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Monthly report of GPS satellite tagged Angolan giraffe (*Giraffa giraffa angolensis*) in northwest Namibia

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In July 2019, Giraffe Conservation Foundation (GCF) and the Skeleton Coast Iona (SCIONA) project fitted seven Angolan giraffe (*Giraffa giraffa angolensis*) across northwest Namibia with solar-powered GPS satellite transmitters (ossi-units). The ossi-units were designed by Savannah Tracking Kenya with support from GCF and are attached to a giraffe ossicone. One young bull and six cows were tagged. Immobilisation of giraffe and fitting of the ossi-units were conducted by a Namibian registered veterinarian under the careful ethical consideration of GCF who have fitted more than 200 units/collars across Africa. 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.

This report provides information on preliminary data from 1 to 30 June 2020 and a brief comparison with last month's findings. Only five ossi-units currently transmit data as two stopped working in January (KT IRI2016-3223) and March (Jackson IRI2016-3141), respectively. All other five remaining ossi-units successfully transmitted data in June 2020 without any gaps (see table 1).

All data analysis was conducted in QGIS 2.18.28 using the coordinate referencing system WGS84 and in Microsoft Excel. Habitat use and movement pattern by all giraffe appears to be similar to May 2020 (see figure 1 and 2).

During June 2020, Ceratops (ST2010-2959) trekked northward from Onjuva to the Nadas and Munutum Rivers. Supergirl (IRI2016-3220) and Tisa (ST2010-2958) both closely interacted in mid-Khumib River, whilst Dorothy (IRI2016-3222) moved further southwards down the Khumib River (see figure 1).

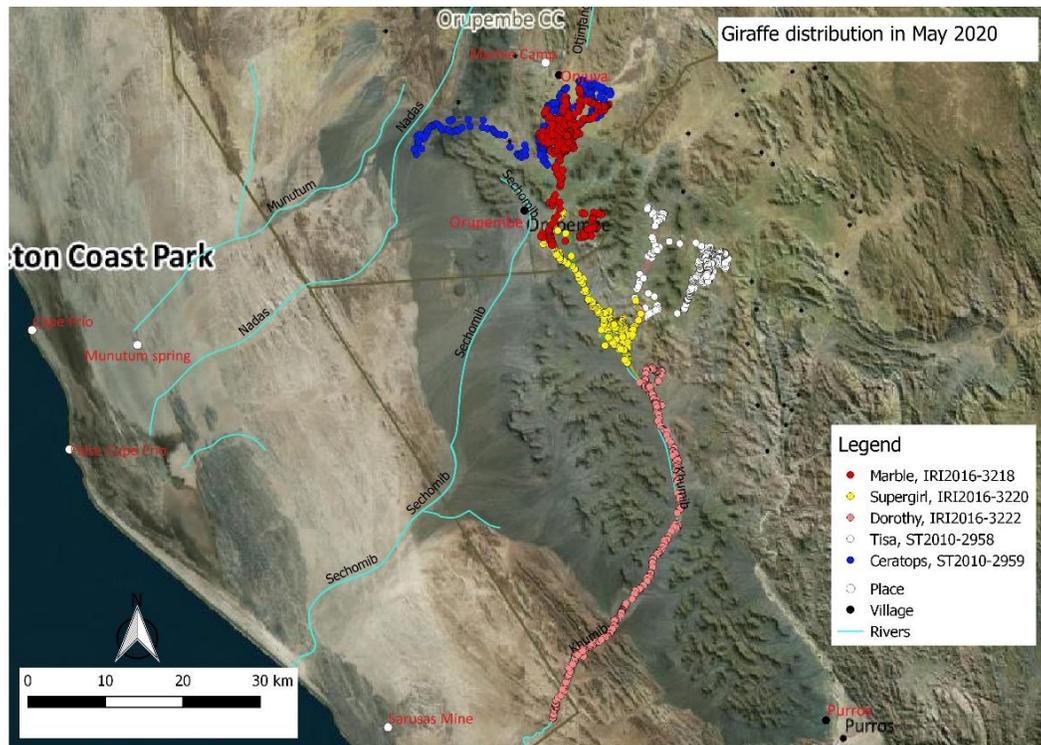


Figure 2: GPS satellite tagged giraffe movements in northwest Namibia during May 2020

