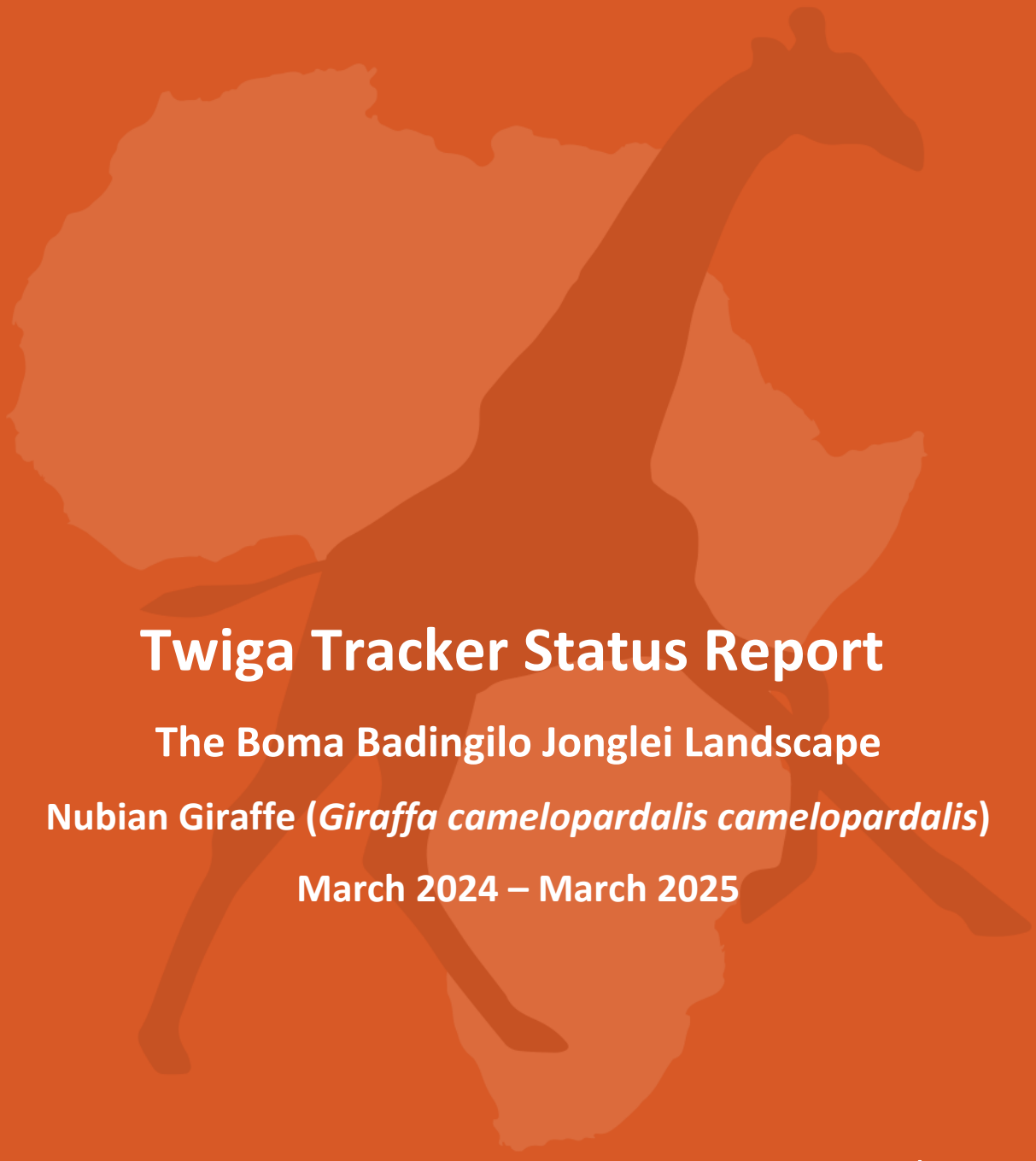

Twiga Tracker Status Report

The Boma Badingilo Jonglei Landscape

Nubian Giraffe (*Giraffa camelopardalis camelopardalis*)

March 2024 – March 2025

In Partnership with:

AFRICAN PARKS

Badingilo National Park
South Sudan

@giraffe_conservation

@giraffeconservationfoundation

@Save_Giraffe

Overview

This document presents a report of GPS tracking unit performance and preliminary space-use metrics for Nubian giraffe (*Giraffa camelopardalis camelopardalis*) in the Boma Badingilo Jonglei Landscape (BBJL) from March 2024 – March 2025. This project is a partnership between the Giraffe Conservation Foundation (GCF) and African Parks (AP) to better understand the spatial ecology, movement patterns and habitat utilisation of Nubian giraffe across the BBJL. The data will help better inform effective conservation management strategies for this critically endangered northern giraffe subspecies. Specifically, this project seeks to:

- Understand movement, habitat utilization, and spatial ecology of Nubian giraffe across the BBJL.
- Identify areas in the BBJL to direct more targeted Nubian giraffe monitoring and tracking studies.
- Generate recommendations for future conservation management and provide critical insights to inform conservation managers and other stakeholders on pro-active long-term measures to manage South Sudan's Nubian giraffe.

Study Area

Within the BBJL, the Badingilo and Boma National Parks (NP) comprise approximately 30,000 km^2 of protected area in eastern South Sudan (Figure 1). These protected areas are an important conservation component of the BBJL which extends over 200,000 km^2 across much of eastern South Sudan, providing critical habitat for one of the largest intact migrations of white-eared kob (*Kobus kob leucotis)*, tiang (*Damaliscus lunatus tiang*) and bohor reedbuck (*Redunca redunca*) This landscape also supports a relatively understudied population of critically endangered Nubian giraffe. The BBJL has faced decades of regional/political instability, resulting in a lack of reliable data on Nubian giraffe abundance, distribution, and movements.

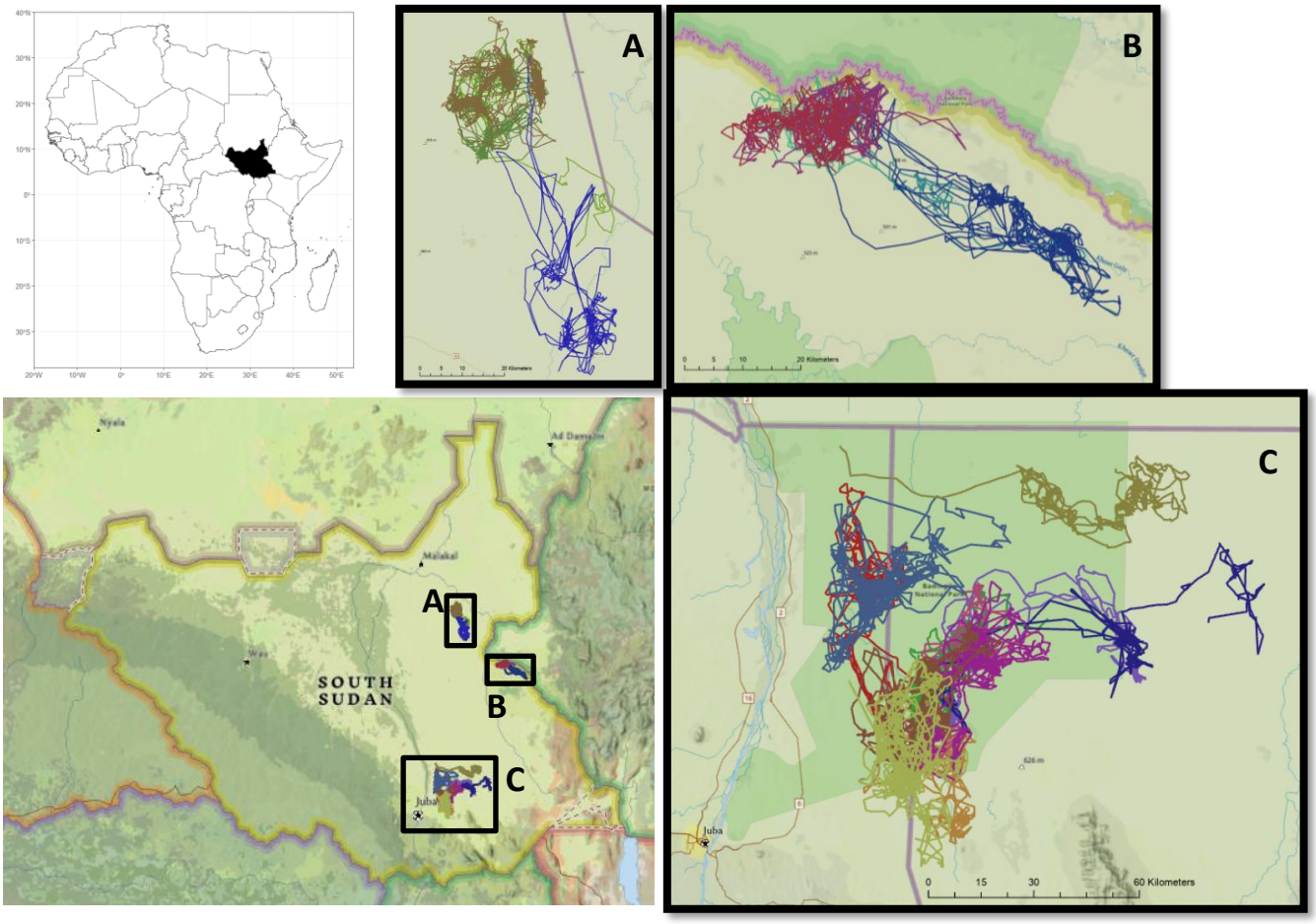

Figure 1: Map of the Boma Badingilo Jonglei Landscape and Nubian giraffe movement data from March 2025 – March 2025. A) Northern, B) Boma NP, C) Badingilo NP.

The ecology of the system is typified by Sudano savanna and floodplain grasslands. The mean annual precipitation ranges from 400 - 1400 mm and falls largely during the rainy season from April-October. The dominant tree species include white thorn (*Senegalia seyal*), pod mahogany (*Afzelia quanzensis),* desert dates (*Balanites aegyptiaca*), stink wood (*Celtis sp.*), Sodom apple (*Calotropis procera*), Bush-willow (*Combretum sp*.), African fan palm (*Borassus aethiopium*), Bell-flowered mimosa (*Dichrostachys cinerea*), African ebony (*Diospyros mespiliformis*), Kaffir boom (*Erythrina* spp.), Fig (*Ficus* spp.), Sausage tree (*Kigelia africana*), Black plum (*Vitex doniana*), Christ thorn (*Ziziphus spina-christi*), Tamarind (*Tamarindus indica*), and Neem (*Azadirachta indica*).

Methods

GPS Tracking

To examine the habitat utilisation and spatial ecology of Nubian giraffe in the BBJL, we supported the tagging of Nubian giraffe from 15 March to 3 April 2024. In total, twenty individuals were darted and fitted with GPS satellite tracking units. This operation supplemented tracking data collected from 11 Nubian giraffe in the same landscape from 2023-2024. Individuals were tagged in Badingilo National Park (NP), near Boma NP and an adjacent area north of Boma NP. During these recent operations, we used two different tracking device models: SpoorTrack (ST) GPS units programmed at a bihourly fix rate with Iridium data transfer, and Ceres Trace tags programmed for 4-hour fix rate with GlobalStar data transfer. Both units were attached to the ears of giraffe (Figure 2).

Figure 2: Examples of GPS tracking devices used on Nubian giraffe in the Boma Badingilo Jonglei Landscape.

Occurrence Estimation

In this project, we used kernel density estimators (kde) with reference bandwidths as the smoothing parameter to estimate animal occurrence for all tagged individuals. In instances where individuals carried multiple GPS units (ST and Ceres), we combined telemetry data for a single trajectory per animal. Total utilisation distribution was defined as the 95% probability contour. To quantitatively evaluate areas of concentrated use within the utilisation distributions core areas were defined as the 50% probability contour.

Results

Tracking Performance Diagnostics

Since the deployment of tracking devices in March/April 2024, we have seen mixed success of unit performance (Figure 3). Of the Ceres Trace units, 10 units (50%) continue to reliably collect and transmit data. Of the SpoorTrack units, two units (10%) continue to reliably collect and transmit data. There was one confirmed death and one confirmed instance of a SpoorTrack unit falling out of the ear. GCF has since worked with SpoorTrack to design a tail-mounted unit to reduce the risk of ear attachments failing.

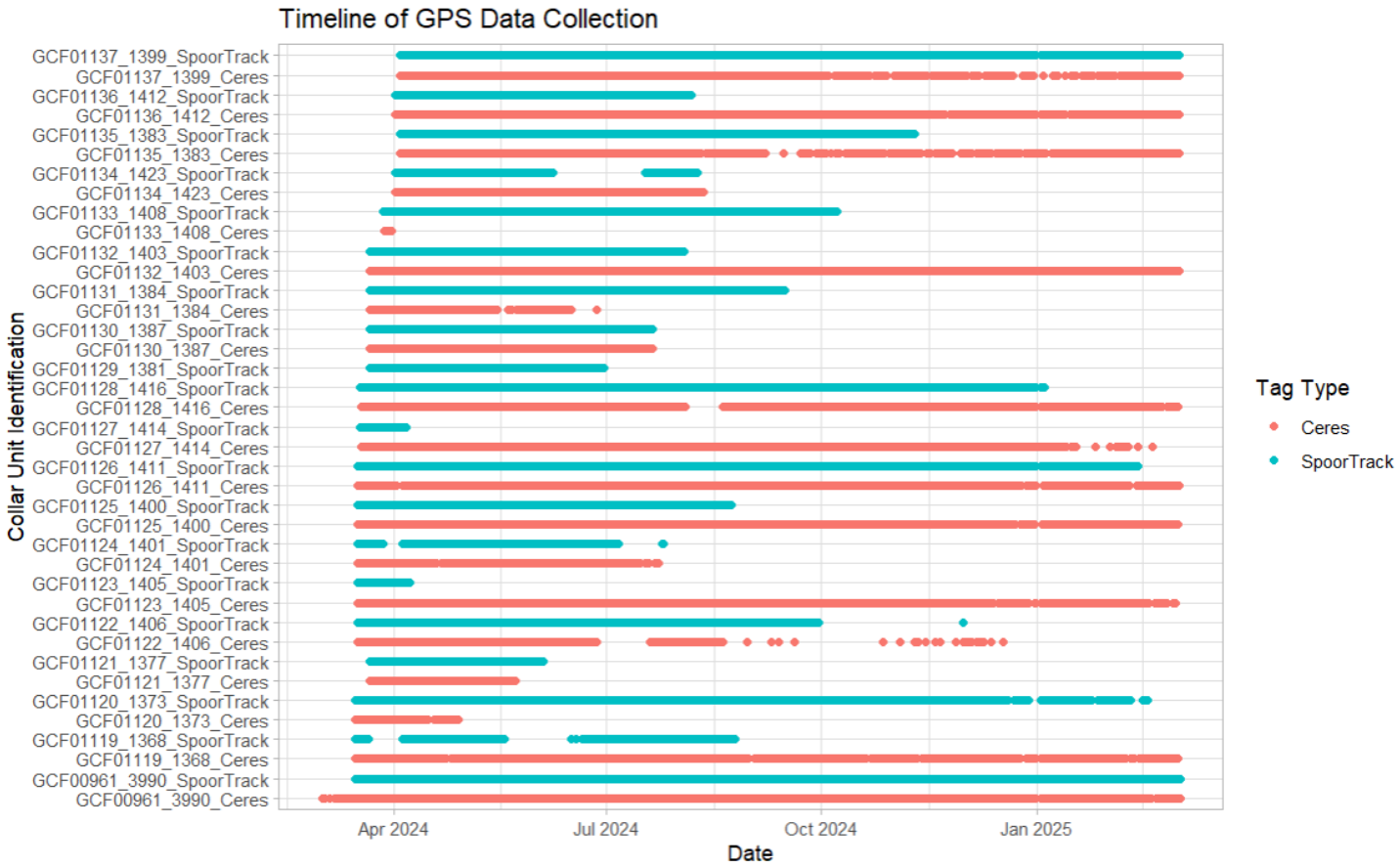

Figure 3: Timeline of data collection for all GPS units fitted to Nubian giraffe in the Boma Badingilo Jonglei Landscape.

Descriptive Parameters of the Trajectory

In the ten months after unit deployment, the tagged Nubian giraffe in BBJL moved considerable distances, with average cumulative hourly displacement since March 2024 of 1965.5 km (SD = 836.9) (Table 1).

Occurrence Estimation Models

Nubian giraffe exhibited diverse ranging behaviours across the landscape. The mean 95% kde for Nubian giraffe during this period was 1,117.7 km^2 (SD = 762.4), and the mean 50% kde was 221.9 km^2 (SD = 139.2) (Table 1). These annual occurrence estimates were significantly larger than the average home range size of other giraffe species across Africa (356.4 km^2) (Brown et al. 2023), but were comparable to occurrence estimates generated on this landscape between 2023-2024. See supplemental figures for maps of all occurrence estimates. When comparing area of occurrence estimates across the landscape, Badingilo NP supported the largest (mean = 1,559.4 km^2, SD=733.6), followed by the Northern site (mean= 757.5 km^2, SD= 393.2), and Boma NP (mean = 434.2 km^2, SD=222.0).

