Gondwana TRACKS PARK REPORT

APRIL - JUNE 2014

Early morning at Dassiepoort

Highlights

Successful Game Count in GCP

New Wardens for Anib and GCP

Park HQ Solar Power Augmented

Introduction

It has been a time of change and interesting progress.

Senior Ranger Eddy Shipulwa became Trainee Assistant Warden at Gondwana Canyon Park, and Senior Ranger Ignatius "Gammy" Sikongo relocated to Gondwana Kalahari Park as Trainee Warden; another successful Annual Game Count was achieved for the 12th time in GCP; and Park HQ at Holoog received a tremendous, fuel-saving boost when an array of 12 solar panels was installed to drive the electric pump that delivers our water, so that the main generator is used much less than ever before.
And of course we are very pleased with our new GCP logo!!

Importantly, we received some decent precipitation during the quarter; this time last year we couldn't even spell the word "rain", let alone understand what it meant!

Management and Development

A brief summary of tasks undertaken during these three months is as follows:
Cross-training took place for 2 months between Senior Rangers Eddy Shipulwa and Gammy Sikongo as they shadowed each other in preparation for their new Warden positions (fence-maintenance, quiver tree monitoring, vehicle maintenance, welding, taking minutes, rhino report, finance, food orders, entering data onto the computer, camera traps, biomass determination, building, pump maintenance, etc., etc.)

Erecting solar panels at Holoog

Waterhole construction at Brakwater

Reini and Marco and the park staff transferred 12 solar panels from Augarabis to Holoog and erected them there for pumping water at Park HQ. Repairs were effected to Brakwater and Stamprivier solar pumps, and a new drinking trough was built at Brakwater. All waterholes were cleaned, and the old reservoir at Dassiepoort was demolished and replaced with two large plastic tanks. Augurabis solar pump installation was secured against baboon damage, and three pumps were overhauled. A baboon-damaged solar panel was retrieved from Jagpos for repair. A damaged cable at the Holoog borehole was repaired.
2 ½ km of redundant 32mm plastic pipe was retrieved from the veld east of the Roadhouse, and 70 old telephone poles were cut down and removed from the southern boundary to the Lodge. A complete rearrangement and tidying of fencing material was done at the Holoog workshop area, and a new deep hole was dug for the disposal of old wire that the scrap-metal dealer does not want. A section of redundant/broken/rusted/dangerous fenceline along the GCP/National Park border near the Roadhouse was removed as approved by MET, with a wooden post or steel standard left in position every 80 - 100 metres to demarcate the boundary.

Fitting the new water tanks at Dassiepoort

Ranger Epafras Akwenye by the completed tanks

Section of broken fenceline

Epafras dismantling the broken fence

Eight new recycling bins (4 at the office and 4 at the staff quarters at Holoog) were prepared and positioned to facilitate immediate early separation of glass, tins, plastic and papers/cardboard.
The main generator at Park HQ was serviced, as were all three 4x4 vehicles and the quad-bike.
Some limited *Prosopis* regrowth was eliminated in the vicinity of Jagpos, and between Geluk and Zebra waterholes.

Plastic pipe retrieval

***Prosopis* removal**

Preparation and marking of the 8 game count routes was done, and the annual count was held on 25th May. The count analysis and summary was duly completed, as well as a poster. Preparations for the upcoming Kalahari Anib game count are underway.
Three Hartebeest were chased back into the park from Klein Karas land with the help of the community there.
The Anib Management and Development Plan as well as the 2014 Work Plan were reviewed, and Trainee Warden Ignatius Sikongo (Gammy) together with Trygve and Sue began identifying priority tasks for Kalahari Anib Park.
Camera traps were set up at Springbokvlakte, Kanebis, Steenbok, Quaggagat and Fourie se Gat.
The quarterly raptor road count took place on 14th June, followed by the quarterly game counts along routes 1 and 8 on 18th June. Fence maintenance, raingauge measuring and regular rhino monitoring proceeded as usual – with local MET rangers accompanying our staff on the last-mentioned as part of their new policy of getting more involved with custodians.

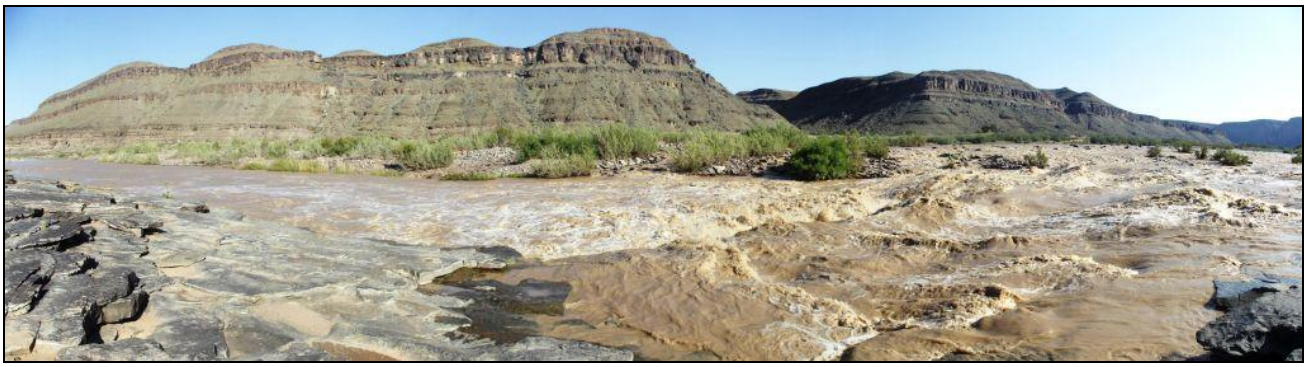
Law Enforcement

No untoward incidents were noticed or reported for the quarter.

Monitoring and Research

Climate

Pleasantly cool to cold weather was experienced during the later part of the quarter, in sharp contrast to the first few months of 2014. Decent rains in April resulted in many pools of veldwater scattered throughout the park, and some gravel pits still contain water. The Fish River is flowing in the north west of the park, alleviating the problems of 2013 when the river did not flow at all.