Home Range (HR) preliminary results were estimated using the Animove plugin in QGIS to determine HR at 50% and 95% Minimum Convex Polygon (MCP) for each individual as well as the total population. The 50% MCP provides standard deviation core HR, while 95% provides the average HR. Home range sizes of giraffe in June 2020 were generally smaller than in May 2020. The giraffe with the biggest recorded HR in June 2020 was Ceratops (ST2010-2959) – 297km² at 95% MCP, followed by Tisa (ST2010-2958) – 268km². Dorothy (IRI2016-3222) had the smallest HR at ~24km². The majority of giraffe had HR overlaps in the Khumib River and near Onjuva village. However, Dorothy (IRI2016-3222) did not show any HR overlaps (see figure. 3). All giraffe combined had an average core home range of ~448km² which was smaller than than May 2020 calculated at 50%, and ~2,271km² at 95% bigger than last month (see figure. 5 & 6). For the rest of the HR records see table 2.

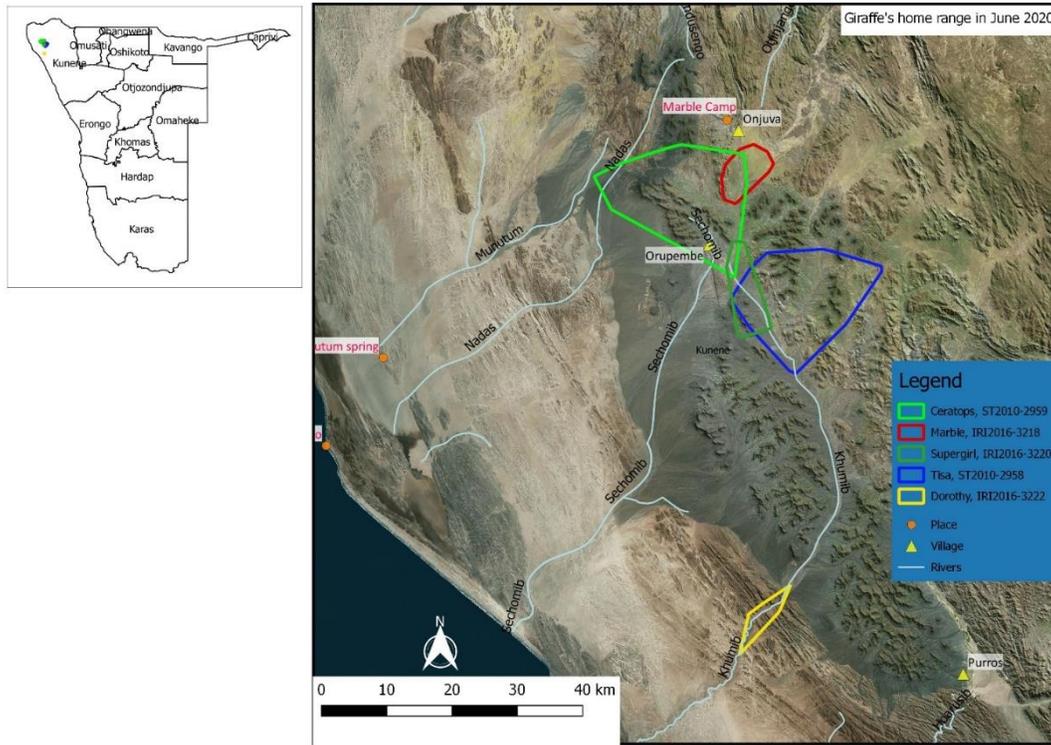


Figure 3: GPS satellite tagged giraffe's individual Home Range using 95% MCP in northwest Namibia during June 2020