Table 1: Distance traveled (cumulative hourly step lengths) and area of occurrence estimates for each Nubian giraffe in the Boma Badingilo Jonglei Landscape.

Giraffe ID	Sex	Area	Step Sum (km)	KDE 50% (km^2)	KDE 95% (km^2)
GCF00961_3990	Female	Badingilo NP	3853.1	476.3	2081.7
GCF01119_1368	Female	Badingilo NP	1,739.5	155.1	754.7
GCF01120_1373	Female	Badingilo NP	2,997.7	449.2	2399.8
GCF01121_1377	Male	Boma NP	634.5	112.1	591.6
GCF01122_1406	Male	Badingilo NP	1,884.7	143	581.9
GCF01123_1405	Male	Badingilo NP	2,038.7	278.4	1425.9
GCF01124_1401	Female	Badingilo NP	980.2	429.3	2920.5
GCF01125_1400	Female	Badingilo NP	2,727.5	294.4	1525.2
GCF01126_1411	Female	Badingilo NP	3,127.3	168.4	841.3
GCF01127_1414	Female	Badingilo NP	2,479.9	289.2	1423.7
GCF01128_1416	Female	Badingilo NP	2,836.8	273	1157.6
GCF01129_1381	Male	Boma NP	769.9	70.8	246.7
GCF01130_1387	Male	Boma NP	1,334.5	142.8	745.4
GCF01131_1384	Female	Boma NP	1,314.3	62	315.2
GCF01132_1403	Female	Boma NP	1,680.6	76.5	272.2
GCF01133_1408	Male	Badingilo NP	1,562.8	456.9	2040.8
GCF01134_1423	Male	Northern	1,340.8	124.3	689.4
GCF01135_1383	Female	Northern	1,872.7	107.2	603.7
GCF01136_1412	Female	Northern	2,011.0	224.6	1321.7
GCF01137_1399	Male	Northern	2,122.9	104.8	415.2

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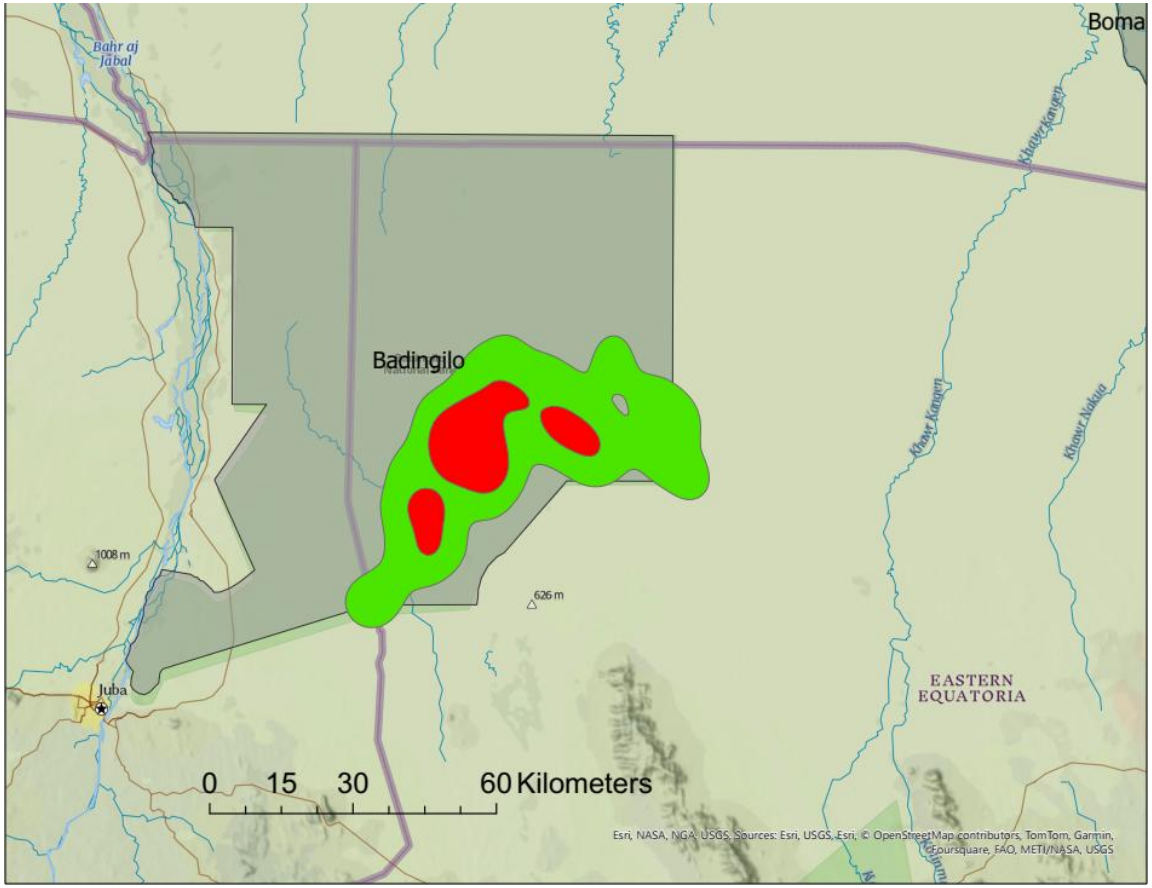
Supplemental Table 1: Summary of GPS tracking deployment on Nubian giraffe in the Boma Badingilo Jonglei Landscape.