Fish River in full flow near Koelkrans

Veld water near Jakkalsdam

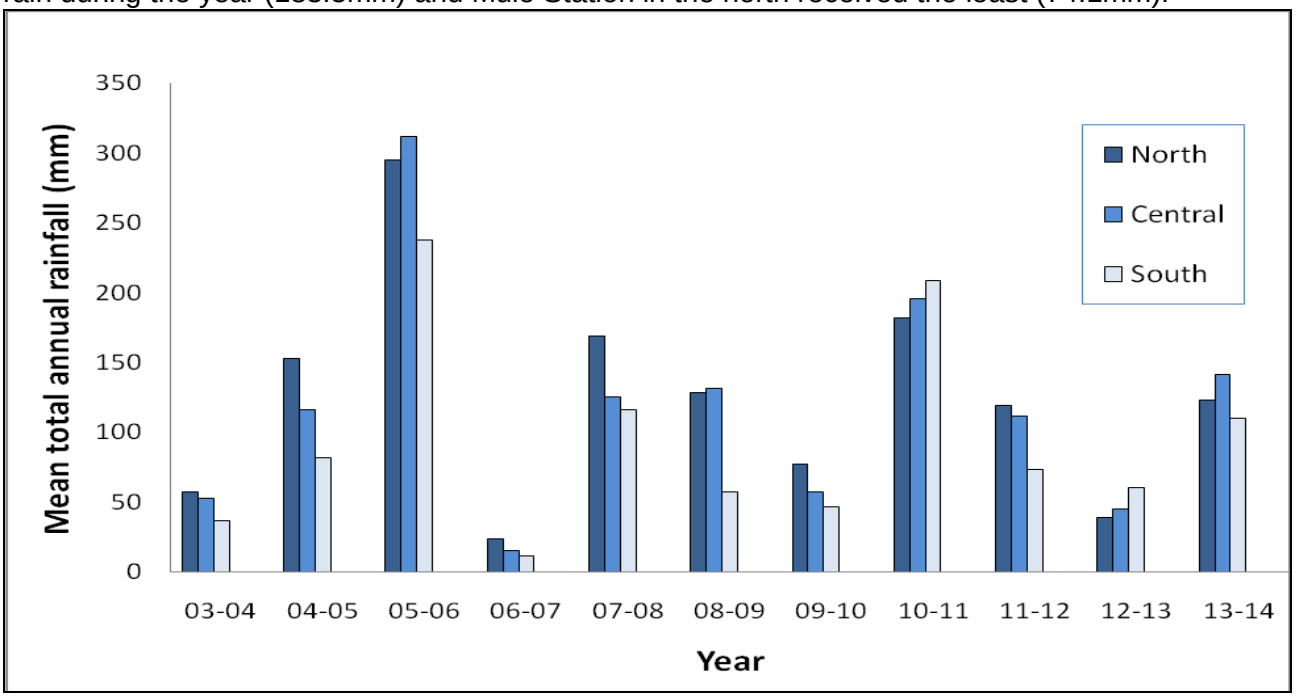
***Tribulus* flowering after April rain**

During April there were scattered showers throughout the park with some areas, such as Jagpos receiving a third of their yearly rainfall this month. With the exception of Grenpos in the northern section and Scorpion water in the central area, rainfall was low in May. In June, the southern part of the park faired best.
A total of 33 rain-gauges are monitored in the Park. Selected rainfall data recorded from these gauges during the three month period is given below.

Name of rain-gauge	April (mm)	May (mm)	June (mm)	Park zone
Augurabis (Canyon Outpost)	22.0	2.5	1.0	North
Holoog	9.2	1.7	2.0	North
Canyon Roadhouse	15.0	3.0	1.0	North
Jagpos	50.0	3.0	0.0	North
Grenspos	0.0	10.0	4.0	North
Klipspringer	37.0	3.5	0.5	Central
Canyon Lodge	5.0	0.0	5.0	Central
Springbokvlakte	8.0	1.5	5.0	Central
Klein Karios	34.0	3.0	5.5	Central
Brakwater	0.0	0.0	8.0	South
Kanebis	15.5	0.0	8.0	South
Quaggagat	20.5	1.0	6.0	South
Fourie se gat	22.5	1.8	8.0	South

Selected rain-gauge data from different park zones April to June

The mean rainfall figure across the whole park for July 2013 until June 2014 was 122.4mm.This therefore despite early fears, has been an above average rainfall year. The average mean rainfall figure for all years across the park is 112.2mm. The graph below illustrates the final figures for the year for each park zone and indicates that the most rain fell in the central region (zone mean 2013-2014, 141.2mm. Central zone mean all years, 118.4mm). The northern zone mean for 2013-2014 was 122.9mm (zone mean all years, 124.3mm) and the southern park zone mean for 2013-2014 was 109.8mm (zone mean all years, 94.6mm). Klein Karios in the central zone received the most rain during the year (183.5mm) and Mule Station in the north received the least (74.1mm).



Mean Annual Rainfall from rain-gauges in each park zone July 2013-June 2014

The maximum and minimum temperatures recorded for April to June 2014 are indicated below, together with the means for each month (derived from data for 2003-2014).

	April 2003-2014 mean	**April 2014**	May 2003-2014 mean	**May 2014**	June 2003-2014 mean	**June 2014**
Maximum temperature (°C)	33.5	**33.4**	30.8	**34.2**	25.7	**28.9.**
Average maximum temperature (°C)	27.9	**28.8**	24.0	**27.3**	19.8	**21.2**
Minimum temperature (°C)	8.3	**6.7**	6.3	**4.4**	1.9	**-1.3**
Average minimum temperature (°C)	16.0	**20.6**	12.7	**17.5**	7.6	**11.8**

Table depicting maximum and minimum temperatures from April to June

Temperatures for April were around the average for this time of the year, but the temperatures experienced in May and June were above average. June 2014 did however contain the coldest recorded temperature of -1.3°C since 2003, when recordings were first made for GCP.

Veld Condition

Flowering Quiver tree and closeup of Quiver tree flowers

Grasses typically lost their green colour during the last few months, but grazing is sufficient and well-spread as are browse plants. Trees along the Gab! River particularly are noticeably more drab in colour with less apparent foliage than in previous years – probably as a result of the previous year of intense heat and little precipitation as well as the fact that the river has not flowed for the past two years.

