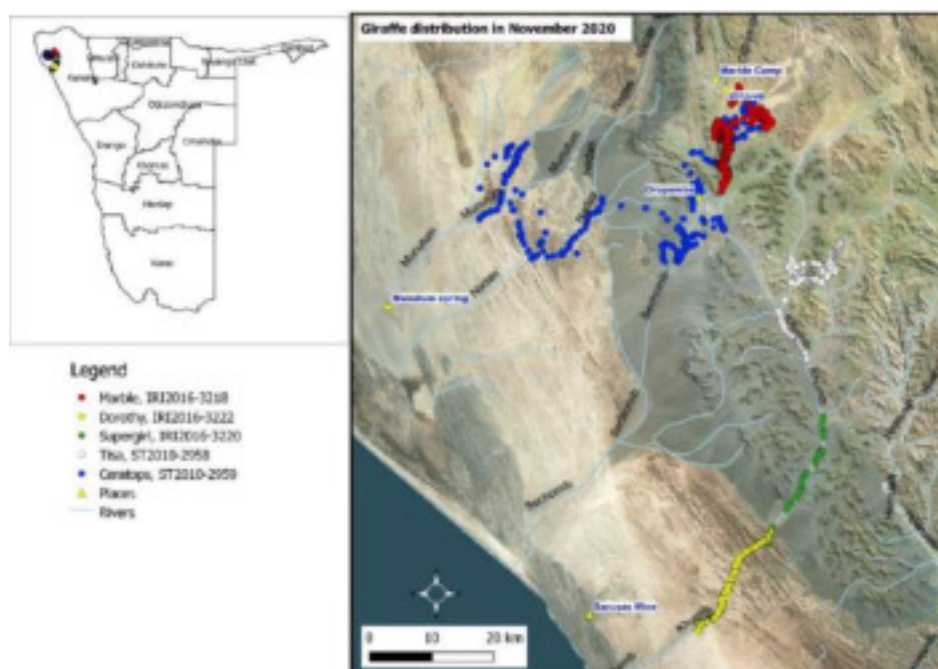


Figure 3: Movements of five GPS satellite tagged female giraffe in Northwest Namibia in November 2020.

This information will help inform a potential reintroduction of giraffe into the Iona National Park in Angola that is tentatively planned for 2021/22.



Capacity building and community involvement in the Puros Conservancy

In June 2020, the Puros Conservancy and the Namibian NGO Integrated Rural Development and Nature Conservation (IRDNC) contacted GCF to request technical support for conducting a survey of the giraffe in the Puros Conservancy. During their field trip in November, our team assisted the Purso Conservancy with their first annual giraffe survey.

Three vehicles were used to travel simultaneously throughout the Puros Conservancy to locate and individually identify giraffe (see Figure 4 for survey routes). The team consisted of two GCF field researchers, one IRDNCY representative and six members of the Puros Conservancy (Figure 5). Survey equipment such as digital cameras and GPS units for data collection for each vehicle were provided by GCF.



Figure 4: Map of Puros Conservancy with survey routes in yellow.

During a rapid training session all survey participants were trained in equipment use and data recording techniques as per the GCF data collection protocol for giraffe surveys. All data recorded during this survey was analysed by the GCF team and individual photos were matched with our existing database.

During the two survey days, the team collectively observed a total of 89 individual giraffe (78 identifiable and 11 unidentifiable) in 25 herds (average herd size of 3.56 giraffe) in the Puros Conservancy. The survey recorded 15 duplicate sightings where more than one vehicle recorded the same giraffe and duplicates were removed from the total number. The individual identification method used during the survey in combination with detailed post-survey analysis has provided an accurate method to assess the minimum number of individuals in Puros Conservancy during the time of the survey.

Giraffe travel large distances in north-western Namibia and display large home ranges as evidenced by our long-term individual monitoring of the population as well as the use of GPS satellite units to record their daily, seasonal, and annual movements. Many of the known individual giraffe travel in and beyond Puros Conservancy into Sesfontein, Marienfluss, Orupembe, Sanitatas, Okondjombo Conservancies and the Skeleton Coast National Park. The results of this report will aid the Puros conservancy in their management and stewardship of their land. Community engagement will continue to provide protection to the wildlife living in the area and help them utilize eco-tourism for income generation.



