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

May 2020

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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 1-31 May 2020 and a brief comparison with last month findings. Only five ossi-units currently transmit data as two stopped working in January (KT IRI2016-3223) and March (Jackson IRI2016-3141), respectively. KT's unit was recovered from the field but damaged as described in the February 2020 report. Ongoing GCF field monitoring undertaken since late March has yet to spot Jackson (IRI2016-3141), however, he was travelling a lot and is likely that he moved into an inaccessible location. A diagnostic analysis of his unit was conducted, as described in the April 2020, when the ossi-unit experienced erratic charging and eventually stopped functioning as a result of consistent power draw without a sufficient recharge. All other five remaining ossi-units successfully transmitted data in May 2020 without any gaps (see table 1).



All data analysis was conducted in QGIS 2.18.28 using the coordinate referencing system WGS84. Habitat use by all giraffe was similar to that observed in April 2020. However, the movement pattern from east to south and west displayed in April slightly changed to northward movement in May 2020. Marble (IRI2016-3218) and Ceratops, (ST2010-2959) moved up river closer to Onjuva village, and Supergirl (IRI2016-3220) into the upper Khumib River. Tisa (ST2010-2958) who had been foraging in a small area southeast of Onjuva also moved up north towards Onjuva village. Dorothy (IRI2016-3222), who gave birth last year, was the only tagged giraffe to move down the Khumib River into Skeleton Coast National Park, thus displayed a southward movement pattern (see fig. 1).

Similar to last month, Ceratops (ST2010-2959) moved the furthest distance (~332.8km), from Nadas River to Onjuva village. Surprisingly, Dorothy (IRI2016-3222) and her calf also moved a long distance (~295km) from mid to the lower Khumib River. The least travelled giraffe was Tisa (ST2010-2958) with a distance of ~244.4 km, similar to last month. Generally, distances travelled in May were longer than in April 2020. Table 2 shows all giraffe distances travelled during April and May 2020 for comparison, and for a graphical representation see fig. 7.