During June, a welcome sight was provided by the Quiver trees flowering in the central region of the park.

Wildlife and Vegetation Monitoring

The central Dassiepoort and Roadhouse plains supported large groups of animals as a result of the April rains, as did the southern plains around Springbokvlakte and Fourie se Gat. A single herd of

Oryx numbering 220 was observed between Ostrich and Geluk waterholes, with many tourist vehicles stopping to view the concentration which also included up to 40 Red Hartebeest, 20 Ostrich, 15 Plains Zebra and 60 Springbok, with a number of Wildebeest on the fringes. A single herd of 75 Oryx grazed close to the Roadhouse for some weeks, and large groups of Springbok were seen near Ostrich and Zebra waterholes. On another occasion 90-odd Hartebeest were encountered between Middelpos and Dassiepoort which included one herd of around 70 animals. On another day in May, 5 groups totalling 30-odd Mountain Zebra were assembled in close proximity between Kudugat and Fourie se Gat as they grazed. Clearly, a lot of animals that entered GCP from the National Park during last year's drought are here to stay.

Red Hartebeest between Middelpos and Dassiepoort

Another occasion of note was when a young Leopard was captured on the camera trap at Stamprivier.

Leopard at Stamprivier

While still Senior Ranger at GCP, Gammy Sikongo was responsible for monitoring the vegetation over the last few years. Twelve photo-points are situated within the park and these areas are photographed and analysed once a year. Below is his report of the most recent survey and a comparison with previous years.

Vegetation is an integral part of any ecosystem and since plants are the primary producers they are of the utmost importance in the ecological unit. Monitoring the health and condition of the veld is done every year in the Gondwana Canyon Park (GCP) to note any changes resulting from rainfall, land-use and stocking rates. The Nama Karoo biome, of which GCP forms a large part, is characterised by low and variable annual rainfall, which results in grass and shrub biomass production which is low and highly variable in space and time. These characteristics of the biome, coupled with fences which restrict animals' movements, challenge the region's wildlife production. However, wildlife has evolved with the vegetation within their habitats since time immemorial reaching an ecological balance which benefits both.
The average rainfall where the vegetation monitoring sites are located is as follows: 2011 - 167.8mm, 2012 - 140.8mm, 2013 - 33.9mm and 122.4mm in 2014.
In 2011 the veld comprised, on average, of 12.7% deterioration species, 86.9% transition species and 0.4% improvement species (table 1). Transition species accounted for the majority of grasses in 2013 with an average of 74.4% showing a reduction of 12.5%. However, improvement species increased to 22.8% and deterioration species increased to 15.2%. The 2014 survey showed deterioration species to be at 14.1%, transition species at 71.9% and improvement species at 14%.

	2011			2013			2014		
Photo-point/Site No.	**Det. spp. %**	**Trans. spp. %**	**Imp. spp. %**	**Det. spp. %**	**Trans. spp. %**	**Imp. spp. %**	**Det. spp. %**	**Trans. spp. %**	**Imp. spp. %**
Average	**12.7**	**86.9**	**0.4**	**15.2**	**62.0**	**22.8**	**14.1**	**71.9**	**14.0**

Table 1. The average values for grass species status from all photo-points - 2011 to 2014.

The mean results for species of low and average grazing value altered throughout the three-year survey from 40.2% for low grazing and 46.7% for average grazing in 2011 to 16.9% and 70.2% in 2013 to 11% and 77.3 in 2014 respectively (Table 2). Species of high grazing value decreased from 13.1% to 12.9% and to 11.7% in 2014.

	2011			2013			2014		
Photo-point/Site No.	**Low**	**Average**	**High**	**Low**	**Average**	**High**	**Low**	**Average**	**High**
Average	**40.2**	**46.7**	**13.1**	**16.9**	**70.2**	**12.9**	**11**	**77.3**	**11.7**

Table 2. Mean percentage of grass species of different grazing values for all photo-points - 2011 to 2014.

The results suggest that the veld is mainly in a transition stage moving towards improvement. However, it must be noted that seasonal variation in grazing value and grass status is likely to occur which may result in the current state moving towards improvement, or in a reverse form depending on disturbance and rainfall. Currently, the results support the perception that the veld is undergoing a recovery since the park was converted from livestock farming, mainly sheep, to wildlife. This is evident in the higher percentage of species in transition combined with the presence of a fair proportion of indicator species of veld which is under improvement. These changes are mainly attributed to rainfall and grazing pressure on the grass.
While the Grenspos area site (photo-point 4) is dominated by grasses in a transition state (100%) from 2011-2014, the field observation indicates that there is minimal leaf production. The basal and canopy cover in this site has been low throughout with only 1% canopy cover in 2014. However, the survey was conducted

two months earlier than normal and shortly after the rain, thus grasses have not had a chance to flower and most annuals did not geminate. As a result, comparison with previous surveys may give a misleading conclusion. Even though this site is located near the waterhole, 1.4km from the waterhole the canopy cover is still very poor and because of the presence of strong perennials such as *Stipagrostis uniplumis* and *S. ciliata* the site is expected to have a higher percentage cover.

Even though 2013 was a poor rainfall year it did not have much of an impact on perennial grasses, as these grasses are only negatively impacted during severe droughts (or periods of extended drought), and by persistent defoliation and trampling. As the food reserves are located in the roots, grazing of these grasses outside their growth cycle does not detrimentally affect the plant and with a small amount of rain the plants are able to recover. Nevertheless, the poor rainfall of 2012-2013 season resulted in plants having less leaf production resulting in the low basal and canopy cover obtained during 2013 study.

