**TITLE**: AN INVESTIGATION OF RAPTOR OCCURRENCE AND ACTIVITY IN THE SOUTHERN NAMIB PARTICULARLY NEAR NADEET
AND
IF THERE IS ANY CORRELATION BETWEEN RAINFALL, FOOD AVAILABILITY AND RAPTOR SIGHTINGS, JUL-NOV 2008.

STUDENT: JONAS HAUSIKU
STUDENT NUMBER: 200535722
TUTOR: MRS. LOUISE THERON
MENTOR: MRS: VIKTORIA KEDING

Namib Desert Environmental Education Trust

## 1. INTRODUCTION

The study was conducted mainly within the vicinity of the Namib Desert Environmental Education Trust (NaDEET) on the NamibRand Nature Reserve. NaDEET is located 500km south of Windhoek and 100km south of Sesriem or Sossusvlei. The NamibRand Nature Reserve is one of the largest private nature reserves in Southern Africa and it is on the eastern edge of the Namib Desert.

NaDEET is an environmental education centre that offers a sustainable living education to its visitors; the main visitors of the centre are school children from surrounding areas such as Maltahohe, Mariental, Keetmanshoop and Windhoek.

The only true desert in Southern Africa is the Namib Desert (Coetzee 2002). The Namib Desert has extreme temperatures, low rainfall and high evaporation .This Desert biome receives rainfall of 0-200mm a year (Komen 2005). With exceptionally good rainfall in the desert like any other part of the country this year, the area around NaDEET received the highest rainfall (147.7 mm) during the month of February 2008.

This high rainfall has led to abundant growth of grasses, dominated by *Stipagrostis ciliata*, but quite interesting is that in the dunes one will find the dune grass *Stipagrostis sabulicola* and the Ostrich grass *Cladoraphis spinosa*. It is so fascinating to also see how different endemic species are adapted to living in the desert environment. Survival of raptors in the desert should not come as a surprise. The fact that raptors, like any other birds have wings to fly can allow them to fly vast kilometres in search of food and shelter.

Within the surroundings of NaDEET different types of birds can be seen. There are raptors, seed eaters, and insect eaters. The Southern Pale Chanting Goshawk, (*Melierax canorus*) is the most common raptor within this area (Keding, V. Pers comm). It is not guaranteed that visitors will see raptors at NaDEET but the Southern Pale Chanting Goshawk is seen quite often. According to Coetzee (2002) even when it is not always possible to see the birds known to occur in an area, there are always certain signs and that betray their presence, if one knows what to look for.

According to MacLean (1993) the distribution of some of the raptors includes the Southern Namib Desert. This is true for raptors such as the Lappet-faced Vulture, (*Torgos tracheliotos*) Black Shouldered Kite (*Elanus caeruleus*), Black Eagle, (*Aquila verreauxii*), Jackal Buzzard (*Buteo rufofuscus*) , Martial Eagle,(*Polemaetus bellicosus*), Black Chested Snake Eagle,(*Circaetus pectoralis*) ,Southern Pale Chanting Goshawk,(*Melierax canorus )*Rock Kestrels ( *Falco tinnunculus*),and Greater Kestrels(*Falco rupicoloides*).

Therefore following the exceptionally good rains early this year few raptors were viewed at NaDEET. Considering the food availability which seemed to be high, it is thought to lure the raptors to the desert environment. for example Rock Kestrels, Greater Kestrel, Pygmy Falcon and the Southern Pale Chanting Goshawk which were all seen around NaDEET feeds on lizards, snakes and small birds (Hockey, Dean & Ryan, 2005).Even though the environment around NaDEET does not really fit the typical or most favoured habitat description of many of the raptors (Steyn 1983.) raptors can still be observed near NaDEET.

This research project aimed to identify the diversity of raptors within NaDEET and the surrounding areas.

1.2. Study area.

The study area is within the NamibRand Nature Reserve, mainly the areas surrounding NaDEET Centre and the NaDEET Base. The study areas also included all the trips travelled from NaDEET to Windhoek or NaDEET to Mariental. See figure 7.

