Namibia Giraffe Conservation Programme

QUARTERLY REPORT

January – March 2020

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 30,000km^2. Our work primarily focuses on the area south of the ephemeral Ensengo, Nadas 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's surface areas 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 population 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, increasing tourism in the region 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 land-owners 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:

Three months into the new decade and 2020 is already turning the world on its head. Covid-19, bushfires, and murder hornets have been first and foremost on our minds and international newsfeeds. As with many

of you, most of the GCF team have been working from home during these unprecedented times and we are feeling the impact just like everybody else. While some of our hands-on work in the field has slowed down in parts of the continent and we are taking this time to catch up on all important admin work and planning our next steps in giraffe conservation post-Covid-19, some team members are lucky enough to continue with their important work in the field. As an NGO, GCF relies on donations and grants and we want to take this opportunity to thank all of you for your continued support during these difficult times.

Our Namibia field team was in the lucky position to continue with their regular field work in the far northwest of the country – taking social distancing to a whole other level!

While Covid-19 is also an important talking point here in Namibia, as an arid country, current and past rains, floods and dam levels are always an important part of every conversation. The drought-stricken country has received some good rainfall this rainy season which has provided much needed relief to vegetation, animals and people alike.

Rainfall is often very localised and patchy in Namibia and by the end of March the far northwest of the country had still not received any significant precipitation. However, that does not mean that the ephemeral (seasonal) rivers in the area remained dry: heavy rains in the large catchment areas in central and northern parts of the country resulted in both the Hoanib and Hoarusib Rivers flooding multiple times this year.

These ephemeral rivers may flood for only a few hours or several days, but the water that fills the rivers helps to replenish the groundwater and sustains the plants along the river as well as provides much needed water for local communities. In February, our team was surprised by the Hoanib River flooding as they drove up-river back to camp for the night. Luckily, a quick turn got them out of the riverbed, where they then watched the amazing spectacle of the first flood in an otherwise dry sand river. It was remarkable to see the amount of water rushing down and how the sandy track turned into a fast-flowing river within minutes. This experience was a stark reminder why you should never camp in a dry riverbed and underestimate the potential dangers of ephemeral waterways.

Figure 1: First water flowing down the Hoanib River

Figure 2: Only minutes later the Hoanib River is impassable.

If witnessing one ephemeral river flood was not enough, in late March the otherwise dry Hoarusib River transformed into a raging torrent within minutes. Luckily for our team, they were in the safety of their campsite on the banks of the river at the time. However, the magnitude of the flood meant they were effectively trapped on the northern side of the river for five days until the water subsided enough for them to safely cross.

But what are the giraffe doing when the rivers flood? Giraffe seem to sense seasonal changes and tend to migrate to higher and mountainous parts of their range during these times to avoid being caught in a flood. From speaking to local community members and tourism guides in the area, we hear that giraffe typically 'disappear' from the Hoanib River during this time of the year. What this means is that people do not see them, and part of our research is to figure out where they go. Through our regular field surveys and online Twiga Tracker satellite monitoring we can show that the giraffe move far down river into the Skeleton Coast National Park and toward the floodplains or they move up into the mountains. Here they often mix with giraffe from the Hoarusib River who have the same idea. Similar migrations happen between the Hoarusib and Khumib Rivers in the north. Throughout this recent rainy season, the team have noted that most of the giraffe spent more time out of the rivers and either on the banks or at higher elevations.