Sites (photo-points) near/at waterholes are dominated by annual unpalatable species like *Schmidtia kalahariensis*. This is to be expected since huge numbers of animals gather and linger around waterholes especially in dry times like the 2013 season. As a result, animals graze close to water points and this, together with constant trampling, considerably reduces cover and vigour of perennial grasses. There is generally a high abundance of perennial grasses (*Stipagrostis spp.*) in the park affording resistance and resilience to disturbance caused by grazing and drought. Although annuals are of slightly lower quality than perennials, they offer reasonable grazing during the wet season but are of little value in the dry season. Most perennials, on the other hand, are able to retain their palatability throughout the season making them highly valuable and palatable to grazers. These are represented in the park by perennials such as *Stipagrostis uniplumis*, *S. ciliata* and *S. hochstetteriana*. Although not regarded as very palatable species in most ecosystems of Namibia where highly palatable grasses like *Anthephora pubescens*, *Brachiaria nigropedata*, *Digitaria eriantha* etc. occur, they form the most palatable species in the Nama Karoo ecosystem where the last- mentioned ones are devoid. They also have an added value of offering better protection to the top soil against wind and soil erosion by having a better root system than annuals.

Though the veld is undergoing improvement animal populations should be managed so as not to exceed carrying capacity. Due to open fences along the boundary with the National Park more grazers, especially Mountain Zebra (bulk grazers) will immigrate to the plains. In dry periods GCP is expected to carry more animals due to constant supply of water from the artificial waterholes, and better grazing areas than those within the National Park. However, the true state of the veld will become more apparent after a prolonged time of monitoring. Rainfall is the main determinant of vegetation cover and biomass production, and the lack of it thereof, combined with heavy grazing, will have a detrimental effect on the veld.

The following two examples show different biomass and cover at particular times of the year. Note the better cover in 2011 attributed to a higher average rain received, compared to 2012, 2013 and 2014.

Figure 1. Photo-point 12 (plains near Dassiepoort waterhole) in March 2011

Figure 2. Photo-point 12 in March 2014

Figure 3. Photo-point 16, Dassiepoort waterhole, in May 2011

Figure 4. Photo-point 16 in March 2014

Gammy Sikongo, June 2014

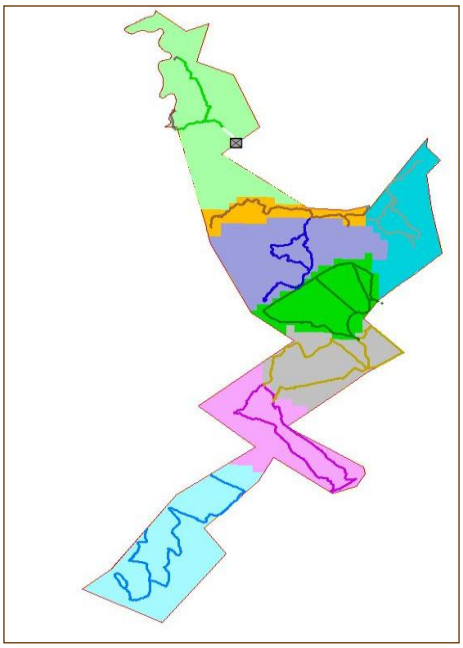
Gammy has also been responsible for conducting research into demography and population dynamics of the Quiver trees in GCP. Below he summarises the latest findings:

An annual survey of young quiver trees was carried out on 31 March and 1 April 2014. Six plots, comprising three 1ha areas from two habitats- the incised rocky hills and the plains- were surveyed. All previously marked seedlings/saplings from earlier years were re-measured and an assessment of their health status was carried out. Seedlings which germinated after last year's survey and before 31 March 2014 were also measured and recorded. Data included in the analysis covers 2006 to 2014. In general, recruitment has been higher than mortality in the Plains habitats, indicating an increase in population at a rate of 24% (2009-2012), 35% (2012-2013) & 104% (2013-2014). The Incised Rocky Hills on the other hand has shown a reduction at a rate of 36% in 2012-2013 then an increase of 5% (2013-2014). Generally, all the surviving seedlings increased in height with the exception of the Plains habitat during 2012-2013. Most of the seedlings were found to be in good condition ranging from 56 - 95 (on a scale of 1-100 where 100 is the most healthy) with the Plains reaching the highest, 95 in 2014 and the Incised Rocky Hills 84 in 2012. As the survey took place a few weeks after the rainfall in 2014, this may have contributed to the high recruitment in the plains as seedlings can germinate shortly after meaningful rain. The Incised Rocky Hills were found to have fewer or unsuitable nursing plants which may have hampered recruitment, combined with the shallow soil of rocky substrate. Most seedlings/saplings in fair and poor conditions were found to be wilting from 'top-down' which may indicate a physiological adaptation employed by the species to retain water within the plant during prolonged periods of water-stress. This adaptation, however, may result in desiccation of the plant after consecutive periods of drought or a lack of moisture. The preliminary results indicate that such signs shown by plants could be a potential long-term indicator of climate-induced stress. Climatic and biological factors such as temperature, nursing plants and herbivores may interact with rainfall to determine the conditions suitable for recruitment and survival.

Gammy Sikongo, June 2014

Annual Game Count

The twelfth Annual GCP Game Count took place on 25th May along the eight usual routes.



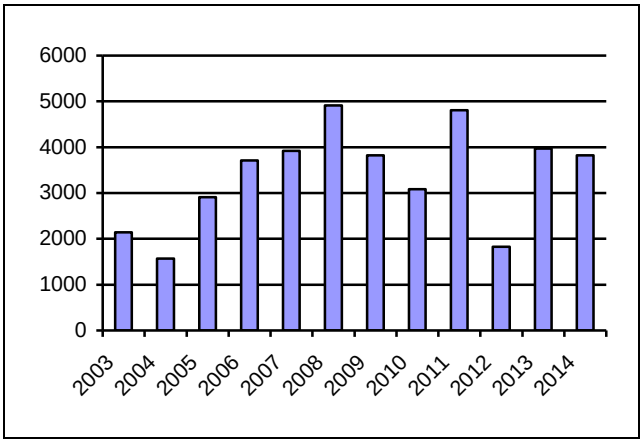
Map and legend of GCP showing Game Count Routes

The results from the count indicate that game populations are recovering from the drought conditions that were experienced during 2013. Gemsbok and Kudu numbers increased and Springbok numbers did not fluctuate very much from the previous high total of 3970 in 2013, if the fact that 123 were taken off to help relieve pressure on grazing and water during the dry conditions, is taken into consideration.

