



Annual Report 2003

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1. Telemetry of brown hyenas

The coastal Namib Desert brown hyenas are ecologically unique, as they scavenge and prey almost exclusively on Cape fur seal pups, which are born at mainland seal colonies, and which are a concentrated, permanent food source. No other large predators occur in our study areas and therefore the brown hyenas are the apex predators, with their only competitors being black-backed jackals.

Desert environments such as the Namib Desert are difficult to access, which restricts the determination of movement patterns of far ranging predators. Brown hyenas are known to have vast home ranges of up to 461 km² (Mills 1990) and recent home range estimates in the Central Kalahari have shown, that individuals even use an area in excess of 1000 km² (Maude pers. comm.).

The only home range estimates available for the Namib Desert of 107 km² and 220 km² were calculated in 1986 (Goss 1986) through radio tracking brown hyenas from a vehicle. The Brown Hyena Research Project has been radio tracking brown hyenas between the port of Lüderitz and Elisabeth Bay in the south since 1998. The limited network of roads, the strict ban of off-road driving and the fenced border of the Sperrgebiet create a bias towards radio fixes, received close to existing roads.

In order to overcome these difficulties and resulting biases, we decided to combine vehicle tracking with aerial telemetry. Since the beginning of 2003 tracking flights are carried out approximately every three weeks, weather dependent, with the support of Sidewinder Films/NNF. We started to track three radio collared brown hyenas of two different clans and the success of the aerial tracking during the first year was great.

Up to date, eight brown hyenas are fitted with collars. These brown hyenas belong to four different clans, namely the Agate Beach/Anigab clan, Peninsula clan, Wolf Bay clan and E-Bay clan:

- Agate Beach/Anigab clan: a male and a female brown hyena are radio collared. The area stretches from the port of Lüderitz up to north of the Anigab Pan. No mainland seal colonies occur in this area, but washed up seals are available.
- Peninsula clan: two female brown hyenas are fitted with collars. The area comprises of the Lüderitz town lands and the Lüderitz Peninsula. No mainland seal colonies exist in this area, but a good amount of herbivores, washed up seals, carrion and refuse from the towns rubbish dump.
- Wolf Bay clan: a female and two male brown hyena are collared. A GPS collar of a male brown hyena was recovered recently. The area stretches from the bay Grosse Bucht just south of Lüderitz to just north of E-Bay. Two mainland seal colonies exist in this area.
- E-Bay clan: a female brown hyena carries a radio collar. The area stretches from Atlas Bay to south of E-Bay. Area possibly overlaps with Wolf Bay clan and therefore one mainland seal colony exists in this area.

The description of the areas is vague, as it is the aim of this study to obtain precise information about the brown hyena home ranges and movement patterns.

From our previous years studies, we discovered, that all den sites close to the mainland seal colonies have not been used since the start of our research project in 1995, although they were apparently still used in 1992 (Wolhuter pers. comm.). We suspect, that home ranges of brown hyenas of different clans overlap greatly in areas with mainland seal colonies and that they moved their den sites, hence territory boundary, further away from the concentrated food source. Therefore instead of expecting small home ranges due to the superabundance of food for two of our studied clans, home ranges will be larger and possibly the same size than for brown hyenas of the Anigab clan. The study of this phenomenon is one of the major aims of the radio telemetry project.

