



Nature and Youth Nurturing Each Other

Cynthia Papettas | 2nd Grade

Unit Description

In this culminating unit, students will apply their understanding of their own environment to understand other habitats and how plants, animals and humans depend on each other. This unit exposes students to the outdoors and gives them an opportunity to make connections with the environment they live in. This unit will have students make comparisons between the Amazon Rainforest and their own environment. Students will also develop an understanding of the diversity of human culture and the unique nature of places through engaging with stories from other Delaware educators.

Content Standards

Science

1. Students who demonstrate understanding can make observations of plants and animals to compare the diversity of life in different habitats. ([2-LS4-1](#))

Social Studies (Delaware)

1. Students will develop an understanding of the diversity of human culture and the unique nature of places. ([Geography Anchor Standard Three](#))

Objectives and Outcomes

Students will be able to:

1. Describe the characteristics of their own environment.
2. Identify what plants and animals live in their environment/ habitat.
3. Explain how plants and animals in their area depend on each other.
4. Explain how the world depends on plants and animals in different regions.

Supporting Material

1. [DTI 2022 Unit](#)



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“If we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it. Perhaps this is what Thoreau had in mind when he said, “the more slowly trees grow at first, the sounder they are at the core, and I think the same is true of human beings.” - David Sobel

Introduction

Old State Elementary School is a suburban school located in Odessa, DE and is a part of the Appoquinimink School District. Old State has approximately 750 learners for the 2020-2021 school year. I am a current 2nd Grade ELA and Science teacher in a departmentalized setting where I see two classes (23 students in one class and 24 students in another). I serve 5 students with IEPs and provide accommodations based on their needs. Traditionally I only teach ELA, however, upon special request I am also responsible for teaching Science and following the Next Generation Science Standards (NGSS). For the past year my students have experienced what it is like to live in a remote world due to the Covid-19 pandemic. During this time, students have been spending the majority of the school day on a device and inside in order to follow the CDC guidelines and state of Delaware protocol for transitioning back to in-person learning. Students have been sitting 6 to 3 feet apart in the classroom, four days a week, with an average of 3 students Zooming into the classroom. On Wednesday’s students participate in asynchronous learning and complete assignments online at home or in childcare.

This unit is based on Jon Cox’s seminar, “Bringing the Amazon Home.” Jon Cox is President of the Amazon Center for Environmental Education and Research (ACEER Foundation) and an assistant professor at the University of Delaware. He also serves as a Board Member of the Dorobo Fund for Tanzania, is a National Geographic Explorer and Full Fellow of the Explorers Club. Through Jon’s seminar, there were many presentations on the Peruvian Amazon Rainforest. The majority of research that is conducted on native species in the Amazon as well as conservation efforts are in Brazil. “Bringing the Amazon Home” has given educators an opportunity to learn about how climate change is affecting the Amazon, the Ese’Eja people of the Amazon, the Maijuna people, and how gold mining and logging have negatively affected their culture and livelihood.

Rationale

This year during science, students have been conducting experiments at home and inside the classroom. Students who are participating from home have parents who pick up bags of materials so they can work on experiments and projects from home at the same time as our in-person cohort. Due to the nature of the school year, there has not been an opportunity to be able to take

our virtual and in-person students outside. In the upcoming year, it will be crucial that students interact with the outdoors and get to learn about the different species of plants and animals that are native to Delaware in order to create those close bonds with nature. Research shows that children who spend more time indoors than in nature may suffer from stress, anxiety, higher rates of obesity and other chronic issues (Kuo, 2019). There are schools that conduct class outside and when compared to traditional schools those students have significantly stronger reading and writing scores which are measured by standardized tests (Ernst & Stanek, 2006).

An even more substantial difference is how nature promotes social connection and creativity which students have been lacking during the Covid-19 pandemic. Being outdoors enhances peer to-peer relationships as well as teacher-student relationships. Majority of students have also been spending 7-8 hours a day (or more) indoors learning with a mask on and experienced their own trauma with going from seeing no one to sitting 3 ft next to four other students in a classroom. Being outdoors in the future and taking away the boundary that masks put up which has taken away many facial expressions and social cues for students is a crucial piece to getting students to relax and ease into a post pandemic era.

