The TEAM Network

AN EARLY WARNING SYSTEM FOR NATURE

TROPICAL ECOLOGY
ASSESSMENT AND
MONITORING

Foreword

STABILIZING OUR CLIMATE, reducing food insecurity, and conserving the biodiversity that underpins Earth's life support systems are perhaps the greatest challenges of our time. If we are to succeed, we must have our finger on Earth's pulse. Leading scientists worldwide agree that we need an accurate and reliable record of the dynamics of biodiversity, ecosystem services and human wellbeing as they interact from local to global scales, particularly in the context of climate change.

Conceived in 2001, with significant support from the Gordon and Betty Moore Foundation, the Tropical Ecology Assessment and Monitoring (TEAM) Network – a partnership among 89 organizations in 18 countries in Africa, Asia, Latin America, North America, and Europe – is uniquely positioned to meet this challenge. TEAM is focusing, initially on tropical forests, because of their role in sustaining life on Earth. Tropical forests absorb carbon dioxide and produce oxygen. They also stabilize climate, house about half of the species on Earth, and produce rainfall worldwide.

Integrating high-resolution remote sensing and strategically placed, standardized ground measurements, the Network distributes near real time data and analyses to gain a better understanding at multiple scales:

THE CLOSE-UP: The health or growth rate of a single tree in a forest;

THE WIDER AREA (one hectare): The health of that area of land, the biodiversity it sustains, and the value of its services, such as carbon sequestration;

THE LANDSCAPE (hundreds of km2): The role of that forest and the other ecosystems within a larger area, including how they affect freshwater flows, agricultural productivity, availability of wild food for the local community, and the resilience of natural and human systems to climate change;

THE REGION (hundreds of thousands of km2): How various landscapes in a particular region interact and how this affects carbon stocks, biodiversity, capacity to support people, and their resilience to climate change.

They work in remote places, under difficult conditions, and sometimes must walk in the forest for three weeks to set up camera trap arrays.

Demand for TEAM data, from scientists to policy makers, is growing. Policy makers in Costa Rica, Peru and Uganda are using information from TEAM's camera trap data to better managed vertebrate species in protected areas. Scientists, such as NASA's Jet Propulsion Lab in Pasadena, are using TEAM data to calibrate measurements from space of global carbon stocks and changes in the Earth system. Policy makers are using TEAM data to plan financial mechanisms for compensating

It was the most ambitious thing I had ever seen.

local communities for conserving forests and for evaluating the effectiveness of conservation actions, such as creating nature reserves.

How does TEAM accomplish all of this? At each site, a local scientist, the site manager, coordinates the data collection, as well as interactions with local communities and government. The level of expertise and commitment of these scientists are extraordinary. They work in remote places, under difficult conditions, and sometimes must walk in the forest for three weeks to set up camera trap arrays. These are the people who make TEAM succeed. At the same time, being part of a global network connects the TEAM scientists to an international research community, and to opportunities for training and support for broader outreach.

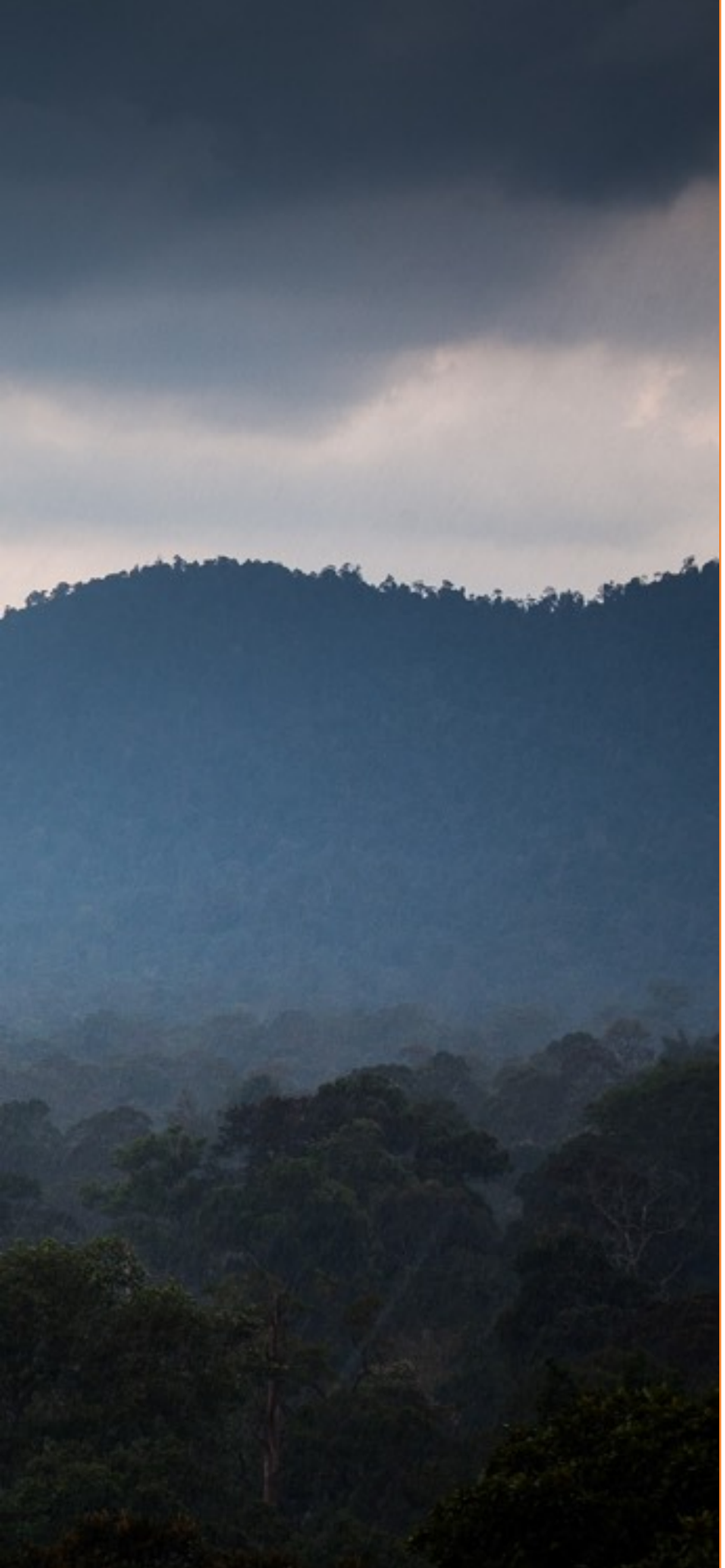
When I started working for the TEAM Network a little over eight years ago, I was fascinated by the challenge posed by this program. It was the most ambitious thing I had ever seen. I believe now that this approach is one of the most important things we can be doing, not only for the planet, but to move conservation science into an enlightened area.

In this eBook, I'm honored to introduce you to the TEAM Network.

Dr. Jorge Ahumada
Executive Director
TEAM Network

INTRODUCTION

An early warning system for nature



UNTIL NOW, CONSERVATION WORK HAS PRIMARILY FOCUSED on a specific area or on a specific species of animal. No one was attempting to understand tropical ecology on a global scale. Part of the reason TEAM was the first to attempt a global analysis of tropical forests is because of the challenges such a network poses.

PHYSICAL AND ORGANIZATIONAL CHALLENGES

Many of the protected areas are difficult to reach and often involve multi-day trips by bus, boat, and airplane just to get to the field station. Safety is not always assured and site personnel must work in the some of the hottest and most humid locations in the world.

LACK OF RESOURCES

The level of resources required to operate a global monitoring network is immense and competition for those resources is high. Stolen equipment and damage to equipment from humans and wildlife are additional financial risks of global monitoring networks.

The idea behind TEAM is deceptively simple: to measure and compare plants, terrestrial mammals, ground-dwelling birds, and climate using a standard methodology in a range of tropical forests – from relatively pristine places to those most affected by development and climate change.

INTRODUCTION
AN EARLY WARNING SYSTEM FOR NATURE

Tropical forests are not only key to our global climate and life on Earth, but are also highly important to our global economic welfare; however, until TEAM, no one had studied tropical forests as a whole. In fact, we actually had very little data on one of the most essential ecosystems on Earth – what we are doing is unprecedented.

Our mission is to generate real-time data for monitoring long-term trends in tropical biodiversity through a global network of field stations – providing an early warning system on the status of biodiversity to effectively guide conservation action.

TEAM represents an evolution in conservation science: from a practice based on closed data, impressions, and hunches to an open, data-driven collaborative discipline.

CHAPTER ONE

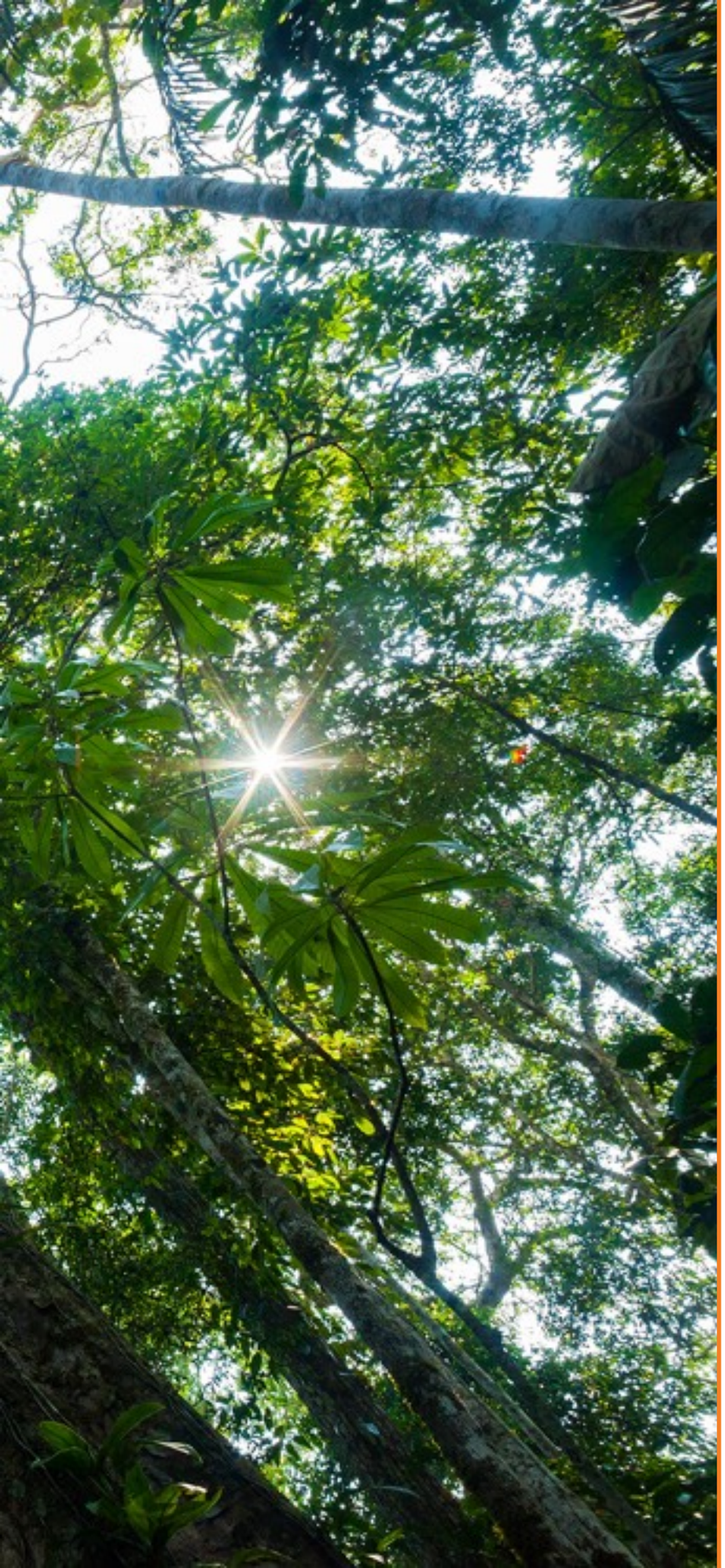
The need for TEAM

A new culture of ecology is needed for today's global challenges.