Figure 5: Puros Conservancy Giraffe Survey team, November 2020.

Calf survival rate

We have started taking a closer look at calf survival rate in Namibia. Literature suggests an average survival rate of 50% for giraffe during their first year throughout Africa. However, in the Northwest survey area we are seeing a higher-than-average survival rate. In her recent paper, PhD student Emma Hart reported a preliminary survival rate of 52%, but only included a limited sample size over a two-year period (Hart et al. 2021). As we collect more data, we see this number increasing. Our data shows that 101 calves were recorded in the survey area from 2016 to the end of 2019, 84% of these were re-sighted once they were older than 12 months old. A low number of predators in the area and limited but consistent food resources may impact these numbers.

In 2020, we have recorded 26 new calves, who have yet to reach the 12-month survival milestone. One of these calves was a young female in the Hoarusib River, who was orphaned later in 2020 at just over six months old. Fortunately, calves can wean at this stage and she was no longer reliant on her mother's milk and old enough to sustain herself. Over the following five months, this young female was observed in the company of another female and her similarly aged male calf (see Figure 6). This giraffe mother appears to have taken on the role of 'aunty' which is a known phenomenon that has previously been documented in wild giraffe. With few threats and no lion in this part of the survey area, the chance of survival for this young orphan is high.



Figure 6: Adult female with a creche of giraffe calves in the Hoarusib River with calves, including orphaned calf.



Our long-term ecological monitoring programme is creating a dataset that will help increase our understanding of giraffe longevity and social structure in the wild as well as provide important information for managing and preserving giraffe in Africa.

Namibia-wide giraffe taxonomic assessment

As mentioned in our previous update, our team in Namibia has been busy collecting DNA samples from giraffe throughout the country to clarify giraffe taxonomy in Namibia and unravel potential hybridisation.

Over the past nine months, our team have visited over 60 farms, reserves, and national parks and collected well over 200 DNA tissue biopsy samples from giraffe throughout the country. DNA sampling will continue in 2021 and a small preliminary sample-set of biopsies will be sent to the Senckenberg BiK-F for initial analysis. Results from this study will provide insights into the taxonomy of giraffe in Namibia, as well as help to gain a better understanding of giraffe numbers and their distribution in the country.

Capacity building of Cheetah Conservation Fund staff

When we encounter a new or unidentified giraffe in the field, we enlist the help of the computer-based programme 'Hotspotter' to double check our database and avoid duplication. Hotspotter uses algorithms that are also used for facial recognition and matches photographed spot patterns with known images in our database.

Elizabeth Pius (Liz), a young Namibian researcher working at the Cheetah Conservation Fund (CCF) in Otjiwarongo, recently spent three days in our office to learn how to use Hotspotter and develop a protocol for individually identifying the giraffe on the CCF property. Our team was excited to share our passion for giraffe and welcome a new giraffe researcher in our midst.



Figure 7: Hotspotter training in the GCF office in Windhoek.

A few highlights from 2020

- Together with the Namibian Ministry of Environment, Forestry and Tourism (MEFT), GCF translocated 30 giraffe to two communal conservancies and one national park. The translocations will increase the eco-tourism potential and promote social and economic development of rural Namibians. These three translocations have augmented an additional 2 million acres of giraffe range in Namibia.
- The translocation was filmed by the team of the Covid-Chronicles, a local Namibian initiative to stay connected with international tourists and Namibia-lovers during times when international travel is



restricted due to COVID-19. These videos are available on the GCF YouTube channel. <https://www.youtube.com/playlist?list=PL4VFia68Sc56udRWHxqjXxNUcBOflw8EI>

- Country wide DNA sampling to determine the taxonomy of Namibia’s giraffe population. The team biopsied giraffe on over 60 properties collecting over 200 samples (2-5 samples from each property). In addition, 34 DNA samples were collected from the giraffe population in Northwest Namibia in 2020.
- Working with our partners at the Namibia University of Science and Technology (NUST), an additional seven giraffe were fitted with ossi-units in Etosha National Park (NP) and the adjacent Etosha Heights Reserve. At the same time, several giraffe lost their ossi-units due to hardware failure. We are working closely with our partners to develop different tracking units and continue to trial new technology.
- The total number of giraffe in Northwest Namibia is 429 (see Table 2 for more details). 59 individuals were added to our database, 26 of which were juveniles (<1 year old). 44 individuals (adults and juveniles) were retired from the populations – adults are retired if they have not been seen for three years and juveniles if they have not seen with their mother for 12 months. Five giraffe died in 2020.