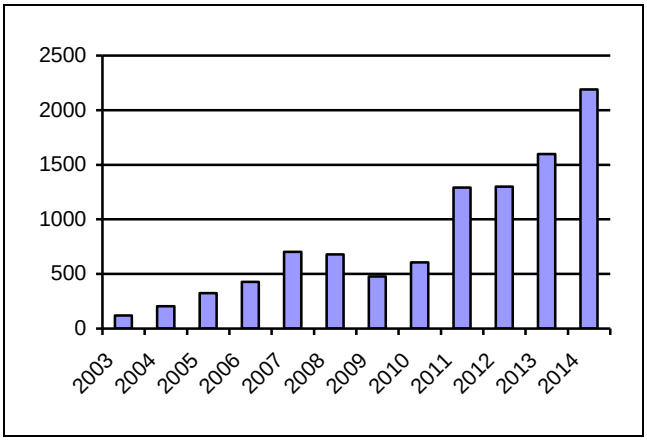
From the figures, it would appear that Red Hartebeest numbers have decreased. However Red Hartebeest are hardy animals that can withstand harsh conditions, and so a more likely explanation for the apparent decrease in Red Hartebeest numbers is that one fairly large group of animals was not observed during the count. Routine park patrols carried out during 2014 would suggest that Red Hartebeest numbers remain the same or have increased during the past year, and some have even spread onto adjoining properties as well as the National Park.

	Year											
Species	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gemsbok	121	204	325	426	703	679	477	607	1291	1299	1597	**2191**
Springbok	2141	1567	2906	3711	3922	4910	3825	3087	4809	1828	3970	**3826**
Kudu	473	321	507	871	935	615	831	771	869	1448	877	**1119**
Steenbok	404	284	195	334	416	232	343	141	193	482	263	**415**
M. Zebra	32	216	252	235	408	401	339	553	417	793	1656	**1550**
Ostrich	164	166	172	330	596	312	600	339	185	349	364	**542**
R. Hartebeest	0	31	12	9	4	78	57	240	138	129	314	**205**
Klipspringer	150	72	283	104	393	150	125	243	213	477	258	**114**
B. B. Jackal	0	0	36	35	119	74	10	13	282	171	53	**158**
Burchell's Zebra	Known numbers			8	13	38	30	41	51	60	71	**71**
Blue Wildebeest	Known numbers						34	46	86	155	170	**170**

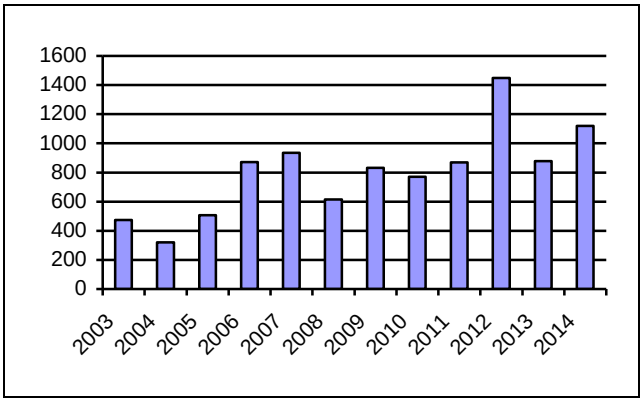
Table (above) and graphs (on next page) showing Wildlife Population Estimates 2003-2014 in GCP from Annual Game Counts