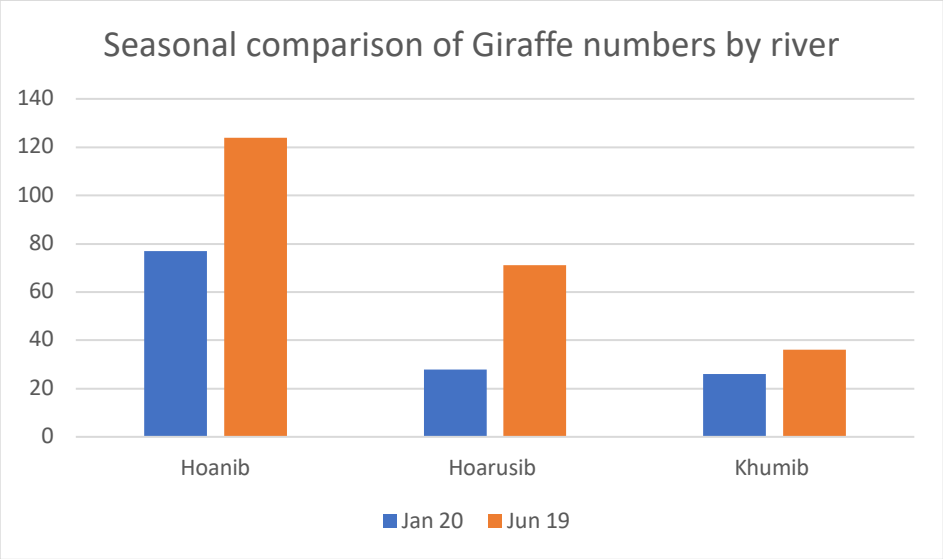

Figure 3: Comparison of number of individual giraffe sightings in January 2020 and June 2019.

A comparison of the number of individual giraffe sightings in January 2020 and June 2019 (Figure 3) shows that the giraffe have moved away from the rivers and accessible regular survey areas into more remote locations. Another interesting observation is the difference in average herd size for the same periods, in particular in the Hoarusib River (Figure 4): we observed a smaller average herd size of less than three animals in the Hoarusib River during this rainy season as compared to the 5.5 animals in the cold-dry season. At the same time the Hoanib and Khumib Rivers and far north showed minimal changes in average herd size. This is likely due to river configuration and access to resources.

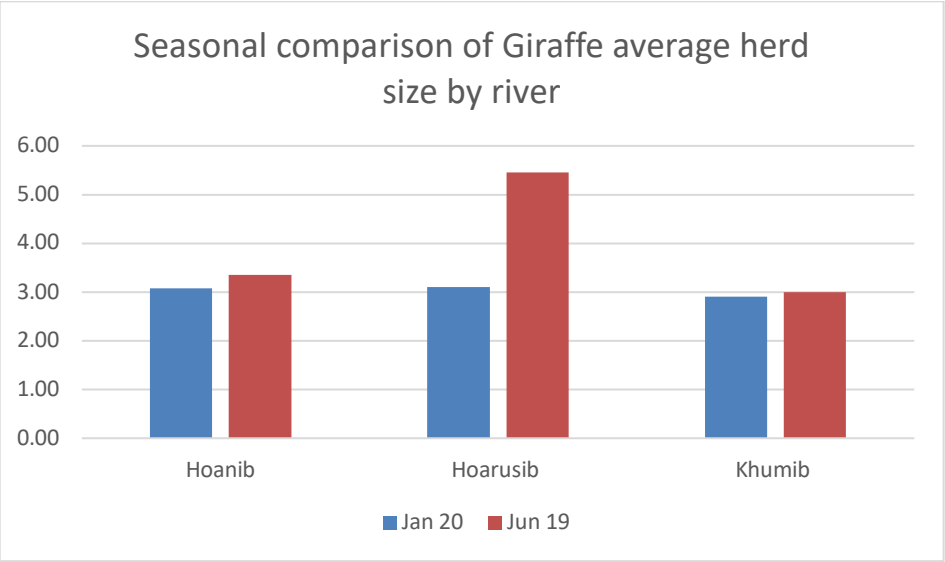

Figure 4: Comparison of herd sizes by river in January 2020 and June 2019.

While the flooding rivers impacted giraffe and researcher movements, the team observed smaller herds and fewer giraffe in areas where we typically see the largest herds. The plains near the rivers can be unstable during the rainy season and may get flooded as the river flow. This could be a reason for giraffe to leave these areas.

Figure 5: Giraffe on far bank of the Hoarusib River

Figure 6: Juvenile giraffe far west along the Hoanib River in the Skeleton Coast National Park.

