**SCIENCE TREK 1802 ZOOLOGY PROGRAM**

Transcribed by Nancy Poore 09/21/16

Presentation of *Science Trek* on Idaho Public Television is made possible through the generous support of the Laura Moore Cunningham Foundation, committed to fulfilling the Moore and Bettis Family Legacy of building the great state of Idaho, by the Friends of Idaho Public Television and by the Corporation for Public Broadcasting.

Zoology is the study of animals and animal behavior. Zoologists help us understand how animals live and interact with the world. So find out more. Stay tuned. *Science Trek* is next.

JOAN CARTAN‑HANSEN: Hi, I'm Joan Cartan‑Hansen. And welcome to *Science Trek*, and welcome to Zoo Boise. Scientists are standing by to answer your questions about zoology. And later in the show we'll learn more about Zoo Boise's effort to save animals on the edge of extinction. But first, let's learn a little bit more about zoology.

Zoology is the study of everything having to do with animals.

QUESTION: Everything?

CARTAN‑HANSEN: Yes, everything, and for all kinds of animals. Zoologists, scientists that study animals, learn about things like animals' anatomy, nutrition, what they eat, conservation, ecology, where they live, the genetics, and cellular biology, everything.

QUESTION: How do they start?

CARTAN‑HANSEN: With observations and by taxonomy, or by classification. All living things are divided into three domains, then five kingdoms, of which animals are one. Each kingdom is divided into ever‑smaller categories of phylum, class, order, family, genus, and species. Species are then divided up based on physical and genetic characteristics into subspecies.

Take your pet dog, a dog belongs to the Animalia Kingdom, the Phylum Chordata, the Class Mammalia, the Order Carnivora, the Family Canidae, the Genus Canis, the Species Canis Lupus, and the Subspecies Canis Lupus Familiaris.

QUESTION: Why do zoologists use such funny names to classify animals?

CARTAN‑HANSEN: The names are in Latin. The first classifications were made in Latin a long time ago. Scientists across the world, no matter what language they speak, all use Latin terms to classify so they know what they're talking about. Scientists use Latin to be precise.

QUESTION: Precise?

CARTAN‑HANSEN: Yes. We can call this a cat, or this a cat, or this a cat. But if you want to tell the difference and make sure everyone understands, then you need to be precise or exact. Systematic naming makes sure that that one species has one name no matter where in the world it can be found.

QUESTION: So is that all zoologists do?

CARTAN‑HANSEN: No. Zoologists help us understand how animals live in our world, how they interact with the environment and how all creatures live together in the natural world.

Some zoologists specialize in specific types of animals. For example, arachnology is the study of spiders. Ichthyology is the study of fish. Ornithology is the study of birds. And paleozoology is the study of extinct animals.

Zoologists study animals not only to learn about them, but sometimes to find out how to save them.

Charles Peterson is a zoologist at Idaho State University. He studies amphibians. He and a graduate student are looking for frogs and where they live. He knows if we don't save certain types of wetlands, we won't be able to save certain types of frogs.

Zoologists travel all over the world to study animals, or they can study right at home. Zoologists are involved in animal conservation, saving animals from extinction and improving their environments. They help us understand the biodiversity in our world, and that's important because animals have a big impact on our lives. They provide us with food, with friendship, and a sense of wonder.

So zoologists help us understand how life works on our planet, which, in turn, helps us understand how we work in our world.

QUESTION: That's right because, remember, we are animals, too.

CARTAN‑HANSEN: Joining me now to answer your questions about zoology are Holly Holman, Zoo Boise's veterinarian, and Steve Burns, the director of Zoo Boise.

Thank you both for joining us.

HOLLY HOLMAN: Thank you for having us.

STEVE BURNS: Glad to be here.

CARTAN‑HANSEN: Okay. Let's go to your questions.

QUESTION: Hi, my name is [unintelligible]. And my question is why do people need to know zoology?

BURNS: So there are millions of different kinds of species on this planet, and humans are just one of them. And so we have to share this planet with all kinds of animals, and so it's important for us to understand and study our neighbors. If we're going to live in harmony with all the other creatures that live on this planet with us, it's good to understand what their needs are. It's good to understand where they live, what they eat, you know, what type of ‑‑ where do they drink their water.

And so it's important for not just scientists, but for everybody to understand all of our animal neighbors so that we can somehow figure out how to all live together.

QUESTION: Hi, my name is Berkley. And my question is do giraffes make noises?