CHAPTER ONE
THE NEED FOR TEAM

1 Tropical forests are critical

Manu National Park in the Peruvian Amazon is one of the most biologically diverse forests on earth.



CHAPTER ONE
THE NEED FOR TEAM

TROPICAL FORESTS MAY COVER LESS THAN TWO PERCENT of the total surface area of the planet, but they are critical to ensure the continued survival of millions of plant and animals species, as well as human beings. This impressive ecosystem helps produce oxygen, store carbon, control climate, sustain species, and alleviate poverty for the entire planet.

OXYGEN PRODUCTION

The Amazon rainforest alone produces about **20 percent of the world's oxygen.**

CARBON STORAGE AND CLIMATE CONTROL

Tropical forests store roughly **2.8 billion tons of carbon** and help regulate key components of the global climate system, including temperature and precipitation.

BIODIVERSITY REPOSITORY

More than half the plant and animal species on Earth live in tropical forests.

POVERTY ALLEVIATION

One in four people on the planet depend on tropical forests for their livelihoods.

2 Tropical forests are under threat

A truck pulls away from a logging operation near Pasoh National Forest in Malaysia.

CHAPTER ONE
THE NEED FOR TEAM

TROPICAL FORESTS FACE MANY THREATS that endanger their continued existence and productivity. In addition to covering a small portion of the surface of the Earth, thousands of acres of tropical forests are cut down every year. As habitat is destroyed, tropical forest species will be ill-equipped to respond to challenges imposed by a changing climate. Poor management and illegal hunting also threaten to empty our tropical forests of prized species like the Sumatran tiger and Southern pig-tailed macaque.

DEFORESTATION

We lose roughly 90,000 square kilometers of tropical forest each year – an area twice the size of Denmark.

CLIMATE CHANGE

Thirty percent of tropical forest species are not prepared to deal with climate change – deforestation will further exacerbate the situation.

HUNTING PRESSURE

More than half of protected tropical forests may be empty of large animals due to overzealous hunting and poor protected area management.

3 Information does not exist

A new plant colonizes the mud of a drying riverbank in the Peruvian Amazon.

CHAPTER ONE
THE NEED FOR TEAM

MANY OF THE COUNTRIES THAT HARBOR TROPICAL FORESTS do not have the resources needed to conduct research and publish their results. Due to these limitations, tropical forest ecosystems are vastly underrepresented in scientific literature and databases. These limitations also force policy makers to legislate without crucial information about the state of their tropical forests.

TEAM scientist Patricia Alvarez uploads data to the TEAM servers from the Peruvian Amazon.

Out of the 30,000 long-term data sets available for forests and natural systems, only

15 came from tropical forests.

Most ecological studies last fewer than five years and occur at only a single study site, with measurements focused on an area of only ten meters squared. In addition, these studies tend to be focused on one species (e.g., Jane Goodall's Chimpanzees or Diane Fossey's Gorillas) or a particular group of species, such as carnivores or herbivores. While this research is important, it does not provide any information on how ecological processes are occurring on a global scale since methodologies can vary greatly from study to study.

TEAM is different. It's a network of field sites performing standardized methods on a global scale.

By providing data in near real-time, TEAM is attempting to fill this information vacuum so protected area managers can use data-driven approaches to adapt to changes in the climate and other environmental perturbations like human disturbance and disease.

CHAPTER TWO

How TEAM works

Explore the strategy and protocols behind this global network.

1 TEAM is a global network

TEAM works at both local and global scales. Here Christine Fletcher points to a camera trap location in Pasoh National Forest in Malaysia.

TEAM CURRENTLY OPERATES IN SIXTEEN TROPICAL FOREST sites across Africa, Asia, and Latin America. A network of scientists use standardized methods of data collection to quantify how plants and animals respond to pressures such as climate change and human encroachment.

Each site uses methods that are standardized across the network, allowing TEAM to make comparisons at local, regional and global scales.

LOCAL
Multiple TEAM sites in a country provide locally relevant information.

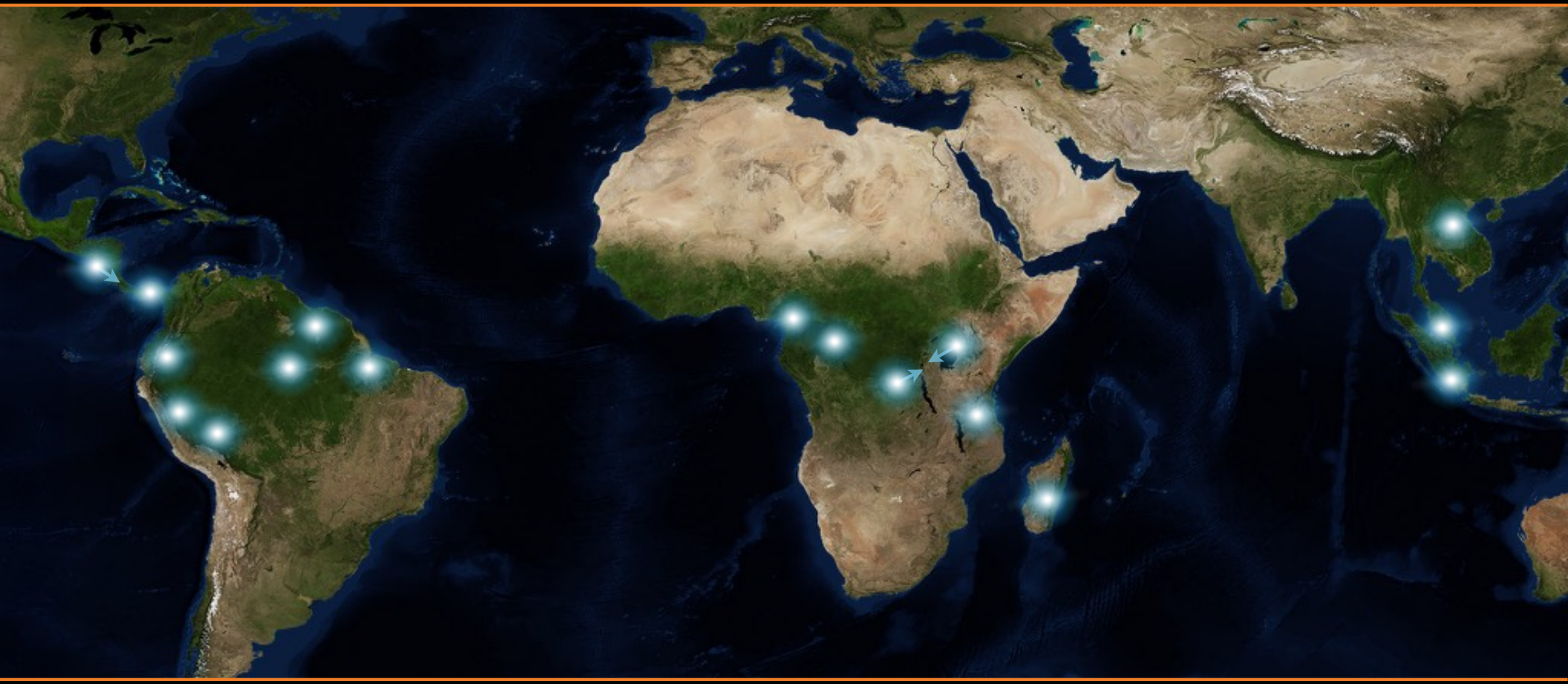
REGIONAL
Information is provided from all of the sites located on the same continent.

GLOBAL
Data from all of the TEAM sites provides insight into global processes.

TEAM is not just a collection of sites, but rather a network by design. Sites are carefully distributed along natural biophysical gradients as well as gradients of expected climate and land use change.

A NETWORK BY DESIGN

TAP A FIELD SITE TO LEARN MORE

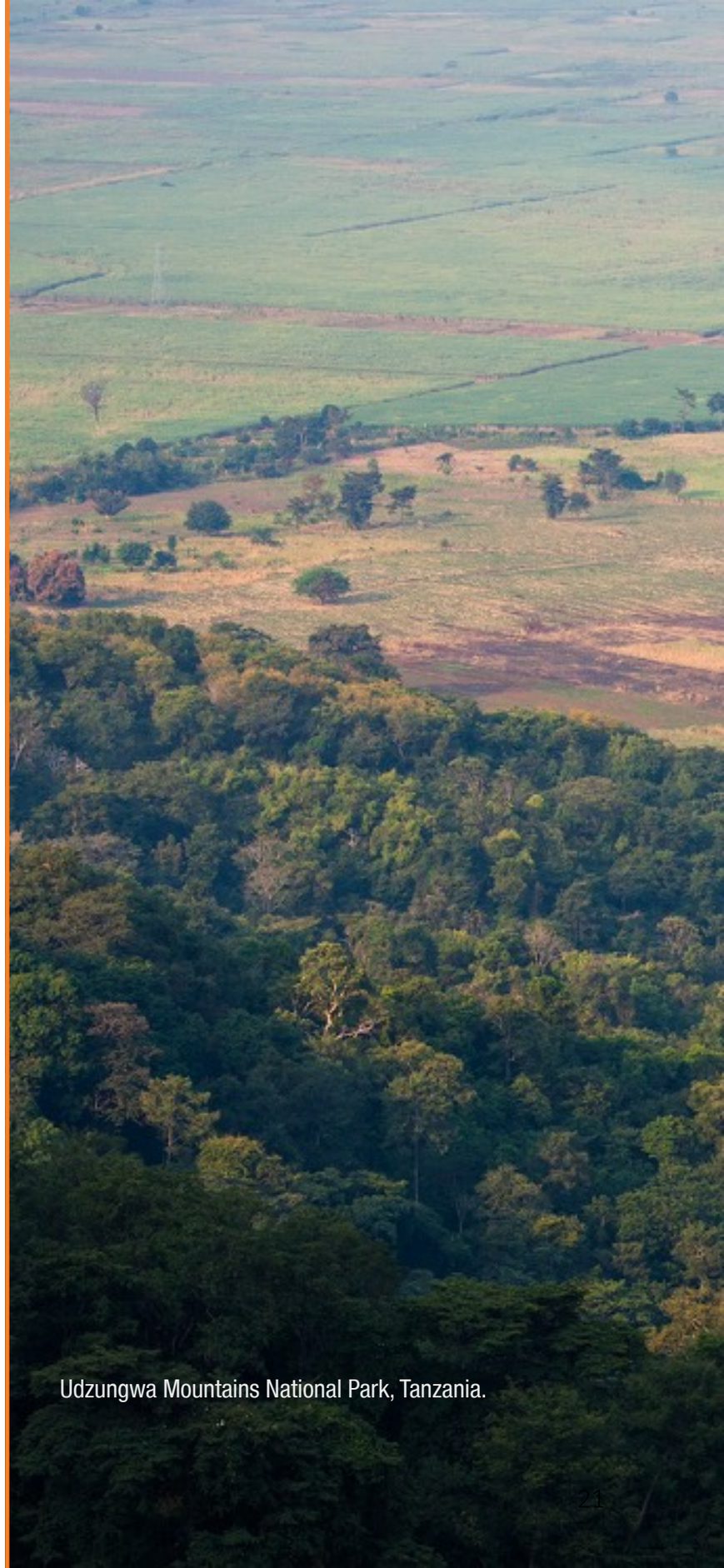


CHAPTER TWO
HOW TEAM WORKS

The goal of the TEAM Network is to improve protected area management by providing data

