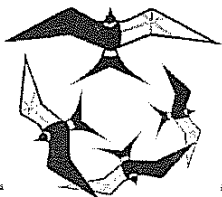
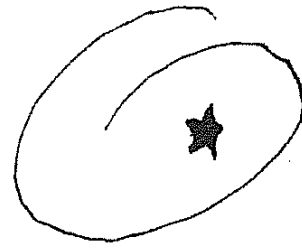


Where Birds

are Prey

True
stories
about
threats
to
birdlife
in
Namibia



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NARREC 2005

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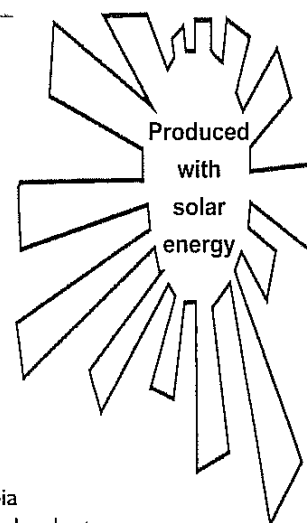
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I ntroduction

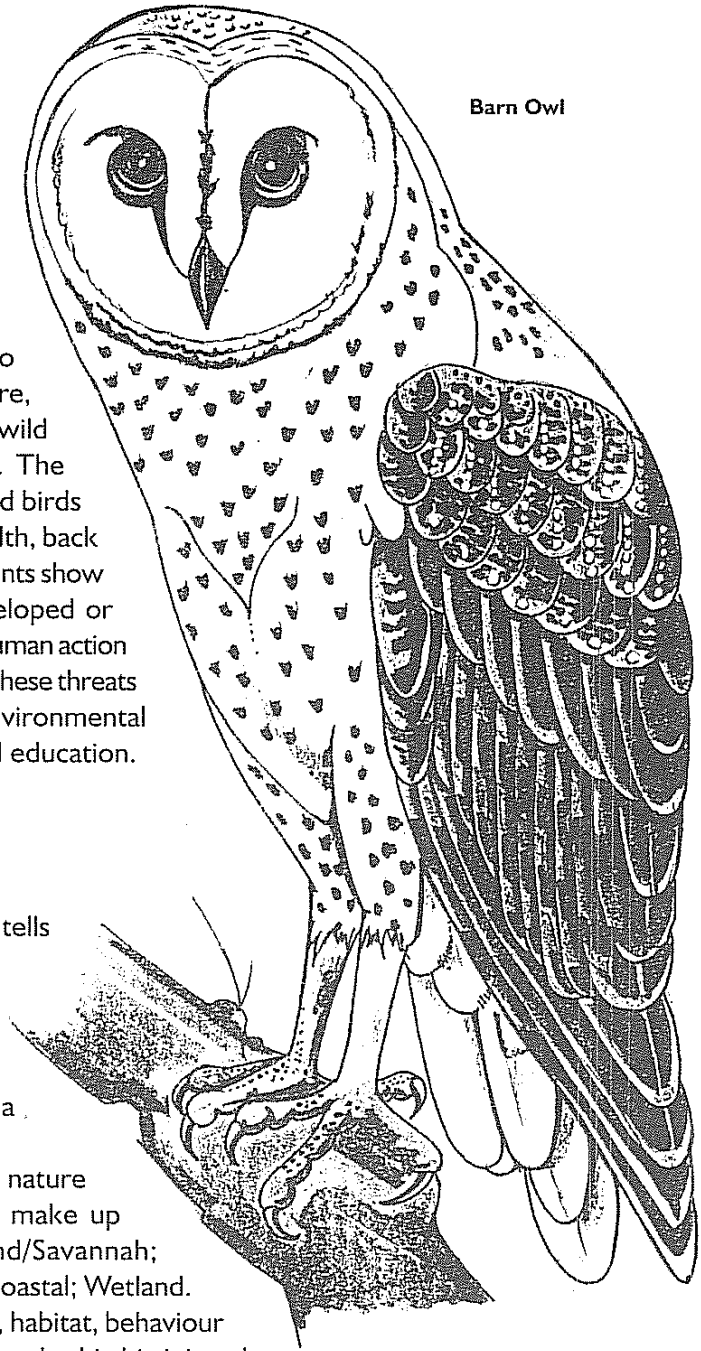
Background

The type of birds found in an environment, what they eat, where they nest, when they move and what their population sizes are, tell a story about the conditions in that environment. Scientists therefore often describe birds as “indicators of the state of an environment”. In our modern world, many true stories about wildlife also tell of *threats* to natural environments. These threats can injure, poison or orphan wild animals. In 1988 a wild animal hospital was opened in Windhoek. The hospital gives a second chance to injured wild birds by caring for them and releasing them, in health, back into a natural environment. These animal patients show a link between the natural and social (developed or developing) environments. The link is often a human action that creates a threat to natural environments. These threats are covered in the subject content of the environmental (natural and social) sciences syllabi in formal education.

The stories

Seven true stories are told in this book. Each tells about a bird that has been received at the animal hospital in Windhoek. Through the event that causes the wild bird to be injured, a link connects the natural environment with the social environment in a Namibian context.

Each story begins with the bird living in nature within one of the five major biomes that make up Namibia's natural environment: Grassland/Savannah; Desert and Karoo; Woodland; Marine and Coastal; Wetland. The ecosystem and the birds' natural biology, habitat, behaviour and food requirements are described. When the bird is injured, poisoned or orphaned, the link with people and activities in the area is brought into the story. This link, created by people's activities, is a real threat to the natural environment. The stories tell of the threats, of the rescue of the threatened birds, and of the eventual outcome.



Barn Owl

More about the content

The **biomes** pages give a brief description of each biome in Namibia.

The **story** pages comprise, for each story:

- ➔ *background information* on the natural and social environments in which the story takes place, and on the natural history of the main character in the story (the species that is injured);
- ➔ a *summary of the learning content* of the story.
- ➔ *the story*; and
- ➔ *activities* based on the story, which extend the learning content into art, language, geography and mathematics.

The **activities** page at the back of the book is intended to encourage the students to act on what they have learnt from the book.

The **glossary** on page 30 defines new or difficult words marked in *italics* in the book.

Who should read the stories

The stories contain factual information and cover learning content requirements for Grades 3 to 7 in natural and social science. They can be read by or to students. The stories can also be used as a reader for students in Grades 3 to 5 whose first language is English, and students in Grades 5-8 learning English as a second language.

The learning content in the stories

The learning content covers subject material from the natural and social science syllabi for Grades 1 to 7. From these stories students can learn facts about Namibian environments and see links between natural, social, economic, cultural and historic environments. Teachers can ask students to expand on any of the environmental themes raised in a story (see **activities** following each story).

Environmental Sciences:


- ➔ *Physical geography*: biomes; ecosystems; habitat; weather; international links.
- ➔ *Biology*: animal and plant communities in specific habitats; Namibian wild bird species (characteristics, adaptations, reproduction, food chain, threats).


Social Sciences:


- ➔ *History* (of an area).
- ➔ *Land use* (agricultural, mining, recreation, tourism, national parks).
- ➔ *People*: development; human activity in an area; attitudes and values; threats to an environment (habitat) or an animal (wildlife).


The learning content in the activities

Language, art, geography and mathematics activities are included at the end of each story. After reading a story the activities can be used to develop skills in different age groups and grades (1-7).

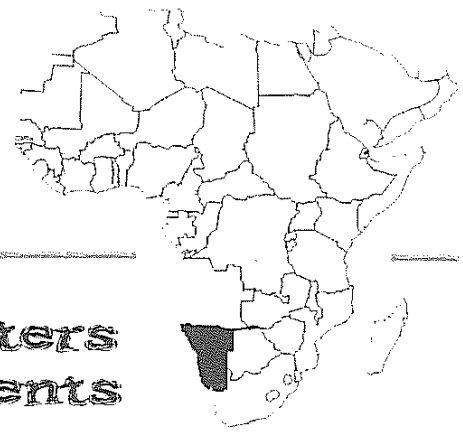
 *Language*: reading; listening; understanding; vocabulary; writing.

 *Art*: pictures from language.

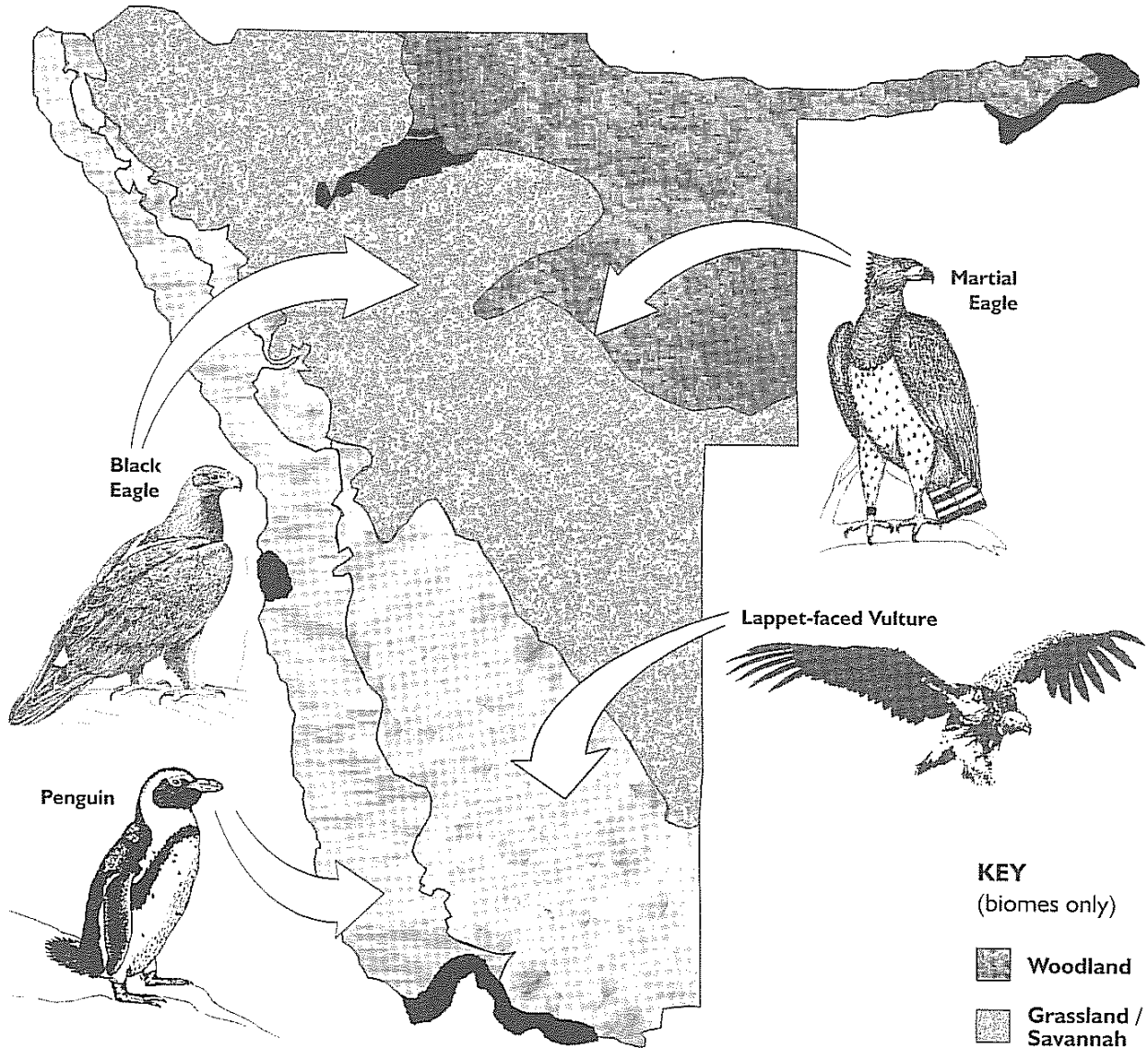
 *Geography*: Reading and making maps.

 *Mathematics*: units of measurement; addition, subtraction, multiplication, division; metres and kilometres; grams and kilograms; series of numbers.

Namibia's biomes








Some of our story characters in their natural environments



Natural environments are divided into zones. The type of zone is influenced by the amount of rain that falls. Zones are called **ecosystems** or **biomes**. Biomes merge into one another; they do not have clear-cut borders. In each biome there are many different **habitats**. For example, in a grassland biome there could be a mountain habitat, a plains habitat and/or a river habitat. The habitat is the place where organisms live. Birds may use more than one biome in their lifetime.

KEY

(biomes only)

-  Woodland
-  Grassland / Savannah
-  Desert and Karoo
-  Marine and Coastal
-  Wetland

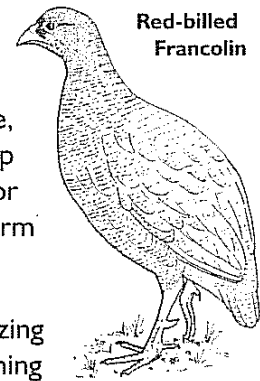
Grassland / Savannah

Grassland or **savannah** biomes are found in all countries of southern Africa. This is Namibia's largest biome, with a rainfall of 400-750 mm a year, falling in a short summer season. The land is covered in long grass; trees or bushes are dotted about, or form small thickets. Thorn trees (*Acacia* species) are the most common trees in Namibia's central regions, with mopane trees occurring in the northern regions. Savannah grasslands support many large wild herbivores, especially grazers. The trees and bushes supply food for browsing herbivores. There are also many carnivores, ranging from small to large. In all the animal classes (mammals, birds and insects) seedeaters, insect-eaters and predators are common.