## 2. OBJECTIVES

### 2.1 Project objectives

1. Determine the raptor species likely to occur in the Southern Namib, particularly in the vicinity of NaDEET.

2. Observe raptors at or near NaDEET and record their presence and activities.

3. Observe signs indicating presence of raptors near NaDEET.

4. Interview experts (Marc Durr, who lived at Die Duine for almost ten years, and Peter Bridgeford) to find out about the occurrence of the Southern Pale Chanting Goshawk, Greater Kestrel, Black Chested Snake Eagle and the Lappet faced Vulture in the southern Namib, particularly near NaDEET, in years without such good rainfall.

5. Contribute to the development of suitable resource materials on the Raptors of the Southern Namib that can be used at NaDEET and NARREC in future.

### 2.2 Personal objectives

- To explore and get to know the southern part of the country, particularly the southern Namib Desert and the area around NaDEET.

- To share ideas and my knowledge of the environment with different school children.

- To broaden my experience of different living and working conditions.

- To work hard and make useful contacts for future employment opportunities.

- To learn about working with school children and environmental education in general.

## 3. MATERIALS AND METHODS

The methods included a literature survey, field observations, and personal communication with raptor experts and also the preparation of environmental education material for school groups to use.

### 3.1 Determine the raptor species likely to occur at in the Southern Namib, particularly the vicinity of NaDEET.

*Literature survey* A desk study using books like Roberts Birds of Southern Africa seventh edition (Hockey, et al 2005) and Birds of Prey of Southern Africa (Steyn 1983) was done to get an idea of which raptor species are likely to occur in the Southern Namib.

**3.2 Observe raptors at or near NaDEET and record their presence.**

*Own observation, bird field surveys:*

- The first observations started of well driving with Andreas Keding around the reserve, doing birding and also with him explaining important aspects to look for when identifying raptors or birds in general. E.g. GISS (General Impression of Size and Shape).
- The following guides were used: Sasol birds of southern Africa a field guide (Sinclair, Hockey, Tarboton 1997) and Robertss Birds of Southern Africa (MacLean 1993).
- A pencil, clipboard and a data record sheet was completed, writing the names of the raptors, the time seen, the number of raptors seen and what they were doing.
- Binoculars and a watch: binoculars were used to view raptors from a distance and the watch was used to record time when a certain raptor was seen.
- A 4x4 vehicle was used together with NaDEET staff to do birding.
- While working with groups of kids, Wednesday mornings from 07h30 to11h00 were used to do birding during the Dune activity.
- Two hours walk in the morning and afternoons were done twice a week. When not occupied with a school group or when no work was to be done at the NaDEET base.
- Own observations, daily activity pattern graphs for each of the seen raptors was drawn up. The graph shows the time of day and activity observed on the seen raptors e.g. perching, feeding, nesting, resting, flying, drinking etc.

**3.3 Observe signs indicating presence of raptors near NaDEET**.
Any signs betraying the presence of a raptor were noted with pictures taken. Signs were also observed while on the Dune walk activity or during data collection. . Book such as the one for beginners by Coetzee (2002) was used as a guide in identifying the signs that show if certain birds might occur in an area.

**3.4**. **Interview**
*Interview with an expert*: Personal communications through E-mails were done with Mr. Peter Bridgeford, the former Chief Warden of the Namib Naukluft Park, who was stationed at Aandster and has worked with vultures in the Southern Namib, particularly at Tsondab vlei, for many years. Marc Durr who lived at Die Duine for almost ten years could however not be reached.

**3.5 Help to develop useful resource material on raptors for use by NaDEET**

*Preparation of Environmental Education resource material:*
Using own observation, a poster of the most common raptor (Southern Pale Chanting Goshawk) seen was designed. This poster will be send to NaDEET as a resource material that they can use in their resource corner or library. The poster describes what the bird was doing and where it was seen. In addition a board on biodiversity in the Namib (also including the Lappet-faced Vulture) was developed for the centre.

**4. RESULTS**

**4.1**. *Literature survey*

According to Hockey, et al (2005) the following raptors are occurring within the desert environment.