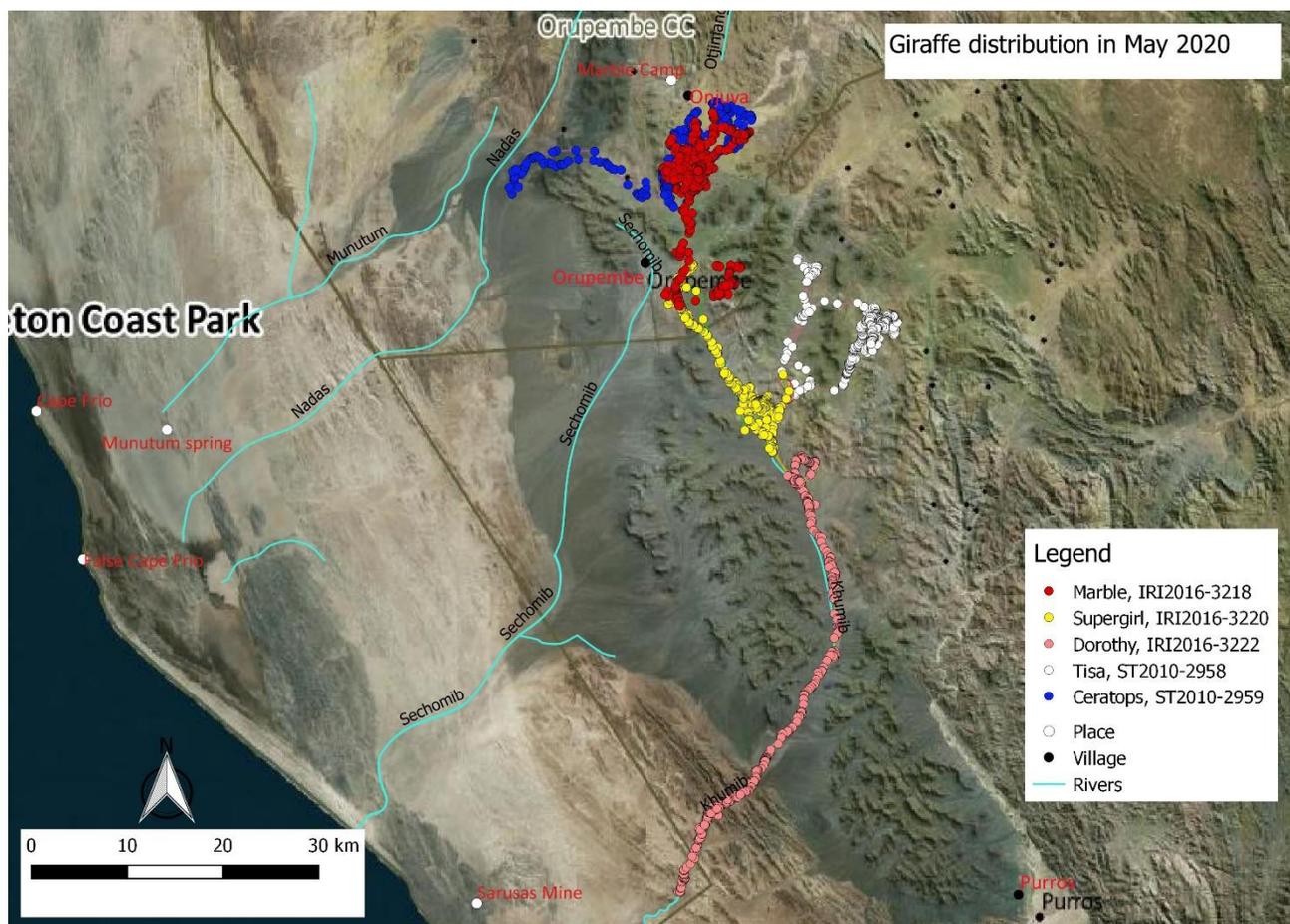


Figure 1: GPS satellite tagged giraffe movements in northwest Namibia during May 2020