Our school district uses STEMScopes for the Science curriculum which utilizes the NGSS. For 2nd grade there is an emphasis on animal and plant dependence and diversity of living things in the Organisms – Needs & Interactions bundle. Students will be starting this unit with their own basic knowledge of what plants and animals need to survive as well as common predators and prey. Students will also have completed the scope on slow and quick changes to the Earth, and this unit would transition also into changes to the Amazon due to uncontrolled deforestation and gold mining. In this unit, students will be exposed to a variety of animals that live in the Amazon rainforest which will aid in them developing a coherent and scientifically based view of the world around them. In order to take a deeper look into how we know so much about the Amazon rainforest, students will have the opportunity to use different tools to first explore their own environment. To investigate the natural world, scientists use camera traps and microscopes as well as other scientific tools. This unit will also explore ways to make science more equitable and accessible no matter where your school is located.

There is a large emphasis on learning about the Amazon rainforest in Brazil, however, this unit will be focusing on the Peruvian Amazon Rainforest and the people Indigenous to the land. It is important that while teaching about indigenous lands that there is a balance between social justice and conservation. The Amazon is not just rich in plant and animal diversity, but also in the culture, language, religion, economic activity, social custom, and political organization. Through cultural mapping we can see how the culture of the inhabitants as well as the ways that culture has changed over time. This unit goes into the scientific background of the Amazon, but also connects to humanities/ social studies. This cross-curricular unit will enhance what students know about their own home and surrounding environments to connect to the world as they grow and become global citizens.

Essential Questions

What are the characteristics of my own environment?

What plants and animals live in a habitat near me?
How do plants and animals in my area depend on each other?
How does the world depend on animals and plants?

Content Standards

Science

K-ESS3-1. Students who demonstrate understanding can use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

K-ESS2-2. Students who demonstrate understanding can construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

K-ESS3-3. Students who demonstrate understanding can communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

2-LS4-1. Students who demonstrate understanding can make observations of plants and animals to compare the diversity of life in different habitats.

Social Studies (Delaware)

Geography Anchor Standard Three: Students will develop an understanding of the diversity of human culture and the unique nature of places.

K-3a: Students will identify types of human settlement, connections between settlements, and the types of activities found in each.

Content

Student Interactions with Nature

Humans can experience nature in direct, indirect and in representational ways.ⁱ Some people live directly in the outdoors, like in forests and other natural areas. In the past year, children have been on a device of some sort to continue staying connected with others as well as to stay in school. As schools begin to reopen up, it is extremely important that students are reconnected with their surroundings, specifically nature. Many teachers may have taken their students on virtual field trips, which is a great example of a representative nature experience. Many children who live in urban areas view nature through their pets. While feeding their pets gives them a connection to animals and an awareness of the outdoors, it is not the same as having a child outside experiencing the outdoors with their five senses.ⁱⁱ Being outdoors allows children to have social and sensory experiences.

Research shows that it is especially important that children are immersed in nature at a young age.ⁱⁱⁱ When children can learn about the environment that they live in, they can better construct ideas about the world around them and other areas that exist. Some ideas to have children immersed are taking short walks, growing plants and seeing different species that live in their environment. For example, Delaware has marshes as well as forests and is lined by the

Chesapeake Bay and Atlantic Ocean. There are different environments to explore in just one state. It is important for children to explore the outdoors and let their curiosity expose them to what lives and exists around them such as crawfish, horseshoe crabs, and invasive spotted lanternflies.

There are some disadvantages of students who are raised in more urban areas and having them experience nature. One of the biggest reasons is that there are no opportunities to know nature- living in a concrete jungle. Other reasons are there are so many virtual opportunities versus taking all your students outside and experiencing nature. One of the other reasons is that children approach nature with fear.^{iv}

Theories

There is a plethora of theories that educators learn about during student and child development courses to best understand where their students are at during their development. Of all the theories, I have highlighted Jean Jacques Rousseau's theory of education as well as Jean Piaget's theory of cognitive development.