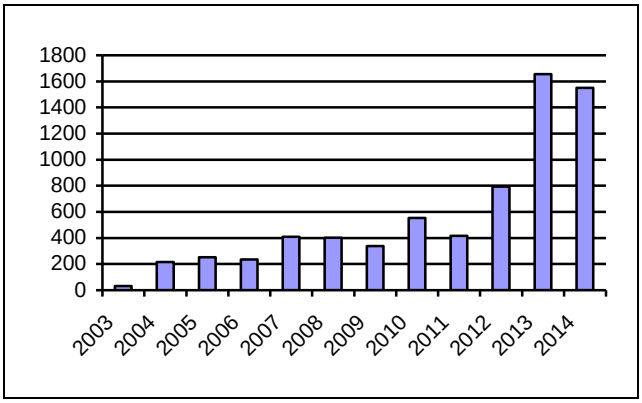
GCP estimated Springbok population



GCP estimated Gemsbok population



GCP estimated Kudu population



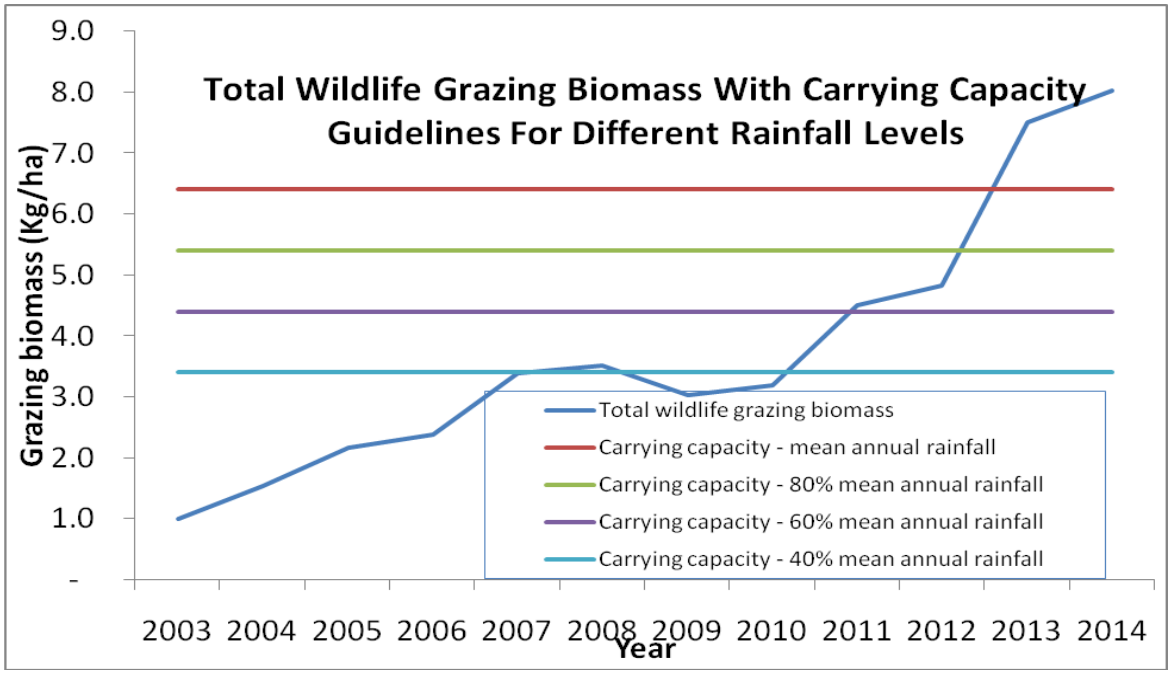
GCP estimated Mountain Zebra population

Although Mountain Zebra numbers decreased slightly, many of those that came into the park during 2013 remained, rather than returning to the rocky mountainous areas of the Fish River Canyon that they have traditionally inhabited. A closer analysis of the Mountain Zebra data shows that the largest changes in Mountain Zebra numbers have occurred in the south of the park during the last few years. This is illustrated in the following table:

	Game Count Route Number								
Year	1	2	3	4	6	7	8	9	Total no. seen
2010	0	7	2	0	56	41	0	9	155
2011	0	0	4	0	33	23	0	16	76
2012	0	35	8	39	58	45	8	2	195
2013	0	111	51	53	47	84	28	23	397
2014	0	105	12	0	77	18	19	41	272

Total numbers of Mountain Zebra seen during GCP Game Count 2010-2014

For the past two years, over a hundred animals have been counted on Route 2, in the most southern area of the park during the Game Count, making it now the route containing the highest number of Mountain Zebra. Professor Morris Gosling, who has been studying the Mountain Zebra in GCP for many years, concentrating on the northern section, has now put four camera traps up in the south to monitor the population there and to examine whether there is movement of Mountain Zebra between the northern and southern areas of the park, or whether ecological and/or physical barriers such as neighbours' fences are preventing this.



As the graph above illustrates, the total wildlife grazing biomass still exceeds the carrying capacity for the park, even when mean annual rainfall occurs. Therefore the area will continue to need careful monitoring over the next twelve months.

We would like to thank all the Game Count participants for taking part in this important exercise. We would also like to thank the lodge managers, Anja, Johann, Mattanja, and staff from the Canyon Collection for hosting the participants and Charles, the Operations Manager for helping us with the logistics. We look forward to seeing everyone next year for the thirteenth Annual Game Count.

Game Count participants on Route 1 taking a break

In addition to the Annual Game Count, quarterly game counts were carried out in June on two of the same routes. On Route 1(Frankfurt Plains), numbers of Gemsbok per 100km showed a large increase between 2013 and 2014, and Springbok numbers increased rapidly from May 2014 (Annual Game Count) to June 2014, as animals took advantage of the better grazing conditions in the area where the most recent rains occurred.

	Numbers per 100 km on Game Count route 1, May & June							
	Kudu	Gemsbok	Springbok	Steenbok	Klipspringer	Ostrich	Mountain Zebra	Black Backed Jackal
2013 June	6.5	13.0	28.1	4.3	8.7	26.0	10.8	2.2
2014 May	6.5	210.0	39.0	8.7	8.7	8.7	0.0	0.0
2014 June	0.0	229.4	359.3	0	4.3	47.6	39.0	2.2

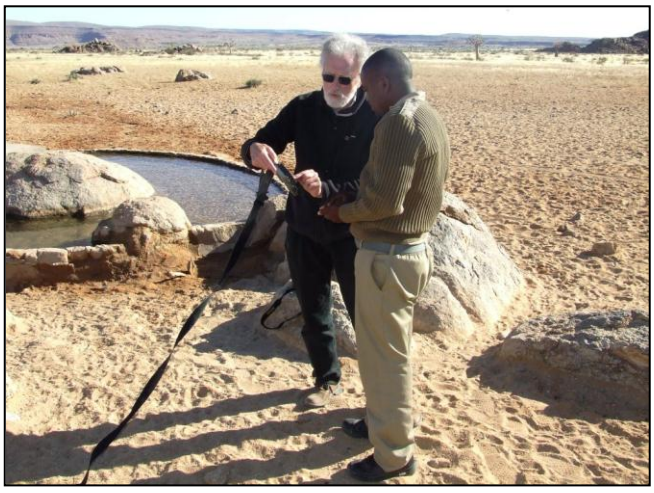
Numbers of animals per 100km on Game Count Route 1 (June 2013 to June 2014, including Annual Game Count May 2014). Route length 46.2km

The major difference in the results for Route 8 (Holoog) when comparing 2013 with 2014 is that the numbers of Mountain Zebra have decreased. This is possibly due to them returning to the Fish River Canyon area after 2014 rains, as they now no longer have to rely on the artificial waters in GCP to supply them with their daily requirements. Gemsbok numbers also fluctuated from a high of 200 per 100km during May 2014 to 31.3 per 100km in June 2014.

	Numbers per 100 km on Game Count route 8, May & June							
	Kudu	Gemsbok	Springbok	Steenbok	Klipspringer	Ostrich	Mountain Zebra	Black Backed Jackal
2013 June	62.5	62.5	40.6	3.1	9.4	53.1	93.8	3.1
2014 May	62.5	200.0	9.4	3.1	0.0	0.0	59.4	9.4
2014 June	53.1	31.3	0.0	0.0	0.0	0.0	18.8	3.1

Numbers of animals per 100km on Game Count Route 8 (June 2013 to June 2014, including Annual Game Count May 2014). Route length 32.0km

As previous mentioned, Professor Morris Gosling spent some time with us during June. He put up camera traps at Fourie se Gat, Steenbokwater, Kanebis and Quaggagat to monitor Mountain Zebra movements in the south of the park. He also gave valuable training to Assistant Warden Eddy Shipulwa and Ranger Epafras Akwenye on setting up camera traps and data retrieval.