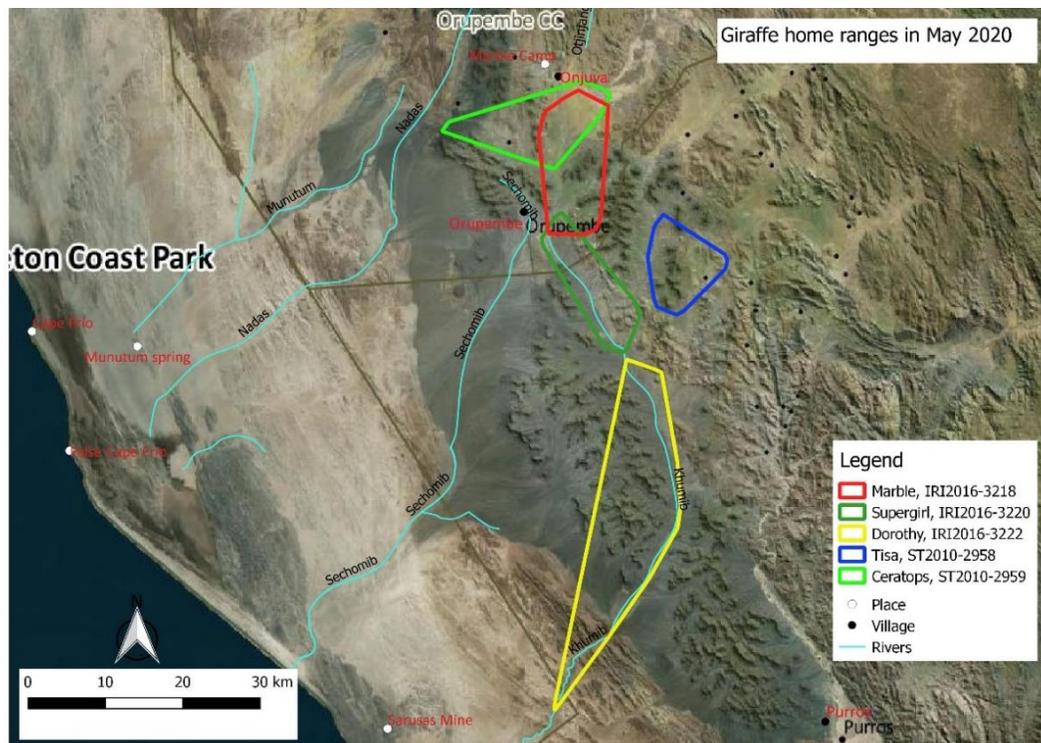


Figure 4: GPS satellite tagged giraffe's individual Home Range using 95% MCP in northwest Namibia during May 2020

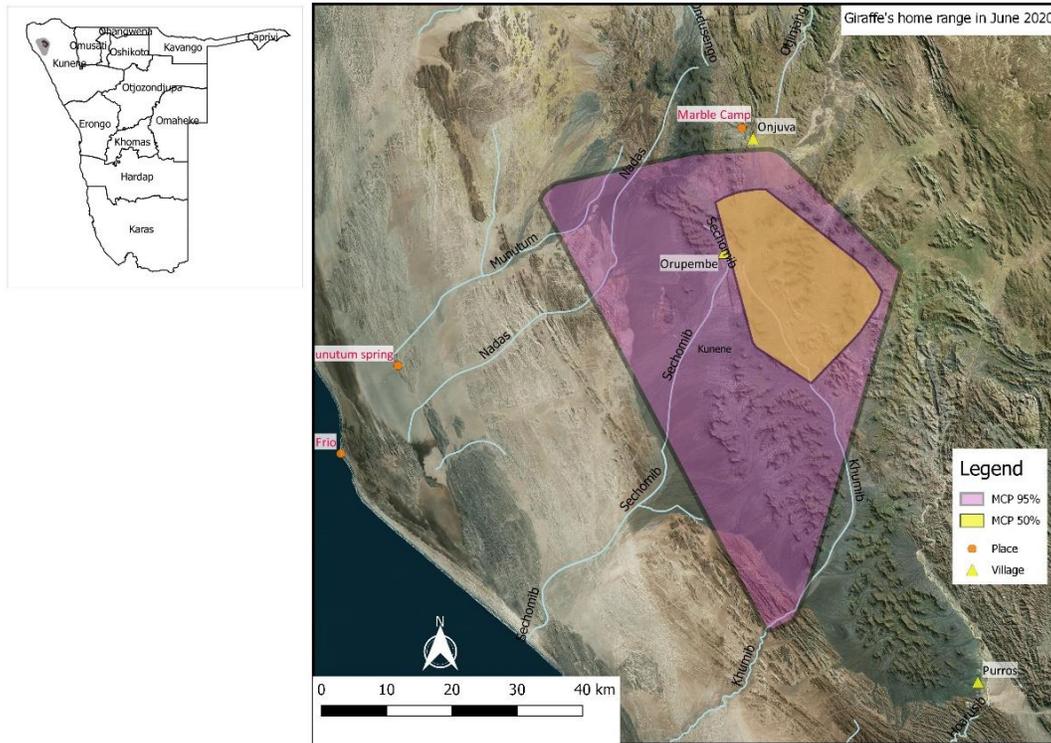


Figure 5: All GPS satellite tagged giraffe's combined Home Range using 50% and 95% MCP in northwest Namibia during June 2020