J. J. Rosseau

Rousseau's theory of education focuses on how children naturally develop without constraints imposed on them by society.^v This allows children to learn how to express themselves in whatever ways feel best and they become balanced, freethinkers at an early age. Rousseau believed that if children were allowed to develop naturally, without societal constraints, they would develop towards their fullest potential both educationally and morally.^{vi} This natural development should be child-centered and focused on the needs and experiences of the child at each stage of development. Examples of this could be having children enjoy sensory experiences outside. Allow children to use their five sense to explore their environment. Children can choose to feel the Earth, touch trees, grass, and leaves. They can be encouraged to listen to the noises around them and see what sounds they can identify, and what sounds they cannot yet attach to an animal. There are also opportunities to let children draw, measure, and write about what they see.

Piaget

Piaget's cognitive theory proposed that there are four stages of cognitive development – sensorimotor intelligence, preoperational thinking, concrete operational thinking and formal operational thinking. Piaget looked into how children construct knowledge and made the assumption that children learn from their experiences on their own. When you think about how children experience the world, they use their five senses and explore. Students should be encouraged to go outside and take in their own observations about nature to better understand it prior to learning about other environments that they cannot physically go to or see for themselves except through pictures and videos. With Piaget's theory in mind, children also spend their first two years of life understanding things through their five sense and actions. From two years old until they are seven, children understand the world through language and mental images which is

important for when students learn about the Amazon through texts, videos and images. Beyond that age, students can then think more logically and critically about what they learn.

Vocabulary

The most important vocabulary to discuss with young elementary students about the Amazon and nature in general are *biodiversity*, *habitat*, *rainforest*, *canopy*, *ancestral* and *culture*.

Biodiversity describes the variety of life that exists in different habitats. Students will be able to identify different types of water resources, land, animals, and insects. As they learn about biodiversity they will be learning about *habitats* and the different environments that animals call “home.” Students will be learning about the Amazon and the rainforest habitat as well as where the students themselves live i.e. in a grassland, the mountains, etc. As they learn about the rainforest, it will be important for them to understand what the *canopy* is. About 100 feet above the ground is where branches and leaves meet together to create the densest part of the Amazon and houses the majority of life that exists in the rainforest. This will give students an opportunity to compare the nature around them to the Amazon.

Students will then reflect on their own community and then learn about the communities that live in the Amazon, specifically the Maijuna in Peru. As they learn about the Maijuna, students will be learning about their *ancestral* land, which is land that has been a part of the Maijuna community since their early ancestors. The Maijuna are an indigenous group in the Amazon that are threatened by loggers, miners and industrial farmers. Their culture is also fading with them as there are less than 500 people residing near the Maijuna-Kichwa Regional Conservation Area. Students will compare how they engage with their community and nature and how the Maijuna engage with their people and land. *Culture* is a culmination of the values of a group of people and their traditions, way of life, as well as language.

Natural Habitats

The Amazon is the most biodiverse area in the world and has an abundance of different species of plants, animals and insects. The Amazon Rainforest resides in eight different countries – Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana and Suriname. In our own communities, as you move more North, South, East or West there are a variety of animals that are special to that region. Natural habitats are the land and water areas that create environmental conditions in which specific plants and animals survive and exist in.

Students will spend time learning about the different habitats that exist and spend an intentional amount of time learning about their own environment and habitat. Students should learn about the different habitats i.e. pond, rain forest, desert, savanna. Each habitat must have a balance of plants and animals- there needs to be enough plants for animals to eat, and enough animals for predators to eat to keep the environment in balance.

Biodiversity

Animals are living things that can move on their own and get their energy from food. *Plants* are

living things that get their energy from the sun and are unable to move from place to place on their own. There are some animals that can live in different habitats, and some that can only survive in one specific habitat. Students can spend time discovering what animals live in their habitat that can survive in other habitats.

When discussing biodiversity with plants and animals, NGSS standards for K-2 do not specify insects and arthropods. *Arthropods* are invertebrate animals with a segmented body and exoskeleton. Kristie Reddick and Jessica Honaker are entomologists and educators who have created a myriad of resources to teach young students about arthropods and have a lot of resources on how to care for arthropods in the classroom if you choose to get a class arthropod 'pet.'^{vii}

After reviewing what arthropods are with my students, I could then discuss beneficial insects and invasive species. *Invasive species* are species that are not native to a particular area that they begin to nest in and cause a lot of damage to vegetation and/ or wildlife. On the East Coast there has been a big boom of spotted lanternflies which cause trees to ooze sap, wilt, and kill many crops. In addition to plant damage, spotted lanternflies excrete a sugary substance, called honeydew, that encourages the growth of black sooty mold.