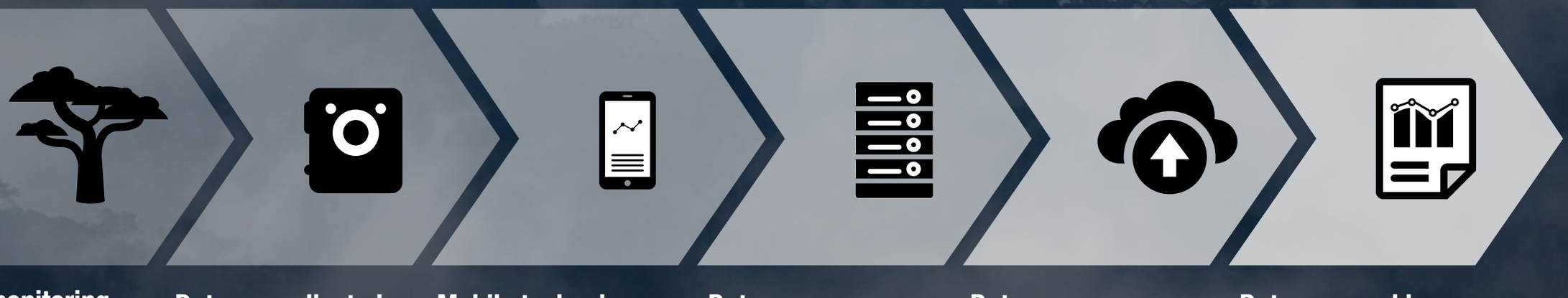
and biodiversity indicators that track the status of species at local, regional and global scales. To achieve this TEAM scales the science to the size of the problem, builds capacity and informs decision makers.

Our complete monitoring solution (described on the next page) begins with TEAM leadership working with a site to design and implement a monitoring strategy. Next, TEAM provides individualized training programs to build capacity with field tools, software packages and other new technologies. A Network site will then send their data to TEAM to be stored in a secure database. New data is analyzed as it is added so that results can be made available to the public in near real-time. This comprehensive approach allows researchers, protected area managers and government officials to make better informed conservation decisions.



Udzungwa Mountains National Park, Tanzania.

HOW TEAM WORKS



TEAM monitoring site

Data are collected according to standardized protocols

Mobile technology facilitates data collection in the field

Data are transferred and stored in servers and databases

Data are disseminated globally in near real-time using advanced technologies

Data are used by NGOs, government agencies, scientists, educators, etc.

2 TEAM uses standard protocols

Patricia Alvarez measures the diameter of a tree in one of six vegetation plots in Manu National Park, Peru.

CHAPTER TWO
HOW TEAM WORKS

TEAM USES STANDARDIZED, PEER-REVIEWED METHODS that cover all aspects of data collection for three crucial components of the tropical forest ecosystem: wildlife, vegetation and climate. Developed in collaboration with our core partners, the four standardized protocols enable TEAM to make direct comparisons between sites.

VEGETATION PROTOCOL Six vegetation plots that cover one hectare of forest each are installed and measured yearly at each site to track changes in tree growth in response to climate through time.

WILDLIFE PROTOCOL Sites deploy two to three arrays of camera traps during the dry season each year for 30 days at a time. Each array consists of 30 cameras spaced every two square kilometers, covering an area of 120-180 square kilometers.

CLIMATE PROTOCOL An automated climate station records temperature, relative humidity, precipitation, and solar radiation in or near the protected area at each site and data is monitored for changes over time.

LAND-USE PROTOCOL Population, species distribution, and satellite data are combined to produce a Zone of Interaction where TEAM can monitor changes in human activities to determine their impact on biodiversity and other forest services.

CHAPTER TWO
VEGETATION PROTOCOL

Vegetation protocol

Monitoring tree and liana (woody vine) biodiversity in tropical forests provides the basic information to calculate aboveground carbon. Repeated annual censuses of trees and lianas in permanent plots are the most robust way to monitor changes in aboveground biomass (amount of living matter) in tropical forests. It is also the best way to monitor the effects of climate change on forest growth and mortality as well as diversity.

CHAPTER TWO
VEGETATION PROTOCOL

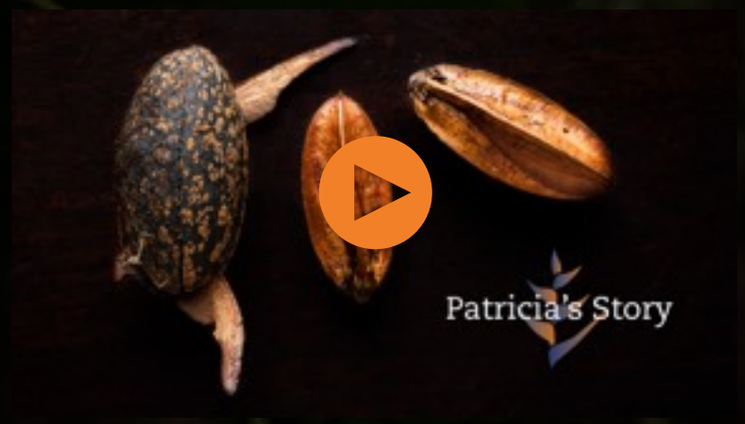
OVERVIEW OF THE PROTOCOL

- Each site establishes six one-hectare vegetation plots.
- Randomly place plots in the dominant vegetation type and along an altitudinal gradient, if one exists.
- Plots are separated by at least two km.
- Measure all stems with a diameter larger than 10 cm.
- Conduct a new census every year during the dry season.
- Measurement error of field personnel is estimated at the start of each census period.

CHAPTER TWO
VEGETATION PROTOCOL

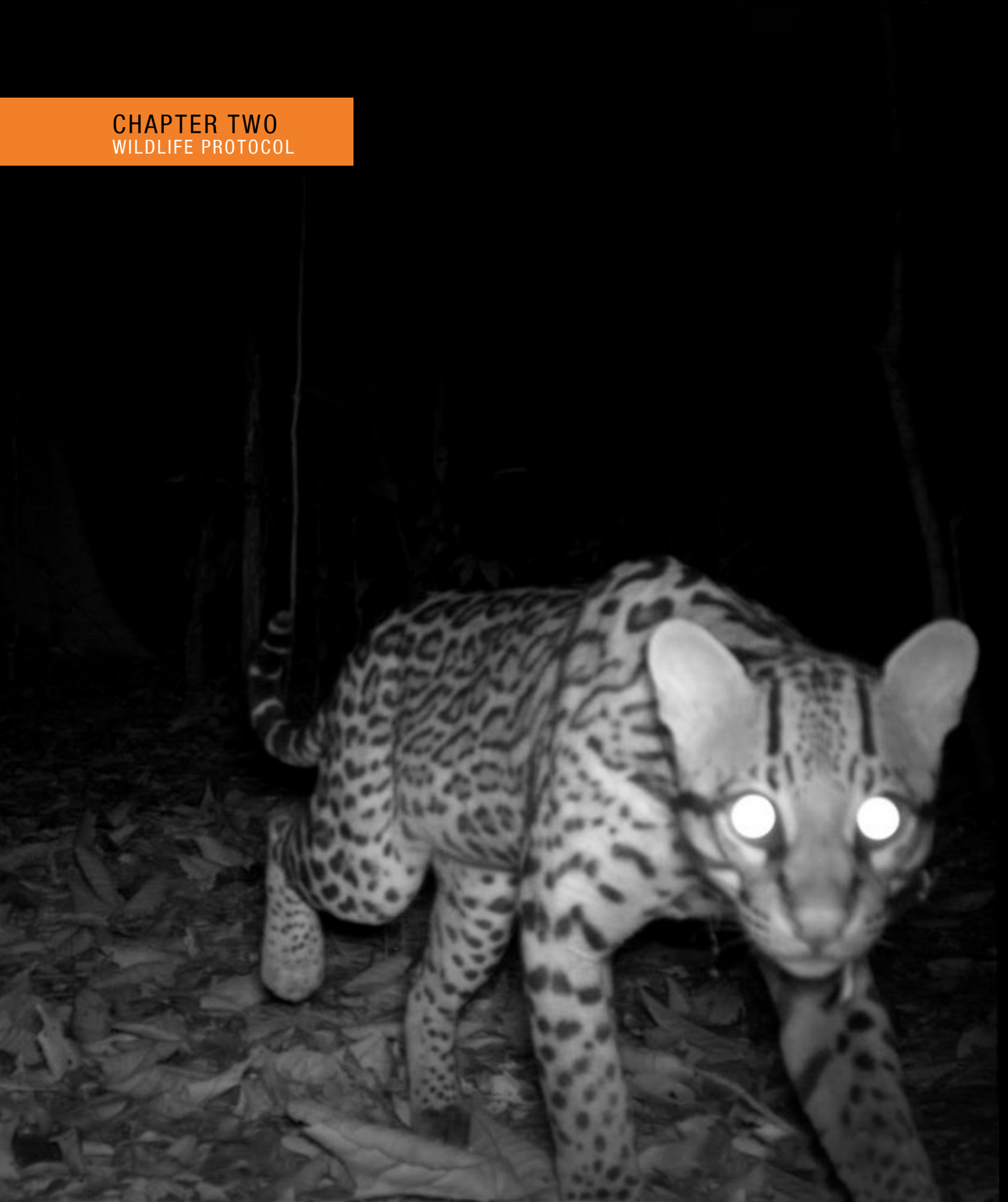
LEARN MORE

PATRICIA'S STORY PAGE 37



PHOTOS FROM THE FIELD

CHAPTER TWO
WILDLIFE PROTOCOL



Wildlife protocol

Terrestrial mammals and birds play important roles in tropical forest ecosystem function, including seed dispersal, herbivore regulation, pollination, and carbon sequestration, among others; however, we have very little or no information on the status of most of the tropical forest species that is collected consistently through time. Camera traps allow us an efficient and cost-effective way to monitor the status of species and communities of vertebrates.

CHAPTER TWO
WILDLIFE PROTOCOL

OVERVIEW OF THE PROTOCOL

- Two to three arrays of 30 camera traps are set annually during the dry season.
- Cameras are placed every two square kilometers and along an elevation gradient, if possible.
- A total of 60-90 sampling locations cover 120-180 square kilometers.
- Arrays are deployed sequentially and left in the forest for 30 days each.
- The cameras monitor medium to large ground-dwelling forest mammals and birds.
- No bait is used so animals are captured naturally.

CHAPTER TWO
WILDLIFE PROTOCOL

LEARN MORE

BADRU'S STORY PAGE 38

PHOTOS FROM THE FIELD

TRAP HIGHLIGHTS

HOW BIG IS AN ARRAY?