How people use grasslands in Namibia: Grasslands are used for farming cattle, horses, sheep and goats. Grasslands in the areas of higher rainfall are used for crop farming. In Namibia game farming has become very popular as an attraction for tourists and hunters. Tourism generates jobs in many sectors and increases farm income.

Threats to the grassland/savannah biome and wildlife: These include overgrazing by livestock (causing desertification or bush encroachment), deforestation, poaching of wild animals, irresponsible use of poison and pesticide, and fire.

In our stories, the **Black Eagle**, the **Martial Eagle** and the **European Bee-eater** use the grassland or savannah biome.



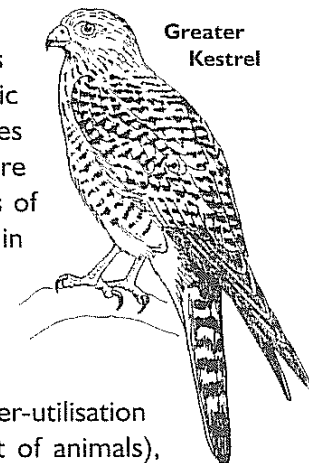
Desert and Karoo

Desert and Karoo biomes range from sandy desert, such as the Namib, to Karoo vegetation, such as sparse low-scrub vegetation. This biome receives rainfall of 0-200 mm a year. The higher rainfall areas such as the Karoo biome support low-growing shrubs and a few grass species. Daily temperatures can reach extremes of hot and cold. Compared to deserts worldwide, southern African deserts show the richest variety of desert animals. The plants and animals of the Namib Desert are supported by moisture from fog coming in from the Atlantic Ocean.

How people use desert and Karoo areas in Namibia: The Namib Desert is used for tourism, recreation and the mining of minerals. A number of scientific research projects are conducted in the Namib Desert. Research includes examining the *biodiversity* and experimenting with fog-harvesting. Fog is moisture that can be trapped as water for communities living in the fog-belt. Herds of springbok and oryx and many small mammals live in the Karoo areas and even in the dry Namib Desert where they can find food in the riverbeds and *estuaries*. Many farmers use this biome for sheep, goat and ostrich farming as well as for hunting of the game animals.

Threats to the desert and Karoo biomes and wildlife: These include over-utilisation of underground water, mining, fencing (preventing the natural movement of animals), overgrazing (causing desertification or bush encroachment), deforestation along riverbeds, poisoning of predators and scavengers, and in some areas off-road driving.

In our stories the **Lappet-faced Vulture** and the **Spotted Eagle-Owl** live in the desert and Karoo biomes.



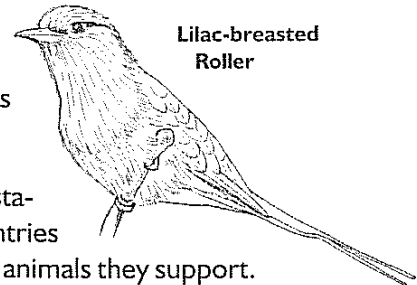
Woodland

Woodland biomes are divided according to the main types of trees they support. There are five different woodland types in southern Africa. These areas have a rainfall of between 450-800 mm a year. Woodlands support many wild animals, especially large herbivores such as elephants and buffalo. Woodlands are important in the prevention of global warming as they soak up carbon, protect watersheds and fertilise the soil from the leaf litter that falls from the trees.

How people use woodlands in Namibia: These areas attract people. They provide firewood, wood for building, many wild foods and areas of reasonable rainfall for livestock and crop farming.

Threats to the woodland biome and wildlife: These include deforestation, poisoning from pesticides and fire hazards. Southern African countries need to co-operate with one another to conserve woodlands and the animals they support.

In our stories the **Martial Eagle** and the **European Bee-eater** use the woodland biome.



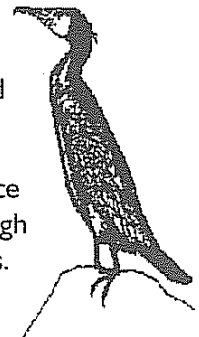
Marine and Coastal

Namibia's marine and coastal biomes contain many different habitats. Cold upwellings from the Benguela Current in the Atlantic Ocean support marine life, and the biome is rich in food. There is a high diversity of marine fish and birds. There are also sea mammals, such as the Cape Fur Seal, and increasing numbers of whales. Coastal mammals include the Brown Hyena and Black-backed Jackal.

How people use marine and coastal areas in Namibia: Tourism, recreational and commercial fishing and diamond mining are the main activities.

Threats to marine and coastal biomes and wildlife: These include over-fishing, disturbance of aesthetic value through off-road driving, environmental destruction and pollution through coastal developments, especially urbanisation and mining, and pollution at sea from oil spills.

In our stories the **Damara Tern** and the **African Penguin** use the marine and coastal biomes.

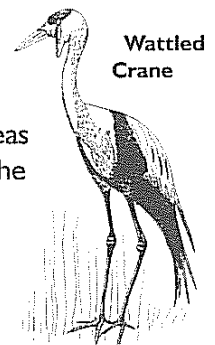


Wetland

Wetland biomes are areas of permanent or temporary water. They can be ephemeral or perennial rivers, floodplains, springs, marshes, coastal estuaries or constructed dams. Over 5% of Namibia's land area is wetland, but many wetland areas are dry for large parts of the year. Wetlands support many wildlife species and are important as resting and feeding places for migrating birds. Wetlands are important for recharging underground water and providing people with water, food and other materials, such as reeds.

How people use wetlands in Namibia: Settlements are common, especially near areas of permanent water. Tourism and farming are common. An example from Namibia is the development of grape farming on the banks of the Orange River.

Threats to the wetland biome and wildlife: These include pollution from pesticides, fertilisers and industrial waste, over-utilisation of the water and other wetland resources, and deforestation and overgrazing on the edges of wetlands.



The stories

Story 1

Background to the story

During the summer months in Namibia, *migrant* birds including European Bee-eaters, can be seen in grassland and woodland ecosystems. They eat insects such as grasshoppers, termites, butterflies and bees. Birds that eat insects are called *insectivores*. There are eight different types (species) of Bee-eater in southern Africa. Four species remain all year around and four are *migrant* species.

All Bee-eaters are colourful. European Bee-eaters have a brown back, yellowish wings, white forehead, green eyebrows, bright yellow throat bordered by a black collar and blue to blue-green underparts. Before

the winter starts in southern Europe and Russia, European Bee-eaters fly (migrate) south in flocks of up to 150 birds. At the end of the southern African summer they return north to *breed* in Europe.

Migrating birds fly over many countries, over urban and agricultural land. Poison (pesticides) is used to kill insects on agricultural crops and in gardens. These products threaten all insect-eating animals and birds. In some countries people shoot and trap birds that are on *migration*. *Urbanisation* and development create other dangers for birds such as habitat destruction and road accidents.

Summary of the learning content:

Environmental Science

- *Species*: European Bee-eater
- *Ecosystem and Habitat*: Grassland (savannah) to woodland
- *Food*: All kinds of insects
- *Behaviour*: Migrates from Russia and southern Europe to southern Africa. Usually flies in flocks of up to 150 birds

- *Breeding*: Breeds in Europe. Lays 2-4 eggs in a sand bank tunnel
- *Conservation status*: Unknown

Social Science

- *Main activities*: Agricultural and urban
- *Threats to Bee-eaters caused by people's activities*: Pesticides and road accidents

Bee-eater is set free

On a hot summer day a girl named Ndeshi picked up a Bee-eater from the road close to where she lived. The beautiful colours of the Bee-eater flashed in the palm of her hand. Bee-eater had chased a bee across a road without looking and a car had hit her. Ndeshi looked down at the small colourful bird whose eyes were closed. Bee-eater's head ached and she felt cold, scared and hungry.

Ndeshi ran home with Bee-eater and took her to her bedroom, where she wrapped her in a clean T-shirt. She heard a cat meow outside and quickly closed the windows. Then, closing the door behind her, she ran outside to the back of the house to find a cardboard box. She needed to find a safe place to keep the bird. With a knife, Ndeshi made small holes in the box so that Bee-eater would be able to breathe. She laid newspaper and an old but clean cloth at the

bottom of the box so that the bird would have something soft on which to lie. She then put the bird into the box. Ndeshi was very worried because Bee-eater looked very ill but she knew that keeping it in a warm, dark and quiet place would help it. She also knew that the bird needed food. Ndeshi telephoned her aunt who worked for the animal hospital in Windhoek.

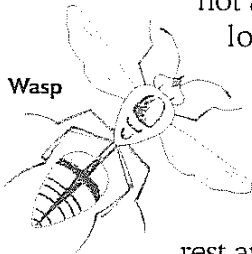
Bee-eater awoke two days later. She looked around the dark box in which she was sitting. Her head ached and she felt very hungry. Later that morning a hand reached into the box and carefully lifted her out. The hand seemed very big but it did not hurt her. Gently, Ndeshi's aunt opened Bee-eater's mouth and put a small grasshopper into it. At first Bee-eater spat out the grasshopper, but soon she understood that this was the way in which she could get food. Ten times a day the hand came into the box and Bee-eater ate. When she wasn't eating, Bee-eater rested and slept in the quiet, dark box. She had plenty of time to dream and think. She tried hard but she couldn't remember how she had landed in a dark box. Her thoughts and dreams were about the thousands of kilometres that she had just flown.

She thought back to when she had been born, in Russia. Then, in the month of May when Russia was getting very cold, she flew south to Namibia. She was not alone. She fed, rested and chatted with lots of other Bee-eaters on the long journey. The birds knew which direction to take in order to find food and water along the way. They flew through Europe and across the seas into north Africa. In Egypt they found tall trees on which to rest and roost. They ate butterflies along the Nile

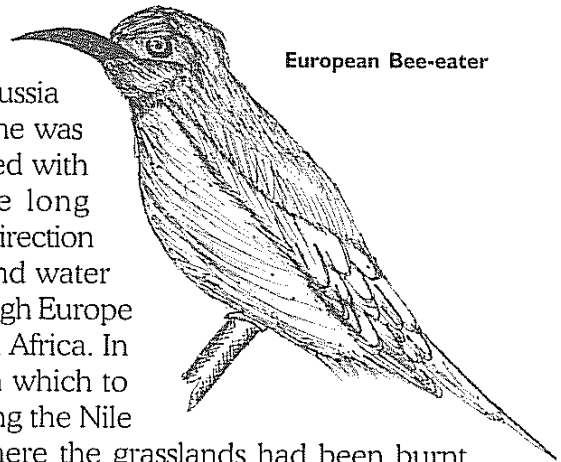
River. Then on they went, through the Sudan, where the grasslands had been burnt because of the war. Here food was scarce. The air was black and bad to breathe from the smoke of the grass fires. The Bee-eaters flew fast and high. Over central Africa, rain had already fallen and there were dragonflies, termites and lots of grasshoppers to eat. At last, in September, they had reached southern Africa, feeling well fed but very tired.

Bee-eater remembered the sad day when some of her friends had died. They had been flying and feeding over the grasslands. There were herds of wild African animals such as kudu, eland, oryx – even elephant. There were birds eating grass seed, sucking nectar from flowers and chasing insects. The Bee-eaters had to watch out for the falcons, who sometimes tried to hunt them. That night they found trees in which to rest. Then they continued going south. Soon there were no wild animals, only people and herds of camels, cattle, donkeys, goats and sheep. They saw women planting in the fields. One morning they flew over fields of young maize and sorghum and found a lot of grasshoppers – big, fat, juicy ones that were hopping very slowly. In fact, some were not hopping at all. The Bee-eaters came down to eat. Some of the birds were hungry and ate a lot very quickly. Suddenly an aeroplane flew low overhead. The birds took off in fright – the aeroplane was spraying smelly water onto the maize and sorghum and onto the grasshoppers. Later that morning the birds that had eaten the grasshoppers felt weak and ill, and one by one they had died. They had eaten poison from the aeroplane that had been spraying the grasshoppers.

Bee-eater's thoughts were broken off when a hand came into the box and picked her up. "More food," she thought. But she was wrong ... Ndeshi's aunt took the box outside and put it down under a big tree. Gently, she lifted the bird out of the box. Bee-eater was free! She looked around and then quickly flew straight into a nearby tree. Looking down, she couldn't believe her luck. In the lowest branch of the tree was a big hollow, and buzzing in and out of the hollow was a family of bees! Hundreds, maybe thousands of them. The sun was shining and other birds were singing nearby. Oh, beautiful life!