Table 2: Total number of individually identified giraffe in the Northwest Namibia survey area in 2020.

	Male	Female	Juvenile (sex unknown)	Total
Hoanib River	72	71	11	154
Hoarusib River	84	74	2	160
Far North (including Khumib, Nadas, Munutum, Sanitatas and Ensengo Rivers)	68	46	1	115
Total	224	191	14	429

- Our team counted a total of 1,635 giraffe sightings in 2020 (in comparison, 1,600 in 2019). 84.5% (363 of 429) of known individuals were observed at least once in 2020. See Figure 8 for percentage comparison with 2019. The increased sightings are likely due to newly added criteria for ‘retirement’ of individuals and increased survey time in the field.

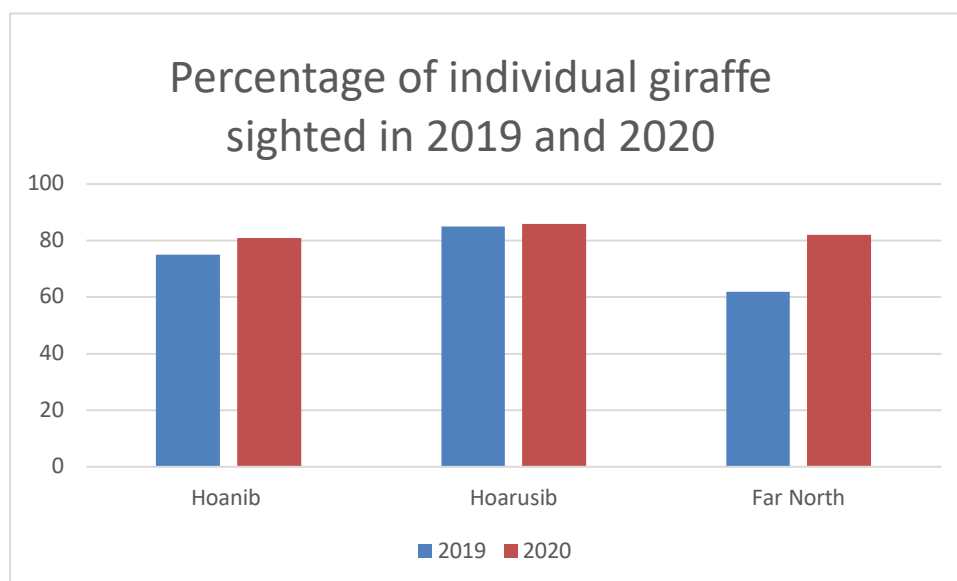
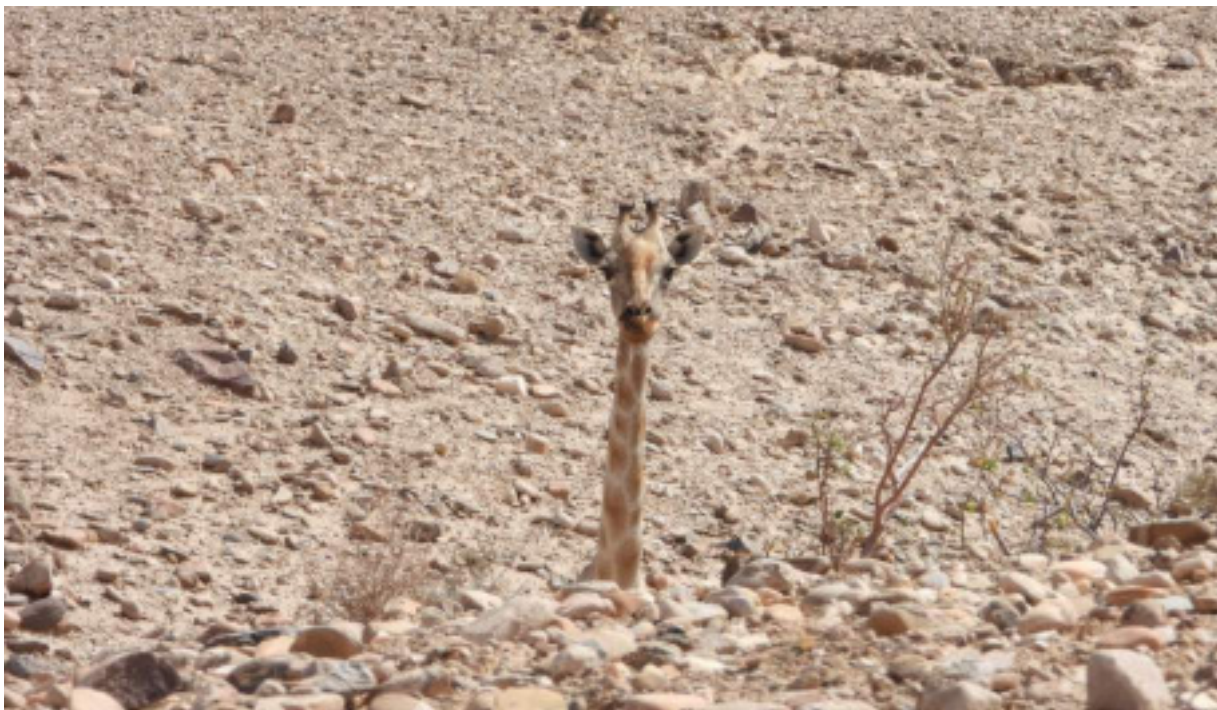


