

## Presenter notes and transcript

Capstone project

6/17/2021

### **Giant kangaroo rat – Endangered keystone species of California grasslands**

**Environmental setting:** can be done in a classroom

**Age group:** elementary school kids

**Preparation:** could take 1-2 hours, the speaker can do additional research on California grasslands, the terms used like “keystone species”, “adaptations”, “endangered species”

**Props required:** This presentation, drawing paper and colored pencils

**Notes:** this presentation can be a part of learning about **California grasslands habitat, California endangered species** or **survival adaptations**.

**The following includes both, presenter notes (in black) and the transcript (in blue):**

Before starting the presentation, distribute paper and pencils.

#### Slide 1

Greet everyone and make a connection with the topic being studied and the topic of the presentation. For example, if you want to connect this with the “endangered species”: *Hi everyone, today we are going to talk about a GIANT kangaroo rat! A very important endangered species of California that needs our protection.*

#### Slide 2

Get the children excited about the name!

*When I say GIANT Kangaroo rat, you probably imaging a rat the size of a kangaroo! That’s what I thought the first time I heard that name! But in fact, giant kangaroo rats are quite small creatures.*

#### Slide 3

Explain why they are named Giant kangaroo rats

*But why is it called like that then? Though it is named the giant **kangaroo** rat it is not at all related to kangaroos, this creature got its name because of its large back legs that allow it to jump much like a kangaroo. Kangaroo rats are not what you think of as rats as well. They are not like common household rats. It's referred to as 'giant' because it is the biggest kangaroo rat known.*

*Today we are going to learn some fascinating facts about this little creature!*

#### Slide 4

*Let’s start with its’ other names: The giant kangaroo rat’s scientific name is Dipodomys ingens, Dipodomys is the genus family of the kangaroo rats and ingens means huge. They are also sometimes called “ninja” rats! And you will find out soon why!*

## Slide 5

And now let's take a look at their appearance!

Giant kangaroo rat is **the largest of over 20 other species of kangaroo rats**, that's why they are called giant! They have **tan fur with a white belly and a white stripe across its' hips**. It is usually **about 13 inches long including long tufted tail**. Their tails are as long as their bodies or even longer, **about 7 inches long**! This helps them balance when they jump. And of course, they have **large hind/back legs for jumping**. They have **large fur-lined cheek pouches** for carrying around big quantities of seeds and big eyes for being able to see in the dark. And as I mentioned earlier, they are quite small animals and **weight only up to 5.5 ounces**.

Besides being the largest out of other kangaroo rats, you can also differentiate them by 5 toes on their hind feet while other kangaroo rats only have 4.

## Slide 6

So where can you find a Giant Kangaroo rat? They prefer sandy slopes of grasslands. Historically, its range included the whole western edge of the San Joaquin Valley, but it is now limited to the southwestern edge of the San Joaquin Valley, including the Carrizo Plain, Elkhorn Plains, Kettleman Hills, and Cuyama Valley. They are endemic to California grasslands, meaning they are native to California and are not found elsewhere but California grasslands.

## Slide 7

We now know their name, appearance and habitat. Let's get to know giant kangaroo rat even better and learn about their fascinating behavior!

- **They are nocturnal** animals and only active above ground for about 15 minutes per night foraging for seeds and other food
- They are primarily seed eaters, but also eat green plants and insects
- They are **solitary species** and enjoy living alone in underground burrows on sandy grassland slopes
- **Their Burrows** are a complicated combination of tunnels and different rooms each with their own purposes (for example, a room for sleeping, living and food storage)
- They are very **territorial!** Within its individual territory, a giant kangaroo rat will maintain a number of shallow pits, which it uses to dry seeds before storing them in their underground burrows, as well as patches of dirt it uses for "**dust baths**." These baths help the animal maintain good skin and fur condition, and facilitate marking of its territory.
- The individuals communicate with each other by **drumming their feet** on the ground (These foot thumping signals range from single, short thumps to long, drawn out "footrolls". These audible signals serve both as a warning of approaching danger, as a territorial communication, and to communicate mating status.) You can see the drumming motion on the right side of the slide.

## Slide 8

Ask children if they know what adaptation is and to think of the adaptations that help giant kangaroo rat survive in their habitat.