Animal and Plant Dependence

Students will spend time learning how animals depend on plants, and vice versa. Time can be spent depending on grade level discussing *herbivores*, *carnivores* and *omnivores*. *Herbivores* are animals that survive by eating plants, *carnivores* are animals that survive by solely eating other animals i.e. meat eaters, and *omnivores* eat both plants and animals. Animal and plant dependence is not only how animals rely on plants, but plants rely on animals as well.

Plants depend on animals to disperse seeds, and there are many different ways this can occur. Some seeds have characteristics that make them stick to fur, such as thistles. Some seeds get eaten if they are in fruit and will be fertilized after being passed through an animal's digestive system. Some seeds get stuck to birds' feet and get dispersed. Students can learn about the different ways pollen and seeds are dispersed, and then play a game with scenario cards. This activity is described in the activities section of the curriculum unit.

To then add the community connection, teachers can share how animals that exist within your environment rely on each other i.e. how plants rely on squirrels such as nuts and berries, how some humans may depend on deer in the woods during hunting season. As a teacher in Delaware, I would focus on horseshoe crabs and discuss how humans rely on them for research and could further emphasize on how important their blue blood is for cancer research and other biomedical engineering processes. This could further lead to an investigation with students to have them brainstorm ways we can protect horseshoe crab nests on the East Coast since they are so important to us. Japanese beetles are also invasive to Delaware, and will eat and kill trees and shrubs by eating the leaves as well as the roots of plants when they create nests.

Tools

To tackle the fear some students may have about nature and to feed their curiosity, tools are a way to engage students in your lessons. It is also important that students are able to use their senses when exploring in science and tools can help amplify their senses, specifically with the tools below, sight. Tools allow students to observe, compare and measure while they work to discover answers to their unanswered questions.

Camera Traps

Camera traps have been used for the past century to capture images and videos of animals in their natural habitat.^{viii} This tool is known to be used by photographers, hunters and biologists. Modern camera traps have infrared sensors to detect warm objects (animals) and will begin recording once the sensor is triggered. These devices are great to use to see animals engage with their environment without being disturbed by humans. Camera traps are used by biologists to acquire data on the population sizes of different species and to understand animal behaviors.

Foldscopes

Foldscopes were invented to make science more equitable and accessible to students and giving schools an affordable way to put microscopes into students' hands.^{ix} The goal was to try to make a microscope with less than a U.S. dollar. What they came up with was a foldable microscope that is mostly made up of paper and costs less than one U. S. dollar to make. The Foldscopes can be used to look at arthropods, bacteria, assist with medicine and many other things. If a school has access to technology such as a tablet device, students can also place the camera over the lens part of the foldscope to see an enlarged image of what is on the slide. This tool can be used to allow students to explore outdoors and even within the classroom as they get used to using the device.

Ancestral Land

Ancestral land refers to the lands, territories and resources of indigenous peoples. Those who are indigenous, or native, to an area of land by their ancestry are given the right to own, develop, control and use the land and natural resources that exist on the land. According to the Indigenous Peoples' Rights Act, indigenous people also have the right to stay on their land and cannot be relocated without consent. In the Peruvian Amazon rainforest, there is an indigenous group of people who live in the Maijuna-Kichwa Regional Conservation Area. This area is the ancestral land that the Maijuna have lived in the Amazon for thousands of years.

In Delaware, I could talk to my students about the Lenape tribe and who they are and their contributions to the land we live on. Students could learn about the food they eat, what the houses they lived in use to look like compared to now, and other areas of life. The Lenape traditionally live(d) in houses known as wigwams, which are rounded houses made of bark as well as longhouses so multiple people could live in one home. The men traditionally were the hunters and would also protect their families, which the women would farm and cook and take care of the children. Their clothing was typically made of deerskin; the northeast is plentiful in deer, which is one major source of food for the tribe, so after they got their meat, they would use

the skins for clothing. They also used bark and bugout canoes to travel on streams and rivers, as horses were not introduced from Europe for a while. They would also use the streams and rivers as a source for fish. This information could be shared within a full day lesson plan. It is recommended you look into the tribes that are native to where you live to present on and teach about.