HOLMAN: Scientists have found that giraffes do make noise, usually at night, and it's a low hum.

QUESTION: Hi, my name is Sidney. My question is how many types of monkeys are there?

BURNS: There are 260 kinds of monkeys, and they live in Central America, South America, Asia, and Africa.

QUESTION: Hi, my name's Teresa. And my question was why do cats not like water?

BURNS: You know, some cats actually do like water. Tigers will go and they'll swim in the water. There's a cat called a "fishing cat" which hunts fish, and so it will jump in the water after fish. And so not all ‑‑ and some cats don't like water. Maybe your domestic cat doesn't like water, but that doesn't hold true for all cats.

QUESTION: Hi, my name is Eve. And my question is why are some animal's bites poisonous?

HOLMAN: Actually, animal bites are not poisonous. Animal bites can be venomous, like venomous snakes, such as like a rattlesnake. There are other poisonous animals, like poison dart frogs, and their skin secretes a toxin that if another animal were to eat it, it would get sick, so those animals won't eat them.

QUESTION: Hi, my name is Kayden. And my question is how do birds know where to migrate?

BURNS: So birds I think use a variety of different ways to migrate. Part of it is off the moon and the stars, the position of the moon and stars. Part of it deals with the Earth's magnetic field. They can feel the magnetic pull of the Earth and that helps them to migrate.

And then also, you know, during the day, when it's light out ‑‑ because some birds do migrate at night, and that's the way that they migrate, but then during the day when birds migrate they actually can just look down, also, and see where they're going. And they can see where there's water, where there's land, where there's a patch of habitat that looks like someplace they could land and eat some more food. So there's really a variety of ways in which birds migrate.

QUESTION: Hello, my name Liam. Why does my dog wag his tail?

HOLMAN: Your dog wags its tail probably because he's very happy to see you.

QUESTION: Hi, my name is Callie. And my question is how does a parrot talk?

HOLMAN: Parrots actually can't talk, they mimic. So just like you and I, they blow air over their vocal cords, but they use that to mimic sounds they hear in their environment. So if they have a human in their environment, then they learn to mimic the human.

QUESTION: My name is Vanika, and I go to Indian Hills Elementary. And my question is how many types of animals are in Idaho?

BURNS: You know, it just depends on what kind of animals you're talking about, because animals include mammals and birds and reptiles and amphibians. So there is hundreds of different kinds. And how many are here at any one time depends. What I mean by that is some animals migrate. In the summertime there will be more birds than there are during the wintertime.

But if you look at animals that are really only found in Idaho, there's just a handful. There's two kinds of ground squirrels, northern and southern Idaho ground squirrels that live here. There's a few kinds of fish that live over in Bear Lake that don't exist anywhere else on Earth. And then there's the giant Idaho salamander, which is almost exclusively found in Idaho. It ranges a little bit up into Montana. But there's very few animals that only live in Idaho and nowhere else.

CARTAN‑HANSEN: There are lots of fun facts about animals. Like turtles can breathe through their behind. Butterflies taste with their feet. And squirrels can't burp or vomit.

QUESTION: Hi, my name is Sophia. What is the smallest monkey?

HOLMAN: The smallest monkey is the pygmy marmoset. And it's about the size of your thumb. And although, cute, monkeys do not make great pets.

CARTAN‑HANSEN: Molly would like to know: Why do birds fly?

BURNS: Well, birds fly for a couple of reasons. One is so they can escape predators. They can get away from something if it's trying to eat them. Second, it helps them move around much more efficiently so they can find sources of food. And then birds also will fly in order to migrate.

And so, you know, if you're in Idaho, and it's the summer, there's lots of things to eat, but all of a sudden, if it starts to turn winter, there's not so much to eat, and so they need to go to someplace where there is more to eat. And so they would fly to Central America or South America or even the southwestern part of the United States.

And so there's a variety of reasons why birds would fly.

QUESTION: Hi, my name is Merriam. My question is how do scientists get close enough to study dangerous and exotic animals in the wild?

HOLMAN: Scientists have found a variety of ways to get close to animals in the wild without putting themselves in harm's way. Probably, most commonly, they approach the animals in vehicles. But they've also developed things like cameras to monitor their animals, camera traps so that they actually take pictures of the animals as they're walking through.

But it is a concern when scientists are out in the wild that they do put themselves in harm's way.

QUESTION: My name is Caitlin. I go to Wilcox Elementary in Pocatello, Idaho. My question is what's the oldest animal?

