

Tour of the Toronto Zoo for Grade Four: “Animal Habitats & Communities”

Grade 4: African Savanna Habitats & Communities

Background

In this tour we will be exploring the concepts of Habitat and Community by looking for relationships between the animals and plants we see and also observing the effects of human activity. The main point is that an organism (plants or animals) is found in a particular place because the climate, landscape, plants and other animals here provide the things they need to survive.

-The African Savanna is an ideal setting to show a variety of animals in one large community that all depend on this bush and grassland habitat (the African savanna) and each other to survive. Most of the herbivores feed by grazing or browsing but must also be adapted to escape the carnivores and endure periods of drought.

This community occurs because animals and plants co-evolve or adapt to each other over millions of years. E.g. Acacia trees grow sharp thorns to protect their leaves. Giraffes grow longer, more dexterous tongues to get at the leaves.

-We will also pay close attention to smaller habitats within the savanna to illustrate that so many types of animals can live in one community because each uses or exploits a separate part or niche.

-At each exhibit have students identify the species' position in a food chain (what it eats and what eats it) and classify its as a producer, consumer or a decomposer. Students should also be familiar with and apply terms such as herbivore, carnivore, omnivore and insectivore.

Tour Introduction & Definitions

We are going to look at one large plant and animal community called the African savanna. Within that community each species has its own habitat and its own niche.

Ask the students to give definitions for **habitat**, **community** and **niche**.

- **What is a habitat? A habitat is where the organism lives including food, water, shelter and space.** Here in the Zoo we have many natural habitats. The worm's habitat is the rich dark soil of the Core woods. The blue jay's habitat is the branches of the many trees in the forest. The grey squirrel's habitat is the trees and the forest floor where they hunt for seed and nuts. Habitats can overlap. The squirrel walks on the worm's habitat but it is looking for different food so there is no conflict.
- **What is a community? A community is all the living things in an area.** In the Core woods we have many populations or groups of the same species. We have a population of maple trees, a population of oak trees, a population of grey squirrels, a population of earthworms. All these populations live together and form the community.
- **What is a niche? An animal's niche is the place or role it occupies in its community.** This includes where it lives, what it eats, where it forages, the season of its activity, etc.

Today we are going to explore the various habitats in the African savanna community and also look at the niches that various animals occupy. Normally only one species can occupy a niche in a community at one time. We will also be looking at how all these niches and habitats fit together.

- **What is the African savanna?**

* Large parts of Africa south of the Sahara

- * Hot temperatures
 - * 2 seasons, a wet period when there may be a lot of rain fall followed by a long dry period when water may be very scarce.
 - * The predominant vegetation is grass and drought tolerant bush. Very few large trees grow here.
 - * The landscape is broken by riverbeds that are completely dry in the dry season and very fast flowing during the wet season.
 - * Here and there are ancient rock formations called kopjes. Kopjes form special habitats that are used by many animals as observation posts, feeding sites and good hiding places.
- Now let's explore how the animals and plants live together in this environment.

Tour

Elephant:

Look at those big tree trunks in the exhibit.

- **Can you tell me what elephants eat?** Trees as well as any other plants in their habitat.
- **What is this animal; producer, consumer or decomposer?** Consumer

Some call the elephant a "keystone species", which means it affects the environment in ways that allow many other species to thrive. The elephant is like a bulldozer. Elephants destroy trees by pushing them over to eating the bark and leaves. This promotes the growth of grass providing food for grazing animals. They also dig small water holes in dry riverbeds which other animals use and also spread many seeds in their dung. Their dung also supports huge numbers of insects. The elephant has the niche of the largest and strongest herbivore in the savanna.

Dry riverbed

Riverbeds are popular places in the savanna particularly during the dry season. This is where the plant growth is the thickest and occasional water holes can be found.

Warthog

- **Which is the warthog, producer, consumer or decomposer?**

The warthog is a consumer of grass. You may be able to see them on the knees of their forelegs, grazing. Warthogs have the longest legs of any pig and they are also the fastest of all pigs. They are a popular item on the menu for many carnivores making them an important link in the food chain. Because it does not migrate long distances like larger grazing animals, the warthog sometimes becomes the main source of meat in an area. Their main defense is running although they can defend themselves quite well with their tusks when they are able to back down an unused aardvark burrow. You could say that the warthog's niche is smaller, non-migratory grazer and root eater.

- **Is there a producer for the food web of the savanna in this exhibit?**

Grass. The base of this food chain is green plants that take energy from sun and carbon from the air and make food that the grazing animals eat.

Elephant Trail

Note the elephant trail (continue the bulldozer analogy). Elephants make pathways that many other species can use.

Hippopotamus:

- **Is it a herbivore or a carnivore?** Herbivore
- **What producer does the hippo eat?**

Grass. Hippos spend their days in the water resting and socializing and their nights on the savanna grazing. They eat so much they keep large areas near water grazed down to short grass that is very nutritious for many other grazers. Their droppings also add a lot of nutrients to the water. Although

they spend a lot of time in the water hippos do not eat many water plants. No animal lives by mainly eating hippos because they are too big to be hunted by any predator except humans. When they die however many animals may feed on their carcasses (hyenas, vultures, crocodiles and insects). The hippo has the niche of very large grazer of areas near water.