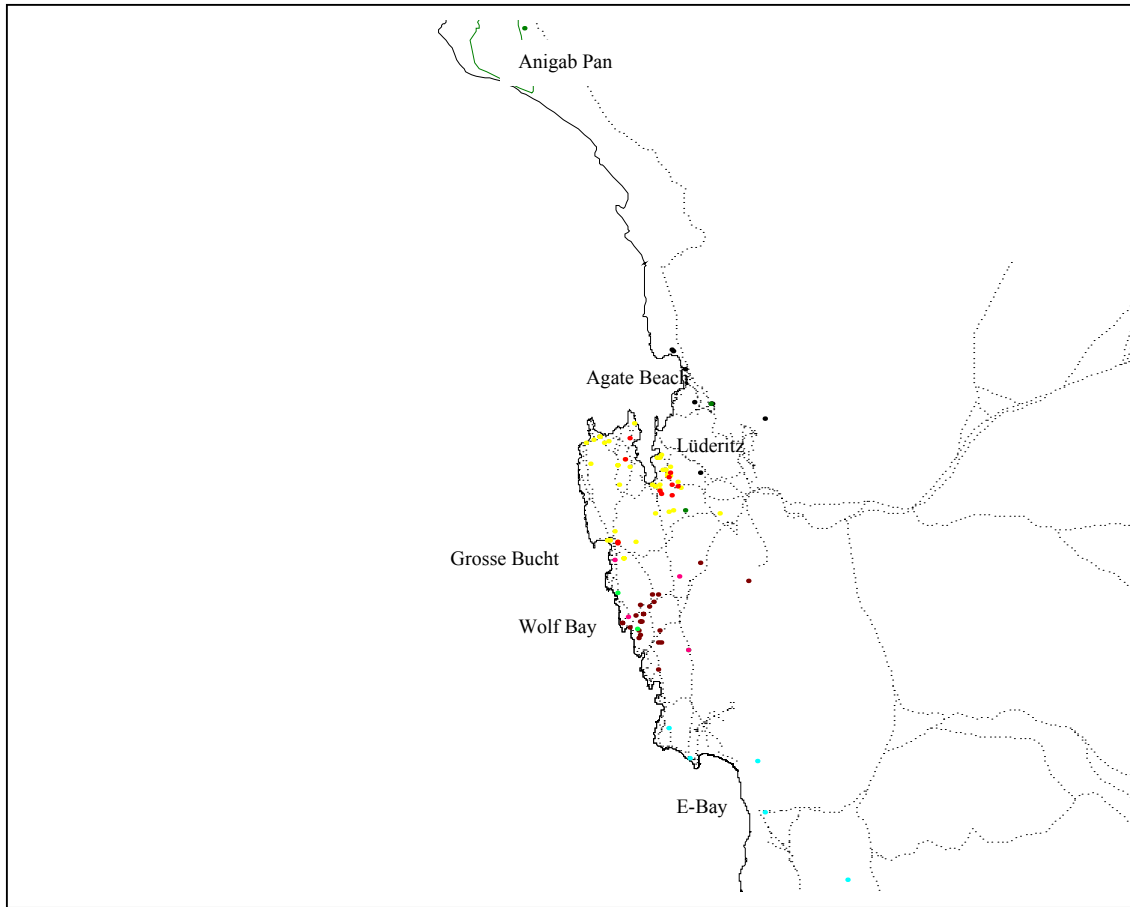
Map 1 shows the vehicle and aerial fixes of eight collared brown hyenas. The number of fixes is given in brackets. The map illustrates the extent of the study area. An accumulation of fixes can be seen in the coastal areas and on the Lüderitz Peninsula, where the network of roads is good.

GPS telemetry is initially extremely cost extensive. The combination of vehicle and aerial telemetry cannot replace the results obtained through this technology, but will provide the same home range information just over a longer period of time. Map 2 shows vehicle, aerial and GPS fixes of a male brown hyena LHb210RC. Vehicle tracking took place between December 2001 and August 2003, aerial tracking from April 2003 until January 2004 and GPS telemetry between August and September 2003.