Prof. Morris Gosling showing Eddy and Epafras how to program and mount the cameras correctly.

Although this monitoring program has only just started, some interesting preliminary data has been obtained, as described by Professor Gosling below.

Mountain zebra in the south of Gondwana Canyon Park

The annual road counts carried out throughout GCP showed a startling increase in the number of mountain zebra between 2012 and 2013, jumping by 109% from 793 to 1,656. While there was some decline in the 2014 count, numbers have remained significantly higher than in 2012. To put this into context, estimates from camera trapping in the northern region of GCP suggest that since 2005 population numbers increased by about 20% per annum although this rate has slowed in recent years. This is probably the maximum intrinsically possible in an arid environment where the two main predators of zebra, lions and spotted hyena, are still absent after being eradicated by people in the years before the Park was created. Thus, an increase of 109% cannot be the result of intrinsic population increase and, if the estimates are correct, they must be largely the result of movement into GCP.

But are the estimates correct? All census techniques are subject to statistical error and mountain zebras are particularly difficult to count using conventional road counts. These census techniques are extremely useful for easily visible species such as oryx and springbok but mountain zebra are notoriously wary and groups often take evasive action to avoid being seen, either running down into gullies or disappearing over hill crests, sometimes in response to the sound of an approaching vehicle and in advance of its appearance. Thus animals are most likely to be seen close by when they cannot escape detection or far away when they are less concerned. The escape behaviours described occur at intermediate distances and so the detection curve away from the transect line is 'U' shaped. This distribution may be further distorted by the tendency of mountain zebra to walk along roads and thus bias the number seen. These factors make distance sampling prone to error in this species and it is advisable to check with other techniques when feasible. However, despite this important caveat, the main changes in abundance revealed by the ground counts probably reveal a real trend and this will be assumed here.

The extent of the increase in numbers between 2012 and 2013 shows marked differences between different parts of the Park. In the area where we have been carrying out intensive camera trapping at water holes in the north of the Park the increase was relatively low. Thus, in the area sampled by ground count routes 4, 6 and 7 the increase from 2012 to 2013 was about 19%, a value that could be explained by intrinsic increase. However, in the extreme south of the Park, the area counted by Route 2, the increase was 216%, from an estimated 183 up to 579. An effective trebling of numbers cannot be accounted for by intrinsic increase and must be due to movement. But from where? The obvious suggestion is for movement from Fish River Canyon which lies close to the west, and more generally the Ai-Ais Park which stretches far to the west and into the Hunsberg mountain complex. But there is no direct evidence for this and it is also possible that some animals have moved from other parts of GCP.

In an effort to explore these alternatives we have started a camera trapping exercise in the south with four cameras at Kanebis, Steenbokwater, Quaggagat and a seasonal water hole, Fourie se Gat. These cameras have been in operation for only 2 weeks and so the results are very preliminary, but, with this proviso, a pattern is emerging. The study is using individual recognition from stripe patterns as in the north. When good enough images are obtained, animals are checked against existing records and, if new, new identities are established. Progress is slow at the start because mountain zebra are very nervous when confronted

with the novelty of a camera trap. But, to date, of the images good enough to set up new identities 42 have been new and two known. In addition, 20 images have been checked that are not good enough to set up new identities but are good enough to decide with certainty whether the animals has been identified previously during camera trapping in the north. Of this latter group all are new. So out of a total of 64 (so far), 62 (97%) have never been seen in the study area in the northern region. The exceptions are two bachelor males, ZR492m and ZR632m. ZR492m was first identified at Jakkalsdam in the northern region in January 2011 and photographed in recent days at Steenbokwater in the south, a straight line distance of 43kms away. ZR632m was been seen at Jakkalsdam, Jagpos and Stamprivier in 2012 and 2013 and then, like ZR492m, at Steenbokwater this June. If considered as the proportion of the northern population that are detected in the south, then two out of 544 (the average number identified in the north over the three years that the two males were known to be in the north) gives 0.4%. In terms of the distance moved by these two males, these movements are records for distances covered by individually known animals in our camera trapping study.

Much remains to be done but these early results suggest that the threefold increase in mountain zebra in the south of GCP did not originate from elsewhere in the Park. While we do not have direct evidence for movement from the Ai-Ais Park, the conjecture that this is their origin is strengthened by these results. The remarkable cases of ZR492m and ZR632m, show that mountain zebra *can* move from the north of the Park to the south, but the rarity of known animals (3% so far) shows that, in general , they do not. This raises a number of questions including the possibility that the plains which separate the mountains around the Lodge in the centre of the Park and the mountains in the extreme south, constitute a partial barrier to movement. Most important these results reinforce the view that the mountain zebra of GCP are only a part of a larger population that extends through to the Hunsberg mountain complex and the Ai-Ais-Richtersveld Transfrontier Park. This poses further questions that need to be answered for scientifically-based conservation management. How large is the whole population and what factors limit its numbers? What proportion of the wider population is in GCP at any one time and what factors are responsible for movements from west to east and back again? These questions also emphasise the importance of maintaining, and hopefully increasing, open systems that allow mountain zebra to move freely, particularly across the boundary between the Ais-Ais part of the Transfrontier Park and Gondwana CP and across borders with other friendly neighbours, in response to local variation in rainfall and grazing conditions. The Greater Fish River Canyon Landscape project (which is running with GEF funding under the MET) is well placed to provide a framework for these movements on which healthy mountain zebra populations depend.

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Morris Gosling
27 June 2014

Figure 1: Mountain zebra near Quaggagat in the south of Gondwana Canyon Park. The animal with its head held low in the centre of the photograph is the breeding group stallion who is threatening the five bachelor males (top of the photo) to keep them away from his harem of three adult females and their offspring (bottom of photo). Photo © L.M.Gosling

Human Resources, Information and Training

The Dorian Haarhof story-telling workshop held at the Lodge on 10th and 11th May was attended by Sue, Gammy and Eddie.

Sue had an immensely informative recce of GCP with Reini in the gyrocopter on 10th April.