BURNS: So the oldest animal at Zoo Boise is actually Mr. Mac. And Mr. Mac is an Aldabra tortoise, a giant tortoise found from the little tiny island of Aldabra, which is north of Madagascar. And he's about 100 years old.

Animals in the wild, though, there's a species of clam in the ocean that can be, you know, 5‑ or 600 years old. Scientists recently discovered a species of shark in Greenland that they estimate to be 4‑ to 500 years old. So some animals can live a really long time.

QUESTION: Hi, my name Isabel. And my question is how do animals get their name?

BURNS: At Zoo Boise we give animals names in a variety of different ways. Sometimes we ask the public for their help in naming animals. And then sometimes the staff will name the animals. But not every single animal at Zoo Boise actually has a name, just some of them. And, you know, it's a whole variety of ways in which we name animals.

HOLMAN: Animals get their scientific name usually based on the taxonomic classification, which just means that scientists have decided that this animal is closely related to another animal, and so they may have a similar scientific name. Usually the last part of their scientific name may reference to the scientist who first discovered that species.

CARTAN‑HANSEN: Why did you want to study about animals?

BURNS: You know, I've always enjoyed animals ever since I was a kid. I used to spend all my time outside. And I loved being out in the woods, so animals were a big part of that. And, you know, when you're ‑‑ a lot of times when you're a little kid you're always just fascinated by animals. And, for me, it just never went away, that fascination. I'm always interested to learn about all of the various things that animals can do, how fast they are, how strong they are. Some of them secrete poison and all kinds of stuff. And so I just never lost my fascination with animals.

HOLMAN: Like Steve, I had a strong interest to animals when I was a child. Then in high school I got a parrot. And when she got sick I did not know how to take care of her. And so that sort of drove me to study more about birds in particular. And then I eventually decided I wanted to go to veterinary school and learn how I could help more animals in my career. And then, ultimately, I hope to learn enough about animals and contribute enough to the medical literature to help animals in the wild.

CARTAN‑HANSEN: We're going take a break from the questions for a moment and have Steve give us a tour of the zoo and talk about what Zoo Boise is doing to save animals around the world.

We've got the lions back here. What's Zoo Boise doing to help save the lions?

BURNS: You know, I wish I could tell you that animals are in great shape, but, unfortunately, there's a lot of animals, like lions, that are kind of in trouble in the wild. There's only about 20,000 lions left in all of Africa. 20 years ago there were 400,000 lions. There's only 3200 tigers. There's only 25,000, you know, polar bears left. So a lot of the animals that we're so familiar with are really in trouble.

So what we've done is we've tried to take a visit to the zoo and turn it into a conservation action. So we were the first zoo in the country that when you come here you pay your admission price to get in, but you also pay a conservation fee on top of that, and all that money goes to help protect animals in the wild. And then when you do stuff like feed giraffes or take our boat ride or feed the sloth bears, or any of the animals in the zoo farm, all that money adds up, and it goes to help protect animals in the wild. In fact, in June of this year, we hit the $2 million mark, in terms of the amount of money raised by our visitors to help protect animals in the wild.

So for lions, in particular, we have a partnership with a place called Gorongosa National Park, which is in the country of Mozambique. And Gorongosa was once one of the greatest parks in all of Africa. And, unfortunately, there was a long war, and the park was destroyed, and almost all the animals were killed. And so we're part of a team that's helping to put that national park back together again. It's an incredibly important place for lions.

There's now ‑‑ the last estimate there were now 76 lions in Gorongosa National Park. There were 200 before the war, so it dropped to just a handful. And so now it's up to 76. So every time you come to Zoo Boise, you're helping to do things like protect lions in Gorongosa.

CARTAN‑HANSEN: So now we've moved to the giraffes. Are giraffes endangered, too?

BURNS: You know, there's about 80,000 giraffes left in Africa, which sounds like a lot, but it's actually down quite a bit. And there's various kinds of giraffes that are in more trouble than others. And I'm always a big fan of giraffes, ever since I was four. I have a picture of myself in a giraffe costume, sitting on my desk, when I was just a little kid, so huge fan of giraffes.

CARTAN‑HANSEN: If you're a young person and you want to help save endangered animals, what can you do?

BURNS: I would imagine being a young person it's difficult, because, you know, you love animals, and you start to hear that some of them aren't in great shape, and you're wondering what can I possibly do.