Giraffe ID	Sex	Device	Deployment Start	Deployment End	Duration (Days)	Fixes
GCF00961_3990	Female	Ceres	4/6/2023	3/15/2024	367.2	1,611
		SpoorTrack	3/15/2024	Current	352.9	4,298
GCF01119_1368	Female	SpoorTrack	3/15/2024	8/25/2024	156.4	1,960
		Ceres	3/15/2024	Current	352.1	1,079
GCF01120_1373	Female	SpoorTrack	3/15/2024	Current	338.3	4,628
		Ceres	3/15/2024	4/29/2024	43.1	242
GCF01121_1377	Male	SpoorTrack	3/21/2024	6/4/2024	79.3	1,304
		Ceres	3/21/2024	5/23/2024	67.4	348
GCF01122_1406	Male	SpoorTrack	3/16/2024	11/30/2024	258.3	3,209
		Ceres	3/16/2024	12/31/9999	276.1	726
GCF01123_1405	Male	SpoorTrack	3/16/2024	4/8/2024	17.2	425
		Ceres	3/16/2024	Current	349.1	1,323
GCF01124_1401	Female	SpoorTrack	3/16/2024	7/25/2024	125.6	944
		Ceres	3/16/2024	7/24/2024	123.8	624
GCF01125_1400	Male	SpoorTrack	3/16/2024	8/23/2024	148.7	2,844
		Ceres	3/16/2024	Current	346	1,382
GCF01126_1411	Female	SpoorTrack	3/16/2024	Current	316.1	4,928
		Ceres	3/16/2024	Current	335.8	1,378
GCF01127_1414	Female	SpoorTrack	3/17/2024	4/7/2024	2.8	385
		Ceres	3/17/2024	Current	324.2	1,381
GCF01128_1416	Female	SpoorTrack	3/17/2024	Current	294.8	4,072
		Ceres	3/17/2024	Current	366.6	1,402
GCF01129_1381	Female	SpoorTrack	3/21/2024	6/30/2024	106.2	1,882
GCF01130_1387	Male	Ceres	3/21/2024	7/20/2024	121	698
		SpoorTrack	3/21/2024	7/20/2024	126.3	2,379
GCF01131_1384	Female	SpoorTrack	3/21/2024	9/16/2024	182.7	3,065
		Ceres	3/21/2024	6/27/2024	102.3	502
GCF01132_1403	Female	SpoorTrack	3/21/2024	8/3/2024	139.7	2,171
		Ceres	3/21/2024	Current	351.8	1,454
GCF01133_1408	Male	SpoorTrack	3/27/2024	10/7/2024	204.2	3,087
		Ceres	3/27/2024	4/1/2024	13.6	22
GCF01134_1423	Male	Ceres	4/1/2024	8/12/2024	143.1	1,864
		SpoorTrack	4/1/2024	8/9/2024	140.3	1,631
GCF01135_1383	Female	SpoorTrack	4/3/2024	11/9/2024	233	3,416
		Ceres	4/3/2024	Current	346.4	1,096
GCF01136_1412	Female	SpoorTrack	4/1/2024	8/7/2024	126.8	2,379
		Ceres	4/1/2024	Current	340.7	1,292
GCF01137_1399	Male	SpoorTrack	4/3/2024	Current	335.7	4,770
		Ceres	4/3/2024	Current	333.3	1,107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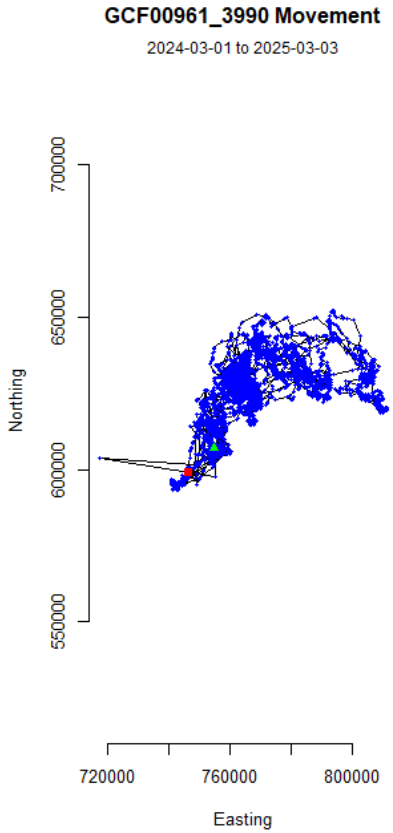
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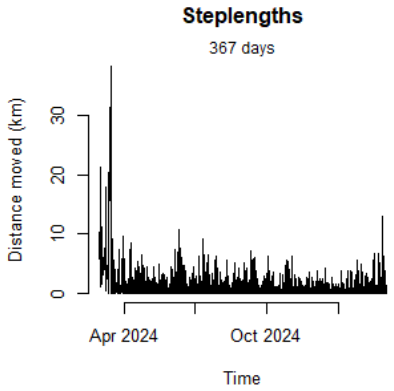
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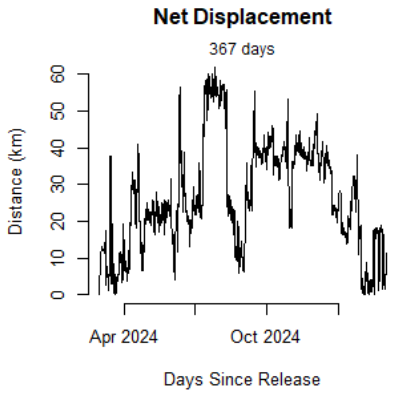
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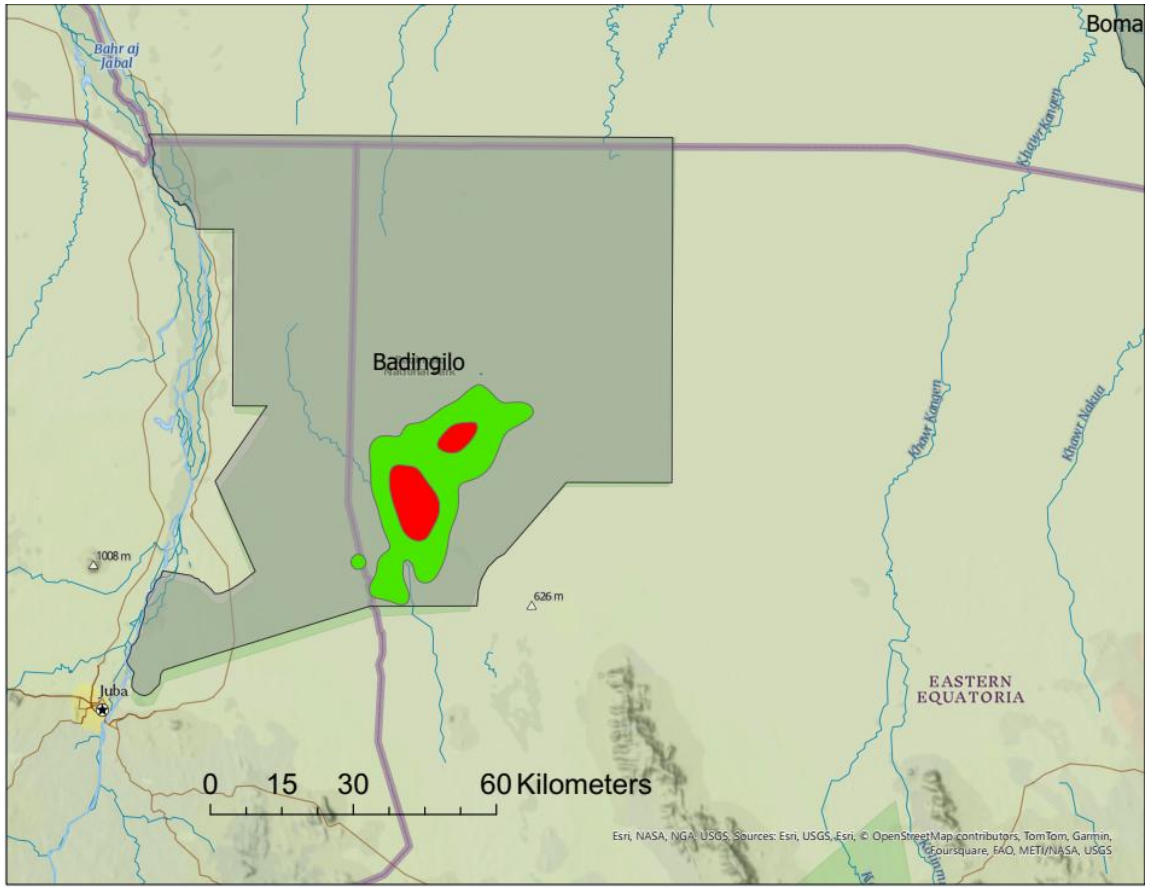
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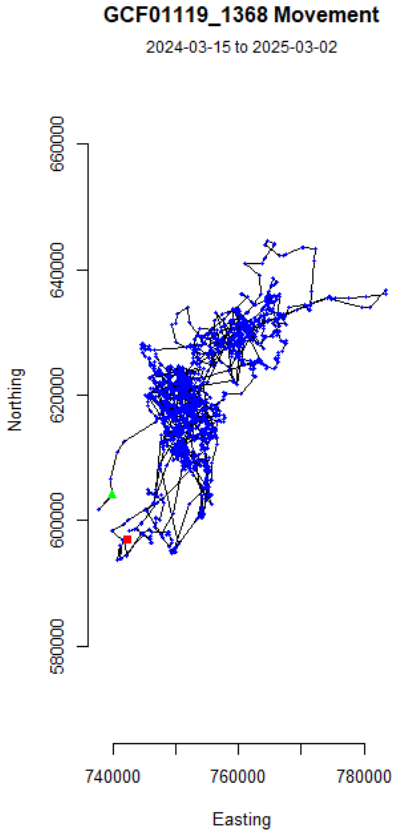
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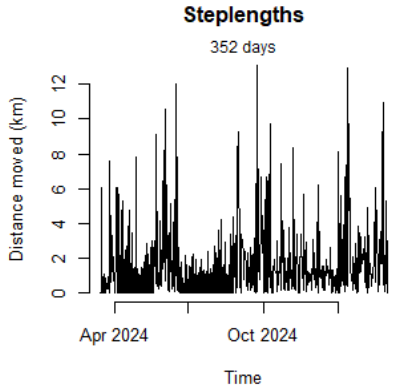
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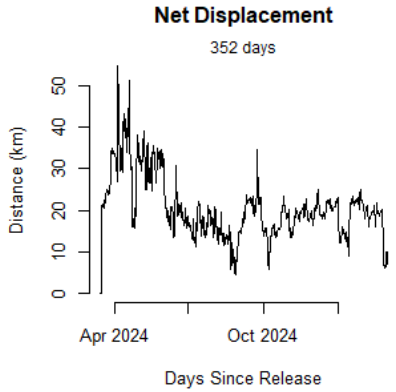
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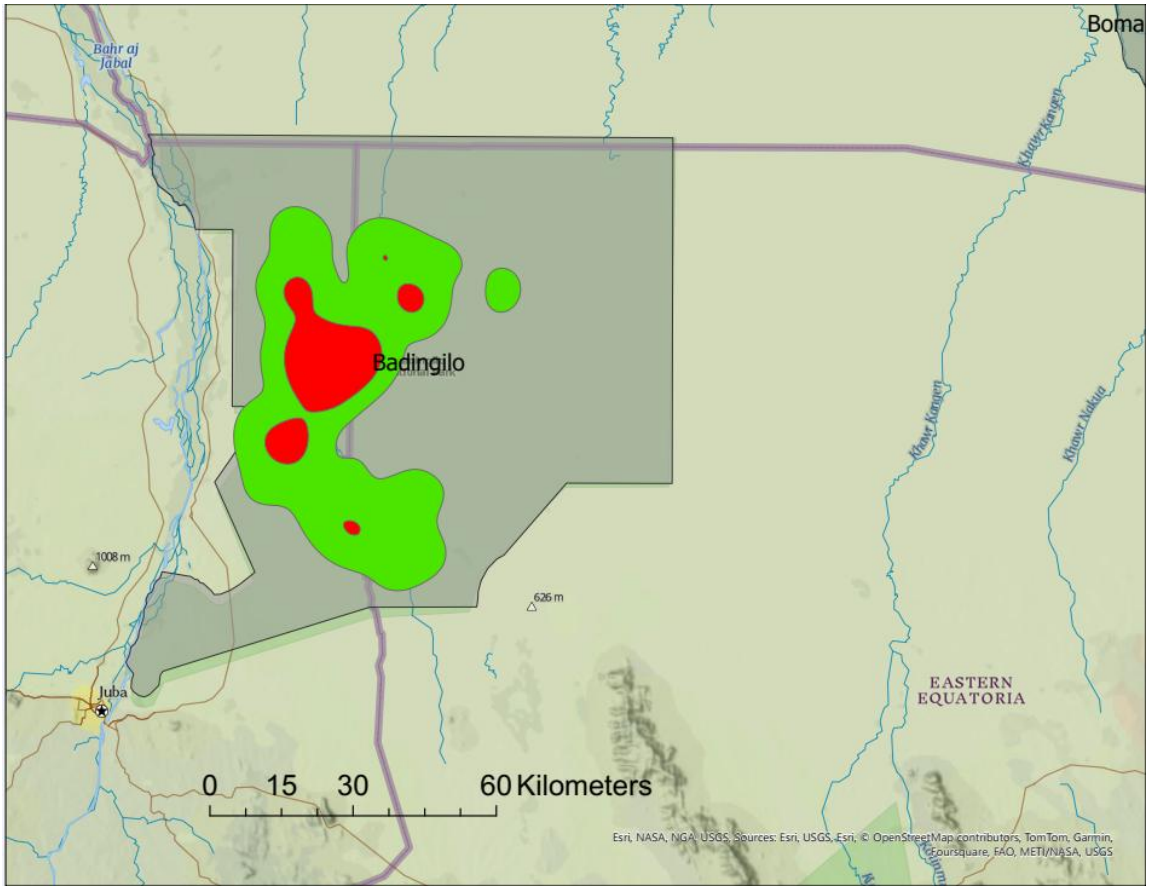
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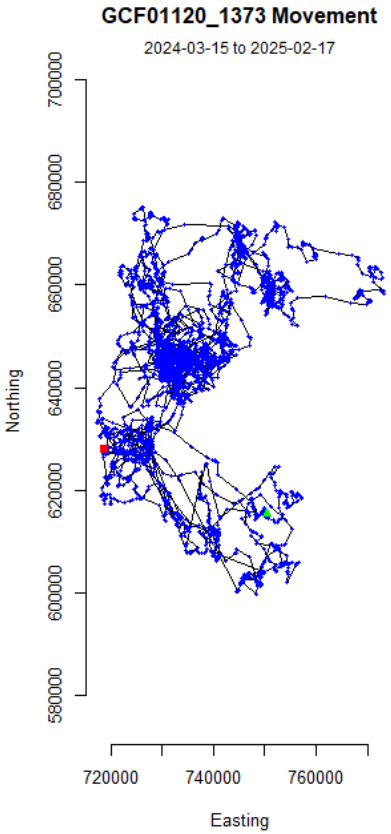
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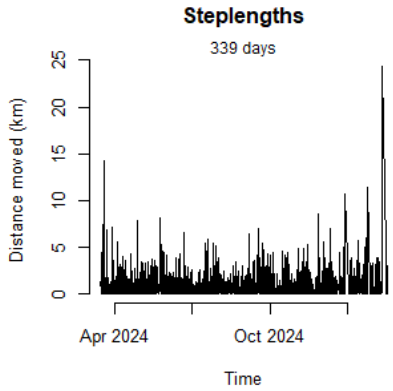
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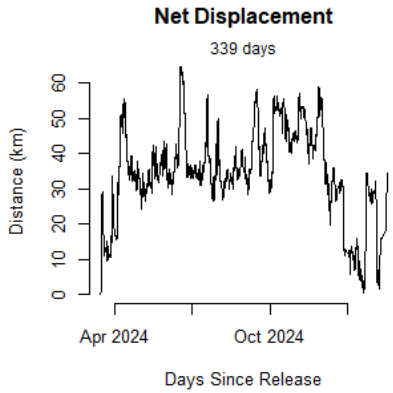
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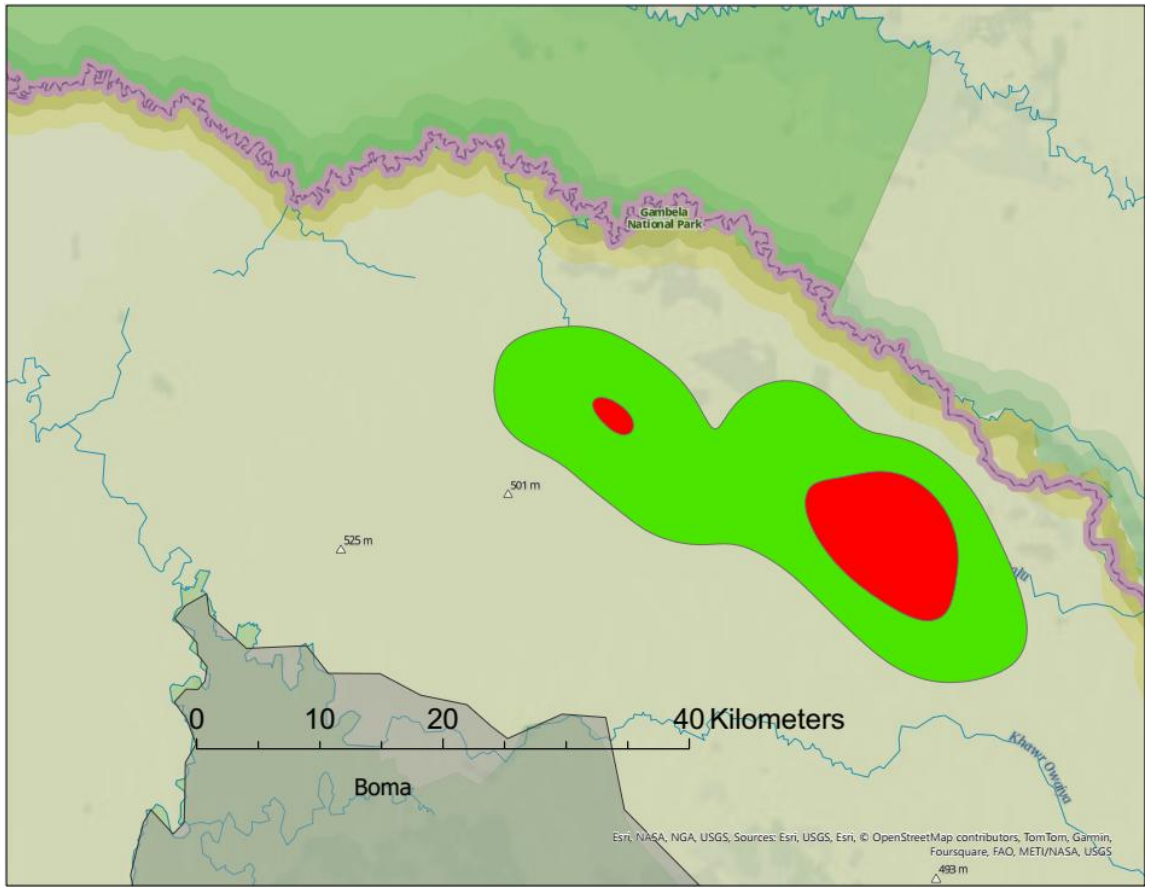
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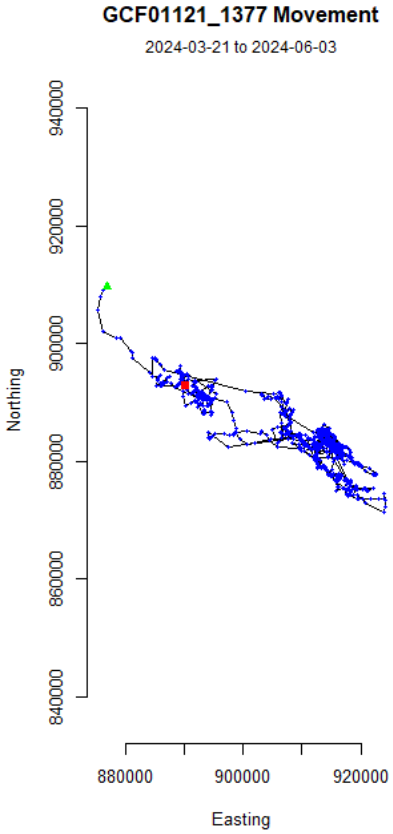
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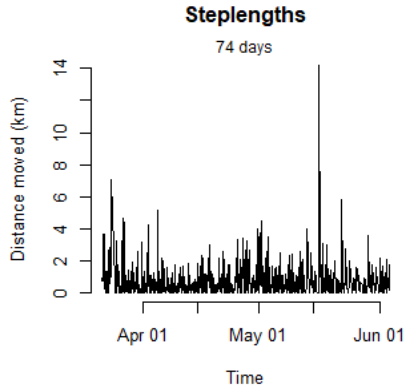
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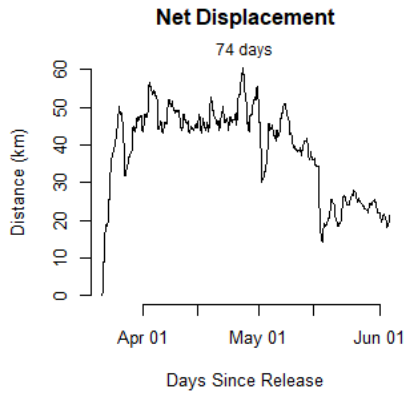
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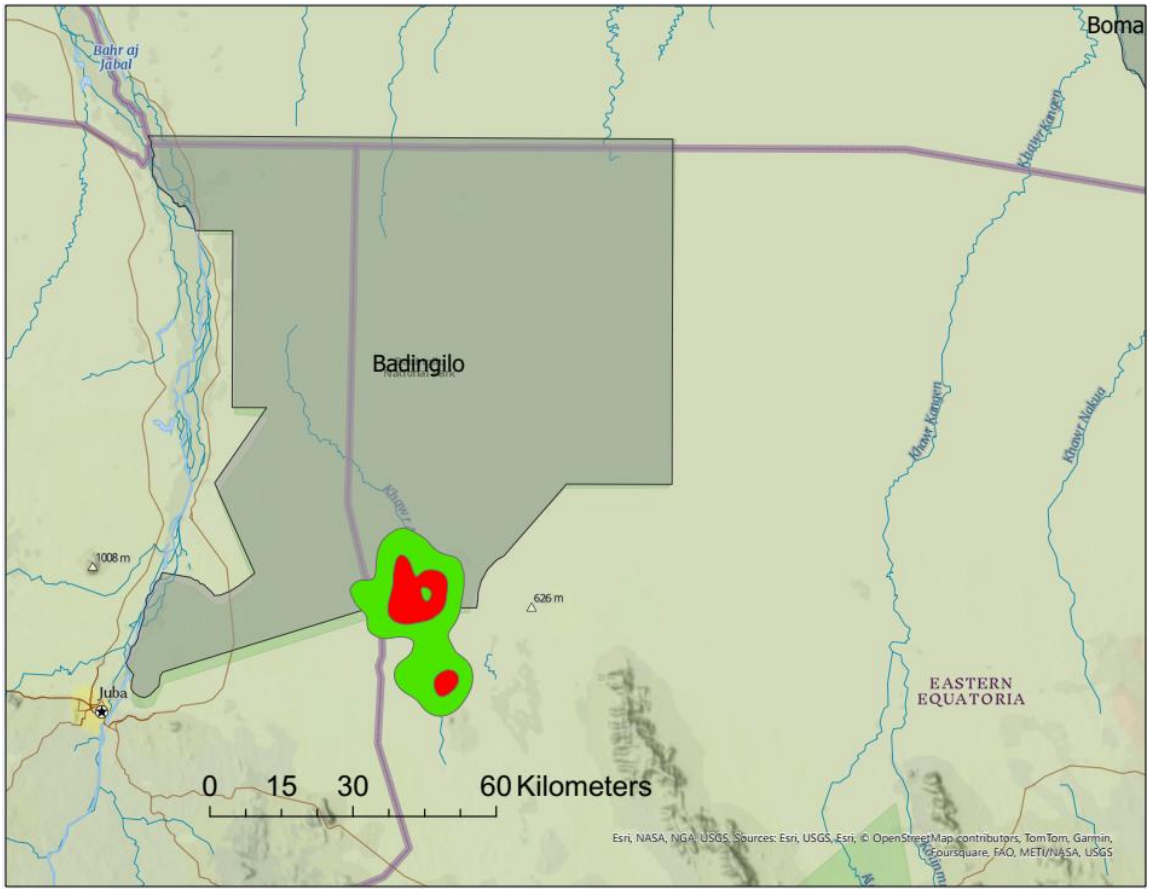
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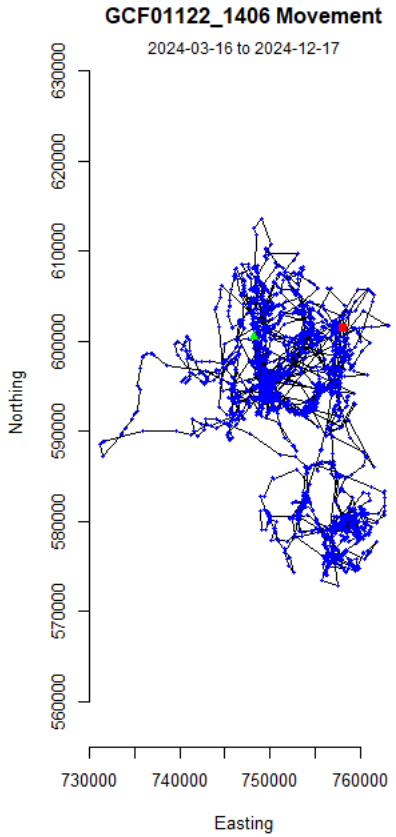
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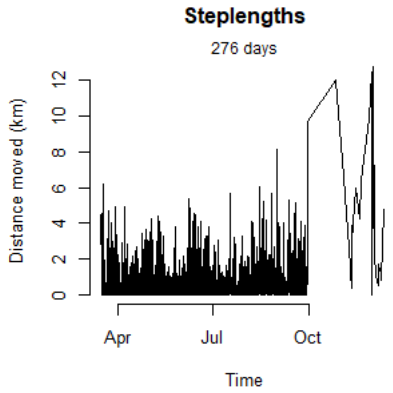
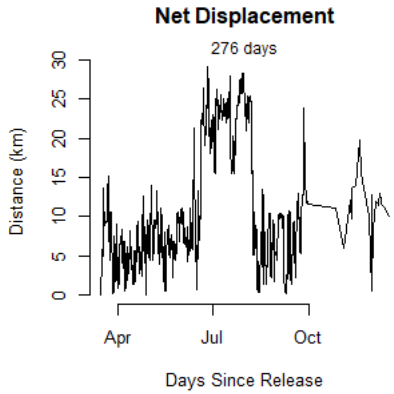
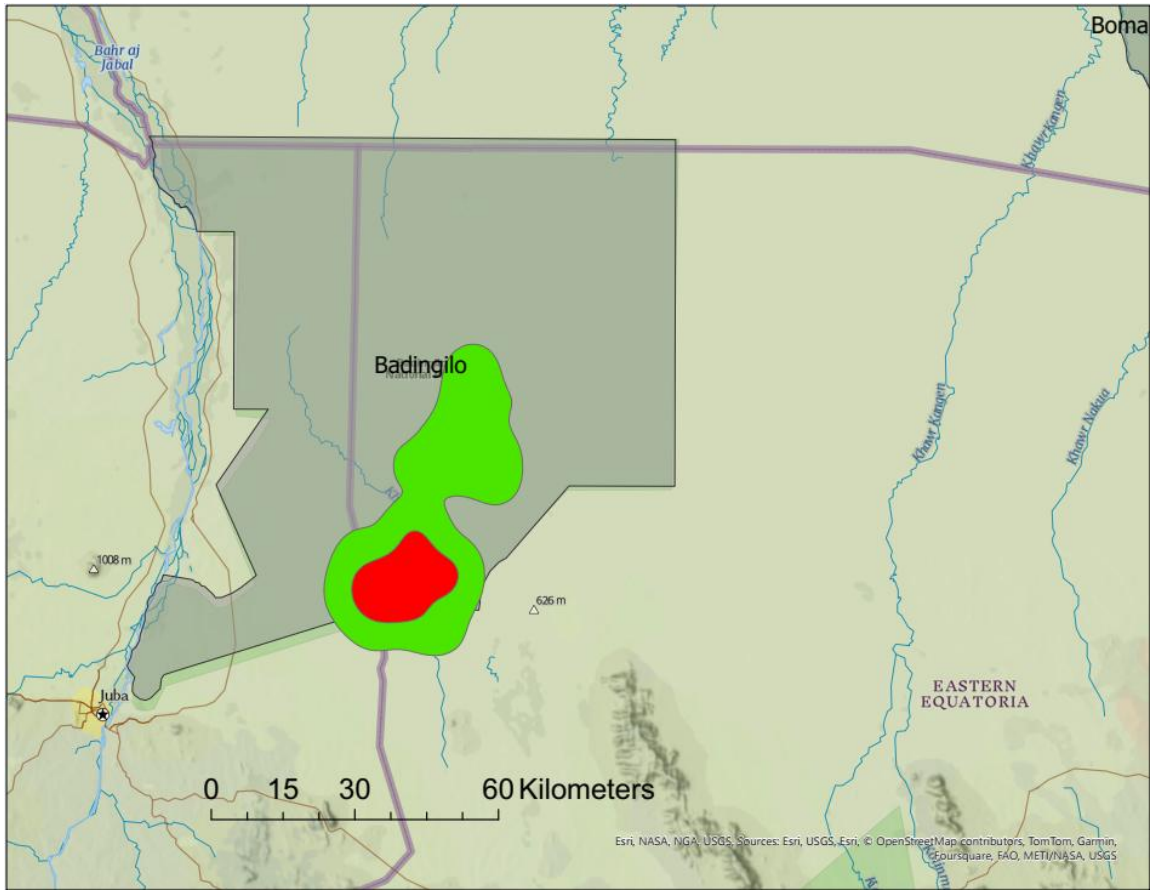
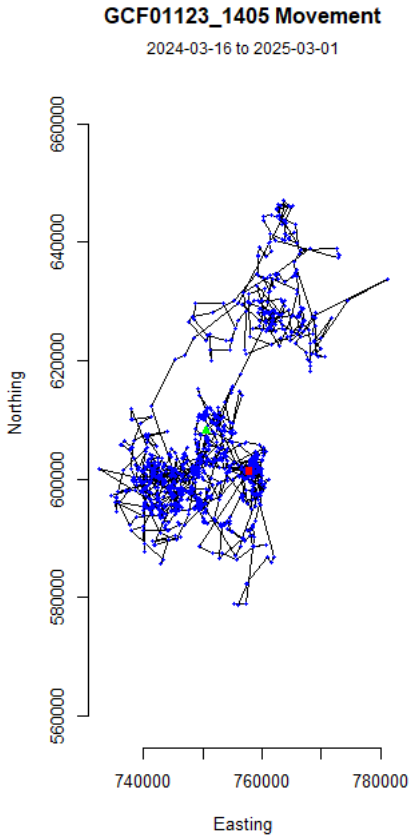
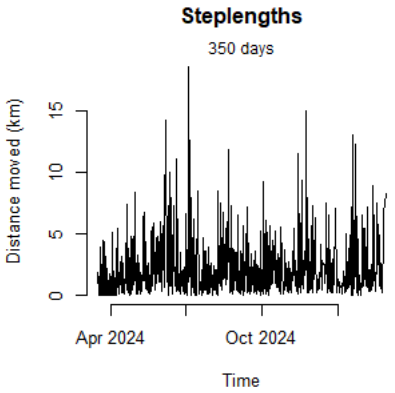
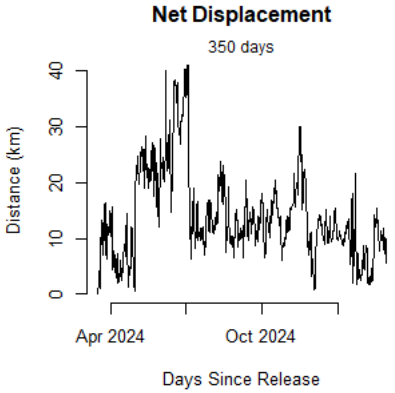