4.1.1. Table 1.Some of the raptors whose distributions include the southern Namib Desert.

| **Scientific name** | **Common name** |
|---|---|
| *Sagittarius serpentarius* | Secretary Bird |
| *Torgos tracheliotos* | Lappet faced Vulture |
| *Gyps coprotheres* | Cape Vulture |
| *Gyps africanus* | African white backed Vulture |
| *Circaetus pectoralis* | Black Chested Snake Eagle |
| *Aquila verreauxii* | Verreaux's Eagle |
| *Polemaetus bellicosus* | Martial Eagle |
| *Hieraetus pennatus* | Booted Eagle |
| *Buteo rufofuscus* | Jackal buzzard |
| *Buteo buteo* | Steppe buzzard |
| *Melierax canorus* | Pale chanting goshawk |
| *Milvus aegyptius* | Yellow billed kite |
| *Elanus caeruleus* | Black shouldered kite |
| *Polihierax semitorquatus* | Pygmy falcon |
| *Falco tinnunculus* | Rock kestrel |
| *Falco rupicoloides* | Greater kestrel |
| *Falco chiquera* | Red necked falcon |
| *Falco peregrinus* | Peregrine falcon |
| *Falco biarmicus* | Lanner falcon |
| *Bubo africanus* | Spotted Eagle Owl |
| *Tyto alba* | Barn Owl |

The above table shows the species occurring in the desert biome. A few from the list were seen and as for the Owls although they are nocturnal species the Spotted Eagle Owl was seen during the day too. Displayed in the table are the scientific and the common names. The distribution of these birds in the desert appears to be abundant. The distribution of the two Kestrels is throughout the whole country and even in the neighbouring Southern African countries.

**4.2.** Raptors at or near NaDEET their presence and activities.

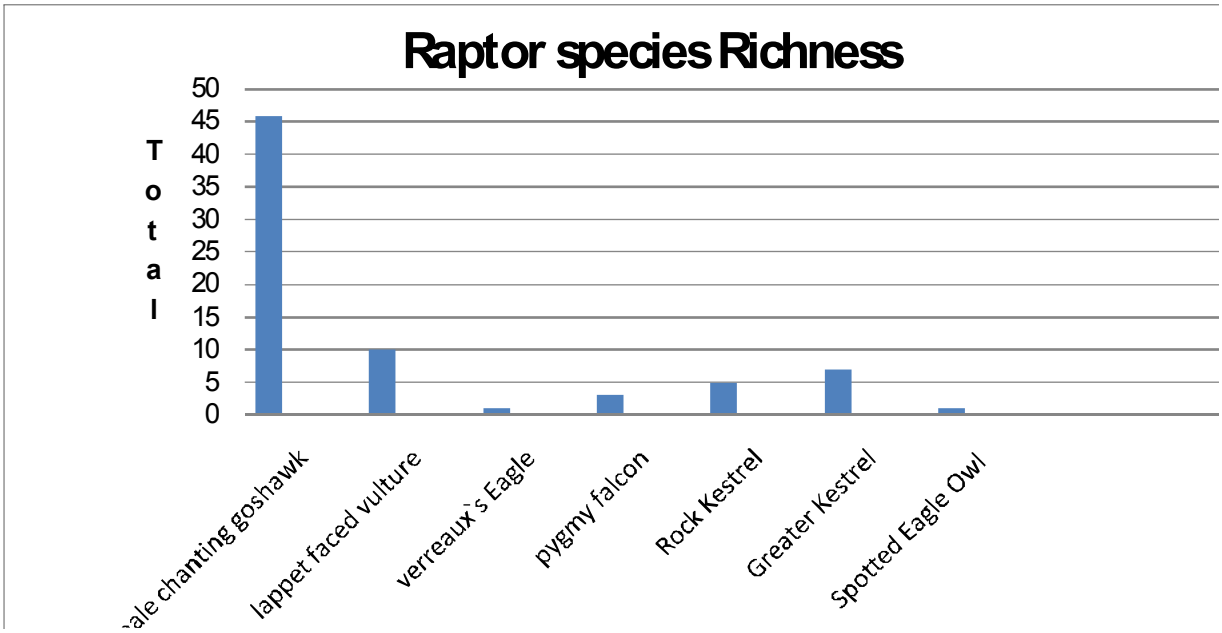


Figure 1. Different raptor species seen while at NaDEET. (Jul-Oct 2008)