Well, zoos are a great way for you to get involved. At Zoo Boise we have this fantastic zoo team program. We have about 140 teenagers who help us all summer long. And I know that a lot of zoos in Idaho and across the country have a similar program. So it's a way for teenagers to come down, they help us educate the public about what's going on in the natural world. They help us raise money for conservation. They help us teach classes to smaller kids.

So it's just a great way. You've got all this energy and interest and enthusiasm, and a zoo can provide a wonderful outlet to help you channel that into something that directly helps protect animals in the wild.

CARTAN‑HANSEN: Okay, let's go to one more stop.

BURNS: Okay.

CARTAN‑HANSEN: These zebras, this type, in particular, is very rare, you tell me.

BURNS: There's only about 2500 of this particular ‑‑ it's called Grevy's zebra. There's four different species of zebra, which Grevy's being one of them. So 2500 of them left. They're found in Northern Kenya and Southern Somalia.

You know, if I had to sort of give a message to all of your viewers out there, I would say, you know, this is the only planet that we have. I know we explore Mars and stuff like that, but we're not going there any time soon. This is the planet that we have, and so I would encourage everybody to learn about their planet, care about their planet, and then take action, because this is the world that you're going to inherit. And what lives here with the rest of us for a long time is really going to be up to you. And so learn about your planet and learn how to care for your planet.

And one of the things that we try to do at Zoo Boise is help you to learn how to care for your planet.

CARTAN‑HANSEN: Great, Steve. Thank you. We appreciate the tour.

Okay, let's go back to your questions.

QUESTION: Hi, my name is Hudson. Why do wolves live in the dark?

BURNS: Oh, I don't think wolves always just live in the dark. I mean wolves are awake during the day sometimes. They're awake during the night at other times. But, you know, there's a lot of animals, lions and tigers, they'll hunt at night. And sometimes they'll hunt at night because it's cooler at night where they live than it is during the day. A lot of animals are more active at night, and so if all of the things that you eat are up during the night, and if you're a predator, then you need to be doing the same, you need to be up at the same time.

But wolves are kind of up sometimes during the days sometimes during the night, it just really depends.

QUESTION: Hi, my name's Oliver. And I'm here to learn about how elephants make noise with their trunk.

HOLMAN: They blow air through the membranes in their trunk, which makes the typical trumpet noise that you're familiar with.

QUESTION: Hi, my name is Olivia. And my question is why do bears eat meat?

BURNS: So there's eight different kinds of bears. And only one kind of bear actually only eats meat, and that's the polar bear. It eats a lot of seals and things like that.

So most bears eat a variety of things. Like if you had a grizzly bear, right now, you know, in the summertime, they would be eating nuts and berries. They would eat some types of meat. But for most bears, they have a whole wide variety of things that they eat and oftentimes ‑‑ and sometimes during the year it's no meat, it's just plants. And so only the polar bear eats exclusively meat.

QUESTION: Hi, my name is Julian. My question is how long do bees live?

HOLMAN: Worker bees only live about ten months, but some queen bees can live three or four years.

QUESTION: Hi, my name is [unintelligible], and I'm from Mrs. Freeland's second‑grade class from Moscow, Idaho. And I would like to know how do you stop animals from being extinct?

BURNS: You know, animals go extinct in a variety of ways. The biggest reason why animals go extinct is because their habitat, or their home in which they live is destroyed. So if you're an animal, and you live in a particular kind of forest or out in a particular kind of desert, and that area gets turned into something else or destroyed, then you don't have a home to live in anymore.

But there's also a variety of other ways. One is that other species, called invasive species, will move in and take over the habitat. Pollution is another way in which an animal might go extinct. Pollution from humans. Sometimes it's diseases that will come in and wipe out a whole population of animals.

And so, really, it's a variety of ways, but it's the destruction of that animal's home. If you can imagine if all of a sudden, you know, you were to have to leave your home and go live out in the middle of the desert somewhere, you may not do very well. It's the same thing if you're an animal, if your home were destroyed, you may not do very well, either.

QUESTION: Hi, my name is Avery. And my question is how do animals adapt to the zoo?

HOLMAN: Most of the animals that you see in zoos were actually born in zoos, so there's really no need to adapt to a zoo setting. However, when we ship animals to other zoos, it's not uncommon for them to be a period of time where the animal needs to adapt to a new set of circumstances, new dens, new keepers, new food items, occasionally. And we do that over a really long transition period to make sure that they adapt well.

QUESTION: Hi, my name is Miles. My question is where do Komodo dragons live?

