



TO CONSERVE, PROTECT AND EDUCATE

## Welcome to our second issue

Temperatures are soaring in the Makgadikgadi, with dust storms and fires dominating the horizon. The zebras and wildebeest have moved on in search of water and days can appear completely desolate of life. The resilient brown hyaenas are well adapted to these inhospitable conditions, sleeping in underground dens during the day and foraging during the

cooler temperatures of the night. In order to study these animals, we too have had to become creatures of the dark!

Our September darting session led to the successful collaring of two large males. These males are now slowly becoming habituated to our presence and have led us to our first active den. Infrared camera

traps at the den site led to a delightful discovery earlier this month—footage of three six-month old cubs inspecting these strange devices! We have now identified at least seven different individuals in the area.

Check out the rest of issue for details of the collaring and current experiments running.

### IN THIS EDITION

- TWO HYAENAS COLLARED
- DISCOVERY OF ACTIVE DEN
- HAIR TRAPS
- NEW SPONSORS
- SOLAR PANELS



*Top left to right: Active den with scattered bones; solar panels installed in camp; building hair traps. Bottom left: A young hyaena caught on camera trap returning to the den. Bottom right: The second collared male 'Enrique' having his satellite collar fitted.*

### Collaring

September was an exciting month for the Makgadikgadi Brown Hyae-na Research team, with the successful collaring of two browns. In preparation for the darting, we set up an offal station to start luring browns to the trap site. A 'honey pot' (a container filled with rotting offal and water) was prepared and small amounts emptied near the trap site each night. Camera traps set up around the area assured us that at least two individuals had been tempted in by the 'tasty' bait. After an entire week of diligent pre-baiting, we set up an oryx carcass surrounded by leg hold traps and began our nightly shifts on 'carcass watch'. Our first hyaena was caught in early hours of the morning on our first trap night. Browns are usually silent, so we were completely taken aback when our first trapped hyaena growled as loud as a lion! He has since been appropriately named *Rumble*. Our second hyaena was caught the following night at around 11 pm. In contrast

to *Rumble*, this hyaena crept in silently and calmly continued to eat after becoming trapped. We named him *Enrique*.

Once captured, the hyaenas were darted by a Botswana registered vet, Mark Bing. As soon as the tranquilliser drugs set in, the traps were removed and the hyaena was weighed, sexed and aged by tooth condition. They were given a body condition score and hair, blood, skin and faecal samples taken.

*Rumble* was approximately 7 years of age and weighed 42 kilograms. He was in relatively poor condition with missing teeth and many ecto-parasites. *Enrique* was much younger (about 3 years of age) and in extremely good condition, weighing a healthy 48 kg.

After each of the males had been collared with GPS satellite collars, an antidote was administered and both were up and running within 10 minutes. We checked their lo-

cations the following morning and discovered that they had moved almost 40 km in under four hours! While both males were caught outside the park it has since become apparent that they are in fact residents from clans within the Makgadikgadi and Nxai Pans National Park.

On behalf of Makgadikgadi Brown Hyaena Research we would like to give a big thank you to our dedicated Veterinarian *Mark Bing* for assisting with the darting session. Also to the enthusiastic volunteers – *Daniela Binder, Celine Steinfeld and Josh Iremonger* who worked tirelessly under the most stressful conditions with no sleep, constant horse fly bites, intense temperatures and the incredible stink of rotting offal. A big thank you from Camp Stink!

*See page 3 for photo gallery*

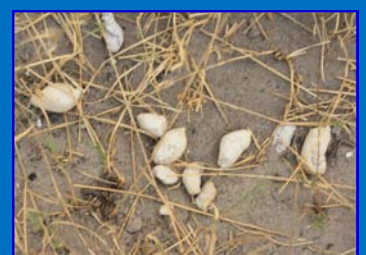
### Did you know?

As scavengers, brown hyaenas feed on the carcasses of animals that have been killed by predators such as lions. Browns are well adapted to eating leftovers; they have incredibly strong crushing power in their jaws and have stomach acids strong enough to

break down bones. The brown's faeces are white and chalk-like, composed of mainly calcium carbonate. Other animals in the environment such as vultures and tortoises eat this and use it as an important element of their diet. For example, vultures require this calcium

source for egg shell development. This interaction is so important that in areas where hyaenas have been removed or driven out, there has been a local extinction of vultures. Brown hyaenas therefore play a key role in the ecosystem. In science, this is referred

to as a *keystone species*, i.e. a species that influences the number and distribution of many other animals.



