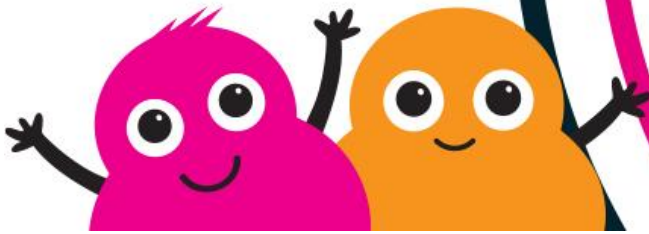


6-15 MARCH
2020



Spotting Spider Monkeys

Saving endangered animals with science from the stars

Animals are going extinct at a rate not seen since the disappearance of the dinosaurs. To help save endangered animals we need to monitor and understand ecosystems very well, and catch poachers before they do any harm. Drones allow us to survey large and difficult to reach areas quickly with minimal disturbance to wildlife.

Do you want to help save endangered animals using drones? Of course you do!

We've teamed up with researchers at Liverpool John Moores University to bring you a brand-new set of imagery taken by drones that need classifying to help us tackle this issue. During British Science Week, we want to tag and classify as many images as possible of spider monkeys in the natural habitat in Central America.

Spotting Spider Monkeys is led by Dr Claire Burke who has a PhD in astrophysics. Dr Burke applies drone and remote sensing technology to methods developed in astrophysics, climate and atmospheric science, computer science, and engineering to tackle major global challenges such as poaching.

Thank you to our partners for making this project possible:

- *The astro-ecology team and Drone Research Group at Liverpool John Moores University*
- *Zooniverse*
- *Mexico-based ConMonoMaya A.C. and Universidad Veracruzana*

What do spider monkeys look like?



Spider monkeys (genus *Ateles*) are so named because their **five long limbs** remind people of spiders.

There is quite a **lot of variation** in the colouration of their fur – some species have entirely black fur whereas others have combinations of black and yellow or brown and white, and even some gold and red.

There are **seven species of spider monkeys** and they are all found from the south of **Mexico** to the north of **Bolivia**.

Spider monkeys are arboreal, meaning that they spend most of their time in the forest canopy, which in some forests can be around 40-50m above the ground.

Like the other primates in their Family (Atelidae), they have **highly specialised prehensile tails**, full of muscles that can be used as an extra arm and which they use to hang onto branches and prevent themselves from falling (like a safety harness).

Why are spider monkeys important?

Spider monkeys are **very long-lived primates** and the females only have one infant about every three years. Sadly, huge areas of the spider monkeys' **habitat is being lost** due to agricultural expansion and tourism expansion, particularly for the production of unsustainable palm oil. Not only that, but spider monkeys are often hunted for food or to be kept as pets.

Their slow reproduction makes it **difficult for spider monkeys to recover** from disturbances in their habitat and as a result all species of spider monkeys are threatened with extinction.

The decline in spider monkey populations is highly problematic as these monkeys **play a vital role in their ecosystem**. Spider monkeys have a diet that consists mainly of fruit. In many cases they ingest the seeds that are in the fruits whole and excrete them far away from the parent tree.

Studies have shown that passage through the **spider monkey gut helps the seeds to germinate**.

Together, this means that spider monkeys can be considered **gardeners of the forest** as they play a very important role in forest regeneration.

Losing spider monkeys from Latin American forests would equate to large scale changes in the tree species that make up the forest as many trees depend on these monkeys for their dispersal.

About Spotting Spider Monkeys

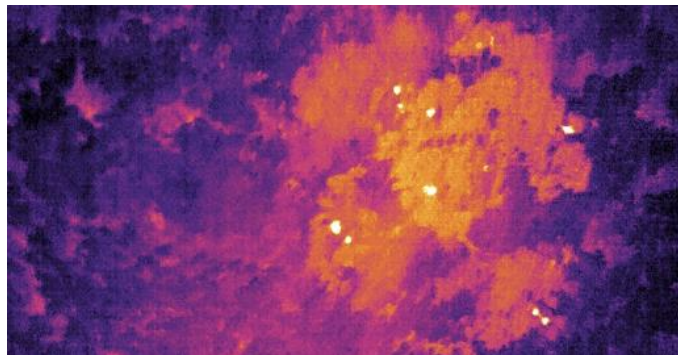
This British Science Week we're asking for your help to find and tag spider monkeys in thermal images of the forest canopy. By tagging these images, we can train an algorithm to spot monkeys automatically, so that ecologists can not only protect them, but also their habitat.

Now tell us, how many spider monkeys are there in this tree?



Sadly, even with a drone it's not always easy to find the animals we're looking for.

Have another go with this thermal infrared image instead!



(There are 9 monkeys - they are the bright yellow blobs.)

In thermal images animals glow brightly because of their body heat - and because they are warmer than their surroundings they really stand out.

This glow is the same type of glow that stars and galaxies have out in the Universe. This means that we can use methods from astronomy to find the animals and poachers and tell them apart automatically.

The researchers involved in this project want to build a system using astronomical techniques which detects and identifies different animals as the drone is flying, so we can get the most accurate knowledge of ecosystem health to build the best conservation strategies.

But to do this we need to tell the computer algorithm what it is looking at, this is where you can help.

Getting started

1. Go to www.spottingspidermonkeys.com and click “Get started”. You can also click “Classify” at the top right of the screen.
2. Watch the video you are shown. **Can you see any spider monkeys?**
3. In the thermal images, spider monkeys glow white or yellow and really stand out. You might even see their long limbs and tail as they climb through the forest canopy.
4. **But other things in the forest are also warm.** We're looking straight down at the forest with the thermal camera on our drone. The brightest shapes in this image are monkeys but you can also see tree branches as well. Sometimes it can be hard to tell them apart.
5. When the monkeys are still they look like warm, **bright yellow or white blobs** sitting in the trees.
6. It's easier to spot a monkey from a tree branch or other object when you look at a video. Especially if the monkeys are moving!
7. Watch the thermal video and look for bright blobs sitting or moving through the trees. You can slow the speed of the video or invert its colors using the controls. If you are not sure, take your best guess for an answer.
8. After watching the video clip a couple of times, **select "yes" or "no"** to tell us if there are monkeys in the film.
9. **Watch and tag as many videos as possible** – you're helping us spot spider monkeys!

Why is this project important?

By tagging the images taken by the aerial drones, researchers will be able to train an AI algorithm to find and track spider monkeys on its own, without the need for human surveillance. However, in order to have enough data to train the AI, **thousands of images need to be tagged** – something that would take the researchers alone years to complete. This is where you come in.



By taking part in this project you are helping the scientists get one step closer to developing an autonomous species tracker.

This would not only save hours of time for the researchers involved in the project but also the local authorities in Mexico and Central America. We will also be better equipped to tackle the threat of habitat loss and deforestation by monitoring larger areas of forest simultaneously.

With the black spider monkey population estimated to have fallen by 30% in the last 45 years, primarily due to habitat loss and hunting, this is vital work. Through the destruction of tropical forests we risk our own quality of life, gamble with the stability of climate and local weather, threaten the existence of other species, and undermine the valuable services provided by biological diversity.