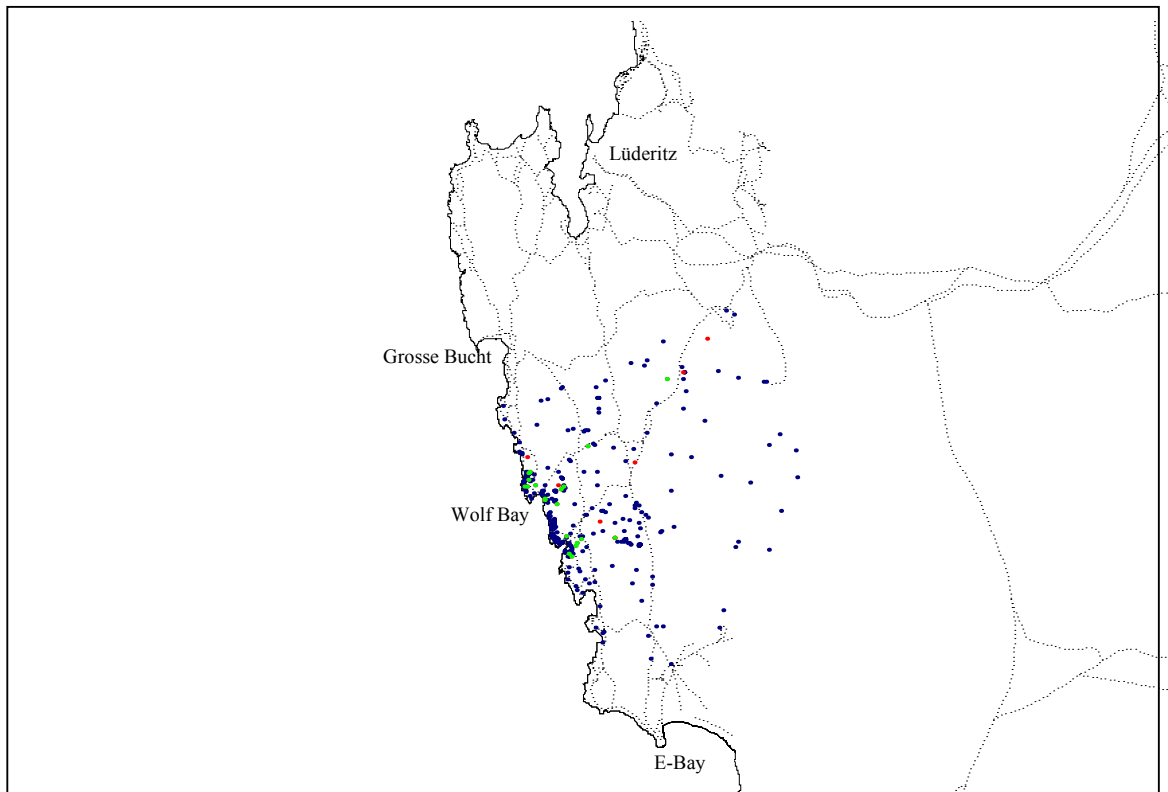
The battery life of two of our radio collars expires in November 2004. We need to replace the radio collar of LHb10 and fit another brown hyena of the same clan with a radio collar; otherwise no animals remain collared in the Peninsula clan by the end of the year. Furthermore we would like to fit a radio collar on a second brown hyena of the E-Bay clan as only one female is currently fitted with a radio collar.

By the end of January 2005 we will be able to give home range estimates for eight brown hyenas belonging to four different clans. We will also be able to present 3D figures of habitat use as well as give a first indication of territory boundaries. We will combine data obtained through radio telemetry with mapping data collected since 1995. If active den sites are found through telemetry during this year, we will also determine clan size and membership, through direct observations at dens and the establishment of a photo ID.

This study is partly carried out in collaboration with Duke University, USA. They provided the GPS collar and four radio collars for the study. We will purchase three additional radio collars for this year, which are sponsored by the Predator Conservation Trust in the UK.



Map 1: Positions of brown hyenas obtained through vehicle and aerial tracking (dark green: LHb23m (3); light green: LHb25m (3); black: LHb22f (8); light blue: LHb24f (5); dark red: LHb276RC (22); yellow: LHb10 (39); pink: LHb26m (4); red: LHb21f (12)). Scale 1:1 000 000.



Map 2: Positions of LHb210RC obtained from vehicle tracking (green (20)), aerial tracking (red (7)) and GPS Telemetry (blue (427)). Number of fixes is given in brackets. Scale 1:333 333.

2. Baker's Bay monitoring

The Baker's Bay monitoring project commenced in June 2002. As this area is part of Namdeb's Pocket Beach Mining Project, the Brown Hyena Research Project was asked to carry out a pre-/post impact study on brown hyena behaviour and population ecology. The first population estimate was higher than expected, as we could identify 12 different adult individuals, all in an excellent condition.

This high number of brown hyenas was worrying, as vehicle traffic would increase on the roads close to the seal colony due to mining activities. Together with Namdeb we worked out several mitigation strategies, such as strict enforcement of speed limits and reduced traffic during night time to avoid road-kills as much as possible.

Later in the year Namdeb decided to mine further away from the Baker's Bay area than originally planned (approximately 50 km further south) but that the brown hyena monitoring should continue. It is known that brown hyenas travel vast distances and that it is therefore possible that the mining will still have an impact on the Baker's Bay brown hyenas.

We received co-funding for this project from the Commercial Bank Go Green Fund and have already purchased a GPS collar to fit on one of the Baker's Bay brown hyenas. Another GPS collar will be fitted in year three of the study.

This project aims to intensively investigate the effects of diamond mining activities on the brown hyena population in the southern coastal Namib Desert. The results will substantially increase the knowledge of the behavioural and population ecology of brown hyenas in an ecologically unique ecosystem, the Succulent Karoo Biome, and will be applicable to land use planning and decision-making as new areas of the coastal Namib Desert are developed (mining and tourism industry). The research outputs will ultimately contribute to management strategies for the conservation of the brown hyena and its unique habitat.