CHAPTER TWO
CLIMATE PROTOCOL

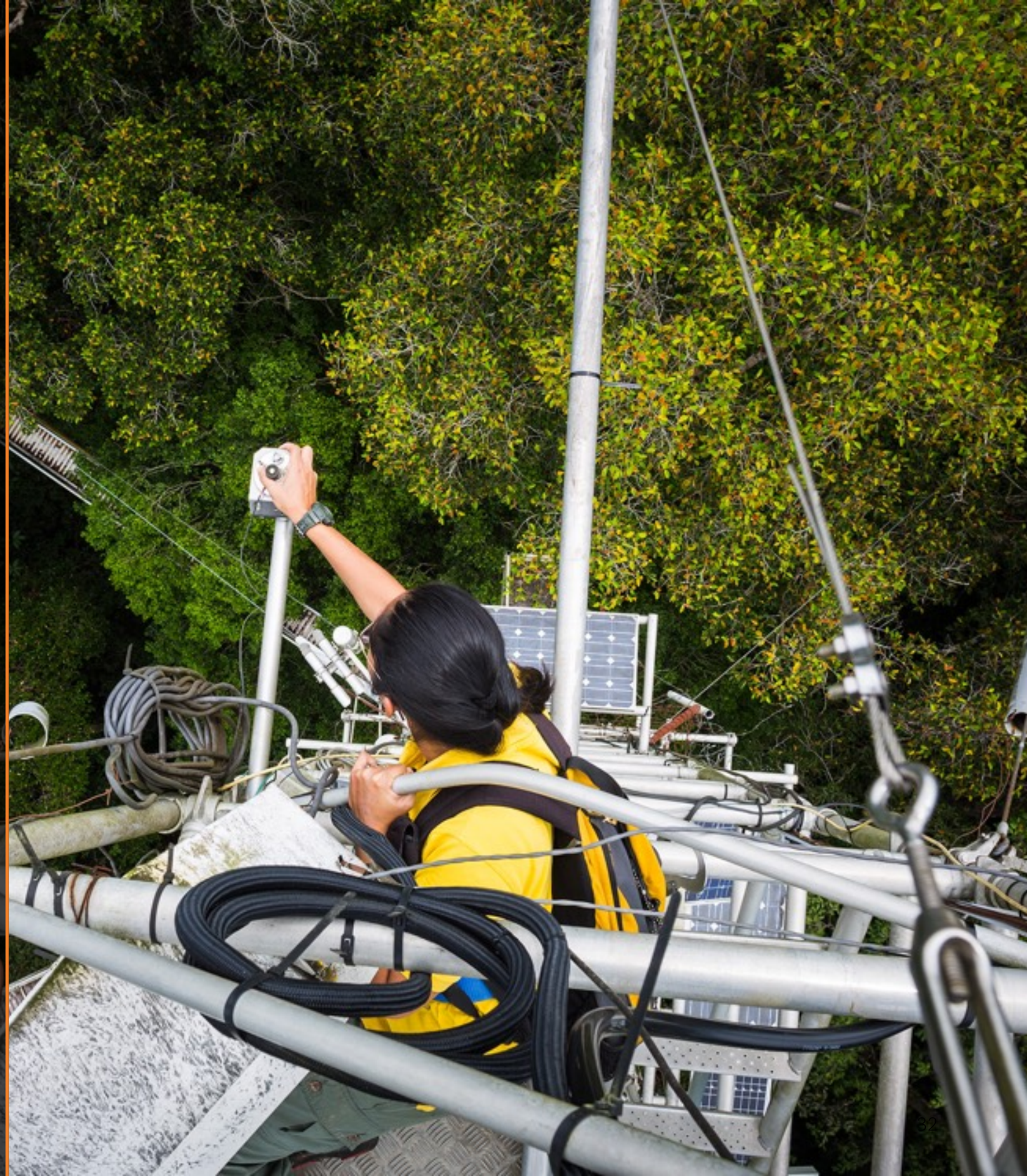
Climate protocol

TEAM generates high-quality, reliable measurements of climatic variables in tropical forests using a standardized protocol that meets the guidelines set forth by the World Meteorological Organization. Using an automated climate station installed as close as possible to the protected area, TEAM can detect changes in the climate and better understand the effects of climate change on biodiversity and the ecosystem services (clean air, water, food) that tropical forests provide for humankind.

CHAPTER TWO
CLIMATE PROTOCOL

OVERVIEW OF THE PROTOCOL

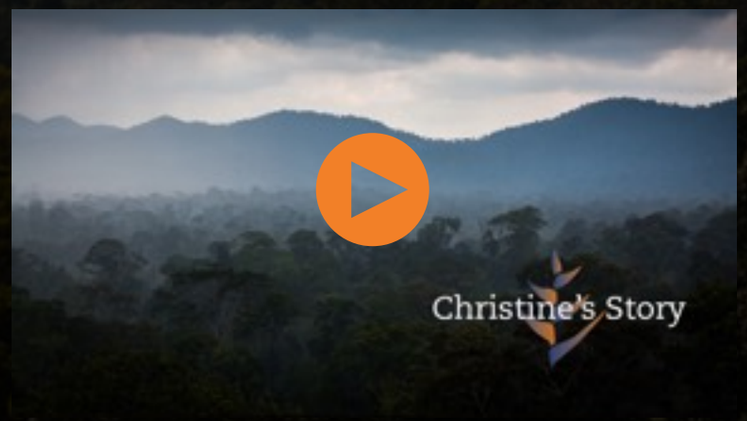
- Climate stations are autonomous and self-powered.
- Each climate station has sensors for temperature, relative humidity, solar radiation and precipitation.
- All sensors are run in duplicate (except precipitation).
- Measurements are recorded every five seconds.
- Staff follow standardized maintenance and sensor calibration schedules and data management procedures.
- Sensors are secured to a 3m tower located in an open clearing as close as possible to the protected area.



CHAPTER TWO
CLIMATE PROTOCOL

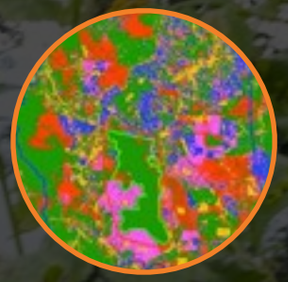
LEARN MORE

CHRISTINE'S STORY PAGE 39



PHOTOS FROM THE FIELD

CHAPTER TWO
LAND-USE PROTOCOL



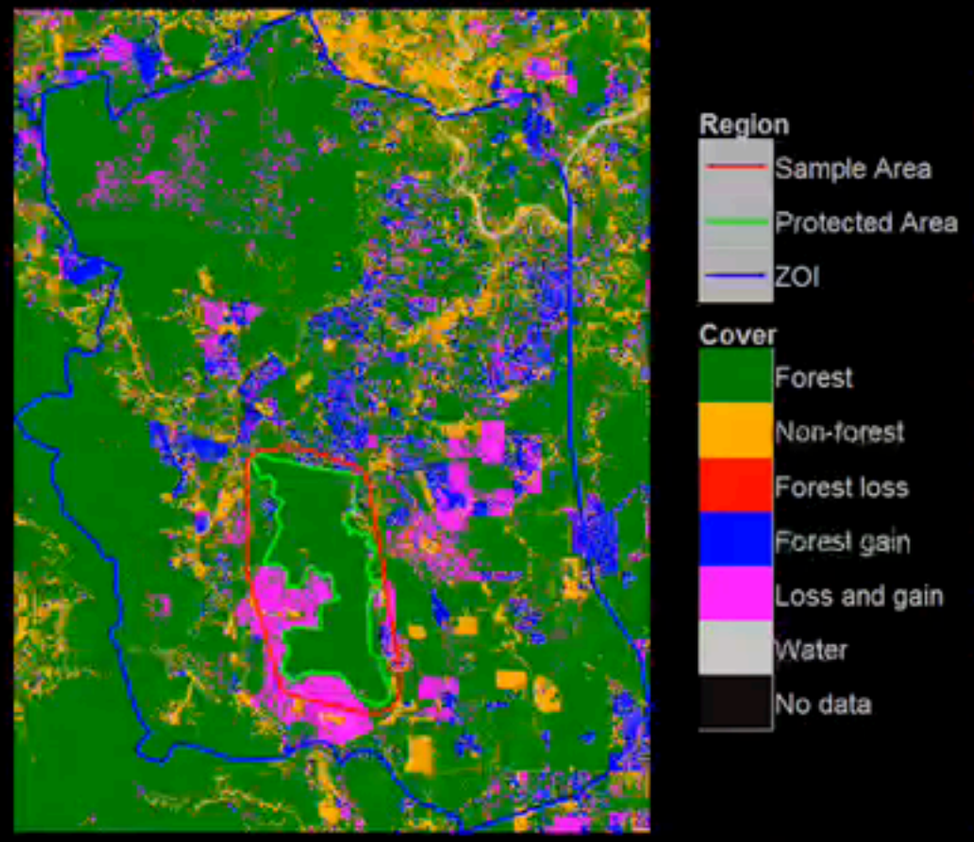
Land-use protocol

Changes in land-use can have an impact on biodiversity within a protected area. TEAM uses data on watersheds, contiguous habitat, human population, wildlife migration corridors and several other factors to model and analyze how human activities, such as hunting and deforestation, cause changes in biodiversity at each site. Understanding the connection between human activities and biodiversity is an important first step towards creating healthy, sustainable societies.

CHAPTER TWO
LAND-USE PROTOCOL

OVERVIEW OF THE PROTOCOL

- Each site assembles a number of geographic data layers.
- Watershed polygons are created from a hydrology data layer.
- Contiguous habitat, obstructed areas and migration corridors are determined.
- Human activities and infrastructure polygons are created based on hunting, grazing, and extractive activities near the core study area.
- All of the layers are combined to create a final estimate of the Zone of Interaction, in which changes in human activities are assumed to influence biodiversity and forest health.



LAND-USE CHANGE NEAR PASOH FOREST RESERVE, MALAYSIA

CHAPTER THREE

TEAM Stories

Follow three scientists into the field in this series of short films.

5:52

5:58


Christine’s Story
5:10

CHAPTER FOUR

Guiding action

Learn how TEAM uses data to drive conservation outcomes.

1 Public access to data and tools

Badru Mugerwa downloads images from a camera trap array, identifies species and begins to upload images to TEAM's servers.

DATA COLLECTED BY THE TEAM NETWORK is made available to the public as soon as it is collected so it can serve as a resource for protected area managers, students, scientists and the general public.

The benefits of publicly available, near real-time data include:

- Tracking results of management plans and adapt them as needed
- Updating our knowledge of species distributions
- Monitoring forests for illegal activities.

To facilitate access to this growing resource

TEAM offers a number of tools and services for data management and analysis.

These components all work together as part of TEAM's comprehensive solution, shown on the next page.

