

Teachers' Notes

Ecological Niches

Surviving with Limited Resources

Chapters

Introduction

The Big Flood

Into the Dry Season

Program Summary

In the Sahel zone, a belt of dry savannah south of the Sahara, there is not much vegetation. The conditions are so extreme that few animals have been able to survive here all year round. Long hot periods alternate with sandstorms that last for days.

But once a year, around October, the situation changes. In the centre of Africa, heavy rain has caused rivers to rise. The rivers branch out, and some even reach the edge of the desert. In a short time, the landscape changes dramatically.

The rivers overflow onto the flat, even land. Shallow lagoons form, and they provide a new living space for plants and animals, even if it is only for a short period of time.

Pelicans and ibises have returned to the area from the African tropics, but most of the other species have migrated from Europe. To get here, they have endured long and exhausting trips - not many of them were able to cross the Sahara non-stop.

Now they only have one thing on their mind – food. This applies to fish as well as birds. Catfish, as well as many other types of fish, have been swept into the flood plains by the swollen rivers.

But how do so many animals co-exist, without eating each other's food? The answer is simple - every species has a different, specialised survival strategy. Every species occupies its very own ecological niche. By doing this, there is enough food for everyone.

We can see this when we look at the methods of hunting that different species employ.

Pelicans prefer to fish in cloudy, muddy waters – they work as a team. Swimming in a big semicircle, they herd the catfish into shallow water close to the shore. They flap their wings to stop the catfish escaping.

Pelicans also breed at this time of year, which is winter, because the plentiful food means that their young have a better chance of surviving.

Because there is so much food the chicks grow quickly and learn to fly in a fairly short period. Reproducing at this time of year fits perfectly into the ecological niche of the pelican.

In the clear green water of the lagoons, the pelicans would not have a chance of finding food.

Here, where the water is often clear right down to the bottom, conditions are more suited to birds that have very good eyesight, like the grey heron, a European bird that has flown south for winter.

It wades carefully through the shallow water, on the lookout for small fish and water frogs. Grey herons can't manage large fish like pelicans do.

Nearby a little egret is walking along in the shallow water. He relies on his dagger like beak and his excellent eyes to catch prey.

Hérons and egrets are able to survive in Africa with a lot less food than the pelicans because they breed in Europe at a different time of the year. This also lessens the competition between the fish eaters.

The black heron uses a unique hunting technique. It only has short legs, so it is confined to the shallow waters, a zone where the bigger herons don't usually hunt.

It takes short, sharp steps to scare the fish. Then it spreads its wings out like an umbrella. The fish seek protection in the darker areas under the wings, and then it's 'goodnight sweet fish.'

But fish aren't the only source of food in the flood zones. These ducks are searching for plant seeds.

Numerous lamellas (lamellae) in their beak form a filter mechanism, which they use to filter out even the smallest particles.

Warthogs find their food in deeper waters. They dive beneath the surface in search of plant seeds, and even the plants themselves.

Singing birds are attracted to the area not only by the water, but by the insects that live in it.

Even in the search for insects competition is avoided. While the yellow wagtails only search for food on the water's surface, only a few meters above them, thousands of swallows chase airborne insects. In this way different insect eaters can share the same area, because they have different preferences and skills.

As winter draws to a close, the temperature starts to rise again. The big lagoons are now small waterholes. Animals that need large amounts of food, like herons and pelicans could not survive here anymore - they left the area weeks ago. Now omnivores like the Nile Monitor have moved in.

The monitor forms a semicircle with its body to trap its prey, and then moves towards the shore. In shallow water, it is easier to grab fish with its mouth.

Monitors are not fussy, they'll eat whatever's available. As well as fish, they also eat eggs, snakes, and warm-blooded animals. Even carrion is on the menu of these huge lizards.

The warthog has switched to a leaner diet. It's much harder to dig for roots in the dry, rock-hard earth than at the bottom of a lagoon.

Like lizards, warthogs are omnivores, and retain an open mind about what constitutes food. In their search for water they have come across catfish stuck in a mud hole. They take advantage of the situation and fill their bellies before this last remaining food source disappears.

Winter is over, and the earth where the lagoons once were is starting to crack. This python is on its way back to the riverbed. The riverbed never dries out completely, and the snake will be able to survive until the end of the dry season. More and more the hot desert climate is winning back the upper hand. Changed circumstances now determine the ecological niches of the animals that are left. And only by adapting to these new conditions will they be able to survive.

Activities

1. If another bird species that also ate Catfish was introduced into the area, what would be the effect on the number of Pelicans?
2. What are the benefits of breeding during the winter?
3. Using an animal native to your area research the following:
 - a. What does the animal eat?
 - b. When does the animal breed?
 - c. Does the animal have adaptations that make it specialised in catching its prey?
 - d. Is the native animal competing with non-native animals for its ecological niche? If yes, what is that animal?
 - e. Design a poster that shows the animal in its habitat, and include in your poster the animal's food source and any competitors.

Questions

1. Where would you find the Sahara Desert?
2. What is the Sahel Zone?
3. When does the dry season cease?
4. What attracts the animals to the area after October?
5. How do animals co-exist without eating each other's food?
6. What is an 'ecological niche'?
7. How do Pelicans catch their prey?
8. Why do Pelicans breed during this season?
9. What prevents Pelicans from finding food in the clear green water of the lagoon?
10. What reduces the competition between the Heron and Egret species with the Pelicans?
11. Match the following animals with the food you observe them eating in the video by drawing an arrow. The animal may have more than one food source.

Animal	Food Source
Pelican	water frogs
Grey Heron	plants
Black Heron	small fish
Ducks	water surface insects
Wart Hog	Catfish
Yellow Wagtail	air borne insects
Swallows	plant seeds

12. Ducks have lamellae in their bills. What do the lamellae do?
13. What does the Nile Monitor eat?
14. How does its non-specific diet aid its survival?