Survey methods & technology in the field

Research can only be as good as the tools of the trade. The GCF team relies on lots of equipment (tech and otherwise) to conduct their surveys in the remote Kunene Region of Namibia. In our last report, we announced procurement of a new research vehicle through a generous donation – a Toyota V-6 Landcruiser called 'Betty'. All equipment including food, fuel, and often two extra conservation supporter volunteers are packed into the vehicle for two weeks in the field. Over the past quarter, Betty was well and truly put through her paces, traversing the rough terrain in our programme area and utilising her extra horsepower to navigate the unpredictable rivers. Travelling through remote landscapes such as the Kunene Region where there is no cell phone reception and the chances of passing another person or

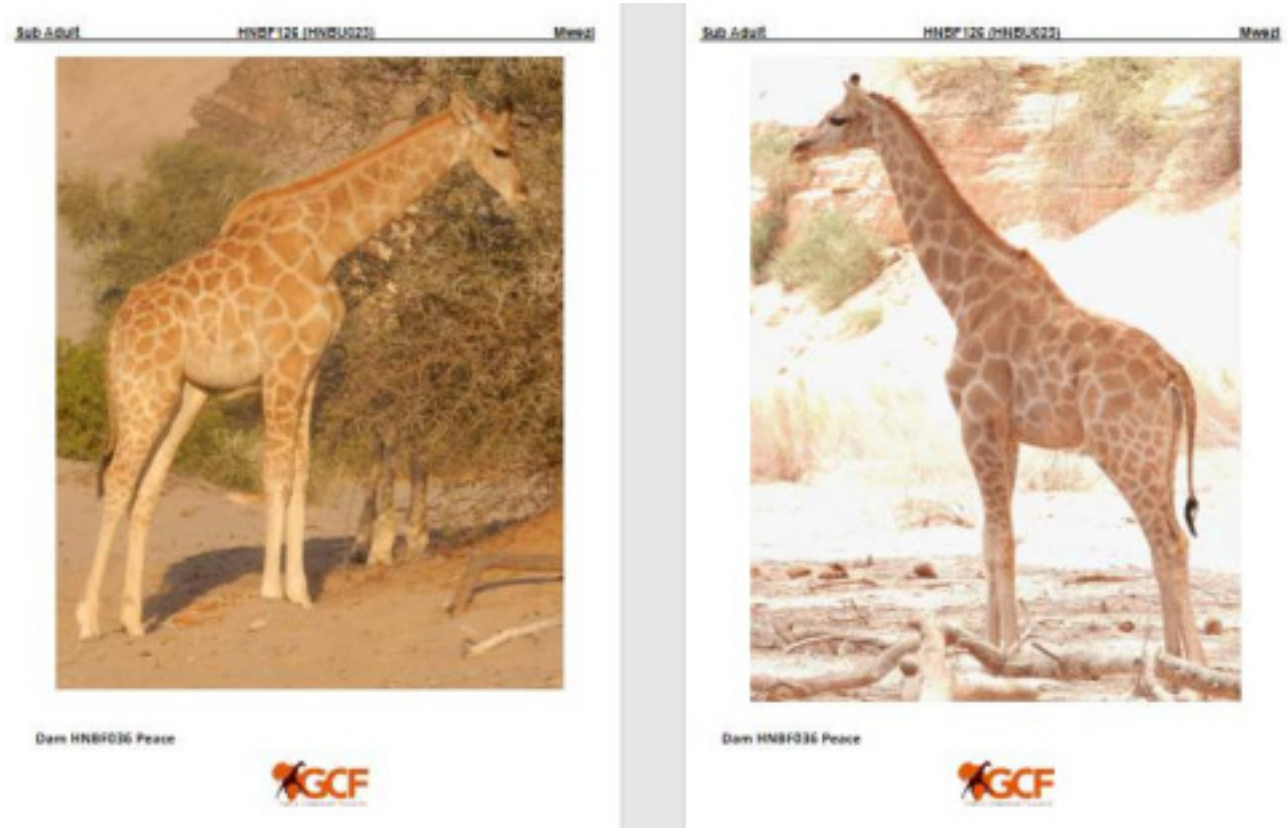

Figure 7: ID sheet for HNBF036-Peace.