Wasp



European Bee-eater

Activities connected to Story I – “Bee-eater is set free”



English and Environmental Science

Individual activity

Write a story about road safety. Words and characters that can be used in your story: an adult, a child, a traffic officer, a driver, a doctor, a nurse, an ambulance, the police, a safety belt, a burst tyre, a bicycle, a stop sign or other road signs.

Group activity

Divide the class into groups. Each group creates a story and a short drama about road accidents and road safety. Each group develops a national road safety code for school children.



Art and Environmental Science

Individual or group activity

- Make posters for the classroom on road safety.
- Make a stick insect using sticks and thorns and leaves.
- Draw a food chain with the Bee-eater (an insect eater) in the middle.
- Draw a picture of an insect-eating bird in an environment (habitat) where it will be happy. Think of food, water, a place to sleep, a place to make a nest.



Mapping and Environmental Science

Individual activities

- Draw a map of Namibia. Colour in the grassland and woodland areas where Bee-eaters can be found.
- Draw a map of Africa. Plot a migration route from North Africa over Sudan and Central Africa to Namibia. Fill in the names of as many countries as you can.

Group activity

Find 5 types of insects in the school yard. Make a map of the yard and mark the places where the insects were found.



Mathematics and Environmental Science

European Bee-eaters fly 10 000 kilometres from Russia to Windhoek every year. They take 50 days for the trip. They fly the same number of kilometres every day.

- How many kilometres do they fly each day? _____ kilometres, which is the same as _____ metres
- European Bee-eaters fly from Russia to Namibia and back again every year? _____ (yes/no)
- How many kilometres do they fly in 1 year? _____ kilometres, which is the same as _____ metres

- How many kilometres do they fly in 5 years? _____ kilometres
- How many kilometres do they fly in 10 years? _____ kilometres
- 100 Bee-eaters fly from Russia, 30 die from eating poisoned insects. How many are left? _____ Bee-eaters

A Bee-eater eats 10 grasshoppers a day.

- How many grasshoppers will it eat in 1 week? _____ grasshoppers
- How many grasshoppers will it eat in 1 month (30 days)? _____ grasshoppers
- How many grasshoppers will it eat in 1 year (365 days)? _____ grasshoppers

A grasshopper damages 3 mahango plants a day.

- How many plants will it damage in 1 week? _____ plants
- How many plants will it damage in 1 month (30 days)? _____ plants
- How many plants will it damage in 1 year? _____ plants

A grasshopper weighs 2 grams. A Bee-eater needs 20 grams of food a day.

- How many grasshoppers must the Bee-eater catch in 1 day? _____ grasshoppers
- How many grasshoppers must it catch in 1 week? _____ grasshoppers
- How many grasshoppers must it catch in 1 month (30 days)? _____ grasshoppers
- How many grasshoppers of 2 grams each are equal to the weight of a packet of 100 grams of sugar? _____ grasshoppers
- How many grasshoppers of 2 grams each are equal to the weight of a packet of 1 000 grams of sugar? _____ grasshoppers
- How many grams in 1 kilogram? _____ grams

A Bee-eater eats 10 grasshoppers a day.

- How many grasshoppers do 10 Bee-eaters eat in 1 day? _____ grasshoppers
- How many grasshoppers do 100 Bee-eaters eat in 1 day? _____ grasshoppers
- How many grasshoppers do 150 Bee-eaters eat in 1 day? _____ grasshoppers

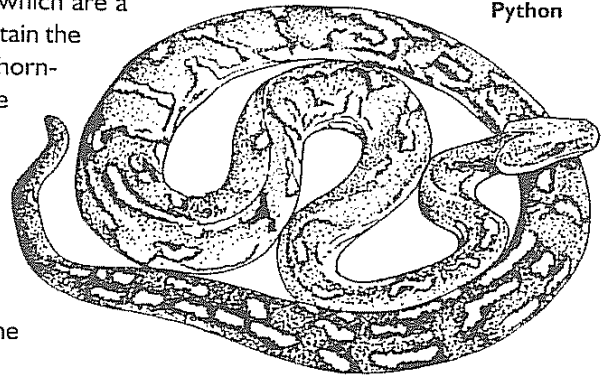
100 Bee-eaters eat 1 000 grasshoppers a day. 30 Bee-eaters die from being poisoned.

- How many Bee-eaters are left? _____ Bee-eaters
- How many grasshoppers are eaten by the remaining Bee-eaters in 1 day? _____ grasshoppers

Story 2

Background to the story

The Auasblik is the second highest mountain peak in Namibia. It is part of a large range of mountains, south of Windhoek and stretching east towards Gobabis. Black Eagles live and nest on the rocky cliffs of these mountains and other mountainous areas in southern Africa. These *majestic* birds glide on the mountain's *air currents* and hunt for their favourite food – dassies (Rock Hyrax). Klipspringers, baboons and leopards also live around the rocky cliffs; so do pythons, which are a danger to the baby Black Eagles. From the top of the mountain the eagles can see the grassy plains and thorn trees of the thornveld savannah. They see the snaking dry riverbeds and the big trees, such as the Camelthorns that grow on the banks of the river. In the riverbeds and on the grasslands there are all kinds of wild animals. Many mammals are there – kudu, porcupine, steenbok, duiker, mongoose and warthog. Reptiles common to the area are tortoises, lizards, and snakes – some are harmless, some very poisonous, such as the puff adder. The eagles also see the many cattle and goats that are farmed in the area.



Summary of the learning content:

Environmental Science

- *Species:* Black Eagle
- *Ecosystem and Habitat:* Grassland (savannah) where there are rocky hills and mountains
- *Food:* Mostly Rock Hyrax but also other small mammals
- *Behaviour:* Usually occur in pairs
- *Breeding:* Lays 2 eggs in winter on stick nests on rocky ledges
- *Conservation Status:* Rare

Social Science

- *Main activities:* Agricultural
- *Threats to Black Eagles caused by people's activities:* Poison, trapping and shooting

Black Eagle's story

In the summer of 1992 there were good rains and the grass grew very high. The dassies and all the grass-eating animals were happy and healthy. The dassies had lots of babies that year, and there was plenty of food for the eagles. In July a Black Eagle (Blacky's mom) laid one egg and sat down to keep it warm. A few days later she laid a second egg, because that is what Black Eagles do. After 60 days of sitting on the eggs, the first little chick started to knock on the eggshell. He used a special baby tooth on the top of his beak. It took a whole day and a night for the egg to crack. The chick climbed out of the shell, wet and tired. The Black Eagle dad brought food, and the mom fed her chick. Four days later the second egg began to crack. This little chick also came out of her egg wet and tired. She was small and weak compared to her 4-day-old brother.

A farmer lived in the valley below the high, rocky mountain. He had been watching the nest through his binoculars. He watched the big Black Eagle male catch a dassie and take it to the nest. He watched the older chick *gobble* all the food and the little chick got nothing. He saw that the little chick was getting weaker and weaker. The farmer began to climb the mountain. He climbed up the rocky cliff until he reached the nest. Then he took the little chick, put her into his

Black Eagle



pocket and climbed down again. The little chick was only two days old and did not know what was happening to her.

"Only one chick would have *survived* anyway," the farmer explained to his wife. "So we will look after this one and have a beautiful pet eagle. We will call it Blacky."

The farmer's wife was cross. "Black Eagles eat dassies. How will we feed the bird?" she asked.

"We have meat and dead lambs," replied the farmer.

They put Blacky into a box and placed the box in a quiet room. At first they fed her small pieces of meat. They stood around chatting and stroking her and invited their friends to see her. Everyone was amazed

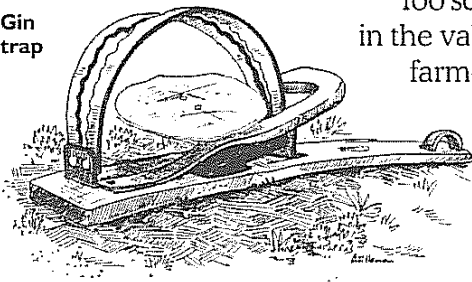
at how fast she grew, from a tiny chick that could fit into a pocket into a beautiful big eagle. By three months old she weighed five kilograms and could stretch her wings so that they measured two metres from tip to tip. The farmer was happy and very proud when one day she flew across to him to take a dead lamb. It was time for Blacky to fly. Soon she could soar up into the blue sky. She flew across the grasslands and up to the top of the Auasblik. Then she went to rest on a cliff ledge and look at the view. When she was hungry she went home to the farmer. The farmer always had meat or a dead lamb for her.

One day Blacky flew very far. She was hungry. She saw a dassie hiding in the rocks and thought, "I am an eagle. I can catch a dassie ...". But as she flew towards the dassie, two Black Eagles came diving through the air. "Get out!" they screamed in eagle-talk. "Get away, get out of our place!" Blacky flew off as fast as she could. Back at the farmhouse, the farmer was happy to see her and gave her a meal.



Rock Hyrax (dassie)

Gin trap



Too scared to go up onto the mountains again, Blacky stayed down in the valley near the farmer's house where she felt safe. Next to the farmer's house was a kraal with lots of little lambs. One day when the farmer went to town Blacky was hungry. She thought, "I am an eagle. I want to hunt. I see the farmer has left a lot of little lambs for me." Blacky flew down and grabbed a lamb. The catch was easy for the big eagle and she took her meal back to the house to eat. When the farmer came home he found Blacky sitting on the dead, half-eaten lamb.

He was very angry and lifted a large stick to hit her over the head. Blacky just stood there. She was not scared of her farmer who had fed her so well. She did not know that it was wrong to eat the farmer's lambs. Luckily, the farmer's wife ran outside. "Don't do that!" she screamed. "This is our baby eagle. We taught her to eat lambs instead of dassies. We taught her that she could stand and eat next to people without being afraid."

Blacky became a big problem for the farmer. She was eating his animals. So one day the farmer tricked her into a box and took her to the bird hospital in Windhoek.

Blacky is a powerful and beautiful bird. Her problem is that she believes that little lambs are the right food for Black Eagles. She is too scared to go up into the rocky mountains where other Black Eagles live, but she is not scared of people, even when they come at her with a big stick! Blacky now lives permanently at the bird hospital.

Activities connected to Story 2 – “Black Eagle’s story”



English and Environmental Science

- Write a summary of the story using about 200 words.
- Write a paragraph about the natural behaviour of Black Eagles from facts that you have read in the story. Include what they look like, where they live, how they behave, where and when they breed, what else lives in the area, what threatens them and anything else that you can think of.



Art and Environmental Science

- Draw a grassland ecosystem with two grassland habitats, the mountains and the valleys and rivers.
- Draw the Black Eagle food chain. Extend the chain into a food web.



Mapping

On a map of Namibia, draw in the mountain areas. Be sure to add the Brandberg and the Auasblik mountains.



Mathematics and Environmental Science

A pair of Black Eagles raised 1 chick in 1980 and then 1 every second year.

- How many chicks did they raise from 1980 to 2003? _____ chicks
- How many of the chicks are already 5 years old this year? _____ chicks
- Half the number of chicks born from 1980 to 2003 survived until they were adults. How many survived? _____ chicks
- One quarter of the chicks survived until they were adults. How many survived? _____ chicks

A Black Eagle eats 5 dassies a week.

- How many does it eat in 1 month (30 days)? _____ dassies

- How many does it eat in 1 year? _____ dassies
- How many dassies do 2 Black Eagles eat in 1 week? _____ dassies
- How many dassies do 2 Black Eagles eat in 1 month (30 days)? _____ dassies
- How many dassies do 2 Black eagles eat in 1 year? _____ dassies

Two Black Eagles have 1 chick that is almost ready to fly. The chick eats double the amount of food of an adult bird.

- How many dassies does the baby Black Eagle eat in 1 week? _____ dassies
- How many dassies does the baby Black Eagle eat in 1 month? (30 days) _____ dassies
- How many dassies does the baby Black Eagle eat in 1 year? _____ dassies

For the 2 Black Eagles and their baby:

- How many dassies do they eat in 1 week? _____ dassies
- How many dassies do they eat in 1 month? (30 days) _____ dassies
- How many dassies do they eat in 1 year? _____ dassies

The altitude (height above sea level) of the Auasblik is 2 479 metres. The Brandberg is the highest peak in Namibia and is 100 metres higher than the Auasblik.

- How high is the Brandberg? _____ metres
- Round off the height of the Brandberg to the nearest 100s. _____
- Round off the height of the Auasblik to the nearest 100s. _____

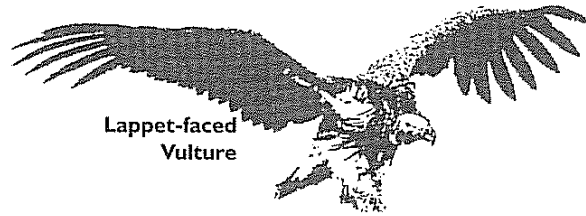
Windhoek lies 479 metres below the Auasblik peak.