"Shamba" African farm:

Many African parks are surrounded by farms. Humans have lived as part of the African landscape for thousands of years and anthropologists believe that it was the African savanna that shaped the evolution of humans. Human numbers, especially in Africa are increasing so fast that even parks and reserves are being threatened by the encroachment of cattle and goat herds and farms. Most African people eat lower on the food chain than Canadians do. Most of their food comes directly from producers, the plants that they grow in small farms like this. Much more of our food comes from consumers (cattle, pigs, and chickens), and as a result, we have a much bigger impact on the environment.

Ostrich, Hornbill, Greater kudu & Impala

- **What is special about the ostrich?**

It is a bird that cannot fly. It is also the largest bird in the world and a very fast runner. The ostrich is an eater of fruit and leaves that can escape large predators by running away. Because it is so large and has a very dangerous kick it does not have much to fear from the smaller carnivores. Its large eyes and long neck also allow it to spot predators before they get too close.

The Greater kudu and the Impala are 2 of the 72 species of antelope that live in Africa. Each antelope species has a slightly different niche so that many different species can inhabit the same area without competing directly for the same resources.

Antelope in tree

- **Antelopes cannot jump that high, so how would a dead antelope end up there in a tree?**

Leopards must be in the area because this is how the leopard keeps other carnivores from stealing its prey. Leopards hunt alone, usually at night. They are tremendously strong but cannot defend their kills from the social carnivores (lions, hyenas and wild dogs). Fortunately for the leopard none of these competitors are good climbers. Hiding kills in trees is behavioural adaptation of the leopard.

White rhinoceros, Pelican, Egyptian goose

The white rhino, like the hippopotamus and the elephant, is one of the mega-grazers of the African savanna. Their name is a corruption of the original Afrikaans name which means wide, referring to their broad flat upper lip which is ideally suited for cropping short grass, the white rhinos' favourite food. Like other large animals of the savanna the white rhino's size is its main protection. Rhinos cannot see well but their senses of smell and hearing are very good. They mark their pathways and territories with large piles of dung called "rhino middens". Although lions may occasionally prey on young rhinos an adult rhino's only threat is the human hunter. Rhinos are often accompanied by a number of birds (cattle egrets) which feed on insects disturbed by the rhino's grazing. All 5 species of rhino are endangered because they are hunted for their horn.

Like most other geese the Egyptian goose is a grazer nibbling grass as its main food source. They can be fierce and very determined in defending their nests and young.

- **What is the pelican, a herbivore or carnivore?**

Carnivore. It lives mainly on fish from lakes and rivers in the savanna (The more precise name would be *piscivore*, or fish eater).

Water Hole

The water hole becomes a very important part of the savanna landscape in the dry season because most large animals in this community must drink at least once a day. This need concentrates grazing animals near water holes and in turn attracts hunters like lions, leopards and hyenas.

Termite mound (fungus culture)

Many of the termite species of the African Savanna are actually "gardeners". These social insects gather plant material (wood and grass), and chew it into compost on which they grow the special fungus they eat. In a way they are both consumers and decomposers. In many of the warm parts of the world termites have the niche of the most significant plant eater in the area. As a result a number of animals have become specialized in eating termites and ants. See if you can find one at the next termite mound.

Elephant tusk

Decaying hut

Humans have not always been destructive of the African savanna. For thousands of years people have been able to live in this environment without harming it. A hut like this on the African savanna is made from natural materials; sticks, mud and grass. When the owners move to a new location the hut crumbles back into the environment.

Baobab log

One of the largest trees on the African savanna is the baobab tree, which is capable of storing so much water during the rainy season that it can withstand very long droughts. It's water however makes it attractive to many animals and thirsty elephants may destroy even the largest baobabs to get at its leaves and bark.

Termite with Aardvark (home builder)

An important predator of the termite on the African savanna is the aardvark, which is one of the few animals strong enough to penetrate the concrete like walls. Once a termite mound has been damaged in this way it often becomes home to the aardvark or many other small animals seeking shelter.

- **What is the aardvark, herbivore, carnivore or omnivore?**

Carnivore The aardvark is a very specialized carnivore that eats only insects and therefore is an "insectivore". The aardvark has the niche of the only animal strong enough to break into termite mounds to eat the termites.

Cheetah

- **Who can tell me something about the cheetah?**

It is the fastest land animal in the world.

- **Why does the cheetah have to be so fast?**

To be able to catch the very fast antelopes that it eats.

- **What is the cheetah, producer, consumer or decomposer?**

Consumer. Yes. The cheetah is the only predator that can chase down some of the very fast small antelopes like the Thompson's gazelle on the open savanna. So you could say its niche is "hunter of small, fast antelopes". Cheetahs generally do not eat carrion but often have their kills stolen by larger but slower predators.