TEAM'S COMPREHENSIVE SOLUTION

TAP A PROGRAM TO LEARN MORE

Wildlife monitoring design and implementation

STANDARD PROTOCOLS

Camera trap and sensor expertise

WILDLIFE PROTOCOL

Image processing and identification

OPEN DESK TEAM

Database design and management

HP BIG DATA AND ENTERPRISE SERVICES

Data maintenance and backup

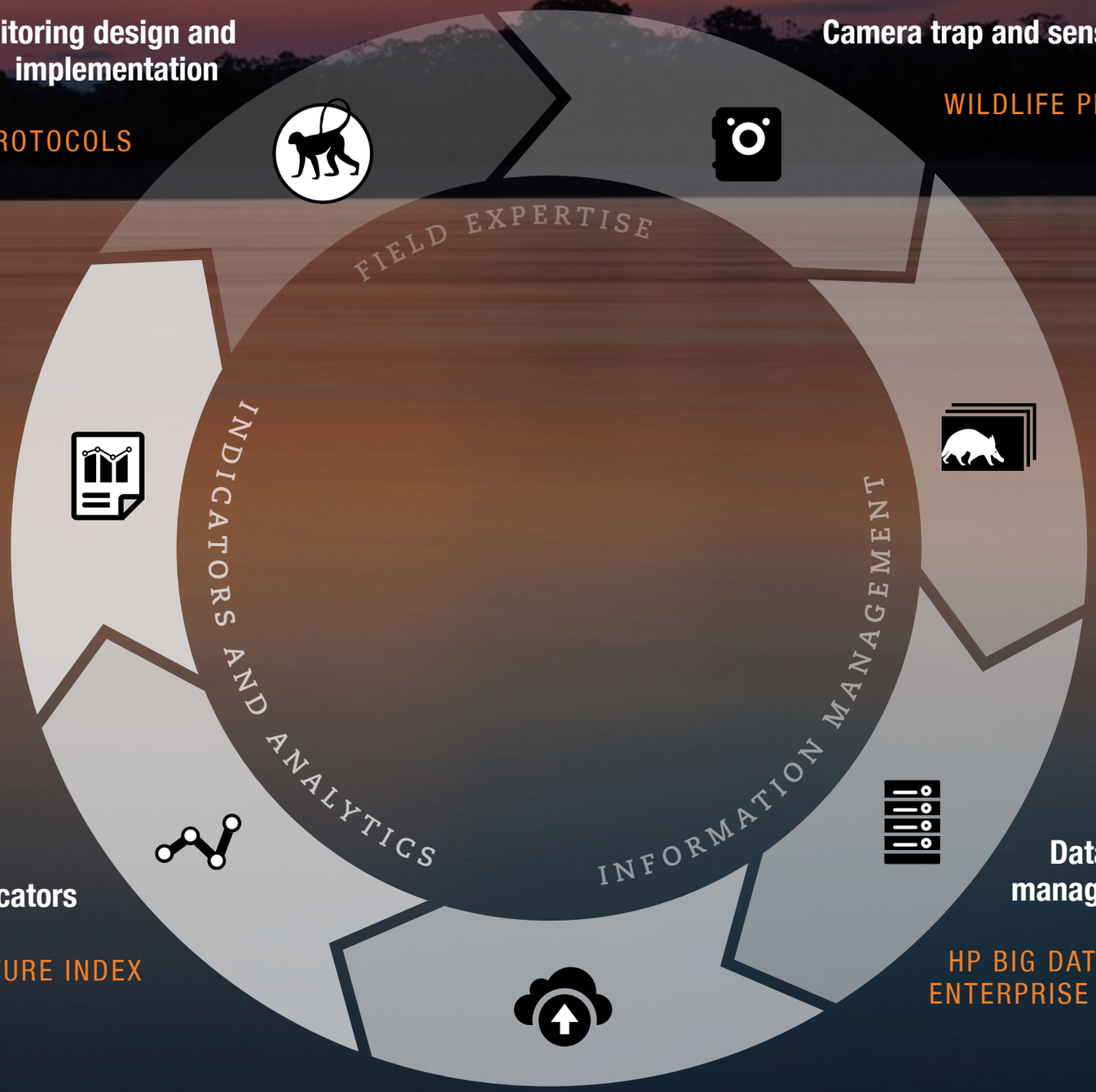
HP HELION CLOUD

Biodiversity indicators

WILDLIFE PICTURE INDEX

Data-driven conservation decisions and actions

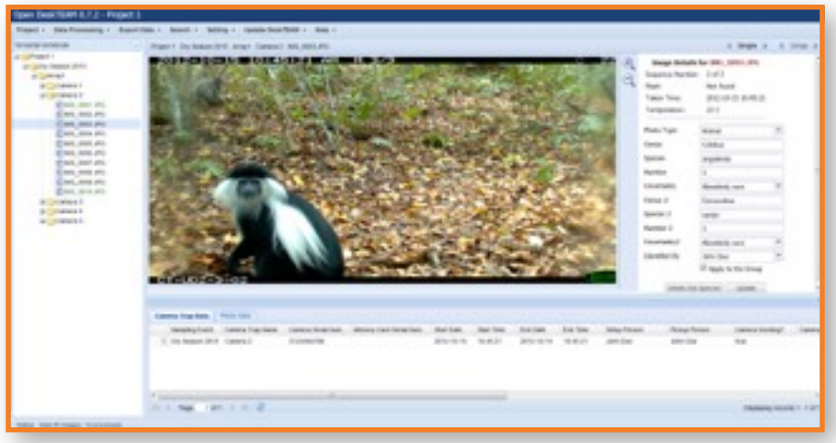
EARTH INSIGHTS



OPEN DESKTEAM

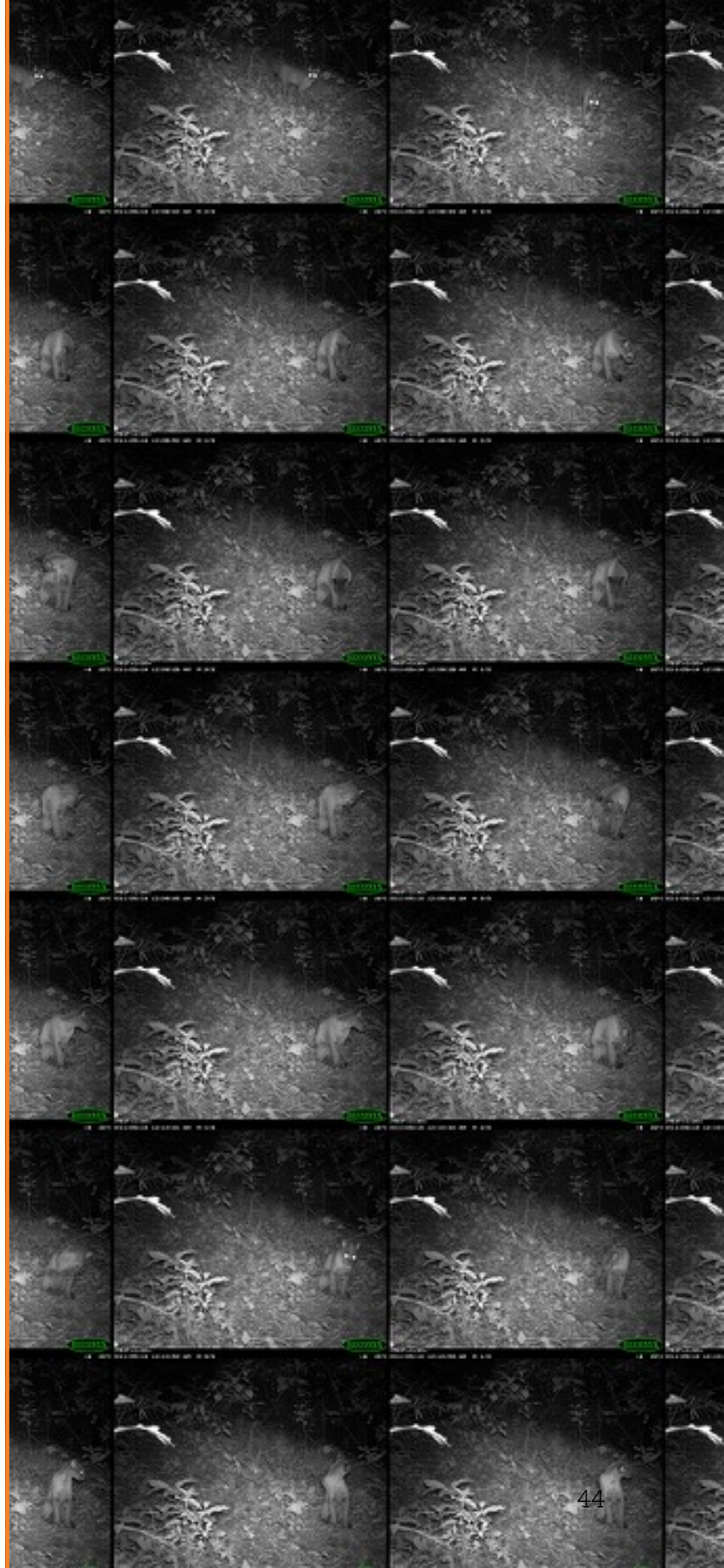
Open DeskTEAM is free, open-access camera trap annotation software designed to help protected area managers and wildlife professionals save time when processing camera trap images so they can quickly get the data in a standardized format that can be exported and then analyzed using statistical programs like Excel and R. In addition to these features, Open DeskTEAM also:

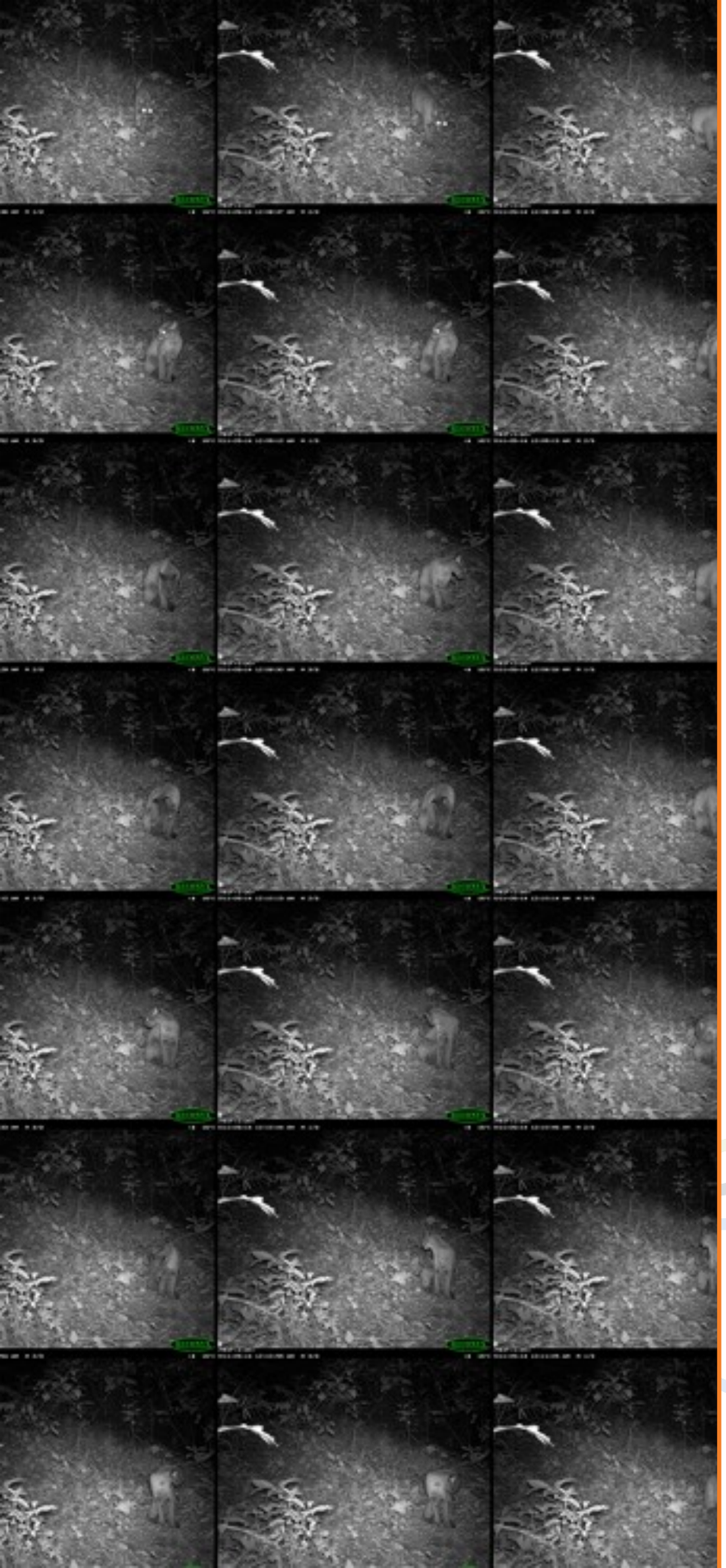
- Runs locally (does not require an internet connection)
- Performs multiple annotations at a time
- Prevents misspellings using an internal taxonomic authority
- Automatically stores date/time and environmental variables from image metadata
- Stores equipment lists and personnel information
- Accommodates multiple species in the same image.