vehicle are very slim, a satellite phone is probably our most important piece of equipment. When trouble arises, as it did for our team in October 2019, the phone is invaluable. In this instance we were able to call our mechanic in Windhoek, ask advice, and arrange for spare parts to be sent north. Every night while on the field, the sat phone is turned on for a specified hour, to allow the team in Windhoek get tin in touch if necessary.

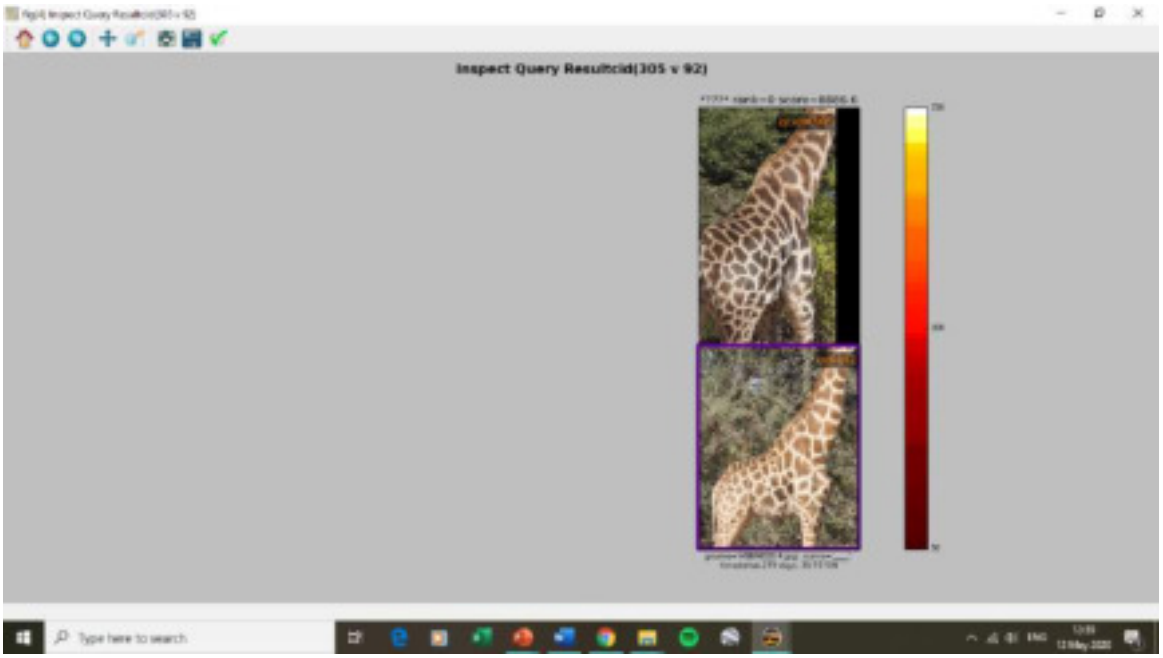

Figure 8: Example from Hotspotter. The software matched a not perfectly angled field photo with HSBM026 in our database.

Whenever giraffe are encountered in the study area, the research team collects a range of data including date, time, GPS co-ordinates, number in herd, photographs, sex, age and a DNA sample (when possible). To achieve this, the team utilizes numerous forms of technology and tools to carry out their research and collect data on the giraffe in the north-west of Namibia.

It is critical to be able to identify each individual giraffe in the study area to understand their behaviour and to investigate aspects of their ecology, such as population structure and dynamics, density, distribution and seasonal movements, home ranges and habitat use/preference. Each giraffe has a unique coat pattern that does not change throughout its lifetime. The colour intensity may fade or darken over time, but the individual can easily be recognised.