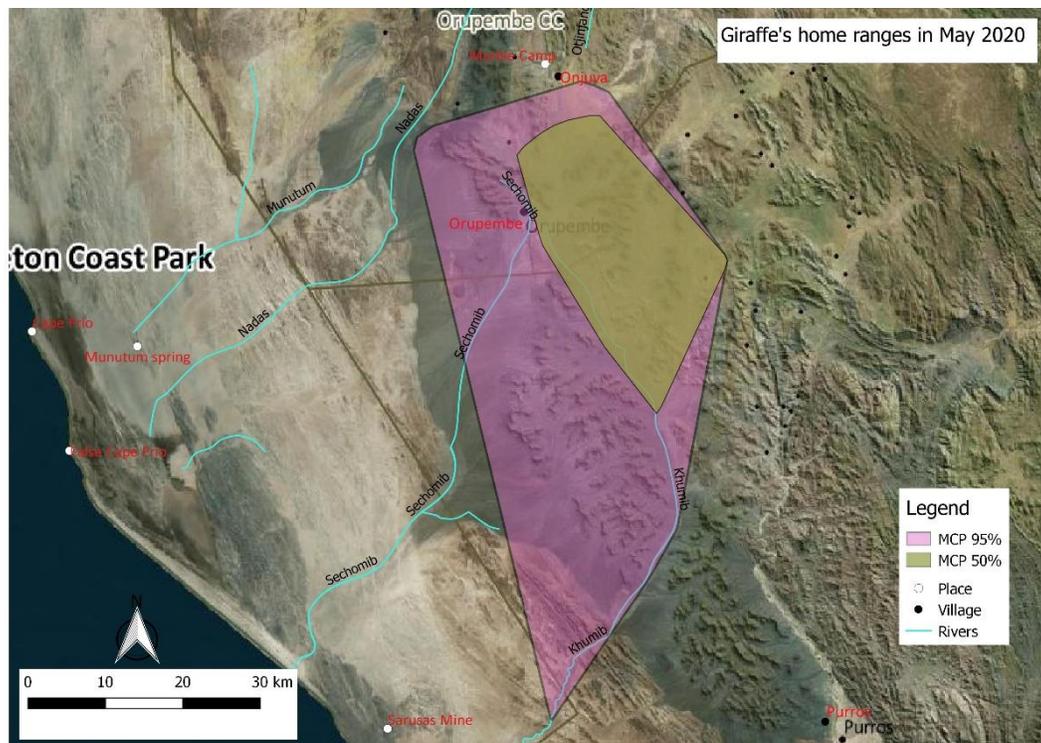


Figure 6: All GPS satellite tagged giraffe's combined Home Range using 50% and 95% MCP in northwest Namibia during May 2020



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Table 1: Data transmission of GPS satellite tagged giraffe in northwest Namibia during June 2020

| ID/Date | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mable IRI2016-3218 (Female) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Supergirl IRI2016-3220 (Female) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Dorothy IRI2016-3222 (Female) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Tisa ST2010- 2958 (Female) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ceratops ST2010-2959 (Female) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Table 2: Distance travelled by each GPS satellite tagged giraffe in May & June 2020

| ID/Date | May 2020 | | June 2020 | |
|---------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|
| | Distance travelled (km) | Home ranges (km ²) | Distance travelled (km) | Home ranges (km ²) |
| Mable IRI2016-3218 (Female) | 293.5 | 140.3 | 158.6 | 45 |
| Supergirl IRI2016-3220 (Female) | 275.4 | 100.3 | 184.3 | 60 |
| Dorothy IRI2016-3222 (Female) | 295 | 310.8 | 132.4 | 24 |
| Tisa ST2010-2958 (Female) | 244.4 | 84.1 | 205.5 | 268 |
| Ceratops ST2010-2959 (Female) | 332.8 | 129.2 | 270 | 297 |



Appendix