Tap to enlarge

Download the software at:
TEAMNETWORK.ORG





DATABASE DESIGN AND MANAGEMENT

TEAM partnered with the San Diego Supercomputer Center at the University of California, San Diego to develop a flexible database structure that is capable of storing climate, vegetation, wildlife and land-use data. This database allows sites to easily edit data and interfaces with other TEAM systems, such as the Wildlife Picture Index Analytics System (next page), so data can be analyzed at different geographic scales and organized by taxonomy, functional groups or trophic guilds. Our database is also outfitted with quality control measures that scan incoming data for common errors. Through an innovative partnership with Hewlett-Packard (HP), TEAM takes advantage of the HP Vertica Analytics Platform to shorten the amount of time it takes to process and analyze data, enabling TEAM to make proactive responses to environmental threats as they emerge.

DATA STORAGE AND BACKUP

TEAM is also able to offer data storage options through our partnership with HP. Cloud-based storage is ideal for protected area managers because it is low-cost, secure and accessible from nearly any location. Automated backups also help prevent loss of data and ensure that all data are up-to-date. Without an adequate storage solution, data cannot be recovered after it is lost and is more difficult to share.

WILDLIFE PICTURE INDEX

Through our partnership with HP (Earth Insights) we created the Wildlife Picture Analytics (WPI) system, a tool that quickly synthesizes and analyzes camera trap data so that is easy to interpret and communicate to conservation stakeholders and policy makers. Direct integration with the TEAM cloud storage tool also allows data from multiple sites to be analyzed and compared with little effort. A new analysis is completed each time a new data set is added to the database.

The WPI is officially recognized by the Convention on Biological Diversity as a biological indicator for the status of species and can be thought of as a stock market for monitoring the health of tropical forest species.

Tap to enlarge

Due to the simple design and speed of the WPI Analytics system, TEAM is able to draft reports and recommend solutions to improve conservation outcomes at different geographic scales – locally, regionally, and globally – in near real-time.

Explore the WPI Analytics System at:
WPI.TEAMNETWORK.ORG

Earth Insights

HP Earth Insights is an innovative partnership that applies HP's big data technology and expertise to the research pursued by TEAM to ensure a healthy and productive planet for local and global communities.

2:32

2 What we've learned

TEAM technicians discuss access along the northern boundary of Udzungwa National Park, Tanzania.

CHAPTER FOUR
GUIDING ACTION

OVER THE PAST 12 YEARS, TEAM COLLECTED ANNUAL DATA for over 50,000 individually mapped trees from more than 100 one-hectare plots as well as over two million images from nearly 1,000 camera trap points and over four million climate measurements from 16 climate stations. TEAM used a portion of this data to publish nearly sixty scientific publications in international journals since 2001.

Some of our analyses of the TEAM camera trap data suggests:

- About 15 percent of populations that TEAM monitors are declining; most of these are species of "Least Concern."
- Species declines are easier to detect when monitoring is longer, protected areas are less remote and hunting pressure is higher at TEAM sites.
- Carbon storage and terrestrial vertebrate diversity at TEAM sites is not related at the local scale – maximizing carbon storage capacity may not be the best strategy for conserving biodiversity.
- Trends for several species are tied to climatic variables, such as temperature and precipitation.
- Mature forests have higher terrestrial vertebrate diversity than those that were recently logged.

CHAPTER FOUR
GUIDING ACTION

3 Generating outcomes

Early morning light filters through the trees along a tributary of the Amazon in Manu National Park, Peru.

TEAM SITE MANAGERS meet with protected area managers and government officials in their districts at least once a year to provide an updated report on the status of tropical species at their site and develop management plans to address any worrying trends.

Since TEAM data is available in near real-time, protected area managers are able to respond to species declines as they are occurring and can receive direct feedback on the effectiveness of their conservation actions so they can be modified or improved. WPI data can also easily be aggregated by IUCN categories so endangered and vulnerable species can be monitored more closely.

TEAM data is also being used to support REDD+ initiatives that aim to reduce emissions from deforestation and forest degradation.

CHAPTER FOUR
GUIDING ACTION

4 Partners make it all possible

A camera trap team relaxes at the end of a long day in the forest in Bwindi Impenetrable National Park, Uganda.

TEAM IS COMPOSED OF THREE CORE PARTNERS – Conservation International, the Wildlife Conservation Society, and the Smithsonian Institution – and is supported by several private donors.

TEAM works with more than 89 partners in 18 countries, including local implementing organizations, governmental institutions, corporate and academic partners.

CONSERVATION INTERNATIONAL

WILDLIFE CONSERVATION SOCIETY

Smithsonian Tropical Research Institute
Center for Tropical Forest Science

PARTNER INSTITUTIONS

Africa

CAMEROON

University of Buea

World Wildlife Fund Cameroon

CONGO, BRAZZAVILLE

Congo Basin Forest Partnership

Ministry of Forestry Economy and Environment

MADAGASCAR

Centre ValBio

Fanamby

Madagascar Institute for the Conservation of Tropical Environments

Ministry of Environment, Water, Forests and Tourism

National Association for the Management of Protected Areas

Stonybrook University

RWANDA

International Gorilla Conservation Programme

Rwanda Development Board

Rwanda Meteorology Agency

Dian Fossey Gorilla Fund International

The Gorilla Organization and Mountain Gorilla Veterinary Project

University of Rwanda: College of Agriculture Animal Sciences and Veterinary Medicine

Rwanda Ministry of Education

Rwanda Ministry of Infrastructure

Rwanda Agricultural Board

Rwanda Natural Resources Authority

Institute of Applied Sciences

TANZANIA

Department of Forestry and Beekeeping

Leeds University

Museo Tridentino di Scienze Naturali

National Bureau of Statistics

National Meteorology Department

Sokoine University of Agriculture

Tanzania Forest Conservation Group

Tanzania National Parks

Tanzania Wildlife Research Institute

University of Dar es Salaam

World Wildlife Fund Tanzania

UGANDA

African Wildlife Foundation

Albertine Rift Conservation Society

Bwindi Mgahinga Conservation Trust

CARE International

Ecotrust

Institute of Tropical Forest Conservation

International Gorilla Conservation Program

Makerere University

Max Planck Institute for Evolutionary Anthropology

Mbarara University of Science and Technology

National Forest Authority Nature Uganda

Uganda Carbon Bureau

Uganda Wildlife Authority

World Wildlife Fund Uganda

Latin America

BRAZIL

Associação do Amigos do INPA

Fundação de Amparo e

Desenvolvimento da Pesquisa Instituto Nacional de Pesquisas da Amazônia

Museu Paraense Emílio Goeldi Projeto Dinâminca Biológica de Fragmentos Florestais – INPA/ Smithsonian Institution – Large Scale Biosphere-Atmosphere Experiment in Amazonia

Universidade Federal do Pará

COSTA RICA

Duke University

Ministry of the Environment and Energy

NASA Jet Propulsion Laboratory at the California Institute of Technology

Organization for Tropical Studies University of Miami

University of Missouri, St. Louis

ECUADOR

Pontificia Universidad Católica del Ecuador

PANAMA

Smithsonian Tropical Research Institute

PERU

Asociación para el Manejo de la Reserva Comunal Yanesha

Duke University

Herbario, Universidad Nacional San

Antonio Abad del Cusco Inkaterra

Iquitos Herbario Truxillense

Ministerio del Medio Ambiente

Museo de Historia Natural

Oxapampa Herbario Amazonense

Programa para el Desarrollo Alternativo de la Áreas de Pozuzo y Palcazu Pro Naturaleza, Oxapampa

San Diego Zoological Society

Servicio Nacional de Areas Protegidas (SERNANP)