A total of 46 Southern Pale Chanting Goshawk (SPCG) were seen compared to only 1Verreaux`s Eagle seen. Greater Kestrels were 7 while Rock Kestrels were only 5.with the smallest raptor (Pygmy Falcon) scoring 3 is also found around the NaDEET area. The Lappet-faced Vulture followed the SPCG with 10 seen in total. Spotted Eagle Owl was also seen once just like the Verreaux`s Eagle.

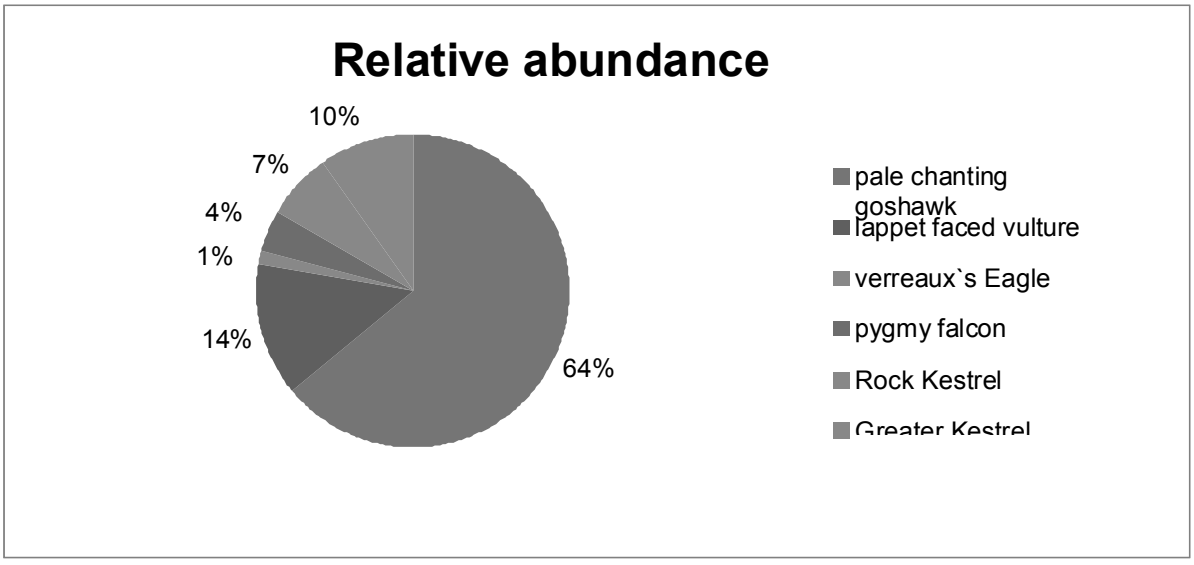


Figure 2. Relative abundance of raptors seen at NaDEET.

On a percentage value the dominancy of the Southern Pale Chanting Goshawk Shows 64% there is a huge percentage different with the abundance of the Verreaux`s Eagle and that of the spotted

eagle Owl which both had only 1%. 14% is the abundance of a Lappet-faced Vulture while the Pygmy Falcon had the abundance of 4%. There's little difference in percentage between the two kestrels with the Greater Kestrel having 10% compared to 7% of the Rock Kestrel.

Below is how the activities displayed by the raptors were classified.
Soaring this was determined when ever a bird was flying high without flapping its wings.
Flying was when a bird started flapping its wings while flying.
Perched was regarded as an activity when birds were seen sitting doing nothing.
Feeding was determined when ever the bird was seen eating something or in attempt to catch its prey.