Steplengths
276 days
Distance moved (km)
0
2
4
6
8
10
12
Apr
Jul
Oct
Time

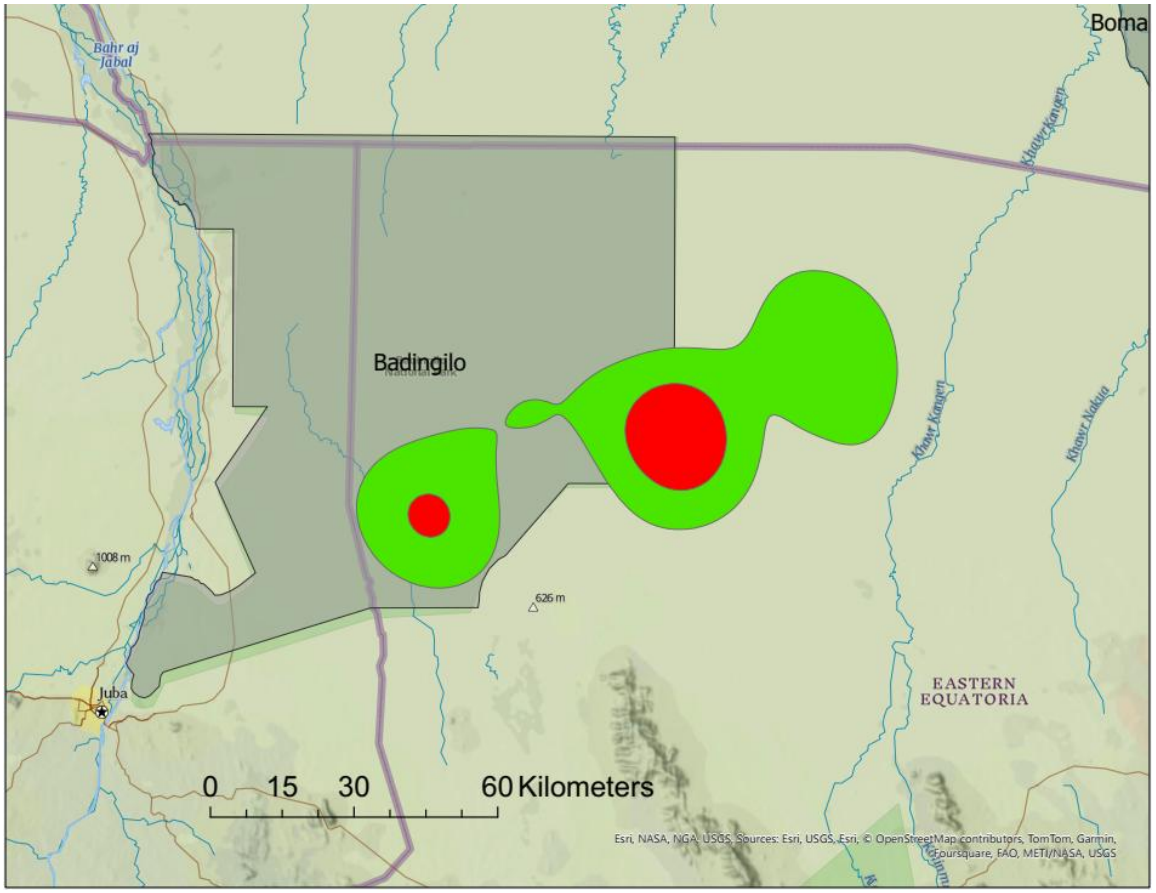

Net Displacement
276 days
Distance (km)
0
5
10
15
20
25
30
Apr
Jul
Oct
Days Since Release

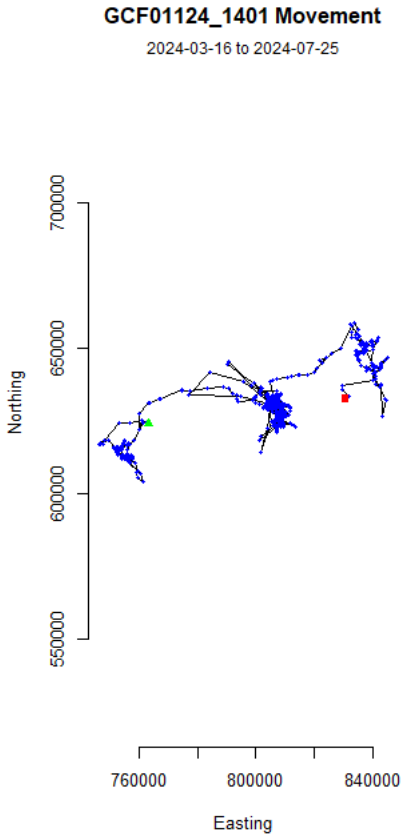

Boma
Bahr aj Jabal
Badingilo
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

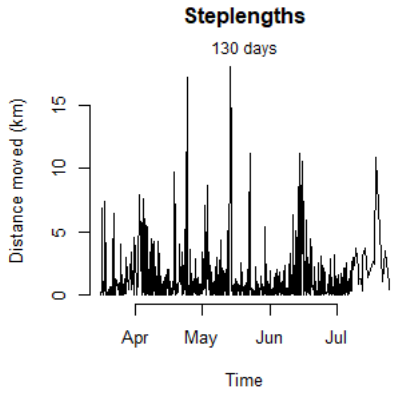

GCF01123_1405 Movement
2024-03-16 to 2025-03-01
Northing
660000
640000
620000
600000
580000
560000
740000
760000
780000
Easting

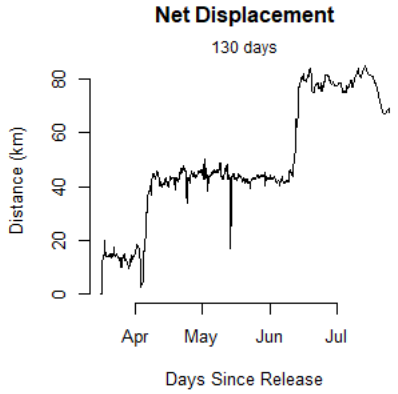

Steplengths
350 days
Distance moved (km)
0
5
10
15
Apr 2024
Oct 2024
Time

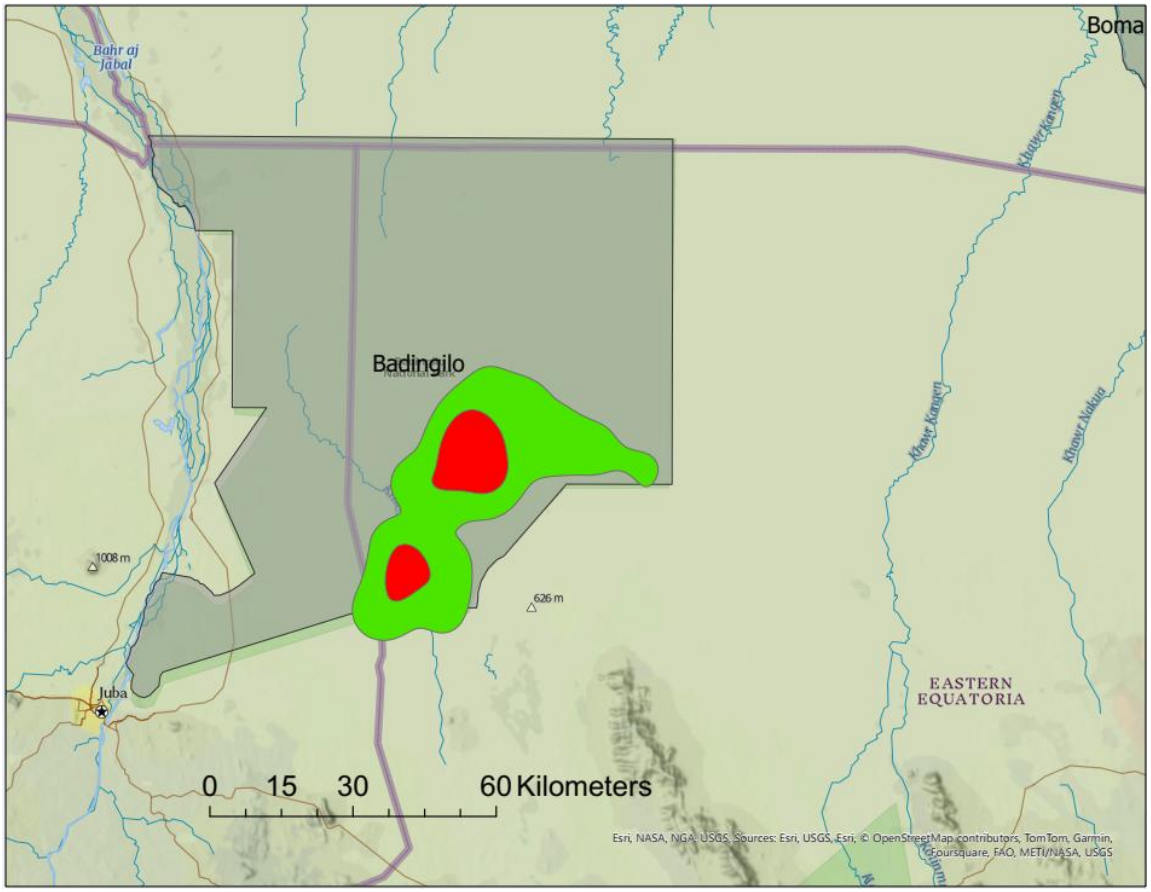

Net Displacement
350 days
Distance (km)
0
10
20
30
40
Apr 2024
Oct 2024
Days Since Release

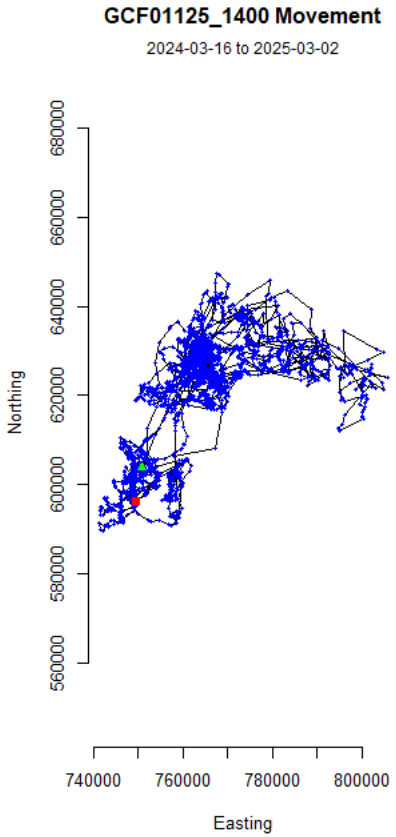

Boma
Bahr aj Jabal
Badingilo
Khawr Kangen
Khawr Nokuu
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

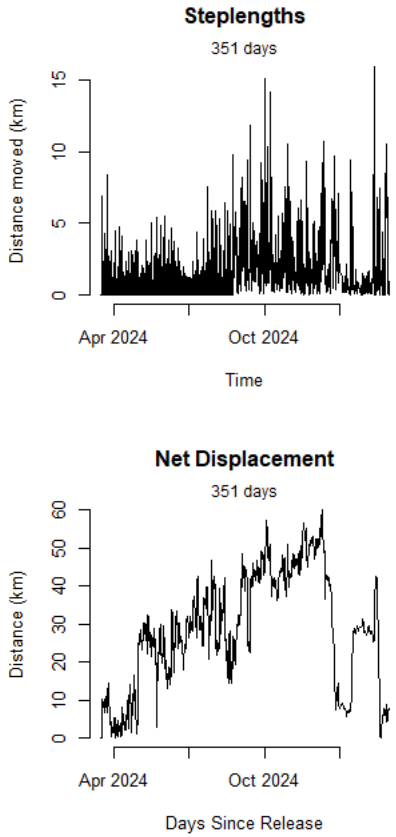

GCF01124_1401 Movement
2024-03-16 to 2024-07-25
Northing
700000
650000
600000
550000
760000
800000
840000
Easting