- At what altitude (height above sea level) is Windhoek? _____ metres
- How many centimetres is the same as 1 metre? _____ centimetres
- How many metres is the same as 1 kilometre? _____ metres

Story 3

Background to the story

Lappet-faced Vultures live in savannah (grassland) and desert ecosystems. In the Namib Desert's winter months they make stick-nests in the trees that grow along the dry riverbeds. Vultures are scavengers. They fly to great heights scanning the ground for dead animals. There are usually fewer Lappet-faced Vultures at a carcass than other vulture types, but they can dominate the food because of their large size. In Namibia mammalian predators such as jackal and



Lappet-faced
Vulture

hyena also scavenge. These animals can cause problems for stock farmers if the farm animals are not carefully looked after. Some farmers put poison onto meat and leave the poisoned bait in the veld to kill jackals, hyenas, lions and leopards. Vultures are often killed by eating this poison put out by the farmers. This is called *primary poisoning*. They can also die from eating animals that have already died from the poison. This is called *secondary poisoning*.

Summary of the learning content:

Environmental Science

- ➔ *Species:* Lappet-faced Vulture
- ➔ *Ecosystem and Habitat:* From desert to grassland (savannah)
- ➔ *Food:* Scavenges on small or large carcasses
- ➔ *Behaviour:* Flies over huge distances, soaring to great heights and scanning the ground for prey
- ➔ *Breeding:* Raises 1 chick at the end of winter in a stick-nest on top of a tree
- ➔ *Conservation Status:* Rare and threatened

Social Science

- ➔ *Main activities:* Farming and tourism on the farmlands and tourism in the national parks
- ➔ *Threats to Lappet-faced Vulture caused by people's activities:* Eating poisoned carcasses, electrocution on power-lines, disturbance at nest-sites (often by low-flying aircraft used for tourism, especially in the Namib Desert)

Lappet-faced Vulture and the farmer

The black Lappet-faced Vulture looked down over the vast sandy plains of the Namib Desert. The air on the surface of the desert was hot. Hot air rises, and Lappet stretched her wings. From wing tip to wing tip they *spanned* two metres. Lappet rested on the air as it took her higher and higher. Suddenly she heard a roar behind her. She turned her head and saw an aeroplane. So she flapped her wings and moved higher. The aeroplane passed underneath her. "There will be more aeroplanes than vultures," she thought.

Then Lappet spied an ostrich lying on the sandy desert floor and forgot all about the aeroplane. She dipped her wings and slowly circled down. The ostrich was not moving. Lappet landed in a tree nearby and watched. Soon, two more vultures arrived. At first they tried to land on the same tree where Lappet was perched. But there was no space so they moved to another tree. They also watched and waited. Then another three vultures arrived. These three were different, grey in colour and a lot smaller. They were White-backed Vultures. After a short wait, one of the young White-backed Vultures flew down to the ground. It hopped to the dead ostrich and started to eat. This was the sign that the other vultures had been waiting for. They all flew down, hopped to the ostrich and in no time at all the meat from the ostrich was eaten.

Feeling well-fed and lazy, the vultures spent the rest of the day in the shade of the trees in the hot Namib Desert. Late that afternoon, two jackals arrived. They sniffed around the ostrich bones, but there was nothing left to eat.

Lappet began to feel very thirsty. She decided to fly to a water pool that was not far away. As she took off from the tree, she felt dizzy. Flying seemed hard. She flapped and flapped, the pool of water seemed very far. By the time she arrived at the water she was very dizzy and had a fever. She landed on the ground and walked to the water's edge. She wanted to drink but her throat burned and she could not see.

Because she was feeling so sick she did not even hear the other vultures arrive. They were the same five birds that had eaten the ostrich with her. They landed and walked to the water. But before they had reached the water the young White-backed Vulture that had been the first to eat the ostrich meat fell over. The other birds came to the edge of the water. They were all dizzy and feverish. One by one they lay down, too sick and weak to move. The cold night air of the desert cooled the feverish birds. But by morning all the vultures were dead, except for Lappet.

The next morning the sun rose and a hot desert wind began to blow. Lappet wanted to move but she was too sick. She lay in the hot sun and wind for the whole day. Late that afternoon a car arrived at the water pool. A family of tourists got out. They saw the birds lying around the water's edge. At first they thought that all the birds were dead. Then they saw Lappet turn her head.

"That one is alive," shouted a boy named Sam.

"Be careful," said Sam's mother, "it may scratch and bite."

But Lappet was too weak to do anything. The kind family put her in their car.

"What will we do?" asked Sam.

"We will take the birds to the farm where we are staying," his father said. "We can take the dead birds too and perhaps the farmer will be able to tell why they have died."

At the farm the family took Lappet out of the car. Then they called the farmer and told him what they had found. They showed him the dead birds. The farmer was very upset. He rushed into the house and telephoned his neighbour.

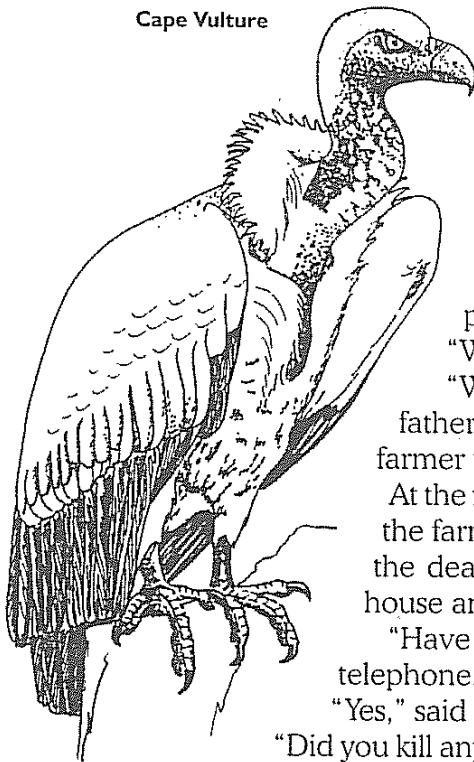
"Have you put poison out to kill jackals?" he shouted into the telephone.

"Yes," said the neighbour.

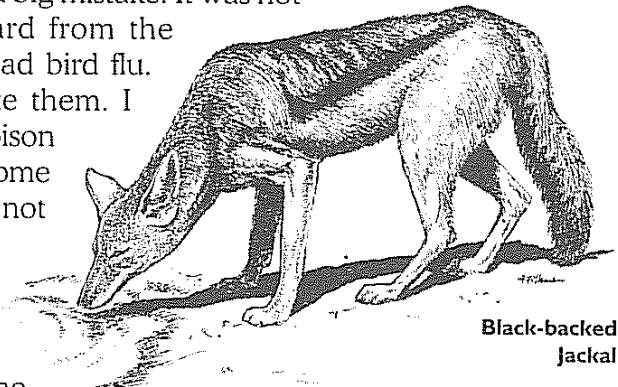
"Did you kill any jackals?" asked the farmer. "We have found one very sick vulture and five that are dead."

"Oh no," said his neighbour. "I have made a big mistake. It was not jackals killing my ostriches. I have just heard from the veterinarian in Windhoek that the ostriches had bird flu. They were dying because I did not vaccinate them. I thought the jackals were killing them, so I put poison onto a dead ostrich. I thought the jackals would come and eat the poison in the night. I know I must not use poison and I feel very bad about the birds."

The farmer put down the telephone. He was angry. The tourists were also angry. Sam was sad. He and his parents had come to Namibia to see the beautiful country and all the



Cape Vulture



Black-backed Jackal

wild animals. The next morning Sam and his parents drove to Windhoek. They took Lappet straight to the bird hospital. Lappet spent three weeks at the hospital. When she got better the farmer came to fetch her. He took her back to the farm and set her free.

Activities connected to Story 3 – “Lappet-faced Vulture and the farmer”



English and Environmental Science

- Write a story that starts: “In the shop a packet of rat poison fell from the shelf ...” End the story with: “We need to be careful because poison is very dangerous”.
- Describe the similarities and the differences between a scavenger and a predator. Can you name 1 scavenger and 1 predator in each of the following animal classes?
 - Mammals
 - Birds
 - Fish
 - Insects



Art and Environmental Science

Your class would like to protest against poisoning of wildlife.

Individual activity

Each student does a drawing about the dangers of poison use. The drawings must give the message. Words can also be used.

Group activity

Divide the class into groups of 4-6 students. Each group creates a poster from the individual drawings. The posters' message can be “Poison kills lives” or groups can create their own message to warn about the dangers of poison use.



Mapping

On a map of Namibia, colour in all the desert areas.



Mathematics and Environmental Science

A Lappet-faced Vulture weighs 8 kilograms. Every day it eats 100 grams of food for each kilogram that it weighs.

- How many grams of food does it need to eat each day? _____ grams
- How many grams of food does it need to eat each week? _____ grams
- How many grams of food does it need to eat each month (30 days)? _____ grams

- How many grams of food does it need to eat each year? _____ grams

1 kilogram (kg) is the same as 1 000 grams.

- The Lappet-faced Vulture weighs 8 kilograms, which is the same as _____ grams
- The White-backed Vulture weighs 4 kilograms, which is the same as _____ grams
- An ostrich weighs 100 kilograms, which is the same as _____ grams

A large ostrich weighs 100 kilograms. The bones weigh 50 kilograms, the organs (heart, lungs, kidneys, liver and stomach) weigh 25 kilograms. The rest of the weight is muscle.

- How many kilograms of meat (muscle) are on the ostrich? _____ kilograms, which is the same as _____ grams
- How much do you weigh? (Guess your weight if you are not sure.) _____ kilograms
- What is the difference between your weight and the weight of the ostrich? _____ kilograms, which is the same as _____ grams
- What is the difference between your weight and the weight of the Lappet-faced Vulture? _____ kilograms, which is the same as _____ grams
- What is the difference between your weight and the weight of the White-backed Vulture? _____ kilograms, which is the same as _____ grams

There are 60 thorn trees along a dry riverbed in the Namib desert. 2 trees die because their roots cannot reach the water. 2 baby trees die because a tourist drives over them. 4 trees are chopped down for firewood.

How many trees are left? _____ trees

85 Lappet-faced Vultures live in the Namib Desert. In 1985 a farmer in the Usakos area poisons 7 of them.

How many vultures are left? _____ vultures

In 1986 the remaining vultures have 10 babies but in the same year a farmer in the Omaruru area poisons 15 vultures.

How many vultures are left? _____ vultures

Story 4

Background to the story

Namibia's biggest eagle is the Martial Eagle. They weigh over 5 kilograms. They use *grassland, woodland and semi-desert* areas. This story is about a poisoned Martial Eagle received at the animal hospital in December 2003. In 1985, 18 years before it was poisoned, scientists had trapped and marked this eagle with identification rings put onto its legs. At that time, because of the colours of the feathers, they knew that the bird was at least 5 years old. When it was poisoned the rings on its legs

possibly helped save its life. The people who found the sick Martial Eagle realised that the bird was special. Rings on birds can help scientists to find out useful information about the natural history of a species. This true story about the eagle gave science a lot of information on the movements of Martial Eagles, how long they can live for and what they eat. All eagle species are *protected* in Namibia. The Martial Eagle is listed as a *threatened* species.

Summary of the learning content:

Environmental Science

- *Species:* Martial Eagle
- *Ecosystem and Habitat:* From grassland (savannah) with large trees to woodland
- *Food:* Mammals, especially mongoose, birds and reptiles. Eating from carcasses (as happens in this story) is maybe more common than has been previously recorded
- *Behaviour:* Hunts over huge distances, soaring to great heights and scanning the ground for prey
- *Breeding:* 1 egg is laid from May to June on a stick-nest in a tall tree or on a power pylon
- *Conservation Status:* Threatened

Social Science

- *Main activities:* Animal farming on the farmlands and tourism in the national parks
- *Threats to Martial Eagles caused by people's activities:* Shooting, trapping, poison, electrocution on power-lines, disturbance at nest-sites, destruction of nest-sites through cutting down of large trees, destruction of habitat through overstocking and overgrazing of land with farm animals (cattle, sheep, goats and donkeys) destroys the eagles' food resources

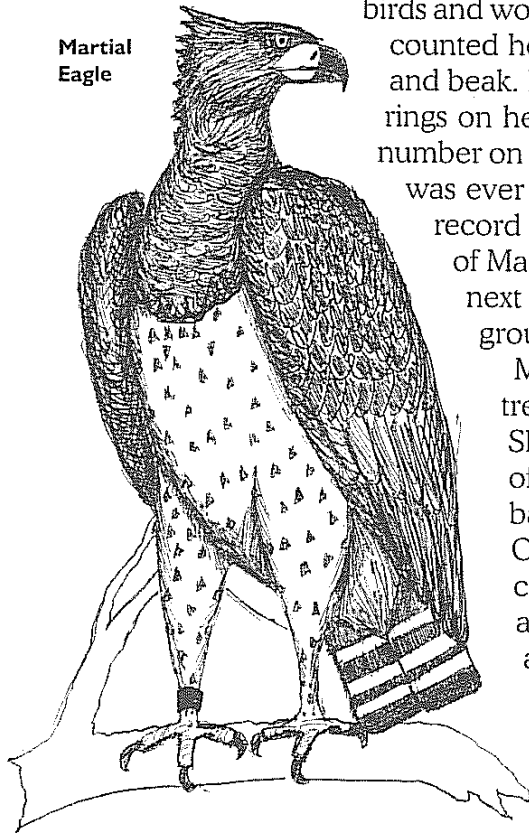
The Martial Eagle that was caught twice

A hungry Martial Eagle looked over the hot, dry riverbed, stretched her wings and yawned. She had spent the morning searching over the thick bushveld of western Etosha for food. She closed her eyes as a dry, dusty wind shook the branch of the tall tree in which she was perched. That morning she had watched a steenbok. She was about to fly down and catch it when a Toyota Land Cruiser passed by and the steenbok ran away. Not many cars passed that way, and Martial flew off in fright. She watched a warthog family for a while, but then they spotted her and quickly disappeared down into a burrow. A secretary bird saw her before she saw it. It flew away.