## COLLARING PHOTO GALLERY

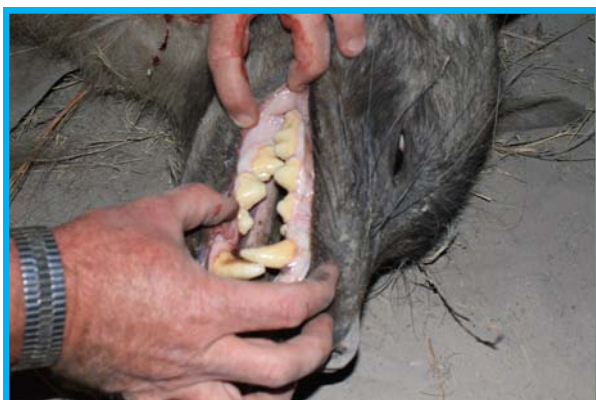


**Figure 1:** Traps staked into the ground surrounding the bait (an oryx carcass).

**Figure 2 (right):** Hyaena researchers drag a bag of offal adding liquid from the stink pot (bucket of rotting offal and water) to create odour trail.



**Figure 3:** Blood samples are taken for genetic testing.



**Figures 4 (left) & 5(right):** Teeth are used to age hyaenas. Rumble (right) is a much older male than Enrique (left) as he shows a higher level of tooth wear, especially on the pre-molars.



**Figures 5 (left):** Hyaena researcher Viyanna Leo with Rumble just before administering a recovery drug to wake him.

**Figure 6 (right):** Tracking Rumble just before sunset, after discovering his sleeping locating.



**Figure 7:** Rumble is finally located late into the night.



**Figure 8:** Collaring team from camp stink share a proud moment as they celebrate after the successful collaring.

### Follows and Habituation

With the amazing new technology of Iridium Satellite collars it is possible to locate the exact GPS location of the browns via emails. To maintain battery life the collars are programmed to send a GPS fix every hour from 6pm until 7am, while they are active. This not only enables us to locate them but also to analyse interactions of the browns by overlaying the GPS points onto a map. As there is no email access in camp, a few dedicated volunteers in town take turns in looking up the coordinates for me and sending via texts. We then put these coordinates into the GPS and determine which hyaena is the best situated to locate for the evenings follows.

Habituation is a process whereby you familiarise the study animal with your presence to the point in which they resume normal behaviour, unaffected by the presence of the observer. Browns are a wonderful study animal due to the fact that they habituate easily, making it possible for their natural foraging and scent marking behaviour to be recorded. Follows are conducted at around 10 meters behind the brown. If they become startled, we immediately stop the car and turn off the

engine until they calm again to a slow walk. This process eventually leads to the browns being so comfortable that they rarely notice the car or get disturbed by it. As browns are nocturnal, follows begin just before sunset and finish at sunrise. During follows scent marking locations are recorded as well as samples taken. Any interesting behaviours or interactions are also noted. Both Enrique and Rumble are in the process of being habituated and we look forward to the wealth of knowledge these two individuals are likely to uncover about the species.



Figure 9: Cache of bones at den site



Figure 8: Makgadikgadi Sunset

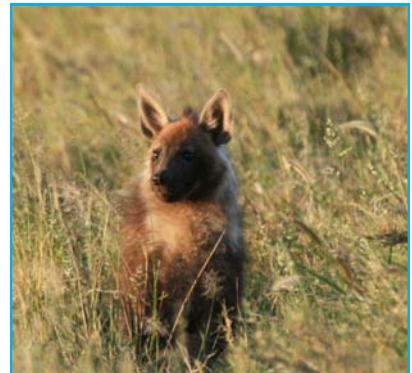


Figure 10: Young hyaena emerges into the sunlight



Figure 11: The new den at sunset

### Active Den and Cubs

The discovery of an active den site is a huge development in the project with a total of five new browns now encountered. The den site was discovered while on the very first follow of 'Rumble', inside the national park. While searching for his resting spot we magically came across a huge den entrance with scattered bones covering the large expanse of the den opening. Indications of an active den site are a cache of bones (browns carry the left over pieces of carcasses or bones back to the den where they store them for later sources of food) and extensive latrine sites where they deposit their distinctive white faeces. With fresh tracks and no cobwebs over the entrance, it was a sure sign that the browns were regularly visiting the den. Active dens are incredibly difficult to locate and provide a great source of behavioural and genetic data. We are currently in the process of habituating the hyaenas at the den site.

## Extract from hyaena diary entry

*With great excitement and anticipation we parked the car 100 meters away from the den to begin a stakeout. After only two hours of waiting we were rewarded with a single adult hyaena returning to the den just before sunset. The following night a sub-adult came to the den surprising us by coming within 10 meters from the car and scent marking right in front of us! Sub-adults are typically naïve and therefore not as nervous as adults.*

*On the third day we placed four camera traps at the den to see if there were any occupants of the den that we were not seeing during our stakeouts. Two traps were placed directly at the den entrance on video mode while the other two were put further away on alternate side of a small walkway. These cameras were put on photo mode to get identification photos of the hyaenas coming in to the den. This led us to the most exciting discovery so far... after bringing in the cameras we found we had over an hours' worth of video footage of three cubs playing at the den! The cubs enjoyed playing with the camera traps, pulling out the posts and chewing on the straps. It must have been a great find to have new toys right at the den entrance. From watching this wonderful footage we have since been able to determine that the cubs are around 6 months of age. This means that we know of at least six individuals using the den; mother, sub-adult and cubs, and our visiting male Rumble, who is the possible father. As there are no genetic studies showing relatedness within clans, this provides a unique opportunity to obtain DNA to verify relatedness within the clan. As we already have Rumbles DNA, it is now possible to verify whether he is the father of these cubs and the sub-adult.*