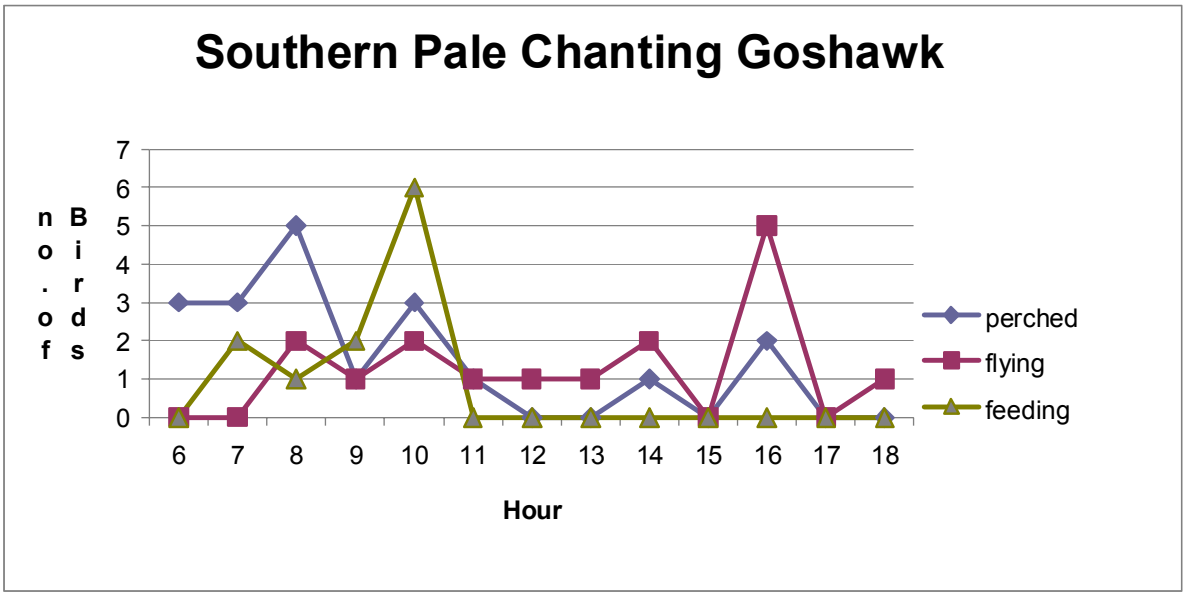


Figure 3. Daily activity patterns of the Southern Pale Chanting Goshawk around NaDEET during Jul-Oct 2008.

Figure 3 above shows the number and the activities of the Southern Pale Chanting Goshawks seen during the days at NaDEET. The SPCG`s were seen perching at different time slots on different days. These species showed the highest peak in perching at 8h00 where five SPCG were seen perching on different days but at the same time. At 6h00, 7h00 and at 10h00 a total of three SPCG were seen perching at each of those hours. 2 SPCG were perching at 16h00 and only one SPCG was seen perching at 14h00.
The highest peak on feeding activities of the SPCG was at 10h00 with a total of six of these species seen in different days.
The SPCG had the highest peak in flying at 16h00 where five individuals were seen.