We attempt to take a broadside photograph of the left and right side of each giraffe we encounter during surveys. Gone are the days of film cameras where you had to wait days, if not weeks to find out whether a photo was in focus or blurred. Our team now uses a Nikon Coolpix P1000 which was kindly donated by National Geographic Photographer and Nikon advocate, Ami Vitale. This camera, which has a significant zoom, allows the team to take sharp photos to identify each giraffe in the study area. The team can quickly ID in the field by eye using our photo book of all known individuals (see Figure 7 for example of ID sheet).

The research team carries a Toughbook laptop where photos and ID sheets can easily be compared. For any unidentified individuals we use a programme called Hotspotter. This software is similar to facial recognition programmes and matches spot patterns of photographed individuals with known images in a database.

If we cannot find a match with the either method, we know that we have found a new addition to our giraffe population. Figure 7 shows an example of our individual ID sheets: HNBF036-Peace is a sub adult female, first spotted in the Hoanib River (HNB = Hoanib, F= female).

GPS co-ordinates are a key component to understanding giraffe seasonal movements, herd structures and social dynamics. We use a handheld eTrex 10 Garmin unit to record locations. A recent addition to our field kit is the mobile phone app Maps.me (see Figure 9), which also works offline and through satellite imagery has picked up all the 4x4 tracks – even those that do not appear on the off-road maps. This app has become invaluable for tracking distance, routes, marking points of interest and even helping to track down lost ossi-units.

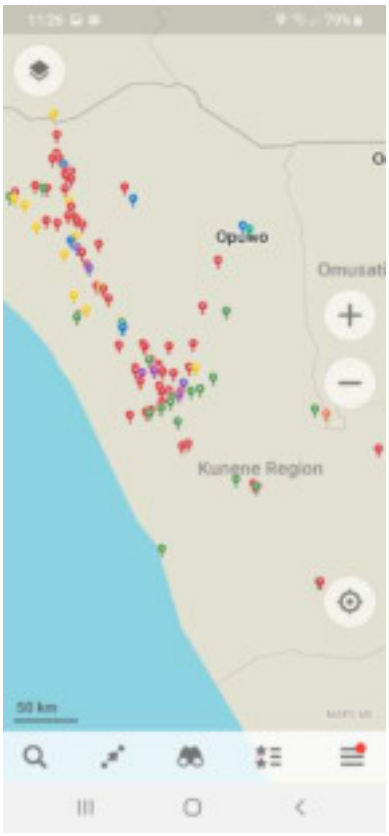

Figure 9: Kunene Region in Maps.me with pins marking points of interest and routes in the survey area.

Aging a giraffe is not easy and rather subjective. Individuals and herd members are classified into appropriate sex class (male, female or unknown) and into one of three different age classes: adult (>5 years), subadult (1-5 years) and juvenile (<1 year).

Whenever a new juvenile is encountered, the team will age it using a set of standardised criteria, such as presence of umbilicus, ossicone shape (flat or erect), belly shape (flat or rounded). These criteria help to

determine whether a calf is only a few weeks old or already a few months up to a year of age. Based on this, we can estimate the birth month which in turn allows us to better track seasonality of birth trends, mother-calf interactions (nursing, socialising, isolating) and age-related changes to the individual.

For individuals with an unknown birth month or year, behaviour, height and ossicone shape and size can be useful measures to determine age in sub adults and adults. Tracking relative age of all individuals provides valuable data to herd structures and social interactions.

On research question asked by our PhD student Emma Hart focused on breeding phenology in desert giraffe and we hope to gain valuable insight to how these giraffe have adapted to this harsh environment. We are looking forward to her publications, but preliminary results show that giraffe breed and calve year-round with a slight increase before the rainy season. Our team were thrilled to spot 13 new calves in the survey area.

Figures 10: New calves spotted in the first quarter of 2020.

Our long-term research, spearheaded by GCF in collaboration with the Senckenberg Institute in Germany and other partners, has clearly identified four distinct species of giraffe in Africa: Masai, northern, reticulated and southern giraffe with several subspecies. This concept is based on the analysis of over 1,000 giraffe DNA samples collected by GCF and partners from all major populations throughout Africa.