Trujillo Herbario Weberbauer

Universidad Nacional Agraria La Molina, Lima

Universidad Nacional de la Amazonía Peruana

Universidad Nacional de Trujillo Universidad Nacional Mayor de San Marcos

Univsersidad Privada Antenor Orrego

Universidad San Antonio Abad Cusco

SURINAME

Department of Nature Conservation Ministry of Land and Forest Management

Asia

INDONESIA

Balai Taman Nasional Bukit Barisan Selatan

Directorate of Forest Protection and Nature Conservation, Ministry of Forestry

Universitas Indonesia

Universitas Lampung

LAO PDR

Bolikhamxay Province Provincial Agriculture and Forestry Office

Department of Forest Resource Conservation

Ministry of Agriculture and Forestry

Nam Thuen 1 Hydropower

Theun Hinboun Power

MALAYSIA

Forest Research Institute of Malaysia

Harvard University

United States

San Diego Supercomputer Center, University of California, San Diego

National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara

Europe

Oxford University RAINFOR

CHAPTER FIVE

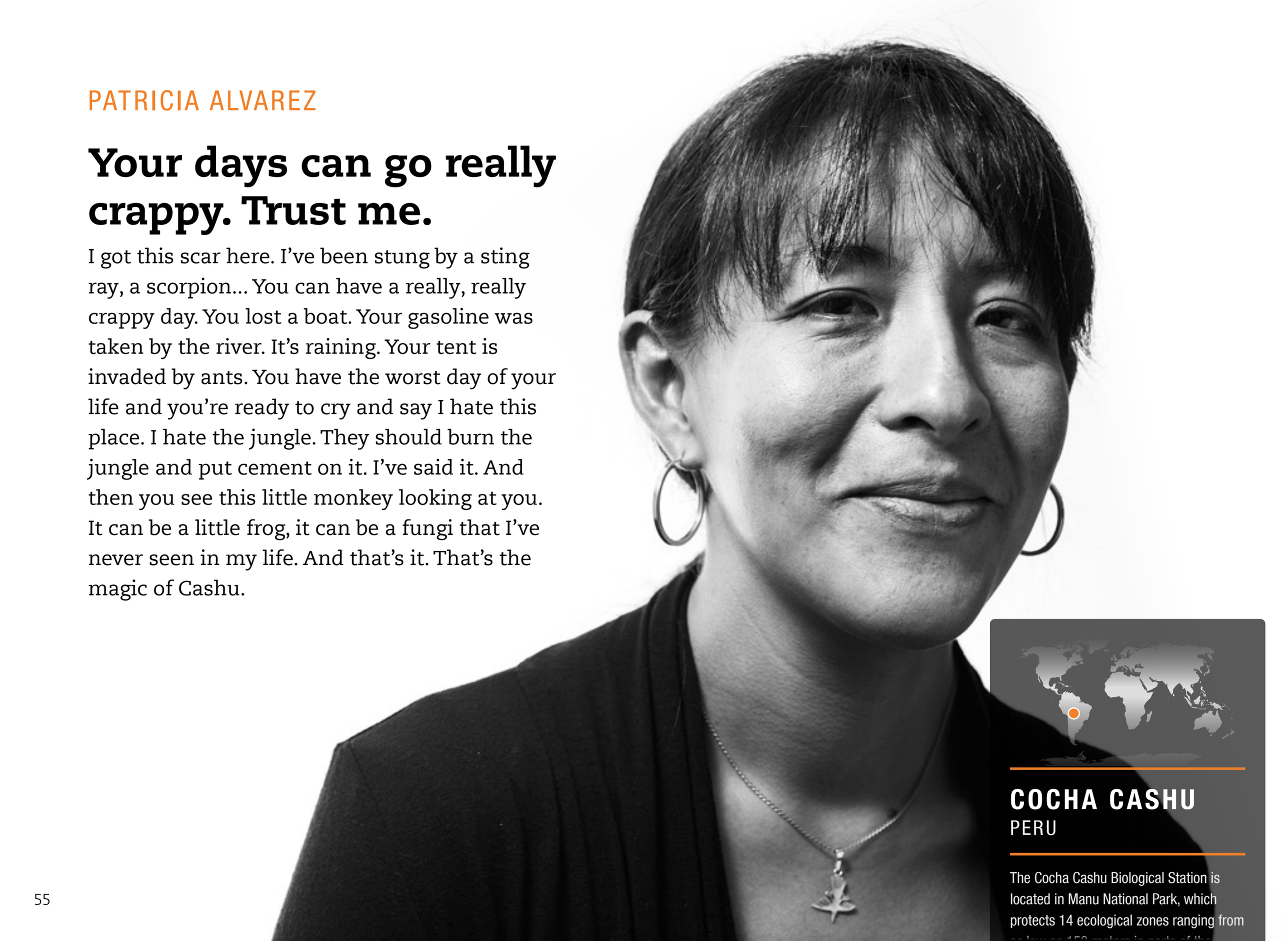
The Faces of TEAM

Hear from the people that make it happen in their own words.

PATRICIA ALVAREZ

Your days can go really crappy. Trust me.

I got this scar here. I've been stung by a sting ray, a scorpion... You can have a really, really crappy day. You lost a boat. Your gasoline was taken by the river. It's raining. Your tent is invaded by ants. You have the worst day of your life and you're ready to cry and say I hate this place. I hate the jungle. They should burn the jungle and put cement on it. I've said it. And then you see this little monkey looking at you. It can be a little frog, it can be a fungi that I've never seen in my life. And that's it. That's the magic of Cashu.



COCHA CASHU

PERU

The Cocha Cashu Biological Station is located in Manu National Park, which protects 14 ecological zones ranging from

EDUARDO ELER

We measure five things:

climate, vegetation, carbon stocks, human–landscape interactions, and bird and mammal diversity. We started in 2002 and are the oldest site of the TEAM Network.

Manaus is in the middle of the Brazilian Amazon. It's a big city, we have almost two million people living there, and our sampling areas are not very far from Manaus. So, we can drive into the plots and it's very interesting to study what is the consequence of the city in the middle of the forest.

MANAUS
BRAZIL

A TEAM site since 2002, Manaus is spread between three different areas surrounding the capital of the state of

DAVID KENFACK

The most exciting for me is the camera traps.

The camera trap data is going to be very important for the management plan of the park because so far there is no clear picture of what is in the park as far as animals. Sometimes when we go to town we have encounters with elephants, but we don't know how many elephants are there. We don't know where they are. So with the camera trap studies we are going to have a better understanding of what is in the park, where it is, how dynamic the population is and so on. It's also important for the entire country because it's going to set an example for how to monitor wildlife. I think it's the first time that this type of equipment has been used in Cameroon.

KORUP
CAMEROON

Korup National Park is one of the wettest and most isolated remnants of the Atlantic Coastal Forest that once spread

EMANUEL MARTIN

It’s a privilege to say that Udzungwa is part of a global network.

TEAM provides real time data for the whole world. By being part of the network we get to collaborate with other institutions and through that you share ideas and experiences, and learn new skills.

UDZUNGWA
TANAZANIA

The Udzungwa Mountains cover 10,000 square kilometers and contain outstanding levels of biological diversity

FERNANDA SANTOS

To get to the scientific station we have to go by boat.

It's a long way from the city of Belém. You have to travel by boat into the interior of the state for 12-14 hours. Then you get another boat and travel nine hours. It's a long way but it's a beautiful way. At the scientific station you have all of the things that you need. We have energy and internet. But to go to the TEAM plots you have to go by boat, too. All of the things that you have to do are by water. You always have to take a boat.

CAXIUÑA
BRAZIL

The Caxiuanã TEAM site is located within the 33,000 hectare Caxiuanã National Forest. Because of its geographic

ARMAND MOREDJO

As a researcher, I think it's important to have good data.

And for the management of the nature reserve, you should know what you are managing. You will only know if you get good data. That's why I'm supporting this work of TEAM and collecting data.

But it's not just about the collection of data; I would like to communicate that data, not only on a scientific level, but more on a public level. Because if you can get the general public to know what is happening and what we have at the Central Suriname Nature Reserve, I think we will have much more ownership by the local people. So you won't have problems of vandalism and maybe you will get more support from the government. That is how I see it, besides the scientific part, I would like to get this information to the policy makers and the general public.

SURINAME
SURINAME

The Central Suriname Nature Reserve covers about ten percent of the land area of Suriname. Established with support

CHRISTINE FLETCHER

A couple of us researchers went into the forest in Pasoh.

We collected some ants – just normal ants – and took them out to the local communities to do some outreach. We put the ants under a microscope and people were blown away. They never knew something that you see on a daily basis could look so different from a different perspective.

And so you can imagine what TEAM can do. Once you show them, OK this is how a climate station works, now we can predict your weather using these models. Or, these are the animals you can see in your forest, in your backyard. I believe it will definitely create an awareness, especially among the younger generation.

PASOH
MALAYSIA

Although surrounded by palm oil plantations, a diverse variety of living organisms thrive in this forest fragment,

RODOLFO VASQUEZ

There are stories about snake bites, but this isn't very interesting.

There are various stories. The last two vegetation plots, for example, it took me 11 days to get to them. There are no trails inside the park and so I had to walk with eight people, four to look for the monitoring points and four people to carry things. The first eight kilometers was more or less flat and easy, but the other part was very difficult. We had to climb mountains and go with ropes and two of the porters quit. We had to carry the stuff ourselves. And so it took us 11 days to find the points. The forest is very thick, but finally we did it.

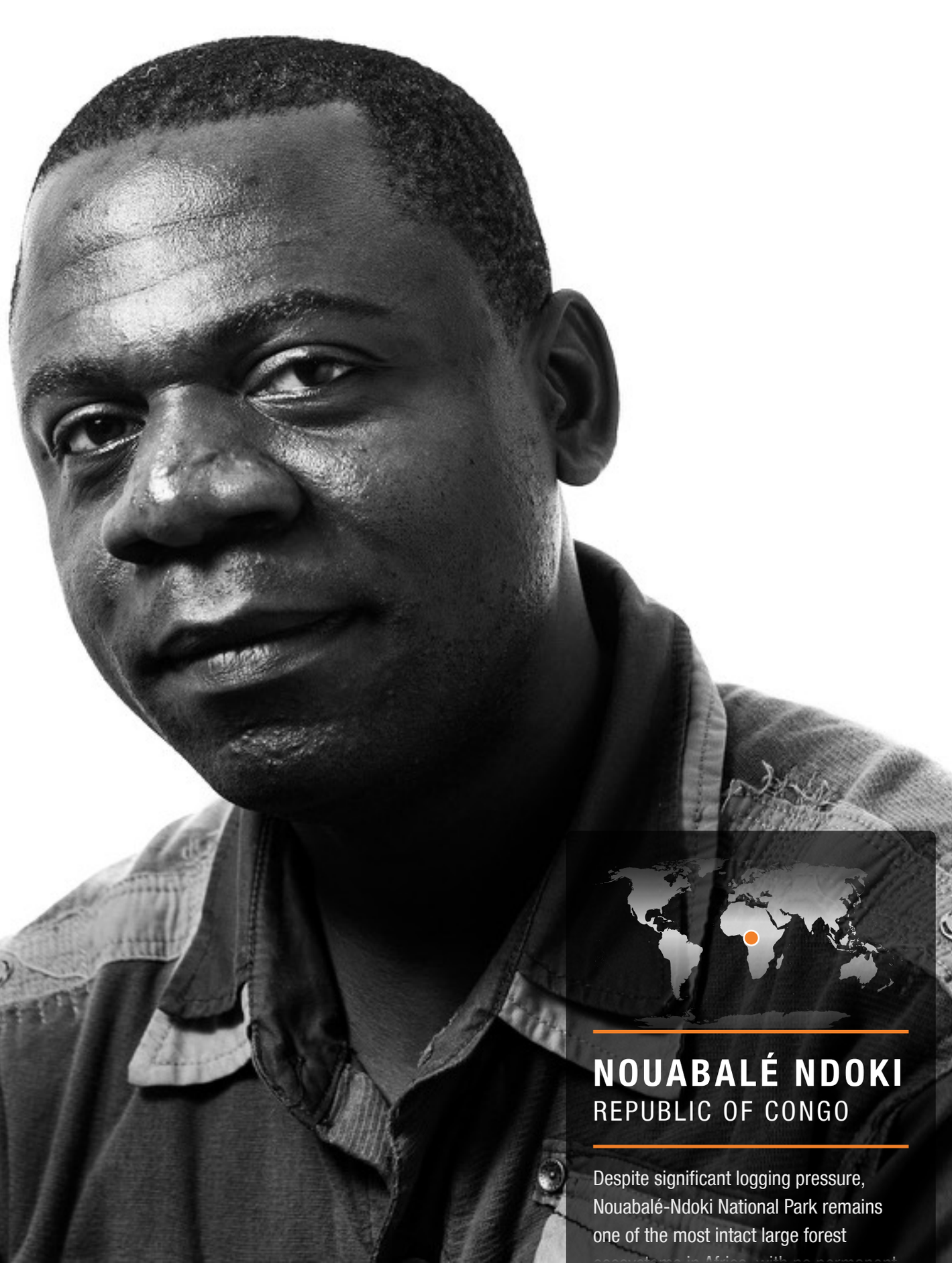
YANACHAGA
PERU

Yanachaga Chimillén National Park encompasses an isolated mountain chain east of the main Andean cordillera. Almost

PATRICK BOUNDJA

The other challenge we have is with elephants.

They are very curious, so every time they see those camera traps they come close and they check. Every year we lose at least one camera trap that has been damaged by an elephant. They really spend a lot of time in front of the camera. You get 100 pictures of just one elephant touching it with their trunk, moving it, going back and forth, and trying to find out what it is and how to get rid of it. They're very curious and intelligent. They know that this is something unusual.