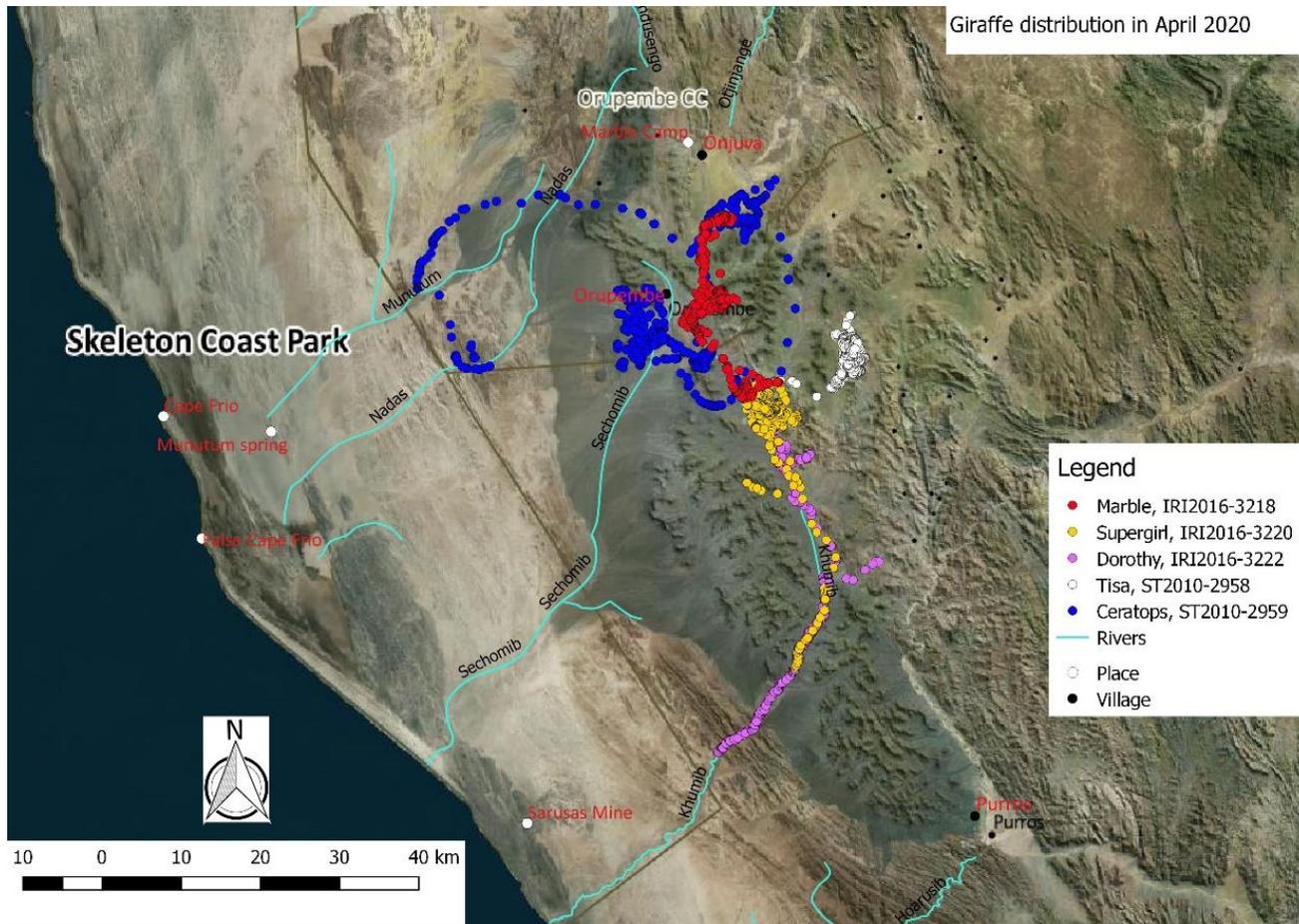


Figure 2: GPS satellite tagged giraffe movements in northwest Namibia during April 2020

Home Range (HR) preliminary results were estimated using the Animate 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. Dorothy (IRI2016-3222) 95% MCP in May 2020 was estimated at 310.8km² followed by Marble (IRI2016-3218) at 140.3km², and Tisa (ST2010-2958) had the smallest HR at ~84.1km² – similar to April 2020. HR overlaps were observed only between three giraffe in/around the Khumb River and Onjuva village. The two other giraffe (Tisa ST2010-2958 and Dorothy IRI2016-3222) did not show any HR overlaps (see fig. 3). All giraffe data combined had an average core home range of ~556km² calculated at 50%, and ~1976km² at 95% (fig. 5 & 6). For the rest of the HR records see fig. 7 and table 2. Home range sizes of giraffe in May 2020 were generally smaller than in April 2020. Individual HR were not related to distance travelled and vice versa (see fig. 6, May 2020).

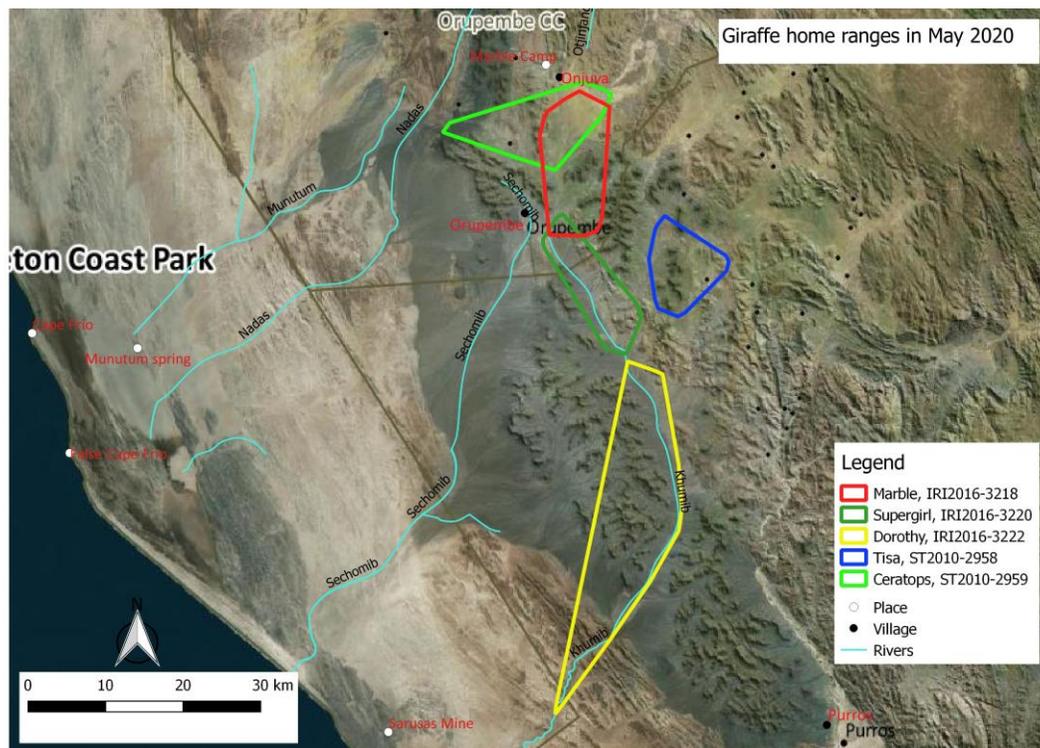


Figure 3: GPS satellite tagged giraffe's individual Home Range using 95% MCP in northwest Namibia during May 2020