Our team in northwestern Namibia continues to add to this data set. DNA tissue is collected by a drop-dart fired from a veterinary rifle. This sampling technique does not involve any drugs, immobilisation and causes minimal stress for the giraffe. In February, the team was joined in the field by Dr Axel Janke, the lead geneticist from Senckenberg Biodiversity and Climate Research Centre (BiK-F) in Germany. It was a great opportunity to get Axel away from his microscope for a couple of weeks and give him a different perspective of his study subjects.

Over the coming months, as part of our nationwide survey, the team will collect DNA samples from giraffe throughout Namibia to confirm their taxonomy. We assume that most giraffe in Namibia are Angolan giraffe (*Giraffa giraffa angolensis*), a subspecies of the southern giraffe (*G. giraffa*), with a few South African giraffe (*G. g. giraffa*) in Bwabwata National Park in the Zambezi Region. This information will help to information giraffe conservation decisions in the country.

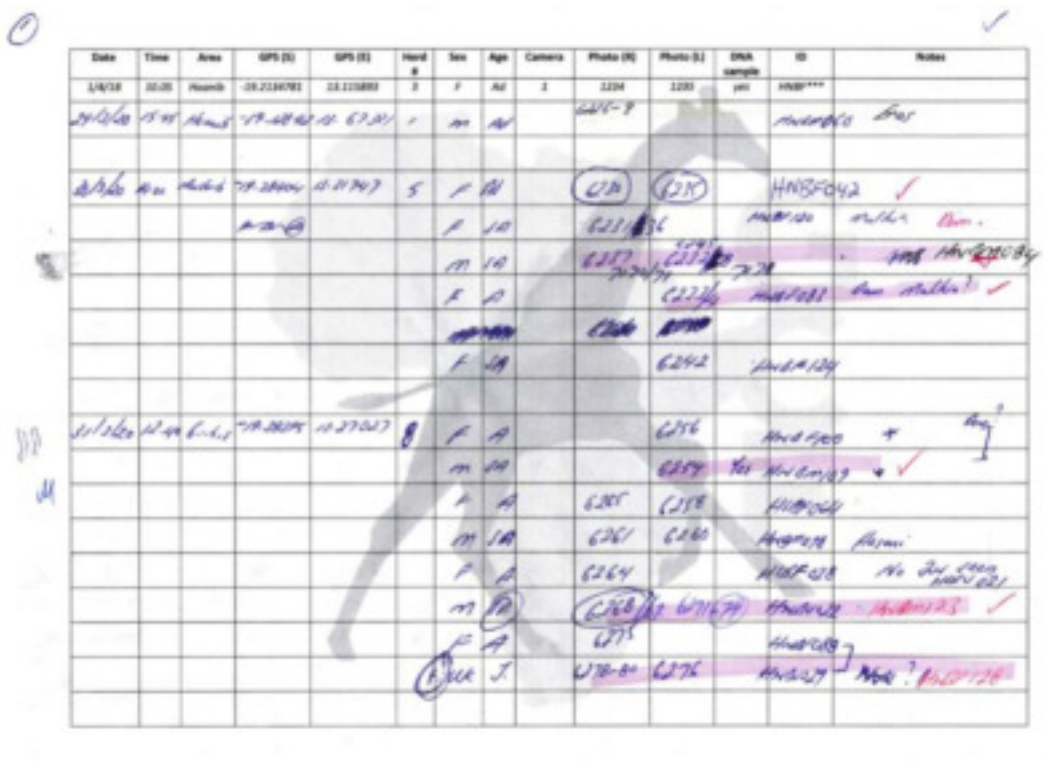

Figure 11: Example of field data sheet and information captured.

In the field, most data is recorded by hand on data sheets (see Figure 11) and transcribed onto an excel spreadsheet later. Back in the office ID sheets are created for any new individuals, gear is cleaned, checked and supplies stocked. Then the team is ready to go out again for another field trip.