*I have named this the storm clan, as on the night of the discovery of the den there was a huge storm which swept across the savannah land. I would like to give an official welcome to the new additions to the study, the cubs - Thunder, Lightning, and Rain, the adult - Tempest and The sub-adult – Nimbus. This makes the naming of Rumble even more appropriate.*



*Top left to right: A camera trap catches the first glimpses of the young cubs, Thunder, Lightning and Rain.*

*Bottom left to right: Adult hyaenas come in to investigate the delicious smell of rotting offal in the 'stink pot'.*

## Den Study

For the next part of study, we will be investigating the resource requirements of brown hyaenas by analysing den habitat selection relative to availability. Surveys will involve sampling available dens along transects within each clan territory. Several variables will be recorded at each den site, including entrance diameter, hiding index, visibility from den, elevation, direction of den entrance, level of use and habitat type. Transect locations will be randomly selected and all dens encountered with a diameter larger than 40cm x 40cm will be counted as possible refuge. This data will enable us to determine what requirements browns have for choosing den sites. This is important because, with increasing habitat fragmentation and the addition of new fences breaking up populations, it is essential to understand the resource requirements of the browns, and specifically what aspects are important for them to be able to make breeding dens and hence continue reproducing.



Figure 12: Den entrance

## Hair Traps

We have designed traps to collect hair samples from browns that will be used for genetic analysis. These traps are built against escarpments and covered in barbed wire. A bait is used to lure in the browns, in the hope that root hairs will be left behind as the browns brush passed the wire. This will give me live DNA cells for analysing. Camera traps, placed at each hair trap, will enable us to individually identify which hyaena leaves the hair. This data will enable us to determine how each member within a clan is related.

Understanding the genetic composition of the hyaena clans is very important as many factors of hyaena behaviour are solely assumptions based on observations instead of scientific data. Obtaining genetics of the individuals within clans will enable us to essentially create a family tree and draw definitive conclusions about their behaviour



Figure 13: Hair trap for obtaining samples

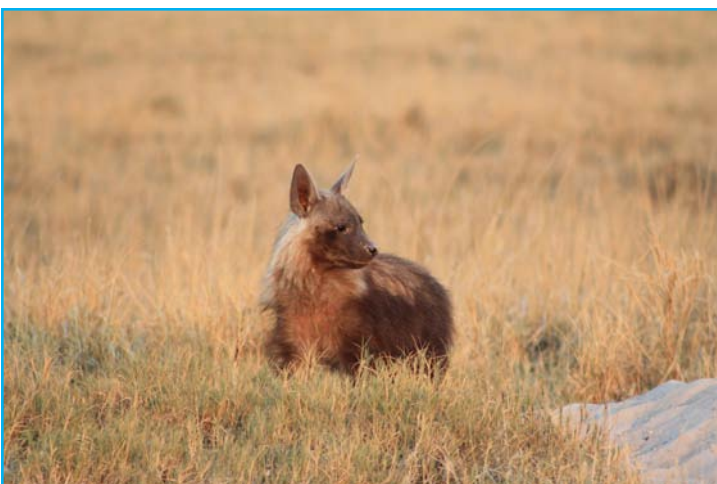


Figure 14 & 15: Sub-adult - Nimbus investigates around the den before a night of foraging.

## HOW TO BE INVOLVED...

Despite the wonderful support this project has already received so far, we are continually seeking funding for equipment and ongoing costs of the project. We are currently trying to secure funding for four extra satellite collars. This will enable us to track at least one individual from each of the six surrounding clans. In addition, 20 camera traps (currently on loan from the University of Sydney until December, 2011) will need to be replaced for the remainder of the project.

If you are interested in sponsoring a hyaena or able assist funding of the project in any way, please see below budget for placement of donations and contact details. Arrangements can be made for donation can be made through a tax deductible organisation

*Approximate Estimation for 12 months of research*

Items/Outlay	Cost (US \$)
Tracking Equipment – Antenna	750
Satellite collar	6,500
Camera Trap	500
Veterinarian (per session)	1800
Flights (Botswana-Australia)	1700
<b>Ongoing costs per month</b>	
Fuel	470
Airtime for satellite phone	100
Collar downloads	150
Food (including volunteers)	270

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## SPONSORS...

A big THANKYOU to the new project sponsors Wilderness Safaris and Denver Zoo who have greatly contributed towards the cost of the satellite collars on Rumble and Enrique. These collars have pushed the project forward in leaps and bounds. Also yet again thank you to Kanabo Conservation link for the continued support of this project with the installation of solar power into the research camp.



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