Land Acknowledgments

A Land Acknowledgment is a formal statement that recognizes and respects Indigenous Peoples as traditional stewards of this land and the enduring relationship that exists between Indigenous Peoples and their traditional territories. To recognize the land is an expression of gratitude and appreciation to those whose territory you reside on. While we spend a lot of time discussing history around the world, it is important to acknowledge the history of the very land we live on and exist on day to day. Creating a land acknowledgement is a way to address indigenous invisibility, which relates to the erasure of indigenous people from the land we reside on and brings a deeper appreciation for the space we have. It is also important to recognize that words should also be followed up by action, which is an important lesson for students to learn. While we can acknowledge the land, we are on that has been taken, we can make strides to give back to those who were stripped of their land and rights. Teachers can work with their district and even state to work up a land acknowledgement and include the tribe(s) that were and still are affected.

Teaching Strategies

Pre-Teaching Vocabulary

Prior to beginning new content, an activity, or reading, pre-teaching allows students to identify vocabulary as you read/ teach. This is also an important piece for ELLs to expose them to new vocabulary that may need pictures to also help with understanding new vocabulary. Suggested words to pre-teach are *rainforest, biodiversity, ancestral, canopy*

Inquiry Based Instruction

Pose thought-provoking questions which inspire students to think for themselves and become more independent learners. Encouraging students to ask questions and investigate their own ideas helps improve their problem-solving skills as well as gain a deeper understanding of academic concepts. As students explore the concept of biodiversity and culture, it is important to allow students to first think about how they would explain the environment that they live in. Asking students to think “inside the box” and “outside the box” in regard to their community as well as their state, will help students inquire more independently on how people interact and engage with their environment.

Turn & Talk

Turn and talks allow educators to scaffold instruction to check for student understanding, and to also let students think collaboratively. Time spent one on one during a lesson will also increase

engagement and keep students focused throughout the lesson.

Small Group Instruction

Small group instruction allows educators to reteach content or support students who are struggling with new concepts. This time can also be used to do a rereading of text with students below benchmark for reading fluency or comprehension. Suggestion to also use this time to review vocabulary. It is important to differentiate instruction to help all learners understand new concepts.

Graphic Organizers

During or after instruction it may be helpful to show and update a graphic organizer on their learning for the day. One graphic organizer can have their community as the core with a list the class comes up with on what parts of nature exist in their community. They can then work on another graphic organizer that focuses on the Amazon and the Maijuna tribe. As the lessons progress students will move past the physical environment to adding animals and describing at the end how people in both communities engage with their environment and land.

Activities

Leaf Packs

This activity is a hands-on way for students to get an understanding of what lives in the streams/ rivers in their environment. Students will be stuffing leaves into a mesh net that will have an anchor at one end to hold it down, while the leaf pack floats. Microorganisms, insects, and other creatures are attracted to these packs of leaves, and it encourages life from the bottom of the river to rise up. After the leaf packs are in the water for a period of time, you and your students can take the leaf packs out of the water to examine plants and animals that live in the area. Activities to do and ways to create leaf packs can be found by the Stroud Water Research Center. If you are native to Delaware, you can contact the center to bring their mobile lab to do the leaf packs with your students.

Camera Traps

This device can be installed anywhere on the land surrounding you school or in a nearby state park with special permissions. Each day you and your students can view footage from during the day or at night to see what wildlife appears. You could create a chart on the different animals you can identify, the behaviors you notice, and so much more. If you do not have access to camera traps, there are lots of resources online where there are archives of camera trap videos as well as live recording camera traps in different parts of the world.

Foldscopes

If your school is able to invest in Foldsopes, there are many published activities your students can participate in with this tool. If snakes are native to your area, you could get snakeskin samples for students look at up close with the lenses. Since spotted lanternflies are an invasive species to Delaware, I could also get this insect at its different stages of life and have the students look at them up closely and look at the characteristics of their wings, bodies, etc. To get use to the tool students could start by observing water with the Foldscope, their ear wax, food, paper, etc.