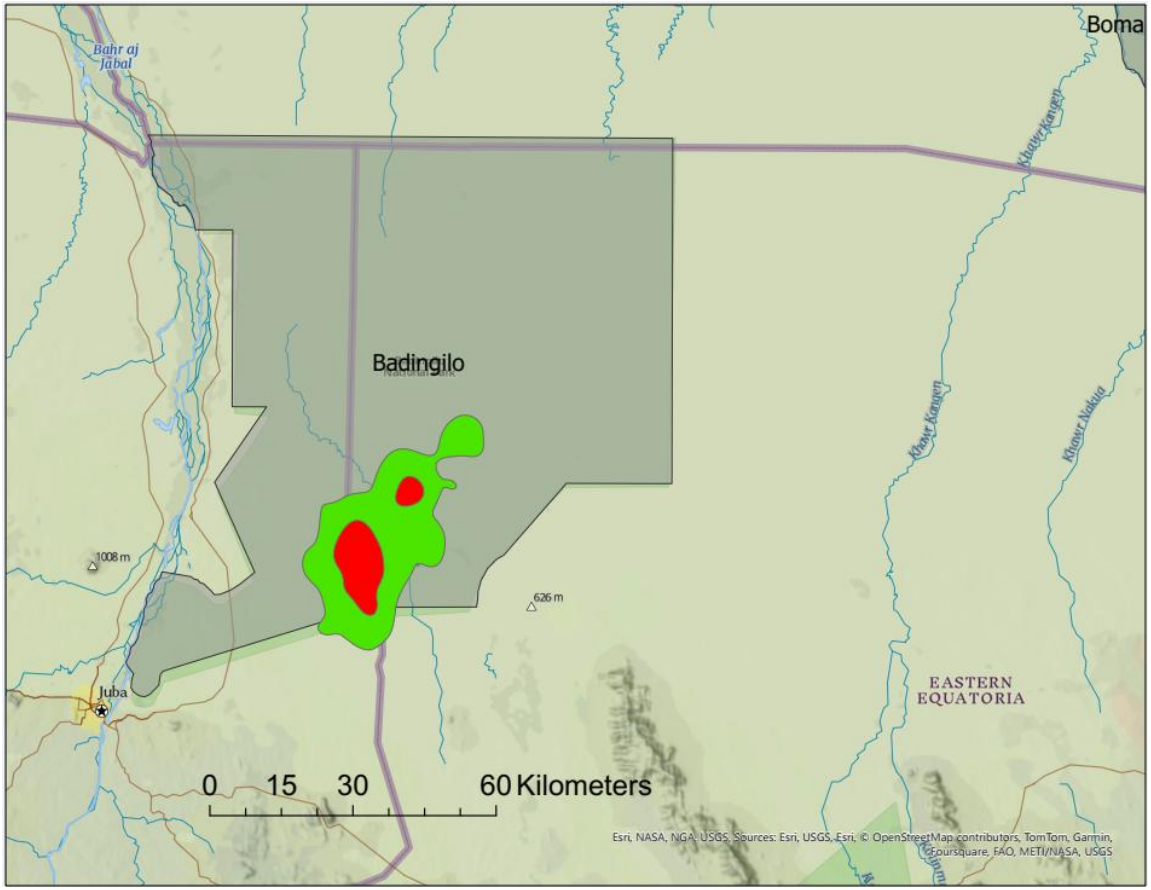

Steplengths
130 days
Distance moved (km)
0
5
10
15
Apr
May
Jun
Jul
Time

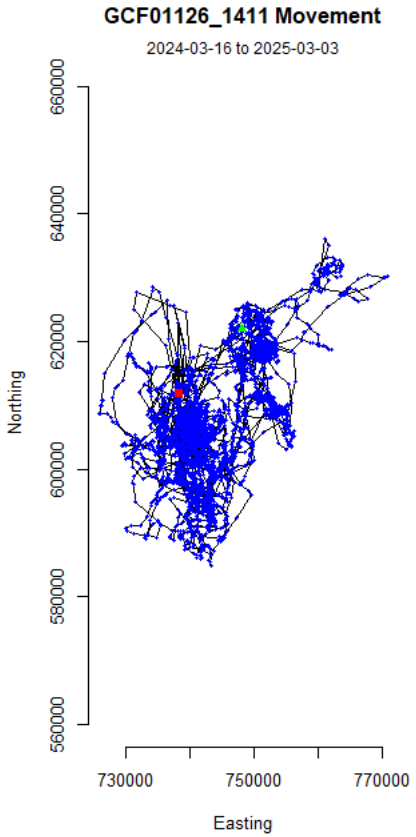

Net Displacement
130 days
Distance (km)
0
20
40
60
80
Apr
May
Jun
Jul
Days Since Release

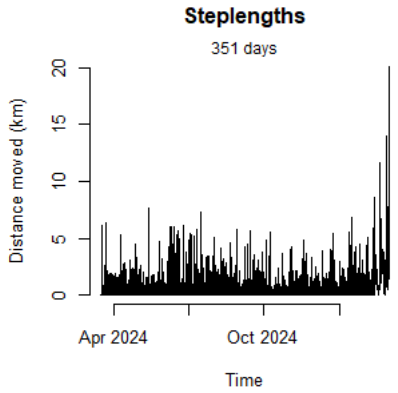

Boma
Bahr aj Jabal
Badingilo
Khaur Kangen
Khaur Nakua
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

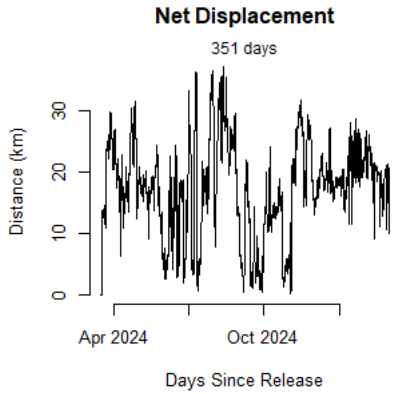

GCF01125_1400 Movement
2024-03-16 to 2025-03-02
Northing
560000
580000
600000
620000
640000
660000
680000
740000
760000
780000
800000
Easting

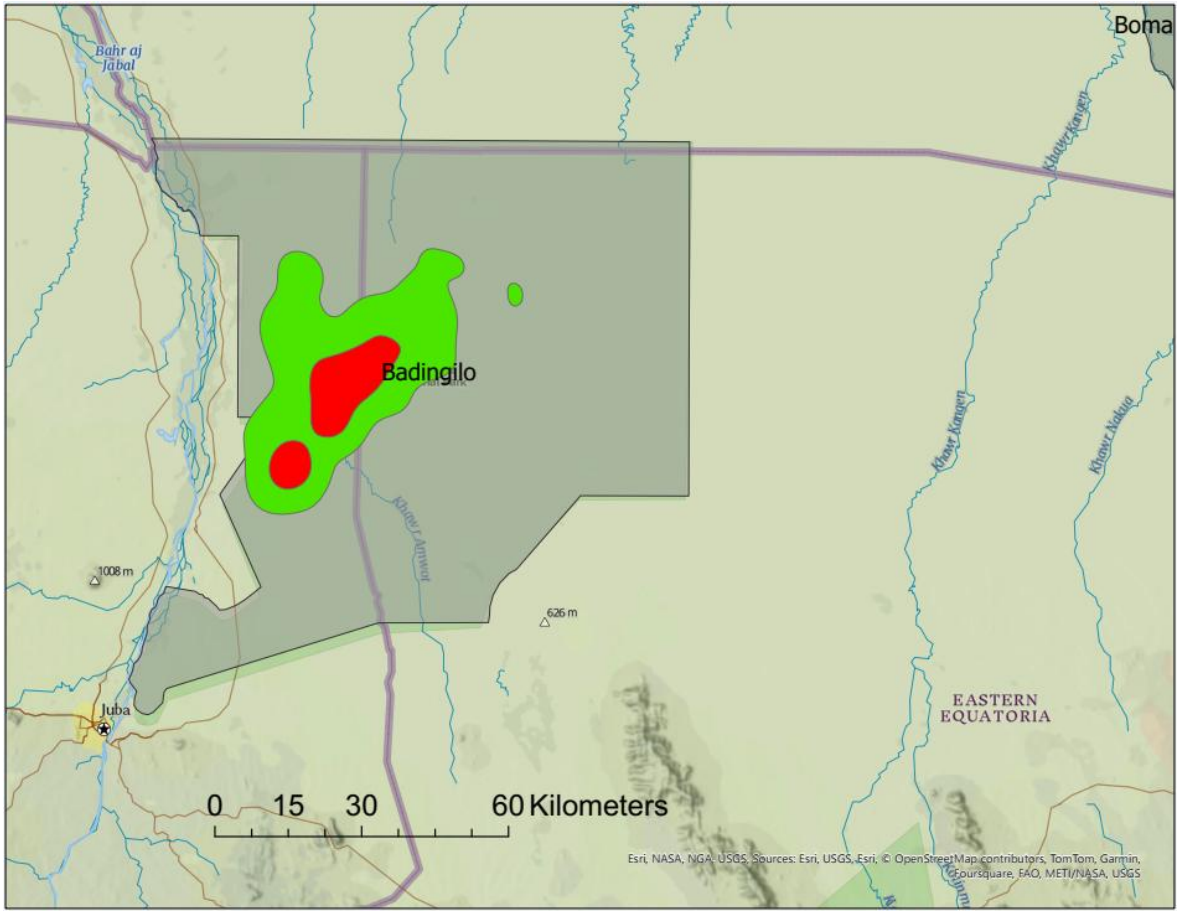

Steplengths
351 days
Distance moved (km)
0
5
10
15
Apr 2024
Oct 2024
Time
Net Displacement
351 days
Distance (km)
0
10
20
30
40
50
60
Apr 2024
Oct 2024
Days Since Release

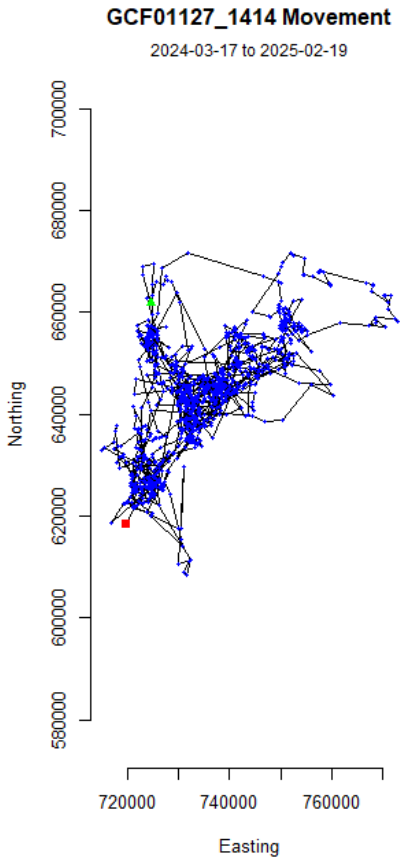

Boma
Bahr aj Jabal
Badingilo
Khaur Kangen
Khaur Nakua
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

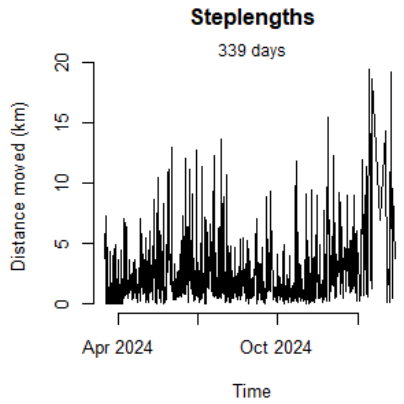

GCF01126_1411 Movement
2024-03-16 to 2025-03-03
Northing
660000
640000
620000
600000
580000
560000
730000
750000
770000
Easting

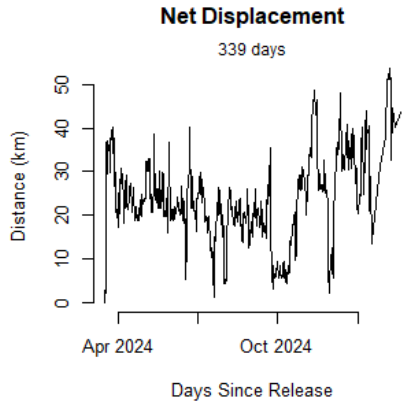

Steplengths
351 days
Distance moved (km)
0
5
10
15
20
Apr 2024
Oct 2024
Time

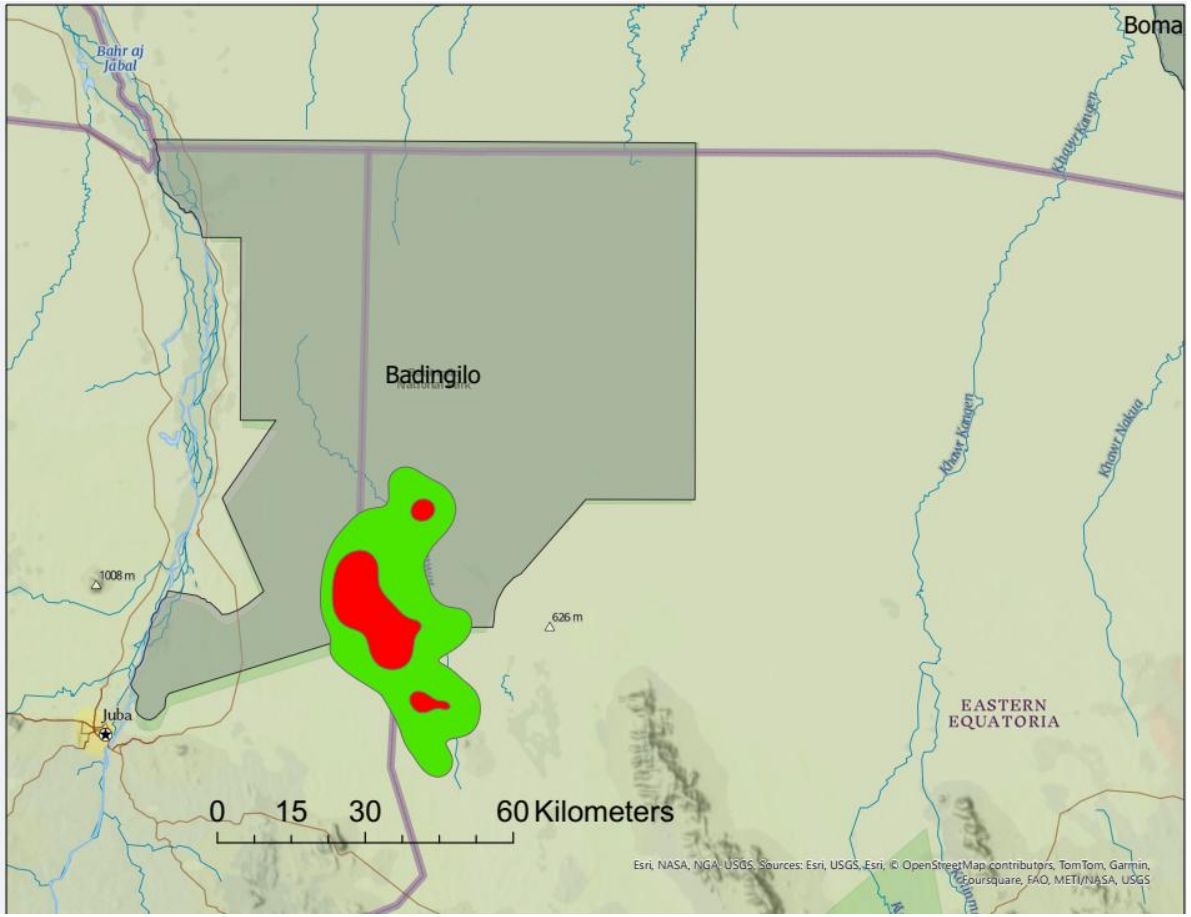

Net Displacement
351 days
Distance (km)
0
10
20
30
Apr 2024
Oct 2024
Days Since Release

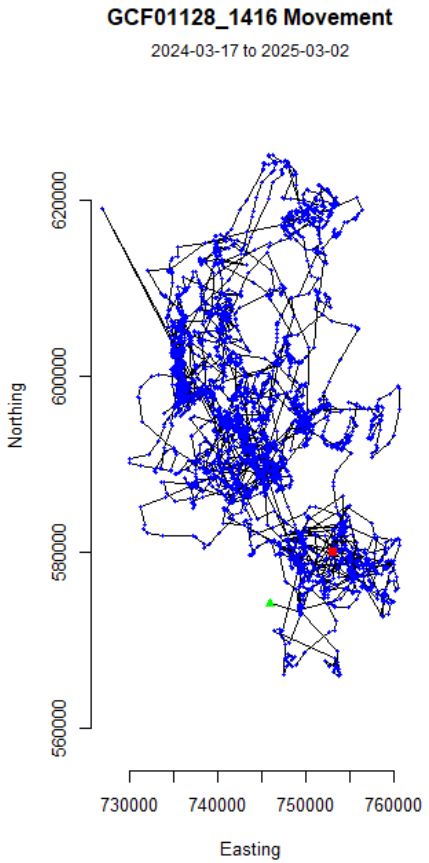

Boma
Bahr aj Jabal
Badingilo
Khawr Kanger
Khawr Amwot
Khawr Nakua
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

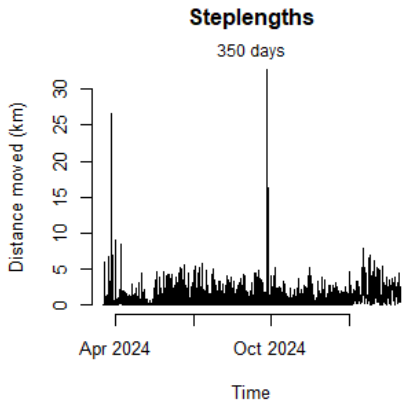

GCF01127_1414 Movement
2024-03-17 to 2025-02-19
Northing
700000
680000
660000
640000
620000
600000
580000
720000
740000
760000
Easting