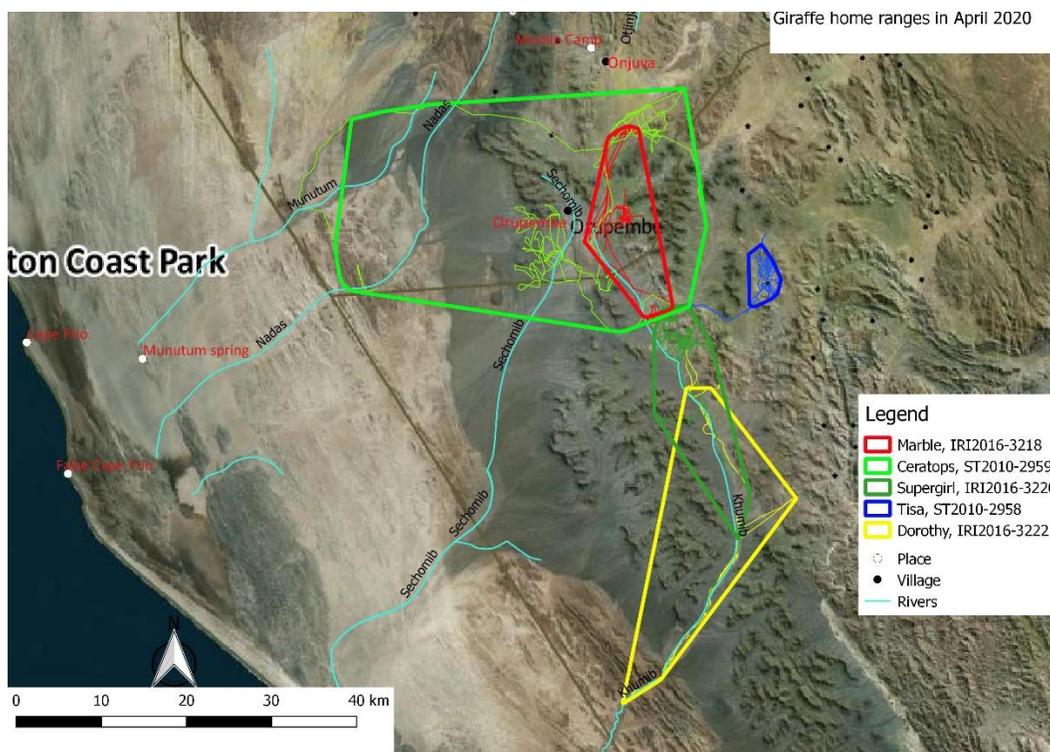
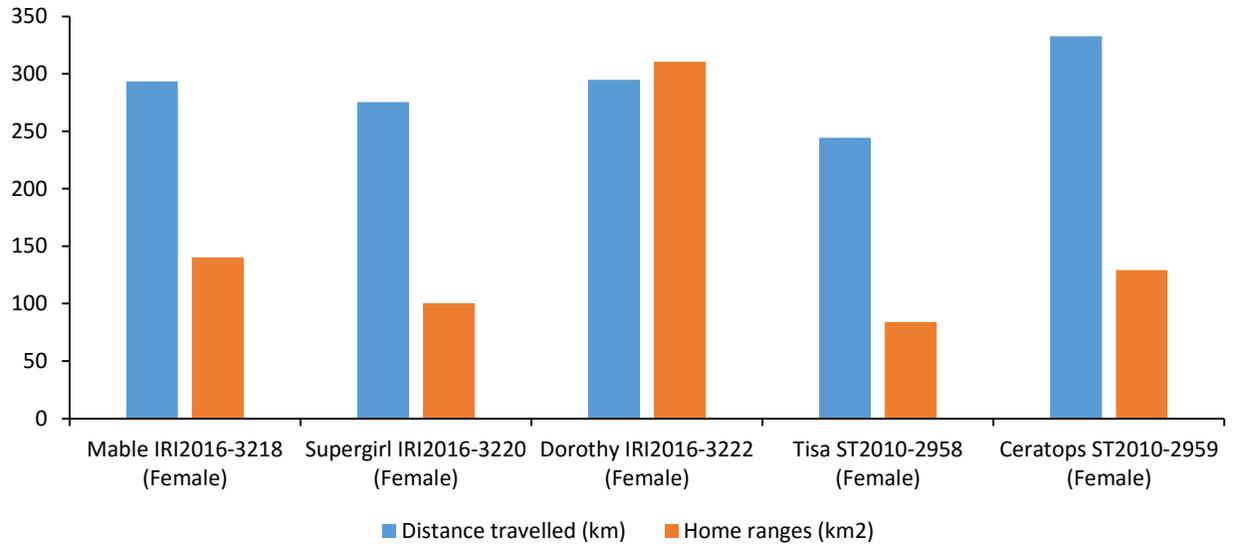