Field Trips

Field trips are a great way to engage students outside of the classroom. These shared social experiences allow for students to engage with nature in a way they cannot during the typical school day or even at home.

In-Person

Resources that could be considered are looking into state parks in your area and seeing if there are any local research centers with their own programs already created. There are also local and large-scale zoos that could be utilized for field trips, as well as beaches if you have access to open water. You could also look into having a speaker come to your classroom if that option is available. If you want to have a tie to social studies, you could do outreach with local indigenous tribes to have someone come and speak with your students, or possibly look at going to a reservation with your students.

Virtual

For classrooms that are fully remote, or in an economically conscious or COVID conscious classroom, virtual field trips are becoming a popular option. There are many live cameras at state run zoos where you can “Zoom” into different habitats/ enclosures. There are also opportunities with National Geographic where you can sign up for free to Zoom in with a Nat Geo professional. It is called Explorer Classroom, and you will get a live interactive session to learn about different stories that have recently been covered and hear from real life scientists and researchers. They have researchers in the Antarctic your students could engage with, as well as archeologists if that is an area your students would be interested in.

Who lives here?

To get your students to explore the different habitats, you could have pictures of a rainforest, desert, grassland, etc. and have students fill out a sheet identifying who lives there i.e. plants and animals. This activity will allow students to identify animals that live in their own environment as well as in other environments. After identifying the different plants and animals and where they live, students can further analyze which animals live in multiple habitats, and why those animals would be able to survive in other habitats. Then discuss with students which animals/ plants only live in one habitat, and why the conditions of that habitat are the only ones suitable for them to survive.

Scenario Cards

This activity will allow for students to role play and read out loud how seeds can be dispersed. You will have students in groups and at least five different scenario cards. You can choose animals native to your area as well as plant seeds, or from other habitats. Some cards will explain seeds attaching to an animal's fur or being ingested by specific animals. Students can either act out the cards to show plant and animal dependence, or you can make physical models of each card using lemonade mix as pollen, and regular seeds as seeds. You can use cotton balls to represent fur as well as pipe cleaners and see which seeds can rely on fur and which seeds would need to be eaten to be dispersed.

Appendix A

Implementing District Standards

Currently Delaware public schools follow the Next Generation Science Standards (NGSS) for science content. Within these standards are discipline areas and crosscutting concepts. The four disciplines are physical sciences, life sciences, earth and space sciences, and engineering, technology, and applications of science. This unit will align with standards within interdependent relationships in ecosystems and earth's systems. While we explore habitats, students will be viewing and working with different models of land and bodies of water (K-ESS2-2). Students will also be able to represent the relationship between the needs of different plants and animals (including humans) and the places they live (K-ESS3-1). While students learn about different plants and animals in their environment and how they depend on each other, students will have opportunities to brainstorm ideas on how to conserve the land around them to protect different species (K-ESS3-3). During this unit, students will learn the core idea that there are many different kinds of living things in any area, and they exist in different places on land and in water (2-LS4-1). This learning will take place as students make observations of plants and animals and compare the diversity of life in different habitats, specifically in the "Where do I live?" activity.

In Delaware, we also have our own standards for social studies. The competency areas are civics, geography, economics and history. For the purposes of this unit, students will develop an understanding of the diversity of human culture and the unique nature of places. This is the third geography anchor standard and will be the main focus when we discuss ancestral land and land acknowledgments. Students will identify types of human settlement, connections between settlements, and the types of activities found in each (K-3a).

Bibliography

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Reddick’s source provides a meaningful way to engage students in every subject.

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ⁱÇağlıyan, Tuğçenur, and Taner Altun, *Investigating Views of Classroom Teachers and Students on the Interaction of Children with Nature*, (2021): 38.

ⁱⁱ Ibid.

ⁱⁱⁱ Ibid.

^{iv} Ibid, 43.

^v Phillip Slee and Rosalyn Shute, *Child Development: Theories and Critical Perspectives*, 2015.

^{vi} Ibid.

^{vii} Kristie Reddick, *Arthropods in the Classroom*, 2021.

^{viii} Oliver Wearn and Paul Glover-Kapfer, *Camera-trapping for conservation: a guide to best*

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