Figure 8: Percentage of individual giraffe sighted in Northwest Namibia survey area in 2019 and 2020.



- A popular article about the Northwest Namibia Programme was published in the *Conservation and the Environment in Namibia* magazine of the Namibian Chamber of Environment (NCE) <http://conservationnamibia.com/articles/cnam2020-giraffe-conservation.php>
- Congratulations to Dr Emma Hart who was recently awarded her PhD from Dublin University for her study of the desert-dwelling giraffe in Northwest Namibia. Emma's research also produced several fascinating papers:
 - Hart, E.E., Fennessy, J., Rasmussen, H.B., Brown, M.B., Muneza, A.B., & Ciuti, S. 2020. Precision and performance of an 180g solar-powered GPS device for tracking medium to large-bodied terrestrial mammals. *Wildlife Biology* 2020. wlb.00669
 - Hart, E.E., Fennessy, J., Hauenstein, S., & Ciuti, S. 2020. Intensity of giraffe locomotor activity is shaped by solar and lunar zeitgebers. *Behavioural Processes*. 178 (2020) 104178
 - Hart, E.E., Fennessy, J., Wells, E.J., & Ciuti, S. 2021. Seasonal shifts in sociosexual behaviour and reproductive phenology in giraffe. *Behavioural Ecology and Sociobiology*. <https://doi.org/10.1007/s00265-020-02954-6>
- Dr Michael Brown and Emma Wells recently published an article discussing their findings on two wild dwarf giraffe in and Namibia.
 - Brown, M.B., & Wells, E.J., 2020. Skeletal dysplasia-like syndromes in wild giraffe. *BMC Research Notes*. <https://doi.org/10.1186/s13104-020-05403-9>
- We are very happy to report that our trusted research vehicle Betty, a Toyota V-6 Landcruiser has not let our team down in 2020. Her extra horsepower has been put to good use to navigate unpredictable rivers and rough terrain. In 2020, Betty and the team have travelled over 40,000 km – more than half of this off road.



Our GCF team is committed to securing a future for all giraffe populations in Africa – together we can make a difference! Thank you for your continued support.



Thank you for sticking your neck out!



GALANTHUS FOUNDATION