In this study we will (a) survey home range/territory size, habitat use and activity patterns through GPS telemetry of coastal brown hyenas, (b) determine changes in behaviour and population size through the analysis of GPS data, monitoring and spoor counts in the area most likely affected by mining disturbance, and (c) gain spatial information (e.g. about location of core areas) through mapping of the study area. The goal is to provide information about brown hyena behavioural ecology and the sensitive nature of their predator-prey ecosystem to reduce long-term threats and impacts posed by disruptive land use. We therefore aim to work together with the mining industry to minimize negative impacts on brown hyenas.

The results of the GPS telemetry will provide detailed information about individual brown hyena home ranges, habitat use and activity patterns as well as any changes in there. The mapping of the study area will provide us with additional data about habitat use and serves as a quick and reliable indicator for changes (e. g. a well-used communal den site abandoned due to disturbance). The systematic monitoring of brown hyenas will show seasonal changes in behavioural patterns (e. g. activity pattern) as well as changes due to disturbances. The results will give an indication of how adaptable the coastal brown hyenas are and about the extent of short- and long-term disturbance in terms of behaviour and population dynamics.

This study is the first pre/post impact study carried out in Namibia on brown hyenas. We will be able to give recommendations for proposed future mining or other land use activities. Furthermore, information from this project will aid in making informed decisions regarding conservation needs of the brown hyena and how these should be incorporated to improve the Sperrgebiet land use plan.

3. Brown hyena hunting behaviour

Brown hyena hunting behaviour has been observed at the Van Reenen Bay seal colony, approximately 80 km south of the port of Luderitz, between November 2001 and January 2002 and since October 2003. The research results are presently being analysed and will be part of Ms Ingrid Wiesel's doctorate thesis, which will be published later this year. A copy of this thesis will be made available for the Ministry of Environment and Tourism.

4. New study areas

We extended our study areas further north and included the area around Saddle Hill/Spencer Bay and Sylvia Hill in our monitoring programme. We visited the Saddle Hill/Spencer Bay area once last year and went twice to Sylvia Hill. We recorded two brown hyena sightings at Spencer Bay and four sightings at Sylvia Hill. We started to establish a photo ID and it is planned to visit these areas twice this year to establish a first population estimate.

5. Predator Questionnaire and Sperrgebiet mapping

With this project we will contribute to the high priority aim of creating a land use plan for the entire Succulent Karoo Ecosystem Planning (SKEP) region in Namibia. We will provide data and information regarding predator occurrence and relative density for the biodiversity inventory mapping and sensitivity mapping through systematic investigation of representative sample areas within the Sperrgebiet. Furthermore, we will include the public and communities in monitoring processes through their participation in questionnaires and sighting forms, predominantly in the areas surrounding the restricted Sperrgebiet, but to some degree also in the uninhabited Sperrgebiet itself. Participants would mostly be farmers, mine workers, local communities, youth development groups, school children and tourists. In the last phase of the project we will try to establish a predator population estimate through photographs taken by local participants and tourists.

Sperrgebiet Mapping: As the Sperrgebiet is not inhabited, we will map representative sample areas for predator signs. The key species for this part of the study will be the brown hyena as a flagship species for the Sperrgebiet, but as mapping is generally very time consuming, data of other large predator signs will be collected during the same survey period. The occurrence of many predator species in the different zones of the Sperrgebiet is yet unknown and this study can provide baseline data for more detailed monitoring projects. Furthermore Namdeb personnel and mining contractors will be asked to participate in the questionnaire and to report any large predator sighting within the Sperrgebiet.

The mapping inside the Sperrgebiet will concentrate on land classes, which seem suitable for predators. We will make use of the limited network of roads and liaise with the MET to use their patrol camps as base camps. The following steps are planned:

- Identification of representative sample areas
- Mapping the sides of roads for predator spoor and other signs (such as paste marks, play trees, marking posts, dens)
- Mapping sample areas for predator spoor and other signs (see above)
- Investigation of area around herbivore carcasses for predator signs
- Investigation of areas around water sources (e.g. Kaukasib fountain)

Buffer Zone Investigation:

Phase 1: Identification of all I&AP to contact and communicate the objectives of the project to them.