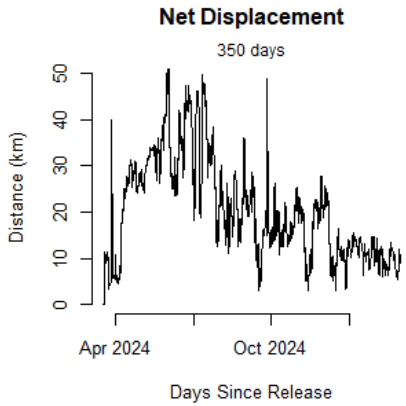

Steplengths
339 days
Distance moved (km)
0
5
10
15
20
Apr 2024
Oct 2024
Time

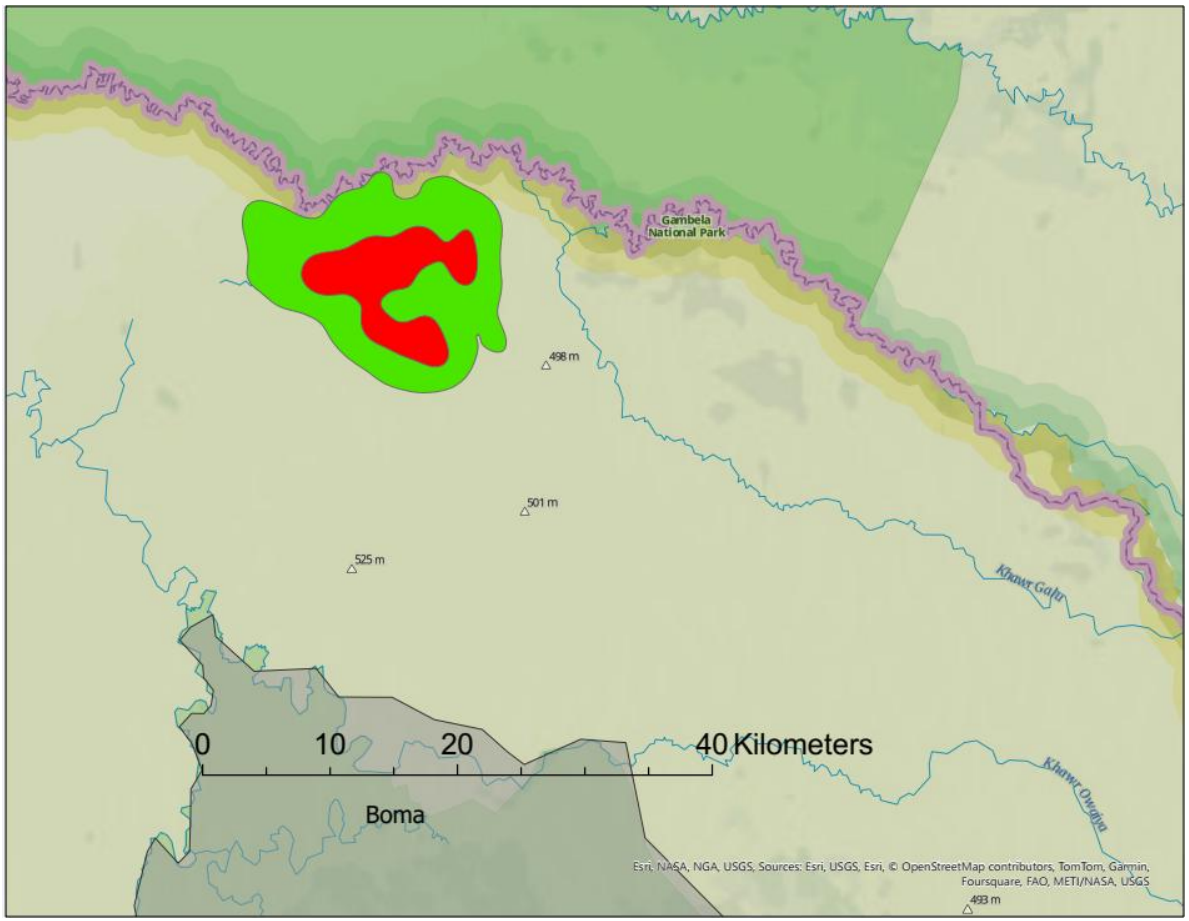

Net Displacement
339 days
Distance (km)
0
10
20
30
40
50
Apr 2024
Oct 2024
Days Since Release

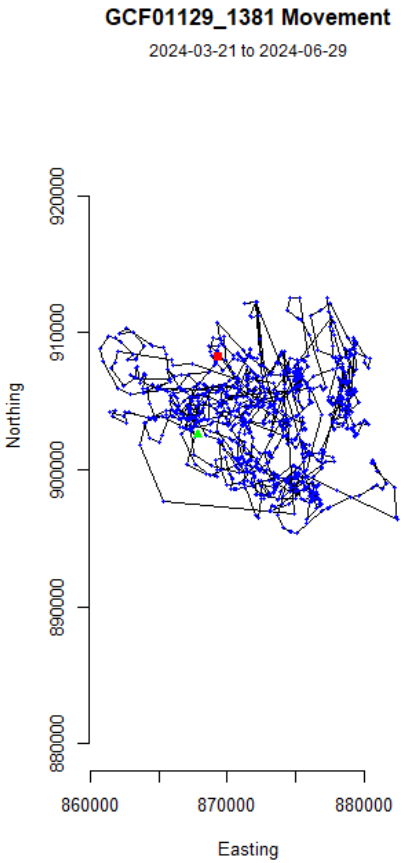

Boma
Bahr aj Jabal
Badingilo
Khawr Kangen
Khawr Nakua
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

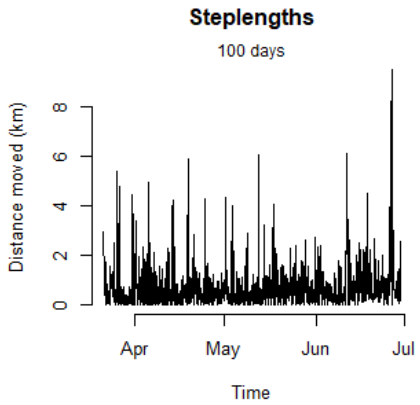

GCF01128_1416 Movement
2024-03-17 to 2025-03-02
Northing
620000
600000
580000
560000
730000
740000
750000
760000
Easting

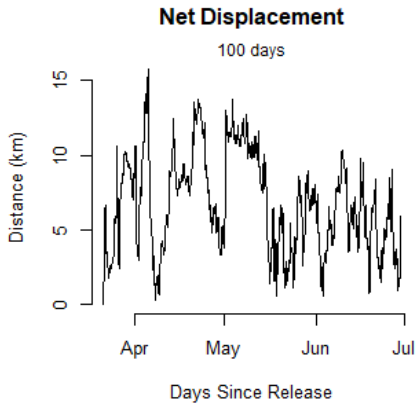

Steplengths
350 days
Distance moved (km)
0
5
10
15
20
25
30
Apr 2024
Oct 2024
Time

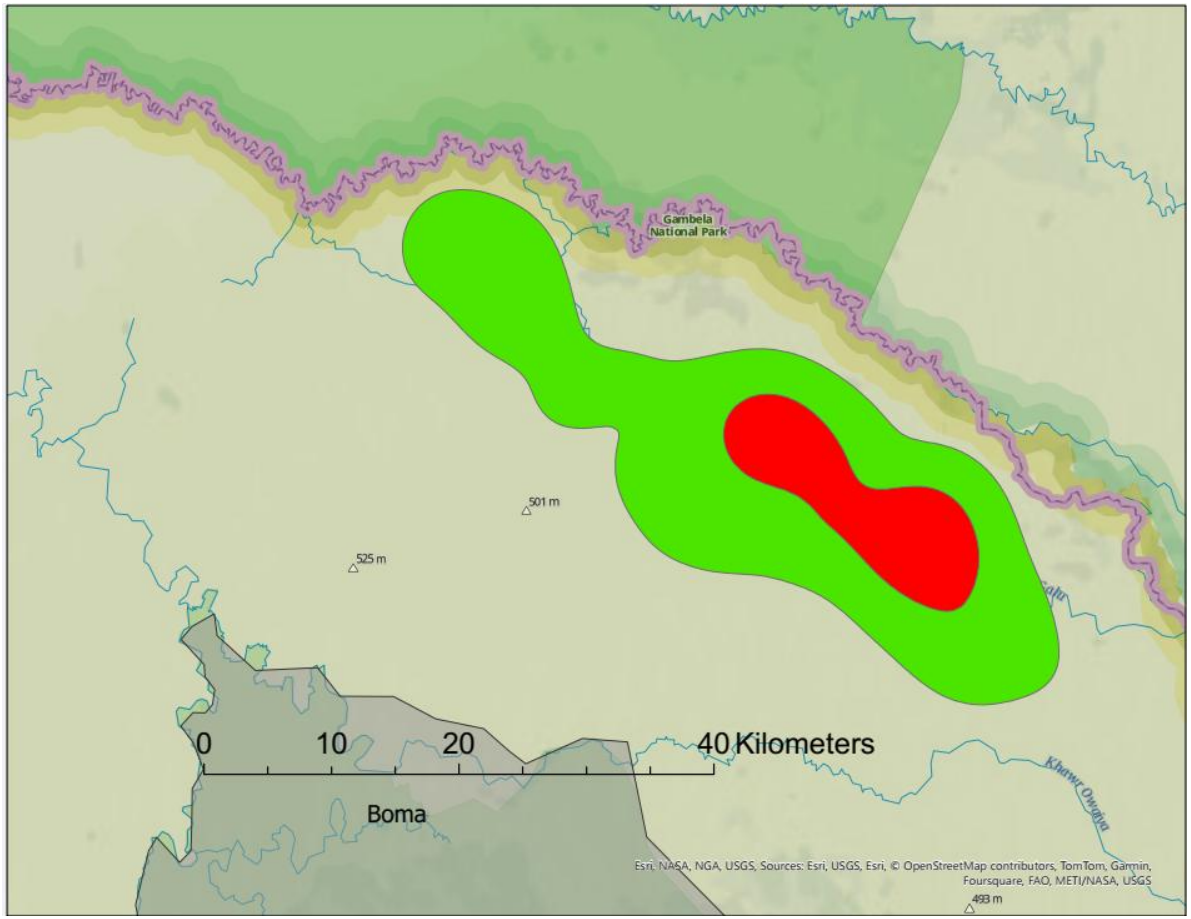

Net Displacement
350 days
Distance (km)
0
10
20
30
40
50
Apr 2024
Oct 2024
Days Since Release

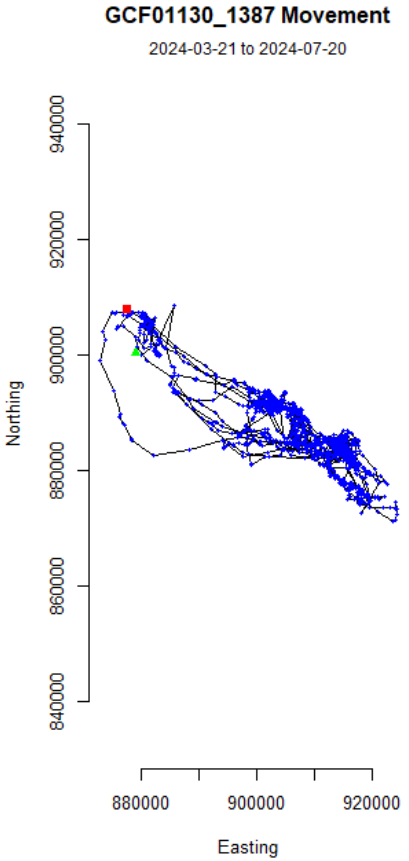

Gambela National Park
498 m
501 m
525 m
Khawr Gaju
0
10
20
40 Kilometers
Boma
Khawr Owgaju
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
493 m

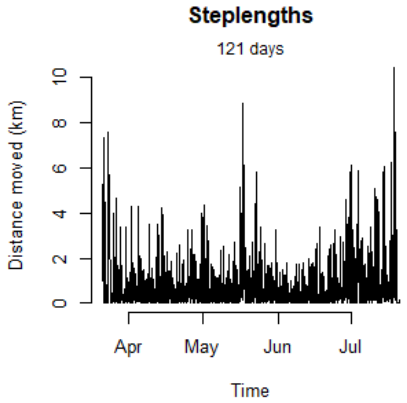

GCF01129_1381 Movement
2024-03-21 to 2024-06-29
Northing
920000
910000
900000
890000
880000
860000
870000
880000
Easting

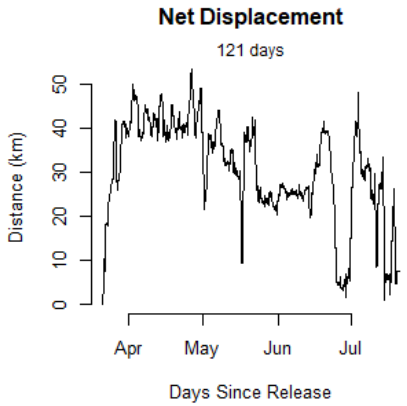

Steplengths
100 days
Distance moved (km)
0
2
4
6
8
Apr
May
Jun
Jul
Time

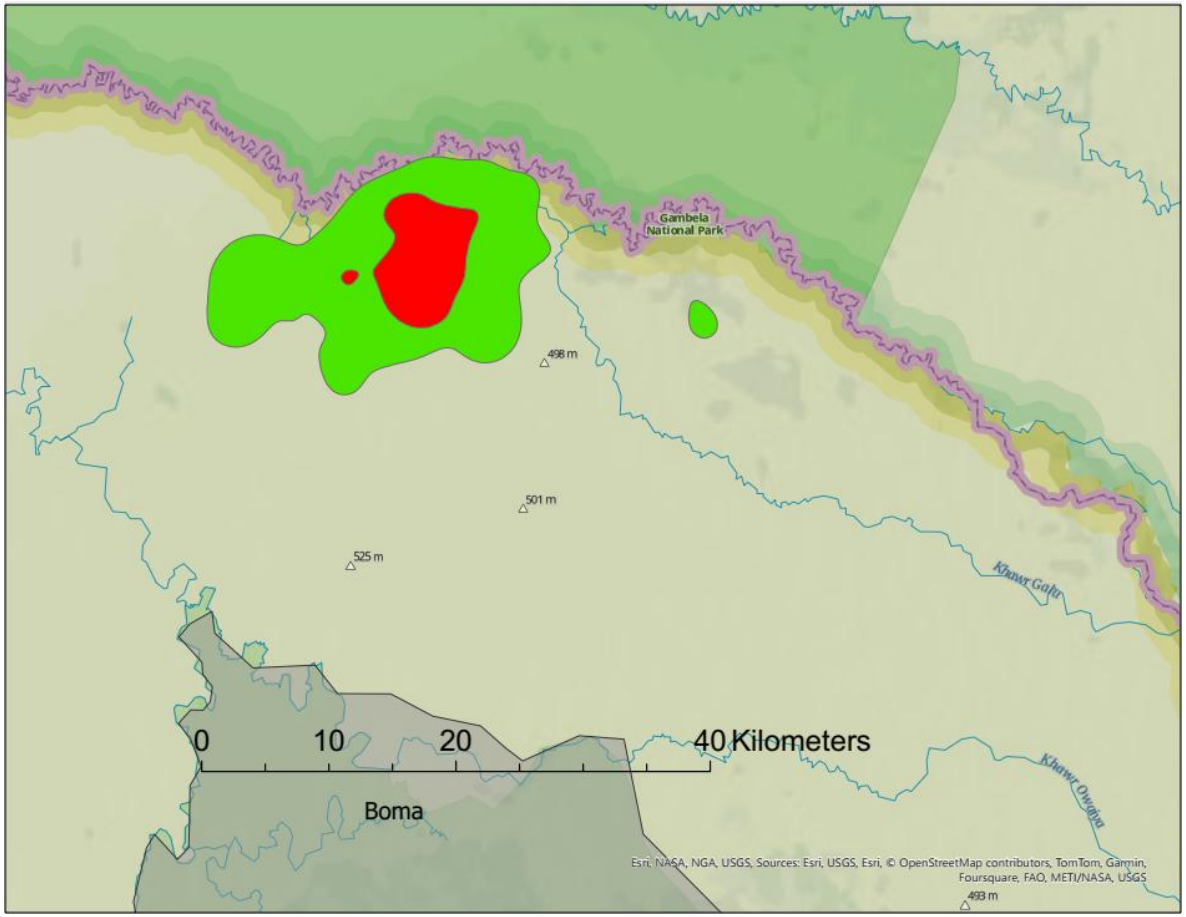

Net Displacement
100 days
Distance (km)
0
5
10
15
Apr
May
Jun
Jul
Days Since Release

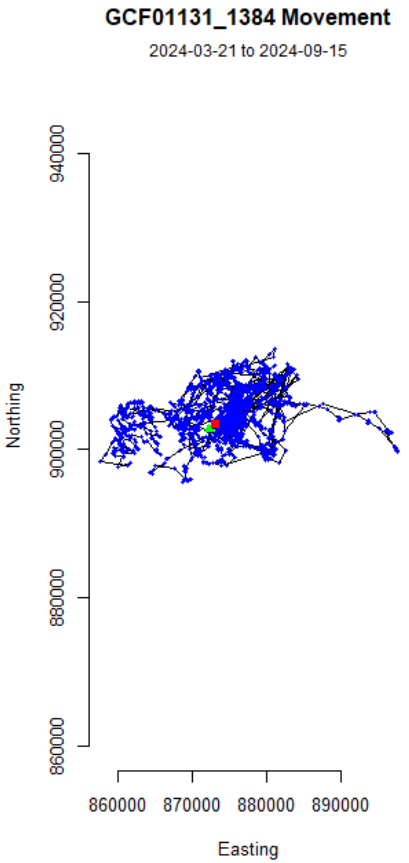

Gambela
National Park
501 m
525 m
0
10
20
40 Kilometers
Boma
Khawr Owwao
493 m
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

