

Project Premonition

Project Premonition is pairing entomology with purpose-built smart hardware and the power of Microsoft Azure to track wildlife populations, enabling organizations to quickly and accurately track biodiversity over time.



3b. Project Premonition smart traps: insect populations

Smart traps can also determine the overall insect population of an area by recording data from every insect entering the trap. This does not require capture.



3a. Project Premonition smart traps: host animal distribution

Smart traps use machine learning to differentiate and sort insects by analyzing their wingbeat frequency, capturing and preserving only those that feed on the animal species being studied.



4. Laboratory

The trapped insects are taken to the laboratory, where the insect and its bloodmeal's DNA are sequenced.



2. Insects

Insects draw blood from animals, which contains DNA, and stores this meal in their stomachs.



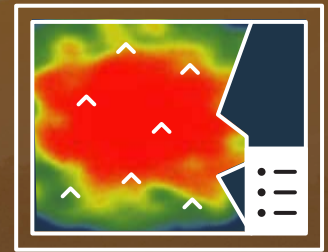
1. Host species

Researchers identify the host animal to study and the species of insects that feed on its blood.



5. Azure

This genetic data is analyzed on the Azure cloud to provide an estimate of an ecosystem's biodiversity and the geographic distribution of the studied host animal. Azure's power and scale reduced processing time from 30 days to a few hours.



6. Insight

Researchers can create a heat map detailing population density of host animals and insects throughout the tested area. This can be used to track population growth as well as movement over time.

Challenge

As vulnerable wildlife populations are increasingly faced with stressors like climate change and disease, it's critical we monitor their wellbeing. However, these species often live in hard-to-reach areas that complicate research efforts. Further, taking DNA samples from animals for deeper analysis can be an invasive process that disrupts the natural behaviors of the species being studied.

Solutions

Project Premonition turns blood-sucking insects into devices that can passively collect data from animals in their natural environment. Each insect bite contains a few microliters of blood that contains genetic information about the host animal, as well as any pathogens circulating in that animal. The power of Azure cloud computing allows researchers to quickly unlock the insight needed to counteract diseases and protect biodiversity.