Martial flew off to a pool of water and landed in a tree at the water's edge. She looked down and spied a big white rat, half hidden under what looked to her like sticks. She sat and waited. The rat did not move, except for the twitching of its nose and whiskers. Suddenly, Martial dropped down from the tree and landed above the rat. But she could not get it because it was in a wire cage. Martial jumped up and down. The rat froze and shivered but it was safe from the eagle's talons.

Martial then heard people's voices. She tried to take off but something had trapped her legs and she could not get away. The people threw a blanket over her head and grabbed her legs. Martial was very scared. She did not know that these people were scientists. They were studying

Martial Eagle



birds and would not hurt her. The scientists measured her wings and counted her feathers. They measured her toes, claws, legs, head and beak. Last of all they put rings around her legs – three yellow rings on her right leg and two red rings and a metal ring with a number on it on her left leg. The number read X 1007 and if Martial was ever seen or trapped again the scientists would be able to record interesting information about the age and movements of Martial Eagles. The scientists wrote the number in a book next to all the measurements. Then they put Martial on the ground, took off the blanket and said, “Go bird, fly away!”

Martial flew for 10 kilometres before she landed on a tall tree. She looked down and saw the rings around her legs. She pulled and pulled at them but could not get them off. For the next 18 years Martial lived and raised her babies in the area from the Etosha National Park to near Ondangwa. Etosha had plenty of wild animals that she could catch. The areas outside the park had lots of wild animals too but also many farm animals, goats, sheep and donkeys.

There had been a problem in a village just outside Ondangwa. Dogs were roaming around and killing baby goats. One farmer from the village had lost four baby goats to the dogs. So he decided he would kill the dogs by tricking them into eating poison. He

carefully laid a trap to catch a rabbit. When he had caught the rabbit, he killed it. The farmer then sprinkled poison all over the dead rabbit's body and put it into the veld, hoping that the dogs would find it. But later that day when Martial was out hunting she spied the rabbit lying in the sun. She swooped down, grabbed it and flew away to eat her meal. An hour after eating the rabbit, Martial

felt very ill. She fell to the ground and could not move. She lay in the hot sun for hours and then night fell.

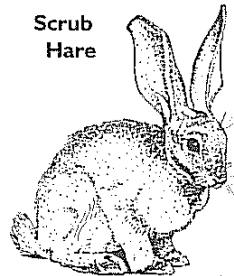
The next day a young boy from the village was herding his father's goats. He saw Martial lying on the ground. When he got closer he saw that the bird was alive but not moving. He went even closer and saw that she had rings around her legs. The boy was worried.

He could see that the bird was sick and was sure that a bird with rings around its legs must belong to somebody. He ran all the way home to tell his father and

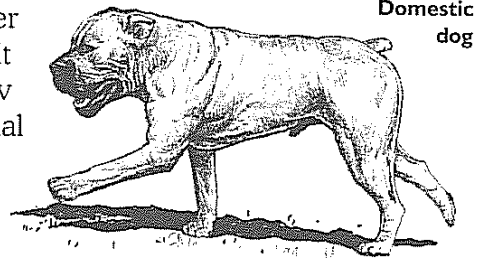
together they went out to fetch the bird. His father sent a message to the *veterinarian* in Ondangwa, who quickly came to the village, thanked the boy and took the bird away.

Martial was very ill. She had eaten a rabbit covered with poison. She needed medicine, rest, food and time to get better. The veterinarian had written down the number from the metal ring on the bird's legs: X 1007. Then he saw something else on the ring, in tiny letters was written: “*Inform Cape Town University*”.

The veterinarian phoned the university and told them about the Martial Eagle. He told them where she had been found and why she had been picked up. He gave them the ring number. The scientists at the university were very happy to get this information. They told the veterinarian that Namibian scientists had trapped Martial in 1978 in the Etosha National Park. At that time she had weighed five kilograms and by the colour of her feathers the scientists thought that she



Scrub Hare



Domestic dog

was just 5 years old. The university told the veterinarian that Martial had flown 600 kilometres from the place where she was trapped in 1978 to the place where she was poisoned in 2004.

Martial was sent to the bird hospital in Windhoek. She got well again and was released outside of the Etosha National Park only five weeks after having been poisoned.

Activities connected to Story 4 – “The Martial Eagle that was caught twice”



English and Environmental Science

- Write a story or paragraph. Use at least 5 of the following words: teeth, beak, meat, predator, scavenger, carnivore, grassland, national park, tourist.
- Create a banner. In one sentence tell people about the danger of using poison.



Art and Environmental Science

- Eagles are at the top of their food chain. Draw a food chain for a Martial Eagle. Can you extend this into a food web?
- Draw a picture of an eagle's feet and an eagle's beak.
- We care because we share. Divide a page in half. On the one half of the paper draw a grassland habitat in a national park. Think of the plants and animals in the park, roads and cars and places for tourists to stay. On the other half of the paper draw a grassland habitat after people have moved into the area. Think of farming activities, a house, a water point, roads, and electricity.



Mapping

- Draw a map of Namibia. Mark the 13 regions on your map. Fill in as many town names as you know. Put Namibia's national parks onto the map. Colour in the grassland and woodland ecosystems. Create a key for the map: towns, national parks and borderlines between the regions.
- Draw a map of your school and school grounds. Mark the areas where wildlife can live (think of insects, birds and reptiles such as lizards). Create a key for the map.



Mathematics and Environmental Science

Ondangwa is 600 kilometres from Etosha National Park.

- From Etosha to Ondangwa and back again is _____ kilometres
- If Martial Eagle flies from Ondangwa to Etosha and back 5 times a year, she flies _____ kilometres
- If she flies from Etosha to Ondangwa 10 times a year, she flies _____ kilometres

Martial Eagle's ring number is 1007. It is a number in a series that goes up in 1s. The numbers start at 1 001 and go up to 1 050.

- In the series, what is the number before 1007? _____
- What is the number after 1007? _____
- How many rings are there in the series? _____

In the series from 1 001 to 1 050, the scientist loses all the rings with even numbers.

- Write down the odd-numbered rings that he has left. Start from 1 001 and go up to 1 050.
- How many odd-numbered rings are there? _____ rings

The scientist loses all the rings with odd numbers.

- Write down the even-numbered rings that he has left. Start from the number 1 001, go up to 1 050.
- How many even-numbered rings are there? _____ rings

The scientist must use the bird rings in an order starting from the lowest number. The first ring that the scientist puts onto a bird has the number 1 001.

- What is the number on the ring of the 10th bird? _____
- What is the number on the ring of the 20th bird? _____
- What is the number on the ring of the 50th bird? _____
- What is the number on the ring of the 100th bird? _____
- How many birds did the scientist ring before the Martial Eagle (number 1007)? _____ birds

The scientist has 100 rings.

- If he loses 10, how many are left? _____ rings
- If he loses 90, how many are left? _____ rings
- If he loses 20, how many are left? _____ rings
- If he loses 80, how many are left? _____ rings
- If he loses 30, how many are left? _____ rings
- If he loses 70, how many are left? _____ rings
- If he loses 40, how many are left? _____ rings
- If he loses 60, how many are left? _____ rings
- If he loses 50, how many are left? _____ rings
- If he loses 70, how many are left? _____ rings

A Martial Eagle weighs 5 kilograms.

How many grams is 5 kilograms? _____ grams

Story 5

Background to the story

Spotted Eagle-Owls use a variety of habitats. The owl in this story uses a *riverine* habitat in a desert ecosystem. Owls are *nocturnal* predators. Spotted Eagle-Owls eat mostly insects and rodents. The young owls leave the nest-site at about 30 days old, but stay nearby to be fed by their parents. They are able to fly at about 45 days old but are fed by their parents for a further 5 weeks. They use telephone poles and fence posts as

hunting perches. Owls are often killed on the roads at night. They also get ill from eating poisoned prey animals, especially poisoned insects and rodents. Namibia is rich in precious and semi-precious gems, as well as minerals. There are large and small mines in our desert ecosystem. The owl in this story was orphaned when people "rescued" the young bird which had moved away from the nest-site but was still unable to fly.

Summary of the learning content:

Environmental Science

- *Species:* Spotted Eagle-Owl
- *Ecosystem and Habitat:* Desert in woodland
- *Food:* Mice, rats and insects
- *Behaviour:* Nocturnal
- *Breeding:* Lays 3-4 eggs in the winter months often on a nest on the ground
- *Conservation Status:* Secure

Social Science

- *Main activities:* Mining and recreation
- *Threats to Spotted Eagle-Owls caused by people's activities:* Poison and pesticides, loss of habitat, disturbance of nests and chicks

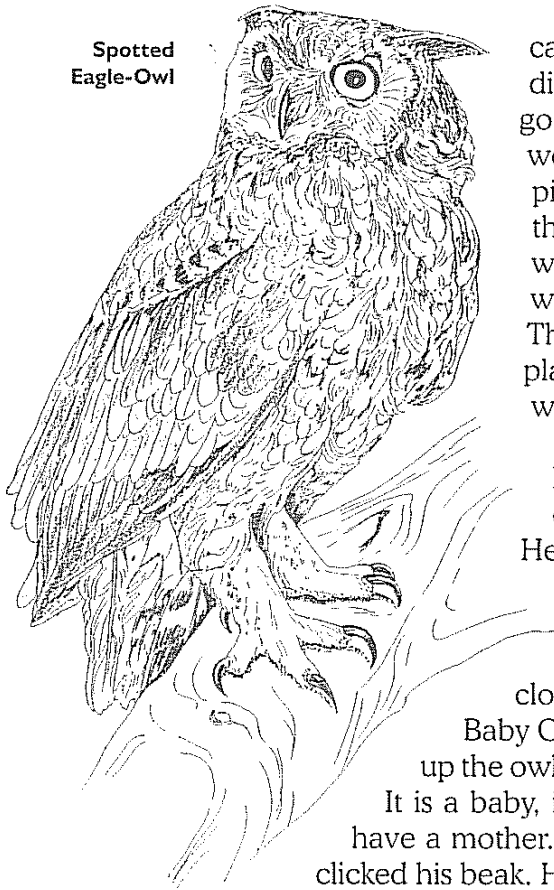
Baby Owl goes home

Spotted Eagle-Owl sat in a tall tree and looked around. She needed a safe place to lay her eggs. In a tree nearby there was an old nest that a Hammerkop had built. She sat and watched the old nest all day. "This is a good place," she thought. But that night a large python crawled out of the nest. Spotted Eagle-Owl flew away in fright. She flew along the banks of the mighty Orange River. There were plenty of insects on the banks of the river. "This is a good area," thought the owl, "there is plenty of food." She chose her nest-site under a large tree near the banks of the river. It was hard to see her; her brown feathers blended with the brown tree-trunk.

Every night the owl's mate brought food to the nest. He brought rats and mice, but mostly he brought insects like fat juicy grasshoppers. Mother owl laid 4 eggs. It took 8 days to lay the eggs, just 1 egg every second day. As soon as she had laid the first egg, she sat down on the nest to keep it warm. Mother owl sat for forty days before her first egg hatched. She kept the fluffy chick warm, together with the three other eggs. By the time the last egg hatched the first fluffy chick was already 8 days old.

One day monkeys were picking fruit in the trees above her. A fruit fell to the ground and landed close to the owls. Mother owl did not even blink, but the oldest baby owl got a fright. He decided that it was time to move away from the nest. He was still fluffy but bigger than his brothers and sisters. Baby owl crept out from under the rock and looked around. In front of him was the river. On either side were trees and rocks. Behind him were bushes and tall grass. Stepping slowly, he made his way to a bush just 10 metres from the nest. He lay down under the bush. That night Baby Owl called softly to his mother. Mother Owl called back. Now the mother knew where her baby was and flew across to give him food in his new hiding place.

Spotted
Eagle-Owl



Not far from the banks of the Orange River is a town called Oranjemund. The people living in the town are diamond miners. From Monday to Friday the children go to school and their parents go to work. On the weekends many families go to the Orange River to picnic and swim. One Sunday a family went down to the river for the day. All morning the children swam while their parents kept careful watch. After lunch they wanted to swim again but their parents wanted to rest. They told the children to stay out of the water and to play in the shade of the trees on the banks of the river whilst they rested.