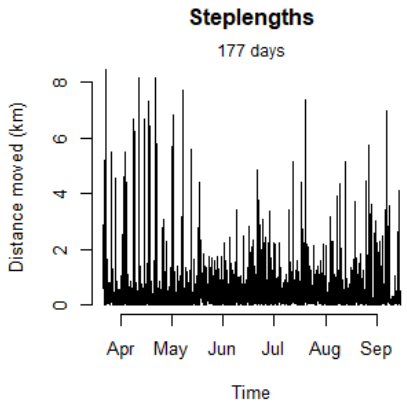

GCF01130_1387 Movement
2024-03-21 to 2024-07-20
Northing
940000
920000
900000
880000
860000
840000
880000
900000
920000
Easting

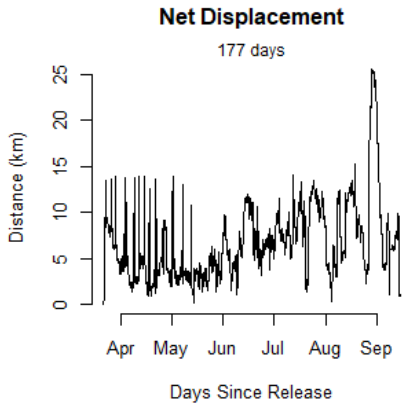

Steplengths
121 days
Distance moved (km)
0
2
4
6
8
10
Apr
May
Jun
Jul
Time

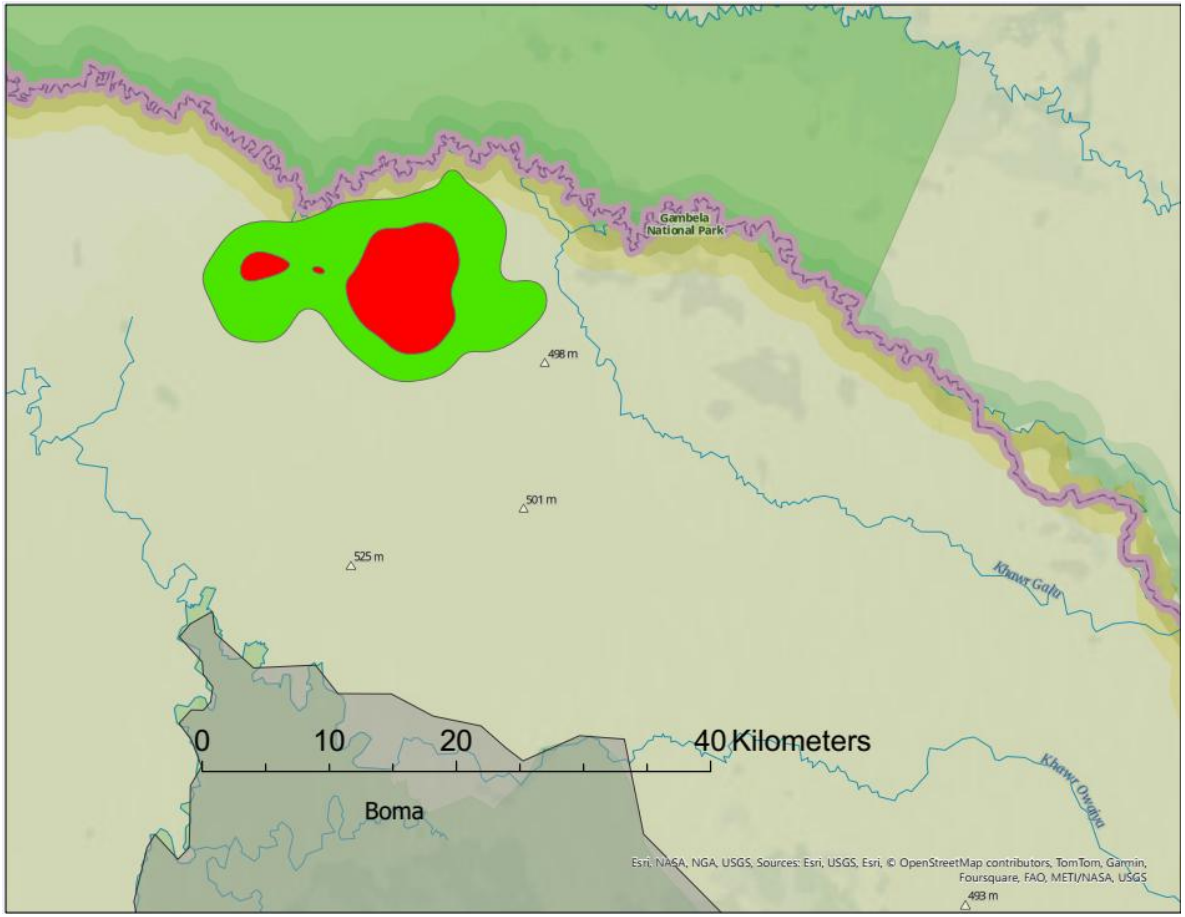

Net Displacement
121 days
Distance (km)
0
10
20
30
40
50
Apr
May
Jun
Jul
Days Since Release

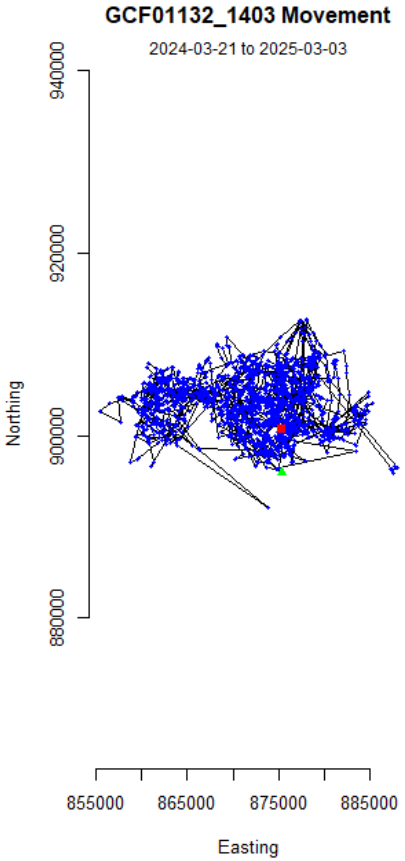

Gambela National Park
498 m
501 m
525 m
Khawr Gaju
Khawr Owidua
0
10
20
40 Kilometers
Boma
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
493 m

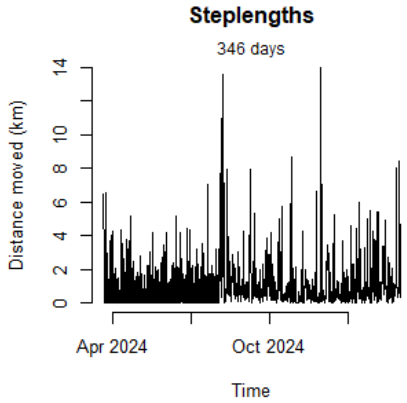

GCF01131_1384 Movement
2024-03-21 to 2024-09-15
Northing
940000
920000
900000
880000
860000
860000
870000
880000
890000
Easting

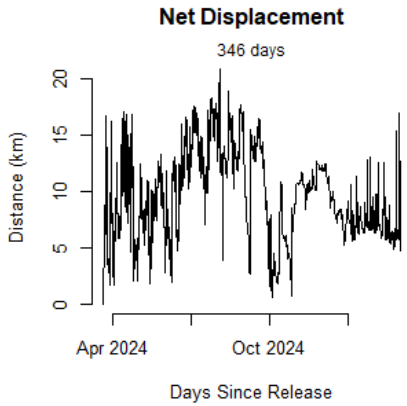

Steplengths
177 days
Distance moved (km)
0
2
4
6
8
Apr
May
Jun
Jul
Aug
Sep
Time

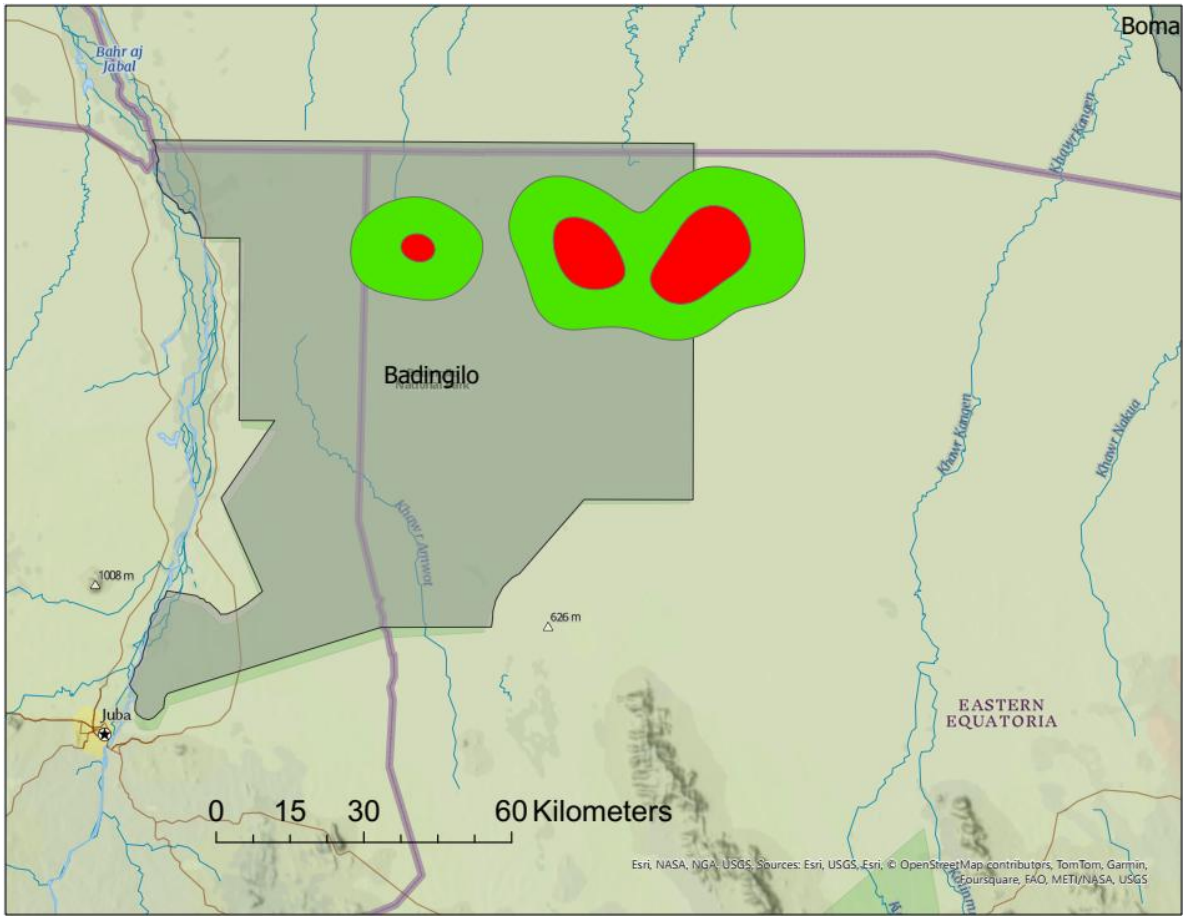

Net Displacement
177 days
Distance (km)
0
5
10
15
20
25
Apr
May
Jun
Jul
Aug
Sep
Days Since Release

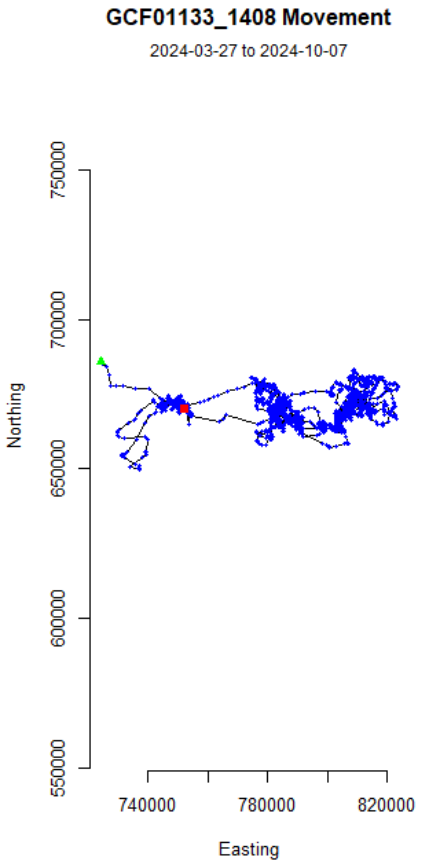

Gambela National Park
498 m
501 m
525 m
Khawr Gaji
Khawr Owgaya
0
10
20
40 Kilometers
Boma
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
493 m

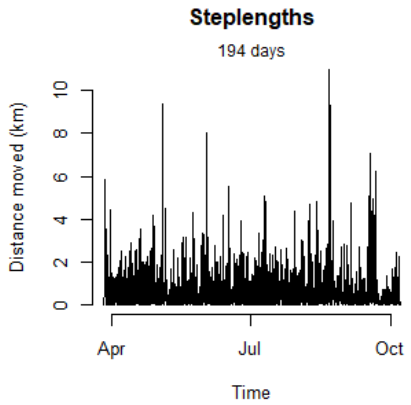

GCF01132_1403 Movement
2024-03-21 to 2025-03-03
Northing
940000
920000
900000
880000
855000
865000
875000
885000
Easting

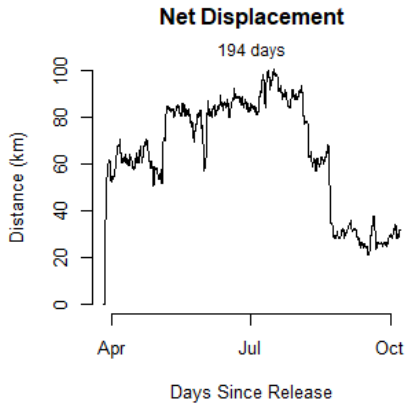

Steplengths
346 days
Distance moved (km)
0
2
4
6
8
10
14
Apr 2024
Oct 2024
Time

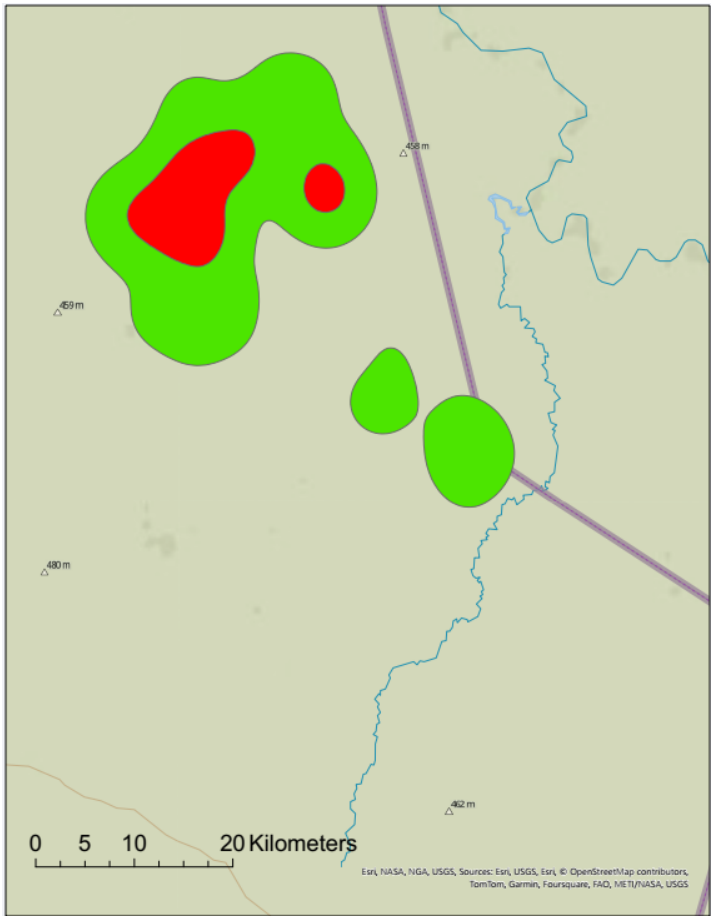

Net Displacement
346 days
Distance (km)
0
5
10
15
20
Apr 2024
Oct 2024
Days Since Release

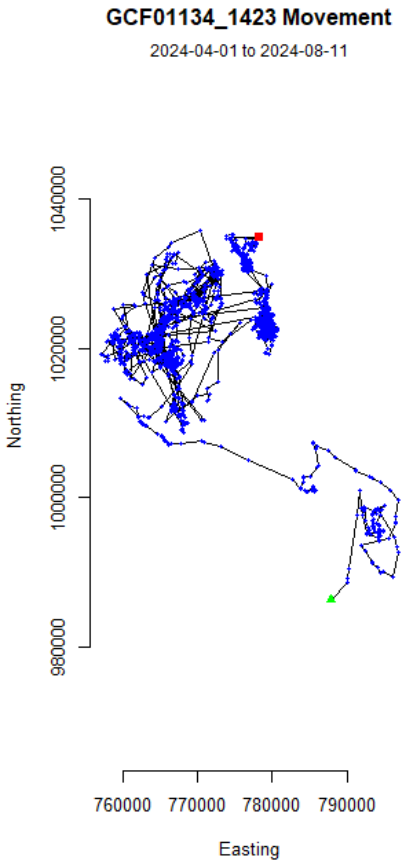

Boma
Bahr aj Jabal
Badingilo
Khawr Kangen
Khawr Nakua
Khawr Lamwot
1008 m
626 m
Juba
EASTERN EQUATORIA
0 15 30 60 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