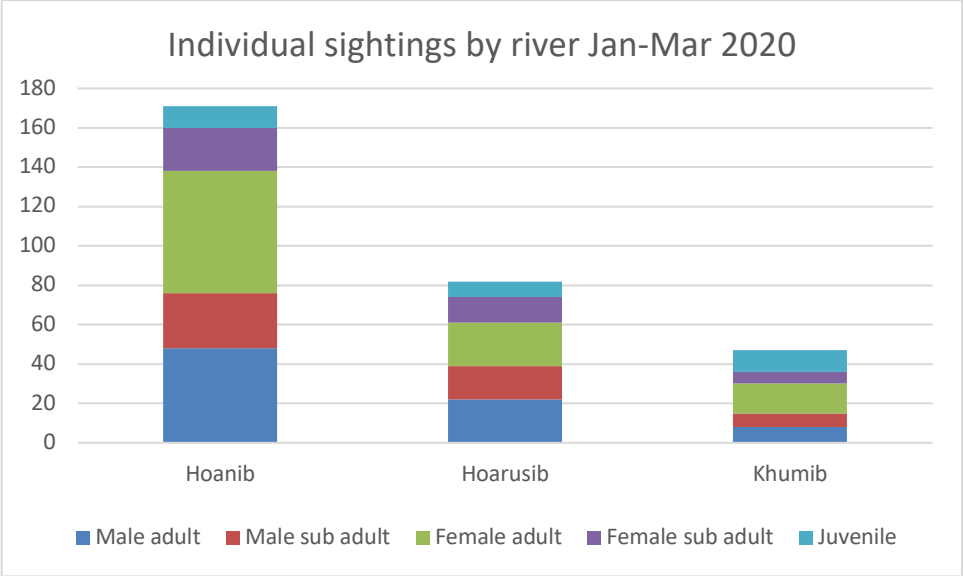

Figure 12: Individual sightings by river in January to March 2020 (Note: There was no data collected in the Hoarusib and Khumib Rivers in March.).

Twiga Tracker and SCIONA Update

The first every giraffe satellite tagging took place in Namibia in 2001. To date GCF has fitted more than 200 units to giraffe throughout Africa as part of our Twiga Tracker programme. Every hour, each unit transmits location and temperature data via satellite.

In July 2019, GCF in collaboration with the Namibia University of Science and Technology (NUST) as part of the Skeleton Coast Iona (SCIONA) project fitted seven giraffe in the far northwest of Namibia with solar-powered GPS satellite transmitters (ossi-units). The data from one young bull and six giraffe cows is analysed to assess giraffe habitat use and spatial ecology in the arid to hyper-arid Kunene Region with the goal to compare this area to southern Angola in preparation for a potential translocation and reintroduction of Angolan giraffe to Iona National Park in Angola.

Preliminary data on distance travelled and home rage in the month of February shows a wide variation between individuals (see Table 1). The average home range of these giraffe so far is 3,898.7km^2 at 95% MCP, most likely due to the arid environment with rather patchy vegetation. Preliminary analysis shows some wet season preference in habitat, but continued and ongoing monitoring is needed to allow firm conclusions.

Table 1: Distance travelled by each GPS satellite tagged giraffe in far north-western Namibia, February 2020 (data provided by Jackson Hamutenya, NUST)

Giraffe name (popular)	Sex	Unit No.	Distance travelled in February [km]
Jackson	male	iri2016-3141	260.65
Marble	female	iri2016-3218	154.8
Supergirl	female	iri2016-3220	229.1
Dorothy	Female	iri2016-3222	200.4
Tisa	female	st2010-2958	77.7
Ceratops	female	st2010-2959	148.8

Early in the year one female giraffe 'KT' lost her ossi-unit. However, as the units sends location data, we were able to locate the unit in the field. As KT does not show any visible damage to the ossicone, it appears that the attachment hardware may have failed. The ossi-unit will be refurbished and re-deployed as part of the Africa-wide Twiga Tracker programme.

Thank you for your support!