BURNS: So, Komodo dragons are found only in one country, and that is Indonesia. And they're found on four islands, not very big islands in Indonesia, with the main island being Komodo Island, and that's how they got their name, by living on Komodo Island.

CARTAN‑HANSEN: Aristotle is considered the father of zoology. He was a Greek philosopher who lived more than 2,000 years ago. Charles Darwin is one of history's most famous zoologists. He's best known for his theories on evolution and natural selection.

QUESTION: Hi, my name is Zachary. And my question is what do bugs eat?

BURNS: You know, bugs eat a variety of different stuff, depends on what kind of bugs. You've got some bugs that eat dead things, and so they're called detritivores. And they will eat, you know, dead animals. They will eat other dead insects. You've got some insects, like bees, that will eat pollen, and then they'll use that to make honey. You've got other insects that will eat blood, like mosquitoes will bite you, and they will draw a little bit of blood out of you.

And so there's a whole variety of things that insects will eat. Some eat plants, some eat animals, some eat dead things, some eat live things. So it really just depends. Pretty much, if you took all bugs together, they pretty much eat everything.

QUESTION: Hi, my name is Sophie. And my question is how does any type of animal species recognize which animal species is their family?

HOLMAN: Animals can recognize other species or other animals in their family through a variety of senses. So they may notice that they look the same as them. They may smell familiar to them. They may make calls to each other that they recognize as each other's individual call. So they use a variety of senses, just the same way that you might recognize other people in your family.

QUESTION: Hello, my name is Asia. And my question is what is it like for bats to be parents?

BURNS: Bats are mammals, and so, you know, they have, usually, one baby at a time. And the babies nurse from their mom just like all the other mammals do. I'd like to say that, you know, it turns their world upside down because, obviously, everything that a bat does is hanging upside down. And then the baby will stay with the mom until it learns to fly, itself. And so depending on the species, it might take anywhere from several weeks to several months before the baby's ready to go and fly off on its own.

QUESTION: Hi, my name is Taylor. And I want to know where elephants live.

BURNS: Well, there are three kinds of elephants. The first is the Asian elephant. And they live in India and Southeast Asia. And then you have African elephants, they're the ones that probably we're most familiar with. And African elephants live in Eastern Africa, on the Savannas, in Kenya and Tanzania, Mozambique, South Africa. And then you actually have a forest elephant that lives in the Congo.

If you want to tell the difference between an Asian elephant and an African elephant, just look at the ears, because the African elephant's ears are much bigger and, interestingly enough, they're shaped like the continent of Africa.

CARTAN‑HANSEN: If someone is interested in a job in zoology, what should he or she study in school?

BURNS: If you're interested in zoology, then I recommend that you study ‑‑ you know, you take some biology classes, you take ‑‑ if you have the opportunity to take some chemistry classes, because there's a whole lot of chemistry in the animal world. If you have an opportunity to study ecology, that's really important because that helps you understand how animals interact with the rest of the natural world.

And so ‑‑ but if you want to work at a zoo or be a scientist and study animals, then you really should think about not just high school, but then going to college and getting a degree in biology, as well.

HOLMAN: Well, I think the important thing is to focus on a career of science courses. I took animal science classes and then went on to veterinary school. So you can take all kinds of science classes and kind of find what fits best with what you're interested in.

CARTAN‑HANSEN: I'm sorry, we've run out of time. My thanks to Holly and Steve for answering students questions.

HOLMAN: Thanks. We've had lots of fun.

BURNS: We hope you enjoyed it.

CARTAN‑HANSEN: My thanks also to the folks here at Zoo Boise for hosting us.

You can learn more about zoology and lots of other scientific topics on the *Science Trek* website. And we'll answer more questions about zoology on *Science Trek: The Web Show*. And if you want to submit a question for *Science Trek*, it's easy. You can send it as an email or as a video question, record it on your webcam or cell phone. And if you're an educator, we'll even lend you a camera. And each week check out my blog for the latest science news for kids. You'll find all the details at idahoptv.org/sciencetrek.

Thanks for joining us. We'll see you next time on *Science Trek*.

Presentation of *Science Trek* on Idaho Public Television is made possible through the generous support of the Laura Moore Cunningham Foundation, committed to fulfilling the Moore and Bettis families' legacy of building the great state of Idaho, by the Friends of Idaho Public Television, and by the Corporation for Public Broadcasting.

If you want to learn more about this topic or watch our videos, check out the *Science Trek* website at idahoptv.org/sciencetrek.