The children played hide and seek. A girl called Fibi hid near Baby Owl. She hid herself very well; the other children could not find her, but Baby Owl saw the girl. He lay very still, he did not want to be seen. The other children ran past and Baby Owl clicked his beak in fright. Fibi heard the click; she looked around and saw the fluffy owl lying under the bush. She went closer and called the other children to come and look.

Baby Owl's eyes were wide with fright. The children picked up the owl and ran to their parents. "Look what we have found.

It is a baby, it does not have feathers for flying, and it does not have a mother." Everybody crowded around Baby Owl. Baby Owl clicked his beak. He was very scared.

The parents were not sure what to do. "Let's take the owl home," said the children. Later that afternoon the family packed the picnic baskets and set off home to Oranjemund. Baby Owl, eyes wide with fright and clucking his beak in fear, sat on Fibi's lap. Back at the house she put the owl into a box, then ran outside to play and forgot all about the bird.

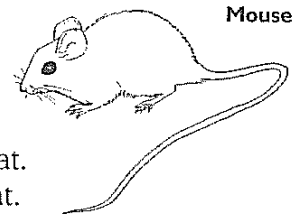
The next morning was Monday and the children went to school. In class Fibi told all her friends and her teacher about the picnic and the baby owl that she had found. "What did you feed the owl?" asked her teacher.

"Nothing," she said. "What does a baby owl eat?"

"Mice, rats and other animals. They will be difficult for you to find," said the teacher.

"What will I feed the owl?" asked Fibi. All the children thought about what to feed a baby owl. "Meat," they said. "Meat will be best."

After school Fibi asked her mother for some meat for the baby owl. He was standing in the box feeling very hungry. She put the meat into the box but Baby Owl did not know what it was. He knew that a mouse was good to eat. He knew that a grasshopper was good to eat. But he did not know what this red thing was. For two days Baby Owl did not eat. By the third day he was very hungry and picked up the piece of red meat. After that, Baby Owl ate whenever Fibi put meat into the box.



In the daytime he lay down to rest in the box. At night he stood up and waited for his food. One night when Baby Owl tried to stand up he could not. Fibi thought that he was tired. Three nights went by and Baby Owl did not stand up. Then he stopped eating. Fibi was worried. She told her mother that the owl was not standing up and would not eat.

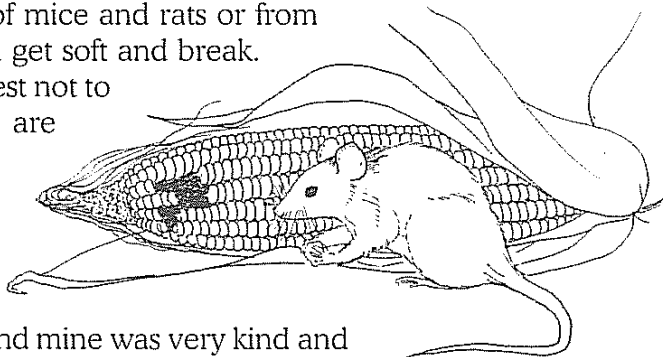
"Maybe we must phone the bird hospital in Windhoek," said her mother.

On the telephone, the nurse from the bird hospital asked her mother a lot of questions. The nurse told her mother that owls need more than red meat to eat. If owls do not get all the

minerals and vitamins from the skeletons of mice and rats or from the exoskeletons of insects, their bones will get soft and break. The nurse also told Fibi's mother that it is best not to pick up baby owls because their mothers are usually nearby.

"What can we do now?" asked Fibi's mother, "This little owl cannot stand up."

"Please send the bird to Windhoek," said the nurse.



The manager of the Oranjemund diamond mine was very kind and said that the diamond mine's aeroplane was flying to Windhoek and they would take the baby owl. Fibi was sad but she knew that the owl needed help. She found a clean cardboard box, punched holes into it for air and laid clean newspaper on the bottom. Her mother took them to the airfield. Tears came into Fibi's eyes as she waved the aeroplane goodbye.

The nurse from the bird hospital collected the owl from Eros Airport in Windhoek. At the bird hospital they bandaged the owl's legs. The little owl had to have a lot of medicines and injections to make his bones strong again. They fed him mice and rats and insects. He seemed very happy to eat owl food again.

After eight weeks in the hospital Baby Owl was better and of course much bigger. His legs were strong and he could fly. Once again the kind manager of the diamond mine said that the owl could go on the mine's aeroplane. This time he went south, back to Oranjemund. He was released near the Orange River, quite close to where he had been born.

Activities connected to Story 5 – "Baby Owl goes home"



English and Environmental Science

- Create a time-line for the life of a Spotted Eagle-Owl: development in the egg, hatching, dependency on parent birds, flying, finding a mate, finding a nest-site, laying eggs, *incubating* (sitting on) eggs, feeding chicks.
- Create a time-personal time-line: your date of birth, year 1, year 2 ... until the present.
- Make up a future time-line: from now until finishing primary school, secondary school and tertiary education, getting a job, getting married, having children ...
- *Understand the threat*: Write a story about a baby animal. Words to use: care, care-giver, warm, cold, hungry, crying (meowing, whimpering, barking, tweeting), food, feeding, and growing up.
- Write a list of the foods you eat. Now check if you have protein, carbohydrate, fat (dairy fat, animal fat or vegetable fat), glucose (sugar), fructose (sugar from fruit), lactose (sugar from milk), vitamins (A, B, C and D), minerals and salts (calcium, sodium).



Art and Environmental Science

Draw a food chain for a Spotted Eagle-Owl. Develop the chain into a food web.



Mapping

- Draw a map of Namibia. Mark the major rivers on the northern and southern national borders, other rivers, wetlands, the diamond-mining areas and the copper mining areas.
- Draw a map of Africa. Mark the major rivers and lakes.



Mathematics and Environmental Science

1 Spotted Eagle-Owl eats 2 rats every night.

- In 1 week, 1 owl eats _____ rats
- In 1 month (30 days), 1 owl eats _____ rats
- In 1 year, 1 owl eats _____ rats
- If there were 2 owls, they would eat
 - + _____ rats in a night
 - + _____ rats in a week
 - + _____ rats in a month (30days)
 - + _____ rats in a year

The owl has 3 babies and must care for them for 2 months. In the first month the babies eat 1 rat each a night. In the second month, when the babies are bigger, they eat 2 rats each a night.

- How many rats must the owl catch for all 3 of her babies in the first month? _____ rats
- How many rats must the owl catch for all 3 of her babies in the second month? _____ rats
- How many rats has the owl caught for her babies in the first plus the second month? _____ rats

1 rat eats 10 grams of seed.

- In 1 week, 1 rat eats _____ grams of seed.
- In 1 month (30 days), 1 rat eats _____ grams of seed.
- In 1 year, 1 rat eats _____ grams of seed.
- If there were 2 rats, they would eat:
_____ grams of seed a day;
_____ grams of seed in a week;
_____ grams of seed in a month (30 days);
_____ grams of seed in a year.

In 1 year, 2 rats had 20 babies. 10 of those babies had 10 babies each of their own.

- How many rats were there at the end of the year?
_____ rats
- How much seed did they eat? _____ grams of seed, which is the same as _____ kilograms

1 kilogram of seed can plant one hectare.

- How many kilograms of seed are needed for 2 hectares? _____ kilograms
- How many kilograms of seed is needed for 10 hectares? _____ kilograms

A farmer has 20 kilograms of seed and 20 hectares of land.

- How many hectares cannot be planted if the rats eat half the seed? _____ hectares
- How many hectares cannot be planted if the rats eat 10 kilograms of the seed? _____ hectares
- How many hectares cannot be planted if the rats eat 1 kilogram of the seed? _____ hectares
- How many hectares cannot be planted if the rats eat 5 kilograms of the seed? _____ hectares

Story 6

Background to the story

The bigger islands off the coast of Namibia are named Seal, Penguin, Halifax, Ichaboe, Mercury and Possession. Many seabirds and seals are found on these islands. In the summer months the islands are filled with seagulls, cormorants, gannets and penguins, making make their nests and raising their chicks. The large seals or sea-lions also use the islands to rest and to have their pups. The African Penguins, who used to be called Jackass Penguins because their call is much like a donkey braying (ass is

another word for donkey) is an endangered species. In the past, threats included sailors who were fishermen, traders and whalers. These men changed the islands' habitat. This habitat included safe breeding burrows for the penguins. The burrows were dug into the guano (bird droppings) that over thousands of years had built up to metres high. The sailors removed (harvested) the guano and also ate the penguins and their eggs. The guano was sold in Europe as an organic fertiliser.

Summary of the learning content:

Environmental Science

- *Species:* African Penguin
- *Ecosystem and Habitat:* Marine
- *Food:* Small marine fish and squid
- *Behaviour:* Fishes underwater at sea. Rests and breeds on land, usually on islands but sometimes on the mainland
- *Breeding:* Usually 2 eggs are laid in the summer months
- *Conservation Status:* Rare to endangered

Social Science

- *Main activities:* Fishing and guano collection
- *Threats to African Penguins caused by people's activities:* Over-fishing of small oceanic fish which are the penguins' food resource, oil pollution caused by oil spills from boats and ships, disturbance and destruction of nest-sites through guano collection

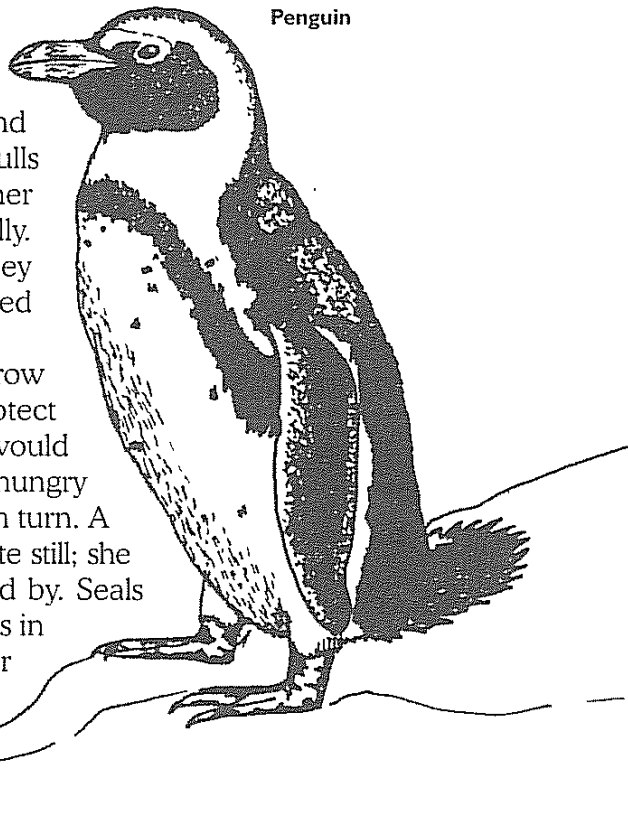
Penguin troubles

The day was hot and the sea breeze hardly cooled the air. Penguin shifted carefully on her two eggs so that they would not break. Her nest was on top of rocky ground. She knew that a safe place for a nest was under the ground or under a bush but she had not found a safe place. Around Penguin were hundreds of other seabirds. All their nests were on the ground and they were very busy looking after eggs or chicks. The noise from the birds was loud. The cormorants argued and stole seaweed from each other. As soon as one stole seaweed and packed the weed into its nest, another cormorant would grab the seaweed and a loud argument would start. The gannets, on their broad white wings, took off and landed all day long. They hunted for fish and arrived back on the island with food for their mates or chicks. They chatted and greeted one another with loud calls. The seagulls circled above. They called with loud screams and kept their sharp eyes to the ground below. Scavenging alone or in pairs, the seagulls stole eggs and chicks from any penguin or other bird that was not watching its nest very carefully. The gulls were also very useful because they cleaned up all the carcasses of animals that died on the islands.

Penguin had searched the island for a burrow that would keep the sun off her back and protect her from the wind. She wanted a place that would hide her eggs and chicks from the eyes of the hungry seagulls. A loud shuffling noise made Penguin turn. A seal was coming up the path. Penguin sat quite still; she always felt a bit nervous when a seal passed by. Seals often chased and sometimes caught penguins in the water. They were useful when the Killer Whales were around because the whales preferred a meal of seal to a meal of penguin. But seals were careless on the island and often walked over the birds' nests.

Penguin closed her eyes. She had to sit and keep her eggs warm for 50 days. She had a lot of time to think. Penguin thought of a story that had been passed down through the generations. The story was about how the island had been hundreds of years ago and how it had changed. Penguin had heard the story from her mother. Her mother had heard the story from Penguin's grandmother.

Three-hundred years ago American seamen found whales in the Atlantic Ocean near Walvis Bay. They began to hunt for whales just off the Namibian coastline. Out at sea Namibia's islands had been used for resting and nesting by the seabirds for thousands of years. The mess from the birds and salt from the sea-spray had built up deep guano on the islands. The seamen were sick of eating fish and wanted eggs to eat. They stole eggs and sometimes even caught a penguin for the pot. But they could not get all the eggs because many of the penguins hid deep down in burrows on their nests. Later the seamen had a new idea. The guano made very good food (fertilizer) for plants. It could be sold for the crops and gardens of people living in Europe and America. The guano was easy to collect. The men came with spades and sacks. They cleared



the island. They packed the guano into sacks, loaded the ships and sailed back to Europe and/or America. There they sold the guano bags to farmers who used it on their lands. The penguins had nowhere to hide their eggs and chicks. The number of African Penguins became fewer and fewer.