Phase 2 includes the development of a questionnaire regarding large predator occurrence (brown hyena, spotted hyena, leopard, cheetah), large predator sightings, population estimate, local attitudes towards different predator species, local problems with different predator species, local conservation measures, proposed conservation measures and local threats, similar to questionnaires carried out by the IUCN, but on a specifically local and not national scale.

Phase 3: Distribution of the questionnaire to all I&AP in connection with presentations and an awareness campaign, carried out in local communities, schools, farms and tourist camps. Posters and brochures will

be distributed and will help in the raising of long-term awareness. Sighting forms will provide us with an estimate about large predator distribution and relative density. This is already successfully carried out by the Namibian Large Carnivore ATLAS, but with the southern parts of Namibia currently being extremely underrepresented.

Phase 4 will include the use of photographs of large predators taken by participants for individual identification of animals to gain a more reliable population estimate.

Data obtained from the questionnaires, sighting forms and mapping can be included into the inventory dataset for the entire SKEP region and will provide information about large predator occurrence and relative density. The results will be presented in tables, importable into the most common GIS systems and on GIS technology based sensitivity and inventory maps, linked to the raw data set.

From the questionnaires, we will ascertain local attitudes and perceptions towards large predators and identify potential conflicts between predators and I&AP to recognise and identify problem areas concerning predator conservation. With the help of this knowledge, we will aim to improve specific negative attitudes towards large predators through targeted education concerning misconceptions and methods to avoid problems. This will increase the possibility of large predator conservation outside protected areas and the conservation of their habitats.

Project deliverables are:

- Maps of sensitive areas
- Inventory of large predators
- Population density estimates
- Large predator awareness programme

Phase 1 to 3 as well as the mapping of representative sample areas within the Sperrgebiet will be carried out in year 1, starting at the beginning of 2004. First results can be presented two months after the completion of first one-year period. We expect, that the quantity and quality of results will depend on the I&AP's awareness and attitude towards large predator species. We therefore would like to extend the entire study period to 3 years. Increased awareness will lead to increased attention and more data regarding sightings are expected following the initial education and awareness campaign. Therefore, after a period of three years, we should have collected representative data concerning large predator occurrence and density and about local attitudes towards them.

Mapping is extremely time-consuming and the prolonged time available during a 3-year study will improve the quality of information obtained for sensitivity and inventory mapping.

Phase 4 of the project will commence after successful implementation of Phase 1 to 3, possibly in year 3.

6. Environmental Information Centre in Luderitz

In connection with the Predator Questionnaire Project, the Brown Hyena Research Project will open an Environmental Information Centre at the Luderitz Waterfront in February 2004. It will serve as an office, but will be open to the public, displaying posters and all available information about Environmental Programmes in Namibia, but with special emphasis on the Karas region and the Sperrgebiet.

7. Collaborations

Save the Rhino Trust

Save the Rhino Trust contacted the Brown Hyena Research Project in order to establish whether we are interested in collaboration. Save the Rhino Trust had at least three brown hyenas in the Ugab region, which were seen in the staff village stealing chickens. Unfortunately a goat herder killed one of the hyenas, as he obviously regarded the animal as a problem. Save the Rhino Trust has a strict policy, that under no circumstances may a person working for them kill or destroy, for whatever reasons, any wild animal in the area.

We decided to radio collar the two remaining brown hyenas as soon as possible to monitor them and to make them a conservation issue to avoid future killings. Dr. Hartmut Winterbach will travel to Ugab as soon as he is available to fit these collars and we will keep you informed about our progress.

Striped Hyena Project in Turkey

We received a phone call from Turkey beginning of January 2004. One striped hyena was caught in a box trap by an illegal hunter, who had previously already captured two individuals, which were sold to a Turkish zoo. The Turkish National Parks Department removed all three hyenas and Mr. Batur Avgan, the assistant wildlife editor of the Atlas Magazine, tried to fit these animals with radio collars before they are returned to the wild. There are only 5000-14000 striped hyenas left in the wild and their international conservation status is Lower Risk: near threatened. In Turkey they were historically widespread, but no recent records are known. This capture, though illegal, is the first live record of these animals in Turkey for a long time.

The Brown Hyena Research Project decided to help with this extremely important project and we sent two of our radio collars, which were removed from brown hyenas recently and have therefore only a limited amount of battery life left to Turkey. These collars will be fitted to the pair, which spent a year in the zoo, as the third hyena is slightly injured and has to remain with the Turkish National Parks Department until it is fit for release into the wild.