Grevy's zebra, Guinea fowl

- **Why do zebras have stripes?**

Dramatic patterns like zebra stripes are effective camouflage in low light conditions. The animals body shape is hard to make out and most of the zebras predators hunt at night. Grevy's zebras are found in the drier northern part of the African savanna and can eat coarse vegetation that other animals could not tolerate. Because the land cannot support as many animals here Grevy's seldom form large herds and unlike other zebras do not form lasting bonds with other adults. Because their habitat does not support large groups (food is spread out) they live mostly alone.

Balance of nature graphic

Here -we can also discuss the co-evolution of plants and animals like the acacia tree and the giraffe. Animals and plants influence each other's adaptations.

Olive baboon (omnivore)

- **How have baboons adapted to life on the savanna?**

Social organization, large size, males' canine teeth They are ever watchful for large predators but are not defenseless as the larger males will vigorously defend the group. The Olive baboon has the niche of the small omnivore on the African savanna. They are consumers of grass, roots, seeds, fruit, insects and even small mammals up to the size of young antelopes when they can catch them. So their niche is that of the small, social omnivore. Their main predator is the leopard.

Lion (top carnivore)

The lion holds the niche of the "top carnivore" of the African savanna. This means the lion will eat almost any animal that it can catch and there is no other animal that survives by eating lions. Only the largest animals are safe from lion attacks. Among the large predators only lions regularly take giraffe and African buffalo. They are able to bring down such large prey only through their social cooperation in hunting.

Kopje (pancake tortoise & lizard)

These "rock islands" are an important habitat for many animals of the savanna community; as vantage point, resting spot, shelter, den site, hiding place etc.

- **Can you see any animals (models) that may be using this habitat?**

Look to the left side of the path for models of the pancake tortoise. Look up for a colourful lizard.

Sable antelope

- **How does this antelope compare to the others you have seen on the tour?**

Darker, bigger, larger horns. The sable has the niche of a large antelope. It is primarily a grazer (herbivore, consumer) but will also eat leaves and twigs. Although it is an important link in the food chain the sable antelope is not an easy meal for a lion, leopard, wild dog or a hyena. They can run up to

57 km/h for a long time and when cornered or wounded will fight viciously with their feet and horns. They are also quite aggressive at water holes and most herbivores will get out of their way.

Caracal lynx

- **What familiar animal does the Caracal lynx remind you of?** The house cat.

Yes, like the domestic cat the Caracal is a hunter of small animals. Tall grass in dry areas provides its favourite hunting ground. Caracals will eat rodents, birds and even small antelopes. It is a very fast runner and good jumper and specializes in catching birds.

- **Can anyone describe its niche in a few words?**

Hunter of small to medium size animals in dry areas of the African savanna.

Spotted hyena

- **How would you classify the spotted hyena: producer, consumer or decomposer?**

Consumer. Yes, but it also has an important role as a decomposer too. Although they are very formidable hunters, spotted hyenas are the only large carnivores that can survive by eating bones. Their jaws are so strong that spotted hyenas can crush all but the very largest (elephant) bones. During the periods when other food is scarce the savanna is often dotted with small white piles of hyena dung consisting mostly of ground bone.

Hyenas compete and often conflict with lions in the niche of large social hunter of larger herbivores.

Masai giraffe

- **Who can tell me what giraffes eat?** Leaves.

- **Why do they have such long necks?**

This allows them to reach leaves high in trees where other animals can't reach. Giraffes are the most important browsers of treetops in the savanna. This is their niche. No other herbivore can easily reach the leaves at the top of these thorny trees. Animals and plants co-evolve or adapt to each other over millions of years. Acacia trees grow sharp thorns to protect their leaves. Giraffes grow longer, more dexterous tongues to get at the leaves.

Conclusion:

- **What would you say is the most important producer in the savanna community?**

Grass. Most of the animals we've seen live by eating grass and the meat eaters all depend on these grass eating animals for most of their food.

- **Who can tell me what a habitat is?**

A habitat is where the organism lives and includes food, water, shelter and space.

- **What is a community?**

A community is all the living things in an area.

- **What is a niche?**

An animal's niche is the place or role it occupies in its community.

Each animal has a niche or role within the community. Its habitat is all the places it uses to support its life and the community is made up of all the plants and animals that live together in the African savanna.

Alternatives for a similar tour in the Americas pavilion

-To explore human influence on habitats the Americas pavilion offers the rainforest monkeys and other rainforest animals and the graphics connecting logging, ranching and the disappearance of their habitat.

To make a local connection, look at Ontario animals that are now rare in this area: otter, massasauga rattlesnake and even bullfrogs. Ask the students why they think there are so few of them around Toronto.

-The black-footed ferret, black-tailed prairie dog, and bison, once common on the prairies have been displaced by fields of wheat and cattle ranches. This display is also a good example of the cascading and often unforeseen effects of extinction. Eliminate one species and there may be an effect that ripples through the whole ecological community. Ask the students if there could be a way for us to let these animals and the plants they depend on exist? Changes in farming practices. More land returned to wild prairie.