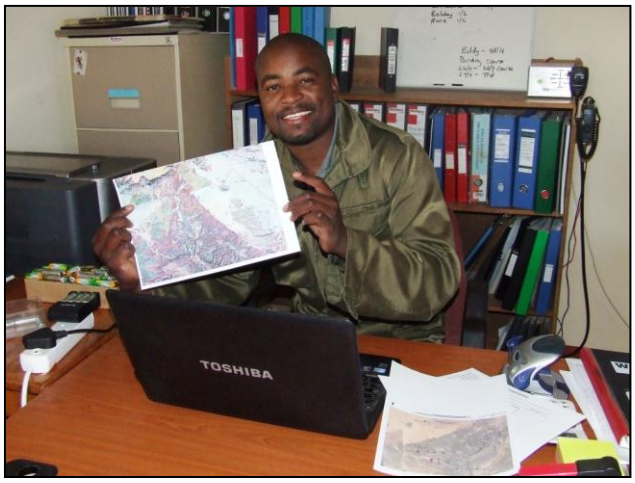
Sue preparing for take- off

!Gab River from the air

Trygve took two days' leave to attend the Brown Hyena Research Project (of which he is a Trustee) AGM in Luderitz 20 – 21 May.

A meeting was held at Park HQ on 22nd May between us Gondwana staff and the local Chief Control Warden, Warden and Ranger from Keetmanshoop, Ai-Ais and Hobas MET, to familiarize them about our rhino monitoring methods and management, and as from then they endeavour to accompany our staff whenever possible to assist with the custodianship program and tracking each week.

Senior Rangers Ignatius Sikongo (Gammy) and Edmund Shipulwa (Eddy) were promoted to Trainee Warden (Kalahari Anib Park) and Trainee Assistant Warden (Canyon Park) respectively as from 1st June. Both of them have made a great start in their new jobs and they will continue to be supported in their new roles by Trygve and Sue.



Eddy producing his first map using GIS technology & Gammy arriving at his new home, Kalahari Anib Lodge

After his first month in charge, Gammy has produced his first report on the current status of Gondwana Kalahari Park (GKP). From September he will be producing his own Quarterly reports that will be completed to the same format as the GCP report. In the next GCP report Eddy will give his impressions of the first few months as Assistant Warden for GCP.

Gondwana Kalahari Park's brief status report – June 2014

Between familiarization of the park and settling in, including three days on site with Trygve and Sue, the first two weeks were spent inspecting the boundary fence-line and waterholes. With the help of Manni Goldbeck and Greg Stuart-Hill, a round trip in the park was undertaken which involved visiting sites of particular interest. The trip also included an assessment of the veld, which appears to be in good condition. In addition, vegetation was cleared from Witputs windmill and all three solar panels, to minimize the impact of damage in the event of fire. Cables and water pipes were dug in at all three solar pumps with redundant fencing and pipes removed from Kalahari Pos (fence) solar pump. A total of four dumping sites were marked on the GPS and a start was made on GPSing all populations of and individual *Prosopis* in the park. The park Landover received a new alternator and the game viewing seats were removed to make it more suitable for field work.

Most of the waterholes require extra reinforcements (sand on the sides is being eroded) and to make them more user- friendly especially to the crawling creatures, and birds -particularly ostrich chicks. A couple of new ones may have to be built and some will require closing down, especially the troughs which are too close to each other. Some water tanks will have to be moved to areas where they do not impact on aesthetic views or where the impact can be minimized.

Gammy at one of the waterholes needing repair

At the moment a fire outbreak will be difficult to control as the grass biomass and cover is high and looking very dry. Alternative ways of preventing or minimizing fire have to be looked at and dealt with immediately. Fire breaks along the fence are urgently required to minimize the chances of fire and to adhere to the legal requirements of fire breaks in reserves and farms.

The vegetation cover looks “much better” compared to the same time last year. Gravel/rocky habitat is predominated by perennials such as *Stipagrostis uniplumis (silky bushman grass)* and *Stipagrostis ciliata* (tall bushman grass) with a fair amount of annuals such as *Enneapogon desvauxii.* Contrasting with this, *Schmidtia kalihariensis* (Kalahari sour grass) is abundant in the sandy habitats.

Animals appear to be in good condition with plenty of grazing and browsing available. Groups of sub-adult oryx are regularly seen totaling from 10-15 animals per sighting with typically one or two adult females among them. Springbok and ostrich account for the highest portion of wildlife biomass with a healthy population of bat-eared foxes being seen frequently and, although only occasionally seen, the park supports a reasonable aardwolf population. Two camera-traps were put up at Witputs and Soloms waterholes to monitor the presence of rare and endangered species. This will also assist in the monitoring of animal condition and sex-age ratio. Recorded mortality so far totals six: five ostrich chicks (in a space of five days), of which one was rescued drowning in Soloms waterhole, and a sub-adult kudu bull of which the cause of mortality is unknown. This again indicates the urgent need to make the waterholes more user friendly, or at least put rocks or logs in to aid the animals in getting out when they fall in.

Gammy inspecting the veld and *Prosopis* growth

The main alien plants in the park are *Prosopis spp.*, pepper tree, cactus and *Datura*. Whereas *Prosopis* is spread out virtually in every corner of the park, pepper trees and cactus are more confined to the lodge area, and *Datura* plants were only seen at Witputs waterhole thus far. However, large numbers of *Prosopis* are located at waterholes and areas historically used as settlements. One thing to be looked at is how to deal with *Prosopis* which are very close to the fence but located on the neighbouring farmers' land. These are highly probable to spread (seed dispersal) and re-colonize cleared areas or other areas in the park, especially when the river is in flood. One challenge is whether farmers are willing to get rid of these plants which are seen as part of fodder in most farmers' eyes. Courtesy of lodge staff, under Mariete's and now under Harald and Daniella's supervision, most cactus has been removed with the rest planned to be finished by the end of the month or early next month.

Gammy Sikongo

June 2014

General

A netball field was created adjacent to the existing football and volleyball facilities at Holoog, as suggested by the lady staff of the lodges in GCP so that they and the MET staff from Hobas and Ai-Ais can also do battle in future clashes.

Trygve and Sue Cooper
Chief Wardens, Gondwana Parks
2014/06/30
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