In less than 100 years the guano had all been taken. Too many whales had been killed and the seamen started fishing for small fish – the sardines and pilchards that were the favourite food of penguins.

The African Penguins had big problems. Their eggs and chicks were on top of the ground and their food, the sardines and pilchards, was no longer easy to find. They struggled to care for their eggs and they struggled to feed their chicks.

Penguin had her eyes closed. She had been dreaming. Suddenly, a hand grabbed her. She tried to bite the hand but the man had thick gloves on. The man picked up her eggs, weighed them and put them back on the nest. Then he fitted a band around her flipper; it did not hurt but it looked a bit odd. The band had a number on it: P999. The man put Penguin back on her nest. The man went from nest to nest, weighing eggs, catching other penguins and putting numbered bands on their flippers. He was a scientist and he was checking the number of birds on the island because scientists knew that there were problems for the penguins.

Every year the man returned to the island to check the birds. Then one year the man found Penguin sitting on the island with no eggs. She looked very ill and she was covered in dirty brown oil. All around her were other penguins, cormorants and gannets looking ill, their feathers covered in oil. A ship had spilled oil in the sea. Many of the birds had been fishing and the oil got onto their feathers. Dirty feathers are not waterproof and the birds got cold. They tried to clean the oil from their feathers and the oil got into their bodies and made them sick.

Penguin remembered very little of what happened next. The man picked her up and put her into a box with a lot of other sick birds. The sick and oiled birds were washed and washed. They were given fish to eat and washed again. They were given medicine. Many of them got better and months later they were put back on the island.

After that year, life started to get better for the penguins. Men came and built a wall around the edge of the island. Now the seals could not get onto the island and the penguins did not have to worry about their nests being trampled by seals. The guano was not collected and began to build up. The penguins could find shelter from the wind, sun and the seagulls. Their eggs and chicks were safe. The seamen fished carefully, leaving enough small fish for the penguins. The man still came every year to check and count and weigh the penguins. And P999 never tried to bite him again.

Activities connected to Story 6 – “Penguin troubles”



English and Environmental Science

Pretend that you are a scientist. You find a new species of bird living on the islands of Namibia. Write a letter to the President telling him of your find. Describe in the letter what the bird looks like, what it does, what it eats, where it sleeps and where it makes its nest. Tell the President about how the bird is threatened by pollution in the sea, about a ship that has spilled oil and a mine that is *discharging waste* into the water. Ask the President for help to stop the threat.



Art and Environmental Science

- Make a penguin from recycled material. You can use plastic bags stuffed with grass or old bits of material for the body. Toilet rolls or other cardboard can be painted and cut out to make beaks and legs. The flippers can be made from wire or sticks or cut cardboard, paper or plastic. Penguins are a good shape for paper-mache models.
- Draw a food chain for the penguin. Add the predators in the sea that can catch penguins, such as seals and Killer Whales.



Mapping

Draw a map of Namibia. Colour in the desert and the coastline. Add all the towns along the coast. Add as many rivers as you can that cross the desert and reach the sea. Add the main roads that lead from inland to the coast. Add the main islands in the Atlantic Ocean off the coast of Namibia.



Mathematics and Environmental Science

In the year 1852, 1 000 penguins lived on an island. There were an equal number of males and females. Sailors came and killed 30 male and 30 female penguins.

- How many penguins were left on the island after the sailors killed 60 penguins? _____ penguins
- How many females were on the island before the sailors came? _____ female penguins
- How many females were on the island after the sailors came? _____ female penguins

300 penguins laid 2 eggs each. All the eggs hatched.

- How many eggs were laid? _____ eggs
- How many baby penguins hatched from their eggs? _____ baby penguins
- Seagulls stole 10 eggs. How many eggs were left? _____ penguin eggs
- Seagulls stole 20 eggs. How many eggs were left? _____ penguin eggs
- Seagulls stole 50 eggs. How many eggs were left? _____ penguin eggs

A penguin must keep the eggs warm for 42 days. The male and the female share this job equally.

- How many days does the male penguin sit on the eggs? _____ days
- How many days does the female penguin sit on the eggs? _____ days

When the baby penguin hatches out of the egg it weighs 100 grams. The mother penguin weighs 3 000 grams.

- How much heavier is the mother than the baby? _____ grams
- One kilogram is the same as _____ grams
- 3 000 grams is the same as _____ kilograms

20 sailors came to the island. They stole 100 penguin eggs. The sailors shared the stolen eggs equally.

- How many eggs did each sailor get? _____ eggs
- Each sailor ate 1 egg for breakfast. How many breakfasts of 1 egg did each sailor eat from his share of the eggs? _____ breakfasts of 1 egg
- Each sailor ate 2 eggs for breakfast. How many breakfasts of 2 eggs did each sailor eat from his share of the eggs? _____ breakfasts of 2 eggs

20 sailors stole 200 eggs and shared them equally.

- How many eggs did each sailor get? _____ eggs
- Each sailor ate 1 egg for breakfast. How many breakfasts can each sailor eat from his share of the eggs? _____ breakfasts of 1 egg
- Each sailor ate 2 eggs for breakfast. How many breakfasts can each sailor eat from his share of the eggs? _____ breakfasts of 2 eggs

In 1852, 20 sailors killed 60 penguins. The 20 sailors were divided into groups of 5 sailors per group. Each group shared 1 roasted penguin for dinner.

- How many groups of 5 sailors per group were there? _____ groups of sailors
- How many penguins did the groups cook for 1 dinner? _____ penguins
- How many penguins were left dead but not eaten? _____ dead penguins

In 2004, 20 sailors killed 60 penguins. The police caught them. Each sailor was sentenced to 10 years in jail for killing an endangered Namibian bird.

Altogether, how many jail years did the 20 sailors get? _____ years

Story 7

Background to the story

Namibia's Atlantic coastline is home to thousands of birds, including the Damara Tern. Damara Terns are a special responsibility for Namibia because most of the world's population of these birds live in Namibia. The terns breed on the sandy and gravel plains up to 2 kilometres from the coastline. Although rules exist about where people are allowed to drive on the coast,

many people drive their vehicles off the roads and onto the gravel plains. People do this just for fun, but careless fun can threaten the environment. Driving off the roads on Namibia's coastline not only disturbs breeding terns but also creates ugly tyre tracks. On the gravel, because of the environmental conditions, the tracks from car tyres will remain as ugly scars for hundreds of years.

Summary of the learning content:

Environmental Science

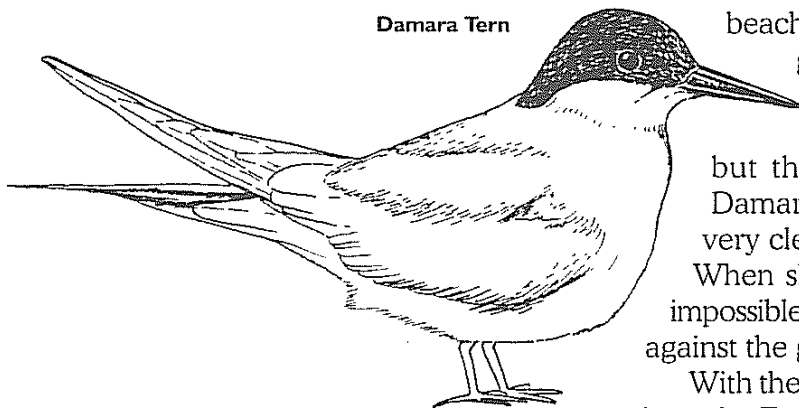
- ➔ *Species:* Damara Tern
- ➔ *Ecosystem and Habitat:* Wetland, coastal sandy shores, lagoons and estuaries
- ➔ *Food:* Small fish and crustaceans
- ➔ *Behaviour:* Lives alone or in small groups. Migrates along the Atlantic coastline to Nigeria.
- ➔ *Breeding:* Lays 1 egg in mid-summer in a shallow scrape on sand or gravel flats near (up to 1 kilometre from) the shoreline.
- ➔ *Conservation Status:* Rare

Social Science

- ➔ *Main activities:* Recreational driving and off-shore angling (fishing)
- ➔ *Threats to Damara Terns caused by people's activities* include disturbance and destruction of nest-sites by people driving on the gravel plains. The new urban development between Walvis Bay and Swakopmund is on a Damara Tern breeding area

Damara Tern and the fishermen

An east wind blew across the hot Namib Desert, straight out to sea. There was so much sand and dust in the air that it was really hard to see even a metre ahead. The colour of the seawater was brown, long bits of seaweed floated everywhere and the waves were wild. A group of big gulls and little terns stood on the beach facing the wind. No fishing was possible in such wild weather and the birds stood with their heads tucked back under a wing and their eyes closed.



Damara Tern

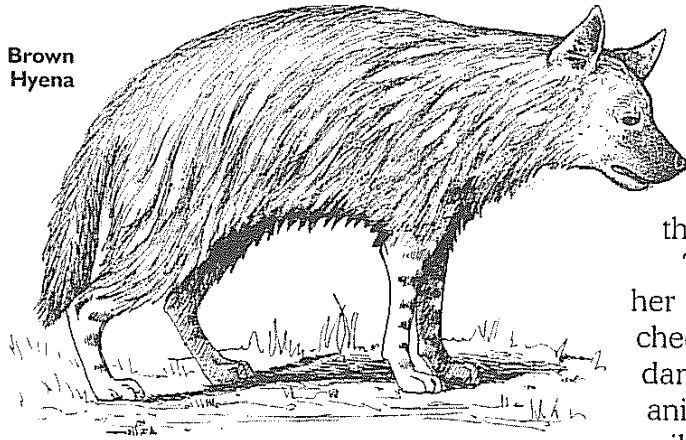
A few hundred meters away from the beach the land opened onto a wide-open gravel plain. Looking past the plain and into the distance, tall sand dunes should have been visible but the dust blanked everything out. Damara Tern sat on her nest. Even on a very clear day she was very hard to spot. When she flew off the nest it was almost impossible to see her egg so well camouflaged against the gravel.

With the wind roaring around, the birds did not hear the Toyota Land Cruiser until the car was very close to them. As they suddenly took fright and flew into the air, a gust of wind caught them. Birds, like aeroplanes, take off and fly into the wind. But one little tern was caught by a strong gust of wind. She lost control and the wind caught her and blew her straight towards the car. On the front of the Land Cruiser were three fishing rods sticking straight up into the air. The tern saw them but she could not get away and her wing hit one of the rods. She tumbled to the ground.

Inside the car the fishermen laughed. "Stupid birds," they said, "Hope our rods are okay." And away they drove. The little tern looked at her wing, then she tried to fly. With the strong wind she managed to get off the ground but she could not get high and she was flying at a funny angle. All her main flying feathers had broken. Down she came wondering what she would do next.

The tern sat for a whole day and a night. She was lucky that a jackal or a hyena did not come by. The next day the wind died down and the gulls and terns began to hunt for food. The little tern was very hungry but she could not fly. Then she heard the sound of a car and began to run. The car stopped and a person in a green and brown uniform got out. He stared at the bird

Brown
Hyena



with his binoculars and realised that something was wrong. It did not take long for the man to catch the bird. The man worked for a nature conservation office and he knew exactly what to do. He wrapped her in his jacket and drove to the veterinarian in Swakopmund.

The tern was scared but the people handled her gently. They took x-rays of her wing and checked all over her body for other signs of damage. "This bird is very lucky," said the animal doctor. "No bones are broken, but she will not be able to fly until she grows new feathers." "That is not such good news," said the nature conservation officer. "It may take months for this bird to moult out her old feathers and grow new feathers." But the doctor had a plan. "If you leave her with me," she said, "I will first feed her for a few days and make her strong and then we can use a special injection that will help her to grow new feathers quickly."

The nature conservation officer was very happy and he wanted to pay the doctor. "No thanks," said the doctor. "This is not your bird. This bird belongs to all Namibians and we will do all the treatments for free. If you could get the fish for the bird it will help a lot."

Finding fresh fish to feed a bird is not always easy, but the officer had a good idea. He drove into town and stopped at a little shop that sold fishing rods, lines, hooks and all manner of things. He told the shopkeeper the story about the tern and asked if they could put up a sign. The sign asked fishermen to donate small fresh fish for the bird. The shopkeeper looked surprised when he heard the story of the bird hitting a fishing rod and he told the nature conservation officer that two men had come to his shop just that morning with a rod, the tip of which was broken. They had told the shopkeeper that a bird had hit the rod.

Just then the two men entered the shop. They had come to collect their fishing rod. Before the nature conservation officer could say a word, the shopkeeper said, "Hello, your rod is ready and as good as new. That will be N\$ 1 000,00.

"What!" exclaimed the men, "Why is this so expensive?"