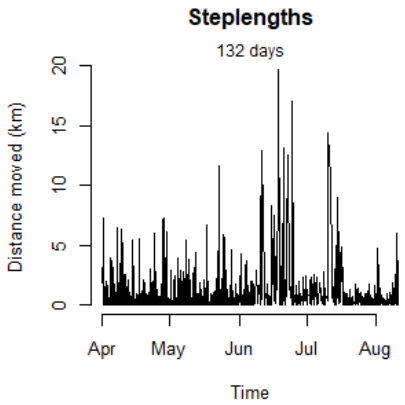

GCF01133_1408 Movement
2024-03-27 to 2024-10-07
Northing
750000
700000
650000
600000
550000
740000
780000
820000
Easting

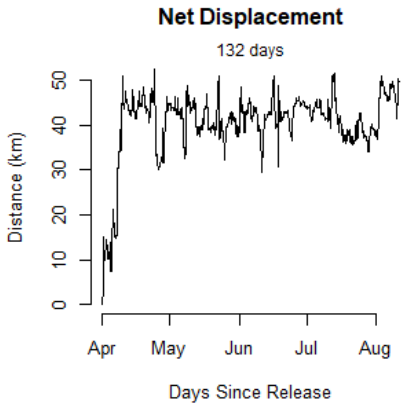

Steplengths
194 days
Distance moved (km)
0
2
4
6
8
10
Apr
Jul
Oct
Time

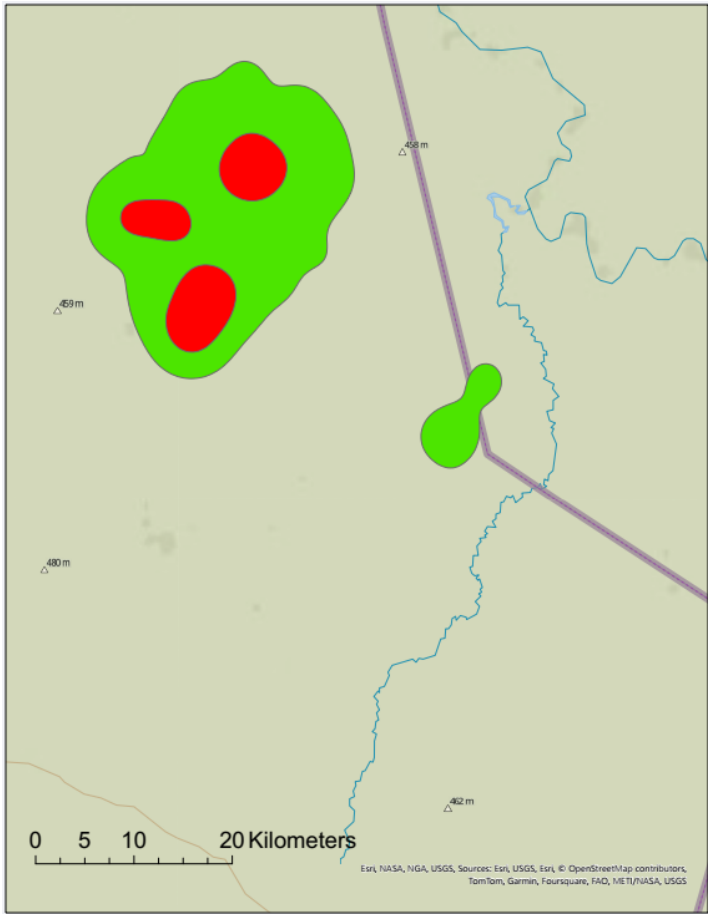

Net Displacement
194 days
Distance (km)
0
20
40
60
80
100
Apr
Jul
Oct
Days Since Release

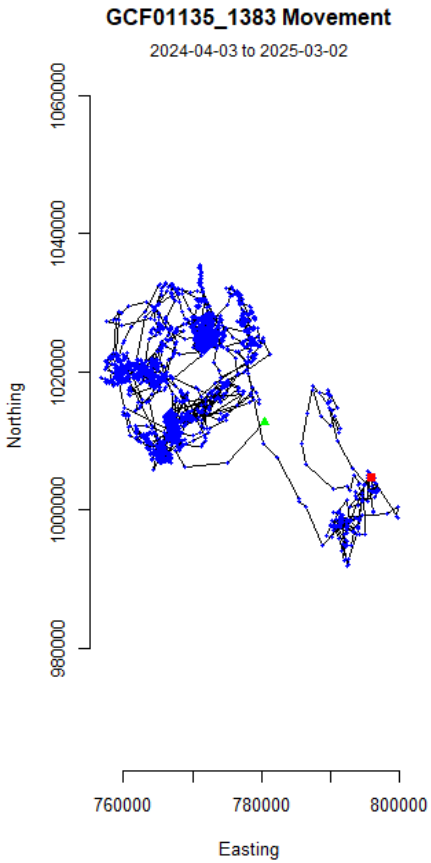

458 m
459 m
480 m
462 m
0 5 10 20 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

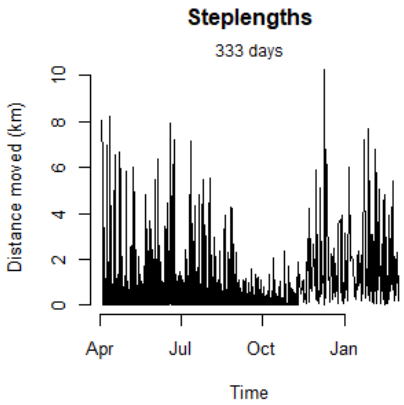

GCF01134_1423 Movement
2024-04-01 to 2024-08-11
Northing
1040000
1020000
1000000
980000
760000 770000 780000 790000
Easting

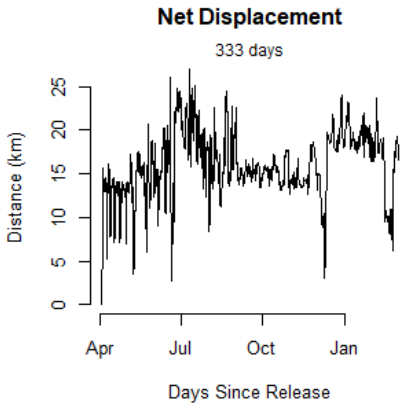

Steplengths
132 days
Distance moved (km)
0 5 10 15 20
Apr May Jun Jul Aug
Time

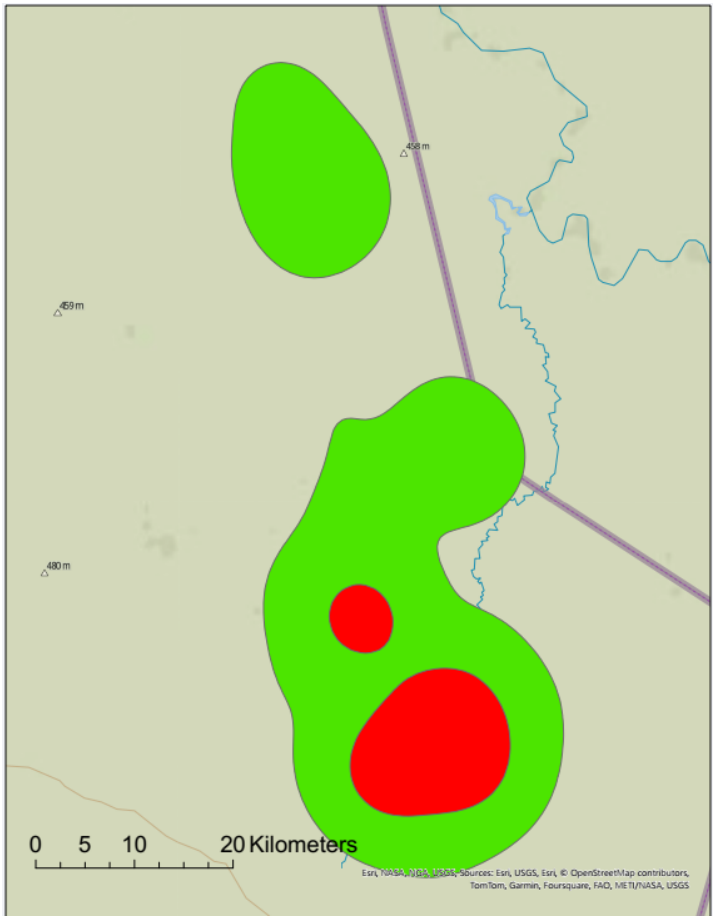

Net Displacement
132 days
Distance (km)
0 10 20 30 40 50
Apr May Jun Jul Aug
Days Since Release

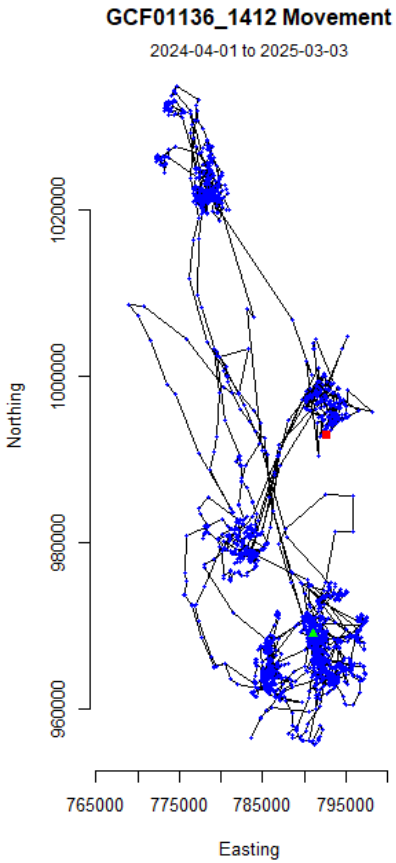

458 m
459 m
480 m
462 m
0 5 10 20 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

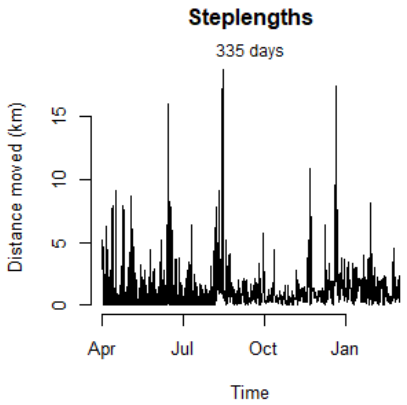

GCF01135_1383 Movement
2024-04-03 to 2025-03-02
Northing
1060000
1040000
1020000
1000000
980000
760000
780000
800000
Easting

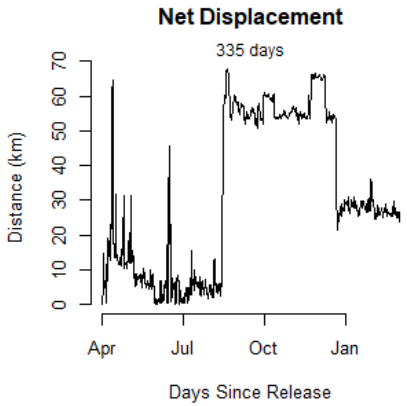

Steplengths
333 days
Distance moved (km)
0
2
4
6
8
10
Apr
Jul
Oct
Jan
Time

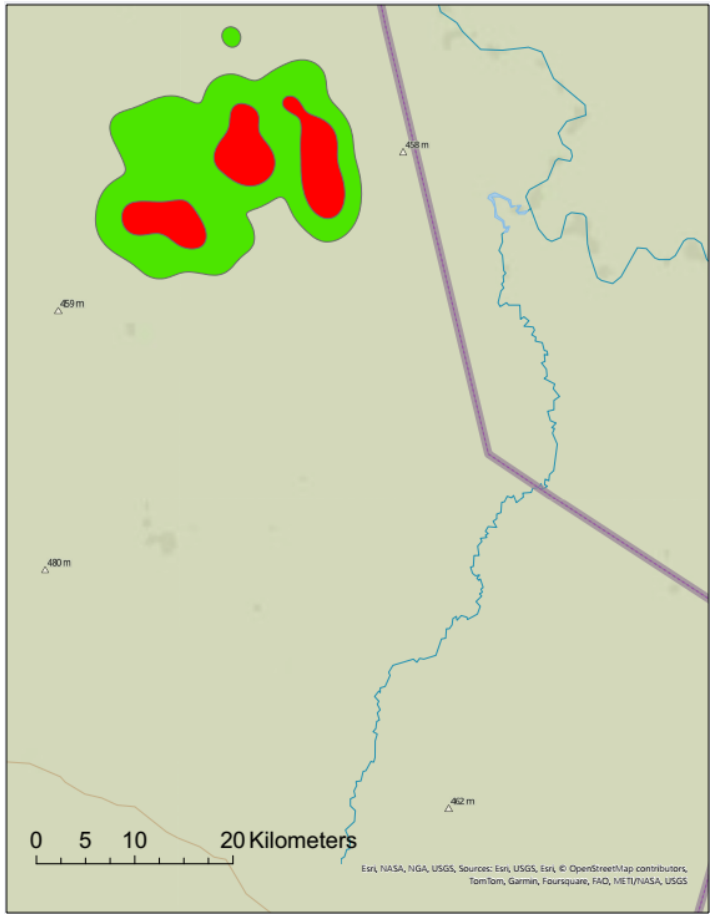

Net Displacement
333 days
Distance (km)
0
5
10
15
20
25
Apr
Jul
Oct
Jan
Days Since Release

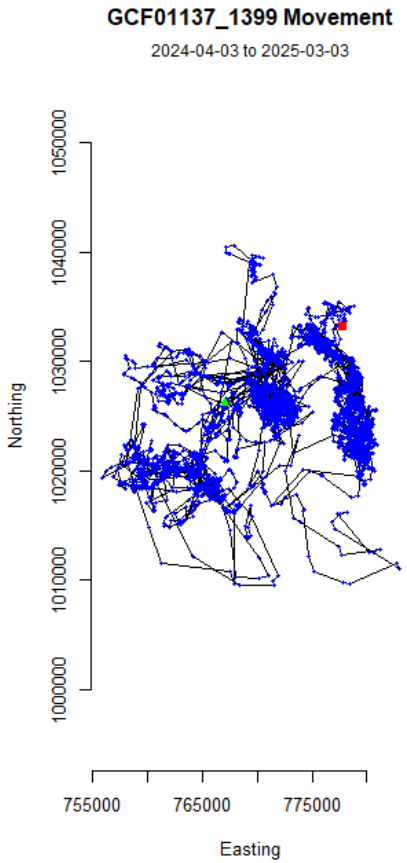

458 m
459 m
480 m
0 5 10 20 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

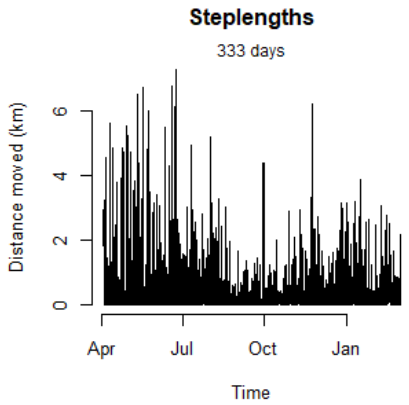

GCF01136_1412 Movement
2024-04-01 to 2025-03-03
Northing
1020000
1000000
980000
960000
765000
775000
785000
795000
Easting

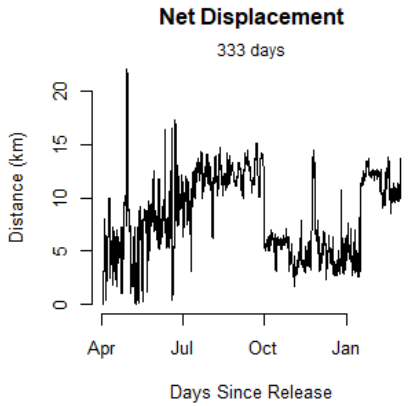

Steplengths
335 days
Distance moved (km)
0
5
10
15
Apr
Jul
Oct
Jan
Time


Net Displacement
335 days
Distance (km)
0
10
20
30
40
50
60
70
Apr
Jul
Oct
Jan
Days Since Release


458 m
459 m
480 m
462 m
0 5 10 20 Kilometers
Esri, NASA, NGA, USGS, Sources: Esri, USGS, Esri, © OpenStreetMap contributors, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS


GCF01137_1399 Movement
2024-04-03 to 2025-03-03
Northing
1000000
1010000
1020000
1030000
1040000
1050000
755000
765000
775000
Easting


Steplengths
333 days
Distance moved (km)
0
2
4
6
Apr
Jul
Oct
Jan
Time


Net Displacement
333 days
Distance (km)
0
5
10
15
20
Apr
Jul
Oct
Jan
Days Since Release