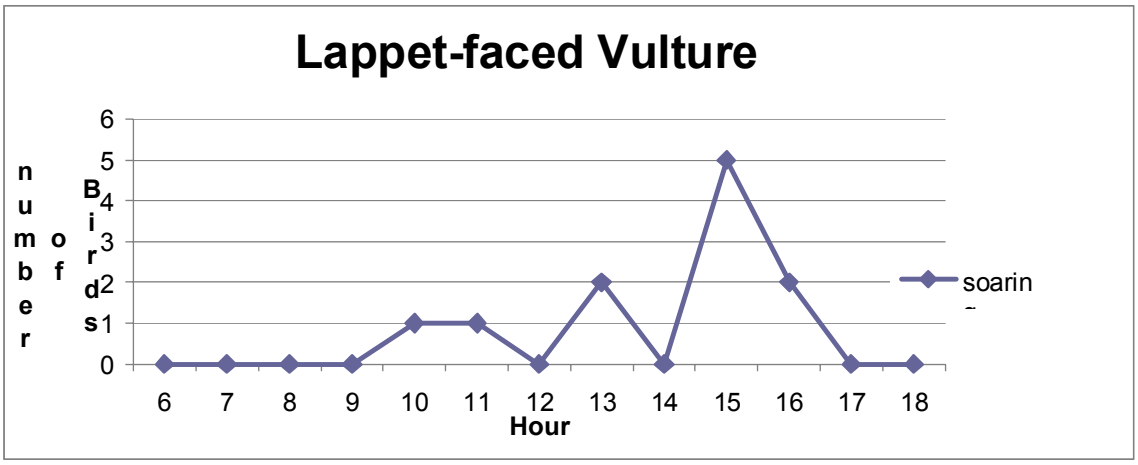


Figure 4. Daily activity patterns of a lappet faced vulture at NaDEET as from Jul-Oct 2008.

The only activity observed when seeing the Lappet-faced Vulture was soaring. The above graph shows that soaring started around 10h00 and reaches a peak around 15h00.

**4.3.** Signs indicating the presence of raptors.

Figure 5.Tracks and droppings as evidence or signs of the presence of a large bird.

Figure 5 shows some evidence of the signs that can betray the presence of raptors in an area. Looking at the size of the track it is definite that a big bird had been around that area. The tracks and the droppings shown above were all seen on the dune where a Southern pale Chanting Goshawk use to sit and warm up in the morning hours. Other signs which were identified are the sound of the voice of the Spotted Eagle Owl like (Huu- Hoo) early in the mornings or during the night.

**4.4.** Interview with an expert.

An interview was conducted with Peter Bridgeford while Marc Durr could not be reached. In discussions with Bridgeford it became clear that there is no data to justify the relationship between good and bad rainy seasons in relation to raptors seen. None the less with studies done by Bridgeford in 2003 on the breeding of Lappet faced vultures in the Namib Desert it was showed that the Vulture numbers raised after a season with low rainfall and this numbers then decreased after a season with good rainfall.

**4.5 Help to develop useful resource material on raptors for use by NaDEET.**

## Daily activities of a Pale Chanting Goshawk around NaDEET.

PERCHED.

Perched on a telephone Pole.

SIGNS OF BETRAY-

*Droppings full of "white wash"*
*Found on the dune*

EVIDENCE!

The tracks showing
The SPCG`s presence on the dune.

FEEDING?

At the waterhole the SPCG
Tries to catch sand grouses,
As a late morning meal

Facts you should know about (SPCG)
Length: 53-63 cm (MacLean (1993)
Southern Pale Chanting Goshawk

**Scientific name:** *Melierax canorus*

- Distributed widely over areas of low rainfall in Namibia.
- It hunts mainly from a perch.
- The SPCG can also hunt on foot running in pursuit of prey.

➢ What does a SPCG eats?

Mainly eats lizards and they are caught often. Insects follows as part of the SPCG`s diet and then comes small birds lastly small mammals. These types of birds are then called raptors or birds of prey.
Raptors for e.g. includes Vultures, Eagles, Kites, Falcons, Kestrels and also Owls. Steyn (1983).

Figure 6. Summary of a SPCG`s daily activity.

## 5. DISCUSSIONS

### 5.1. The raptor species likely to occur at in the Southern Namib, the vicinity of NaDEET.

The literature study indicated that there are actually many raptors in the desert. Although not all the raptors whose distributions cover NaDEET were seen. A Martial Eagle was seen perched on a telephone pole in the early mornings (Menge, pers comm). Seven different raptor species were seen namely the Southern Pale Chanting Goshawk, Lappet faced Vulture, Pygmy Falcon, Spotted Eagle Owl, Rock Kestrel, Verreaux`s Eagle and the Greater Kestrel.