"Well," said the shopkeeper, "there are a number of things to pay for and if you give me a moment I will write out your invoice".

This is what he wrote:

Repair of fishing rod	N\$ 75.00
New eye for rod	N\$ 35.00
Nature conservation officer - time	(no charge)
Veterinarian - consultation	N\$ 125.00
Veterinarian - medicine	N\$ 150.00
Cage to be built to keep the bird	N\$ 300.00
Fish for 60 days	N\$ 225.00
Petrol to return the bird to the place where it was found	N\$ 100.00
Total	N\$ 1 000.00

"And next time," said the shopkeeper, "please help an animal that is in need and especially if you caused the accident."

The nature conservation officer could not believe his eyes. He wondered if the men would pay. The men were also shocked, but they paid the N\$ 1000,00. They then said that they were very sorry and left the shop.

Activities connected to Story 7 – “Damara Tern and the fishermen”



English and Environmental Science

You have N\$ 1 000,00 to spend. Go on a shopping trip. In your story you can spend your money on anything that you wish to buy. There may be some things that you wish to buy but that are too expensive. You can write about those things too.



Art and Environmental Science

Draw a picture of a busy Namibian coastal environment. In the picture there must be mammals, birds, insects and people. Coastal mammals are mostly scavengers such as Black-backed Jackal and Brown Hyena. They feed on animals such as dead seals. Birds that are predators, such as terns, fish over the water. Scavenging birds like seagulls eat on dead fish that fishermen have left on the beach, or that have washed up along the *shoreline*. Small birds run along the rocky or sandy shoreline looking for insects amongst the washed-up seaweed.

Add people to your drawing. Some children fish with nets in the rock pools, fishermen stand on the shoreline fishing, a person drives a car along the beach, some people sit and read, and a few swim in the waves.



Mapping

Draw a map of Africa. Put in the names of the oceans: Atlantic Ocean on the west, Indian Ocean on the east. Add the islands that are off the Namibian coast. Their names are in the background to the story “Penguin troubles” (see page 23). Add the islands that are off the east coast of Africa, in the Indian Ocean.



Mathematics and Environmental Science

At the local supermarket in Swakopmund, oranges cost N\$1,00 each, apples cost 50 cents each, sugar costs N\$2,00 per packet, flour costs N\$5,00 per packet, and sweets cost 10 cents each.

Jack buys 2 oranges, 2 apples, 1 packet of sugar, 1 packet of flour and 10 sweets.

- How much money did he spend? N\$ _____
- He pays with a N\$10 note. How much change does he get? N\$ _____

- He pays with a N\$20 note. How much change does he get? N\$ _____
- He pays with a N\$50 note. How much change does he get? N\$ _____
- He pays with a N\$100 note. How much change does he get? N\$ _____
- He pays with a N\$200 note. How much change does he get? N\$ _____
- If Jack had not bought the sweets, how many more oranges and apples could he have bought?
_____ oranges
_____ apples

Jack buys 4 packets of flour and then another 2 packets.
How many packets of flour does he have? _____ packets

Jack gives 3 packets of flour to Simon.

- How many packets does Jack have? _____ packets
- How much money does Simon owe Jack for the flour? N\$ _____
- If Simon repays Jack for the flour with sweets, how many sweets does Simon have to give Jack? _____ sweets
- If Simon repays Jack for the flour with apples, how many apples does Simon have to give Jack? _____ apples
- If Simon repays Jack for the flour with oranges, how many oranges does Simon have to give Jack? _____ oranges

A bird flies at 20 kilometres per hour (kmph).

- A car drives at 40 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 60 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 80 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 100 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 30 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 50 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 70 kmph. How much faster is the car than the bird? _____ kmph
- A car drives at 90 kmph. How much faster is the car than the bird? _____ kmph

Take action!

Understanding pests and pesticides

Every student makes a list of the pests and the pesticides in their home. Each pest and each pesticide is categorised under 'dangerous' or 'harmless' or 'I don't know', for example:

Pest	Dangerous to people	Harmless to people	Don't know
Mosquito	Yes, in some areas		
...	...		
...	...		
Pesticide	Dangerous to people	Harmless to people	Don't know
Doom	Yes		
...	...		
...	...		

An enquiry into captive animals, pets or livestock

Each student or group of students develops an interview to enquire about animals kept in households in their community. The students should find out whether families or people keep domestic animals or wild animals; how the animals that are kept assist the family or person; whether the animals kept are Namibian *indigenous* species or *exotic*

species; what kind of animals are kept (birds, mammals, reptiles); whether permits are necessary to keep these animals; and whether people who need permits have them.

The students can interview people in their neighbourhood or choose students from another class to interview.

SAVE THE WORLD!

What do students think should be done to ensure the survival of life on Earth?

Students should choose an environment, identify a threat to that environment and write a message on a placard or poster.

Messages for *natural environments* can focus on an ecosystem or a type of living organism. Messages for *political environments* can focus on municipal, regional, national or international issues. Messages for *social environments* can connect to health, nutrition or behaviour. Examples of short messages are given on the right.

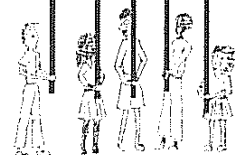
Save water!

Plant a tree!

Don't poach
our wildlife!

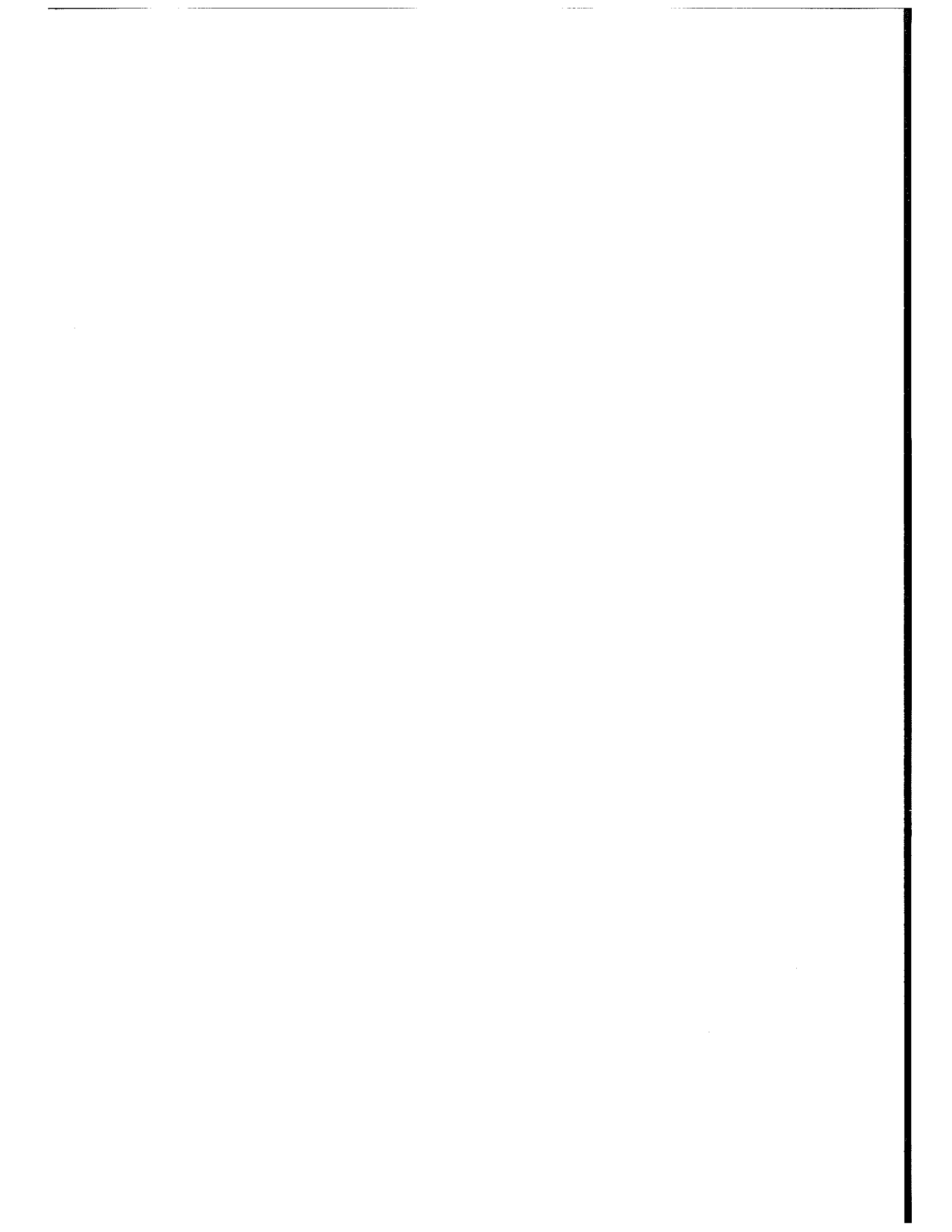
Stop polluting!

Don't get
HIV/AIDS!



Glossary

- air currents** – movements of air caused by environmental conditions
- altitude** – height above the level of the sea
- biodiversity** – the variety of all living organisms
- breed** – have babies
- burrows** – a hole or tunnel dug into the ground
- carcass** – the body of a dead animal
- crustaceans** – a group of hard-shelled animals that mostly live in water
- discharging** – letting out
- endangered** – being threatened
- enquiry** – investigation or questioning
- estuary** – where river and sea meet, water levels are influenced by the ocean tides
- exotic** – from another country
- gobble** – eat quickly
- guano** – the waste (faeces and urine) from birds
- hatched** – come out of an egg
- incubate** – cause the development of something by creating the right conditions
- indigenous** – belonging naturally to a certain country or area
- inform** – tell
- majestic** – grand
- migrant** – person or animal that has moved from one place to another
- migration** – the process of moving
- nocturnal** – night
- pesticides** – a product that kills pests
- predators** – an animal that hunts and kills to eat
- prey** – (1) an animal or bird that is hunted by another one for food; (2) a person or thing that suffers under an enemy
- primary poisoning** – poisoning from directly eating the poison
- roaming** – wandering around
- sea level** – the level of the sea's surface (0 metres)
- secondary poisoning** – poisoning from eating off an organism that died from eating poison
- scanning** – looking over all parts (areas)
- scavenger** – an animal that eats dead material such as a carcass
- shoreline** – the area along the edge of a body of water, especially the sea
- span** – the measurement from one point across to another point
- squid** – sea animal with 10 long thin arms on its head
- survived** – be still alive after or in spite of some event
- threats** – something that can hurt or damage some other thing
- urbanisation** – development of intense human population areas
- veterinarian** – a person trained as a doctor for animals
- waste** – left-over, usually to be thrown away



Important contacts

Our living world, the biosphere, is a thin layer covering the surface of our planet. Around the world today there are people using their knowledge and skills to encourage careful planet management. Environmental education is about spreading knowledge and skills to ensure the survival of life on Earth; it concerns you, your family, your community, your country and the whole living world.

Contact details for environmentally active organisations in Namibia are listed in the *Namibian Environmental Directory of 2004*, available from the Rössing Foundation Resource Centre, Khomasdal, Windhoek, or downloadable from the website of the Namibian Environmental Education Network (NEEN).

Namibian Environmental Education Network (NEEN)

- ✉ P.O. Box 20746, Windhoek
- ☎ (061) 211721
- 📠 (061) 211668
- ✉ Email: neen@rf.org.na
- 🌐 Website: www.neen.iway.na

GROUPS CAN VISIT THESE ENVIRONMENTAL EDUCATION CENTRES IN NAMIBIA:

Namutoni Environmental Education Centre, Ministry of Environment and Tourism (Tsumeb)

- ✉ Private Bag 2014 Tsumeb
- ☎ (067) 229200/1
- 📠 (067) 229200
- ✉ neec@mweb.com.na

Okatjikona Environmental Education Centre, Ministry of Environment and Tourism

- ✉ Private Bag 2506, Otjiwarongo
- ☎ (067) 306320
- 📠 (067) 306320

Africat Foundation

- ✉ P.O. Box 1889, Otjiwarongo
- ☎ (067) 304566 / 304585
- 📠 (067) 304565
- ✉ africat@natron.net

Cheetah Conservation Fund (CCF)

- ✉ P.O. Box 1755, Otjiwarongo
- ☎ (067) 306225
- 📠 (067) 306247
- ✉ cheeta@iafrica.com.na

Namib Desert Environmental Education Trust (NADEET)

- ✉ P.O. Box 31017, Windhoek
- ☎ (063) 693012
- 📠 (063) 693012
- ✉ nadeet@iway.com

Namibia Animal Rehabilitation, Research and Education Centre (NARREC)

See contact details on page 2.

NARREC is a nationally utilised centre for the treatment, care and rehabilitation of wildlife. NARREC works in co-operation with the Ministry of Environment and Tourism, the Ministry of Basic Education, Sport and Culture, the State Veterinary Services, the SPCA, private veterinarians and the public. NARREC staff are available every day to assist in rescuing injured wildlife and to respond to queries on animal-related issues. NARREC offers a guided environmental education programme for students from pre-primary to tertiary level, and for in-service trainees. →