NOUABALÉ NDOKI
REPUBLIC OF CONGO

Despite significant logging pressure, Nouabalé-Ndoki National Park remains one of the most intact large forest

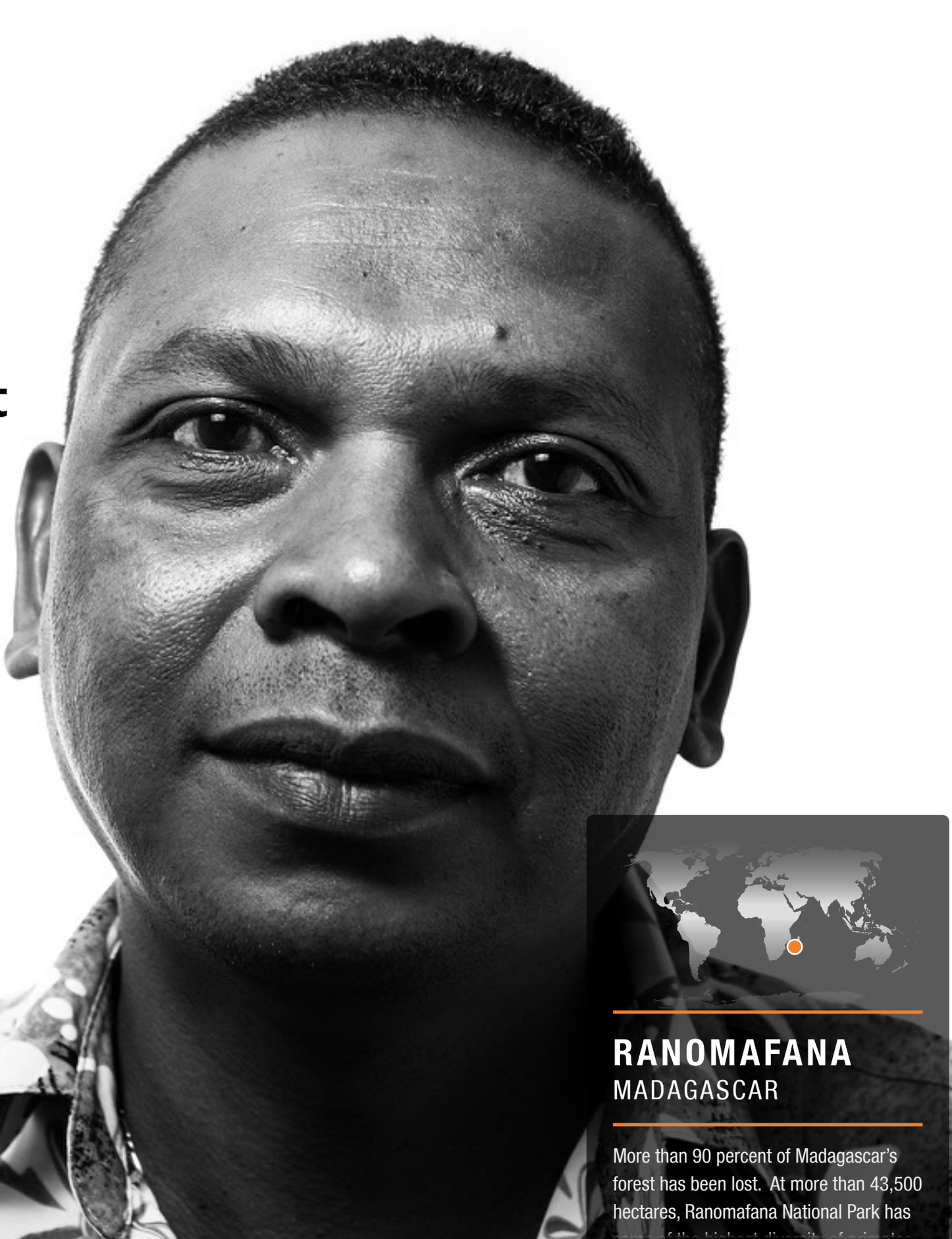

2010-03-27 10:51:16 AM M 1/3
CTNN117


2010-03-27 10:51:29 AM M 2/3
CTNN117

JEAN CLAUDE
RAZAFIMAHAIMODISON

My favorite part is that I can get in contact with people from all over the world.

That is very important because exchanging ideas and results gives me information that could help me improve the work in Ranomafana National Park.



RANOMAFANA
MADAGASCAR

More than 90 percent of Madagascar's forest has been lost. At more than 43,500 hectares, Ranomafana National Park has

JOHANNA HURTADO

TEAM is very committed to building a network that collects standardized data.

For me it's a huge challenge to build a network. All of the sites have very different constraints, very different conditions, so to create a network is very difficult. I think the strategy of team to create an alliance with other people is the best way. And it is very important for me to be part of that.

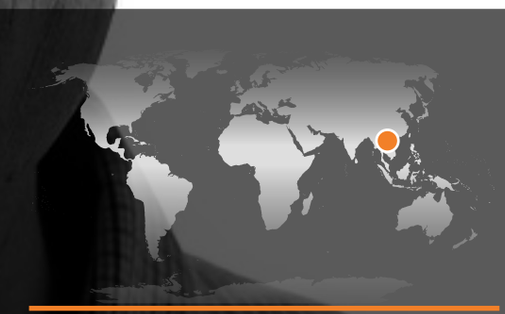
VOLCÁN BARVA
COSTA RICA

The Volcán Barva TEAM site is located within both the La Selva Biological Station and the adjacent Braulio Carrillo National

ALEX MCWILLIAM

One of the great strengths of the TEAM Network is that you're not only one site.

We obviously do things at a site level and we use the information at a site level. But it's also being part of a bigger partnership, globally, with several organizations: TEAM, Conservation International, the Wildlife Conservation Society and Smithsonian Tropical Research Institute. These are all different organizations that are ultimately working towards a common goal.



NAM KADING
LAO PDR

Nam Kading National Protected Area covers 169,0000 hectares of mountainous and rugged terrain in central

MEYNER NUSAWELO

If I know something is true,

if I believe in something, if I know it's good for everybody, I have nothing to lose. We must remain optimistic in conservation.

BUKIT BARISAN
INDONESIA

Bukit Barisan Selatan National Park is the third largest protected area on the Indonesian island of Sumatra, stretching

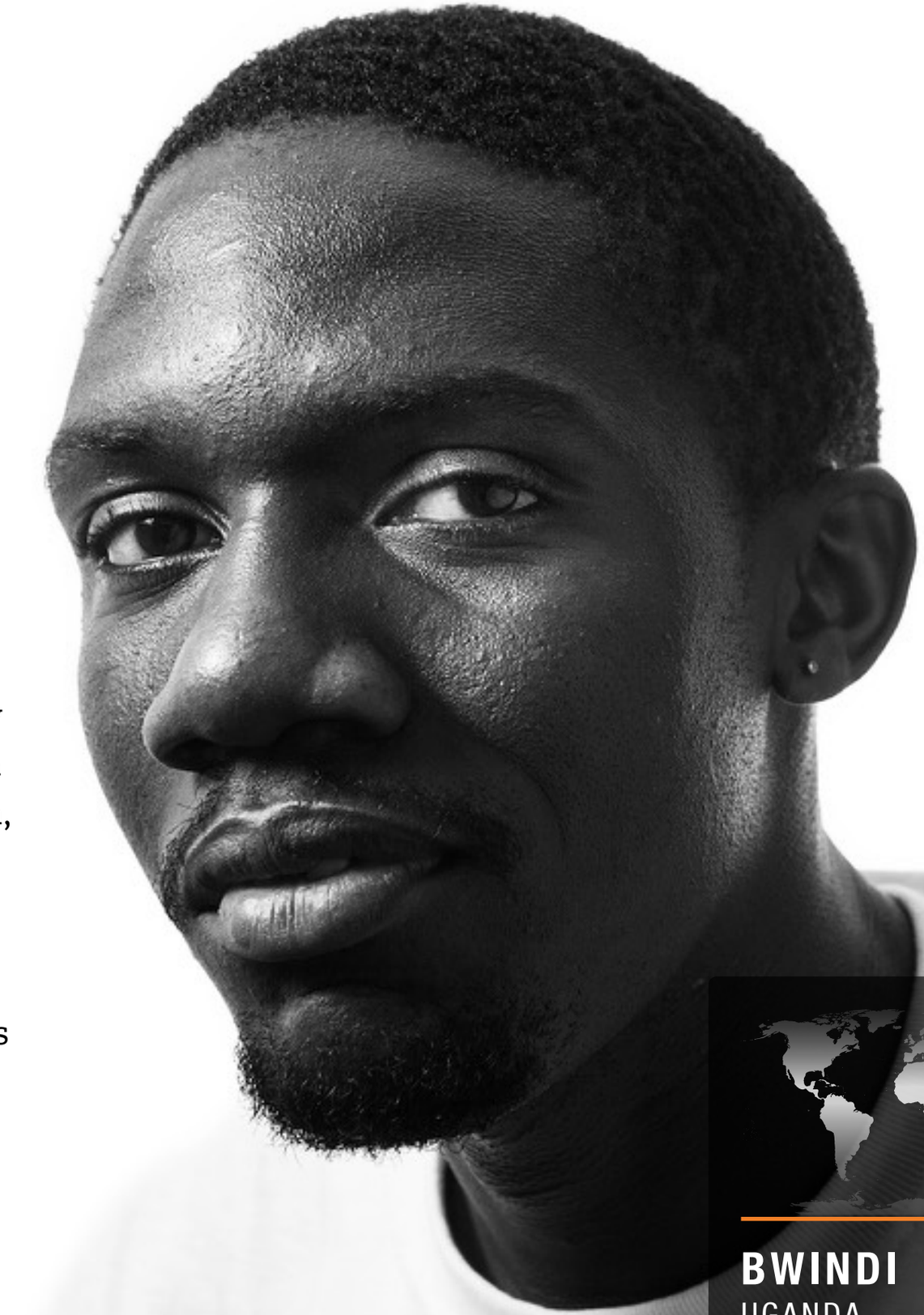
BADRU MUGERWA

I find it amazing that a small group of people came up with this idea.

Now it has grown to a global scale and it's an honor to be part of this Network. So I think my work is to keep it going.

It's not all about collecting data for a PhD study over three years and then keeping your data on a shelf. We need something long-term going on, and data shared on a global scale, just the way TEAM does it.

I think if we're going to help other life survive, regardless of all the threats we are facing, it has to be a joint collaboration. We have to join hands to help other species to live, to continue existing.



BWINDI
UGANDA

Bwindi Impenetrable National Park is one of the few forests in East Africa where lowland and montane ecosystems meet.

Our donors

TEAM WOULD NOT BE POSSIBLE WITHOUT THE GENEROUS DONATIONS from the following foundations and institutions:

THE GORDON AND BETTY MOORE FOUNDATION
THE NORTHROP GRUMMAN FOUNDATION
THE JOHN D. AND CATHERINE T. MACARTHUR FOUNDATION
THE HOWARD G. BUFFETT FOUNDATION
NORTHROP GRUMMAN
MOTOROLA MOBILITY FOUNDATION

We also want to thank **HEWLETT PACKARD** for their collaboration and contributions to TEAM through HP Earth Insights. WWW.HP.COM/GO/HPEI

Finally, we want to thank the following individuals for their continuing support:

GIBSON AND MARGARET ANDERSON
STOLTON AND NIGEL DUDLEY
EDELMAN
FRANK LEVINSON
EDGAR SCHEIN
ANDY SCHILLING AND LESLIE TANG SCHILLING

Thank you!

TEAM
NETWORK

TEAMNETWORK.ORG