Figure 4: GPS satellite tagged giraffe's individual Home Range using 95% MCP in northwest Namibia during April 2020



May 2020



April 2020

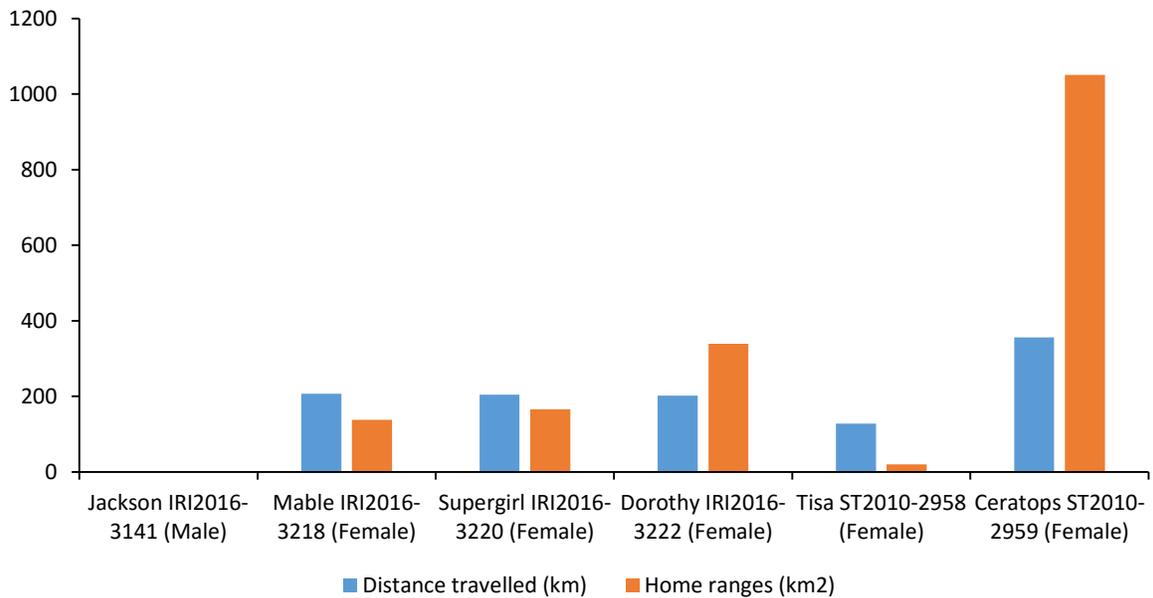


Figure 7: Comparison of HRs with distance travelled by individual giraffe in May and April 2020



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Table 1: Data transmission of GPS satellite tagged giraffe in northwest Namibia during May 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	31
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 April & May 2020

Giraffe ID	April 2020		May 2020	
	Distance travelled (km)	Home ranges (km ²)	Distance travelled (km)	Home ranges (km ²)
Mable IRI2016-3218 (Female)	206.6	137.7	293.5	140.3
Supergirl IRI2016-3220 (Female)	204.3	166.0	275.4	100.3
Dorothy IRI2016-3222 (Female)	202.1	339.4	295	310.8
Tisa ST2010-2958 (Female)	127.5	20.1	244.4	84.1
Ceratops ST2010-2959 (Female)	356.1	1050.6	332.8	129.2



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Acknowledgements

We would like to acknowledge the Giraffe Conservation Foundation (GCF) and SCIONA project for their technical and financial supports. We also express our special appreciation to game guard colleagues in the Orupembe Conservancy. Thanks to Dr Michael Brown (GCF-SCBI) for GPS satellite unit diagnostics updates.



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Appendix