*Now that we learned about giant kangaroo rat's appearance, how do you think their physical characteristics help Giant kangaroo rats survive in their habitat? Give children a little time to think, then help them out: Look at the picture on the right for example, look how large their hind legs are! How does it help them survive? Once you hear some suggestions, start with the first adaptation:*

***They have long hind legs and large feet*** for jumping up to 9 feet to escape predators! And their long tails help with balance when they jump. ( The erratic path of their powerful jumps and top speeds of almost 10 feet per second makes them very hard for predators to catch.) They also use their feet for communicating with others by drumming their feet on the ground. Click one more time for the video to appear: *In this video you can see how incredibly powerful their hind limbs and long legs are which helps them escape predators. But how is kangaroo rat reaction time so fast? -> click*

***They have very good hearing!*** The giant kangaroo rat head is bulbous because they have huge, hollow chambers in their skull which transmit low-frequency sounds better, making their hearing much more sensitive than most animals. It can even detect the silent sound of an owl approaching. -> click

***They are Nocturnal***, meaning they are more active at night, when it's cooler. -> click

***And they have Large eyes*** to see in the dark -> click

*Its front legs are short, and are better suited to digging and stuffing seeds in its fur-lined cheek pockets -> click*

*Its fur color matches the sand and rocks where it lives. (This acts as camouflage and helps them to blend in. Camouflage is another important physical adaptation. It protects the kangaroo rat from hungry foxes, snakes, owls and coyotes. If the predators can't see them, they can't eat them.) -> click*

*They have kidneys that can help the giant kangaroo rat not produce much urine to conserve water. (note - Giant kangaroo rats have the most concentrated urine of any North American mammal, that's right, they almost never have to pee!) -> click*

*They don't sweat or pant like other animals to keep cool ( their body temperature is usually hotter than their surroundings) -> click*

*Giant kangaroo rat never has to drink water! They collect seeds and keep them in the burrow, collecting moisture; giving all the water they need to survive. This is a very important adaptation for the giant kangaroo rat, as its grassland and shrubland habitats typically receive less than 15 inches of rain per year, and during the summer daytime temperatures reach greater than 100 degrees on average. -> click*

## Slide 9

It's very important to help children understand the importance of the species as well as understand what keystone species are.

*So why are Giant Kangaroo rats so important to learn about and to protect? Because they are a keystone species and an ecosystem engineer! This means they provide habitat and food for other animals, including 12 sensitive/endangered species like:*

- *San Joaquin kit fox that is one of the giant kangaroo rat's predators and is endemic to California grasslands.*
- *Also Blunt-nosed leopard lizards and san joaquin antelope squirrels. The giant k-rat's burrows provide shelter for both of them.*
- *Plants also benefit as the seed clippings that the rats use to surround their burrows help enrich the soil with nutrients.*
- *On the Carrizo Plain Natural Area, the endangered California jewelflower grows primarily on the burrow systems of Giant Kangaroo Rats.*
- *Without Giant kangaroo rats the entire ecosystem would fall apart!*

## Slide 10

Last slide explaining why the species is endangered and what the threats are.

*Unfortunately, giant kangaroo rats are facing extinction because of their habitat loss. At this point more than 98% of its habitat has been lost. The primary cause of this habitat loss was conversion of lands in the San Joaquin Valley to **agriculture**.*

***Urban and agricultural development** in California has caused massive habitat fragmentation.*

***Oil and mineral exploration** and extraction in the area also contributed to habitat loss.*

*Additionally, the use of rodenticides to control ground squirrels killed much of the remaining populations of giant kangaroo rats.*

*Even though the giant kangaroo rat is suffering a great decline in population, something is being done. A few different plans are taking place to help replenish the giant kangaroo rat's population.*

Solutions:

- *One of the solutions is to locate and count giant kangaroo rat population (**population monitoring**).*
- *Another solution includes setting aside land for the rodent. What lies between the San Luis Obispo county and Kern County, California, is protected for the sole sake of bringing back the*

*giant kangaroo rat's population. No agricultural development is allowed in this area (**habitat restoration**).*

- *And reintroduction/translocation – returning population to historic ranges*

### **Slide 11**

After the presentation is concluded, ask kids to try and draw a giant kangaroo rat from their memory.

**Optional:** run a short quiz with the group to test what they've learned, questions below.

### **Giant Kangaroo rat Quiz**

**Which of the following is true about the Giant Kangaroo rat?**

- It's related to kangaroos
- It's an endangered species
- It's active during the day
- Primarily eats insects

**Which quality of the giant kangaroo rat does NOT help it stay safe from predators?**

- Its sandy brown hair.
- Its excellent hearing.
- Its tail that allows it to jump very high.
- Its big front paws.

**Which of the following statements is true about the burrow of a giant kangaroo rat?**

- The burrow has different rooms for storing food and making a nest.
- Many giant kangaroo rats live in one burrow.
- The burrow is made by digging a hole in a plant, like a cactus.
- Giant kangaroo rats do not build burrows.