### 5.2. Raptors at or near NaDEET their presence and activities.

Figure 3 shows that 19 SPCG were seen perching compared to only 11SPCG which were feeding and with 16 SPCG`s were flying. There could be a relationship between feeding, flying and perching. According to Steyn (1983) most of the SPCG`s food is caught from a perch, This statement can prove that in order for the SPCG to be successful in prey capture, it need to fly around to different places and needs time to perch and carefully observe the movements of its prey.
As feeding is important in every living things health the SPCG`s feeding peak was in the mornings where most species were seen feeding.
In figure 4 the soaring of Lappet-faced Vultures varied from 9h00, 10h00 were some vultures were seen but the highest soaring peak was at 15h00 with 5 vultures seen soaring.
A total of 46 SPCG`s were seen with the Lappet faced vulture being the second which was often seen due to its massive soaring ability in search of food. Only 10 Lappet faced Vultures were seen. In total 73 birds from seven different species were seen.

### 5.3. Observed signs of raptors presence.

As can be seen in figure 5, several signs, tracks and droppings of the Southern Pale Chanting Goshawk were found on the dunes. Feathers were also seen. This can tell someone that a certain bird had been at that place and at NaDEET the feathers of a Spotted Eagle Owl were found. One last thing which shows that raptors are around an area, although not many were seen at NaDEET, is old nests in big trees, it showed that raptors also nests in that area. All these are signs can let one know that certain birds occur in a certain area. Signs that betray raptors or birds in general were also seen and first a pellet of a Spotted Eagle Owl this then explained that the bird is there. Another sign to prove the presence of this bird within this area is the sound it makes in the night and in early mornings which sounds like (Huu- Hoo).
Later on looking at food which can be eaten by these raptors was done and it showed that the food which can be eaten by these birds occur in the areas around NaDEET. This then brings one to a point that certain birds occur in a certain area. Although not recorded the population of stripped mice is high at NaDEET, another small mammal to talk about is the hairy footed gerbil this animals appears to be food for most of the raptors in table 1. Another prey is the Wedge Snouted Lizard in the dunes, this could be one reason why the Southern Pale Chanting Goshawk is going in to the dunes since its diet also includes lizards in general.

### 5.4. Interview.

In a study done Bridgeford (2003) on Lappet faced Vulture. It was stated that rain plays a major role in regulating Lappet faced vulture breeding activity and that poisoning can significantly reduce that activity in the short term. Further long term effects need more monitoring.

**5.5. Proposed resource material designed for NaDEET to keep in the resource corner.**
A poster will be designed to summarize the activities of the most common raptor (SPCG) seen at or around NaDEET. The Idea of designing figure 6 came up and this is a proposal which should be handed in to NaDEET staff to hear what they thing about such an idea. At this time there is only a draft available (fig 6) which still have to be approved by the NaDEET staff.

## 6. CONCLUSION.

In conclusion, a total of seven species were seen in such a harsh environment where specie has to stake claim on the limited resources. The Lappet faced Vulture is dominant over all vulture species at a kill (Hockey, et al 2005). More raptor species can be seen in the desert environment if all the attention is focused on raptors. Own observations showed that food for these raptors are there so the probability of raptors coming within areas to feed might be high so they might be seen more often. Project expectations were high but what the data showed resulted into a change of some objectives. One objective achieved is the design of a resource material that NaDEET can use if the proposal is approved and this can then be an achievement and a success for the aim of this project.

Only data for two species were plotted into a daily activity patterns graph this was because they were seen more often. This can symbolize that maybe the food of lappet faced vulture and the Southern Pale Chanting Goshawk was more available within that area so this might had led to seeing them more often.

The correlation between rainfall and food availability is that rain brings good harvest in most of the ecosystems but this project could not get the relationship between raptor sighting and food availability. In order to prove this a comparative study has to be done looking at both good rain season and a bad rainy season to see the presence of raptors in this area. According to Bridgeford (2008), the birds that can be seen in an area after that good rainfall include species like the bunting lark. Bunting larks were seen quite often and these small birds can be part of a raptors diet. Although changes were done in the objectives, this project fulfilled most of the objectives.

## 7. Recommendations.

To fulfil a study of this kind more driving is required since the vegetation is sparse and birds (especially big birds of prey) are not seen regularly.

## 8. References

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## 9. Appendices


Figure: 7. a map showing a satellite image of NaDEET Centre in the Namib Rand Nature Reserve.