



The Faces *of* TEAM

THE TROPICAL ECOLOGY ASSESMENT
AND MONITORING NETWORK

An early warning system for nature

THROUGH A WORLDWIDE NETWORK OF TROPICAL FOREST SITES, TEAM TRACKS CHANGES IN BIODIVERSITY AND CARBON STOCKS.

MEET THE PEOPLE WHO MAKE IT HAPPEN.

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 the 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 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 the various landscapes in a particular region interact and how this affects carbon stocks, biodiversity, capacity to support people, and their resilience to climate change.

Demand for TEAM data, from scientists to policy makers, is growing. 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. And policy makers are using TEAM data to plan financial mechanisms for compensating 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.

In this magazine, I'm honored to introduce you to the TEAM site managers and to let them tell you about the TEAM Network through their eyes.



A handwritten signature in green ink that reads "Sandy Andelman".

Sandy Andelman
Vice President, Conservation International and Director, TEAM Network

LEFT: Established in 2008, Udzungwa Mountains National Park in Tanzania was the first TEAM site in Africa and contains outstanding biological diversity and endemic species.



COCHA CASHU PERU

The Cocha Cashu Biological Station is located in Manu National Park, which protects 14 ecological zones ranging from as low as 150 meters in parts of the Amazon Basin, to the Puna Highlands at an altitude of 4200 meters. Because of this topographical range, it has one of the highest levels of biodiversity of any park in the world. More than 3800 species of vascular plants, 230 species of reptiles and amphibians, 159 mammal species, and 230 species of macro fungi are found within Manu.

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.

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 Amazonas. This site contains a mosaic of tropical forest, regeneration areas and semi-urban landscapes.



KORUP CAMEROON

Korup National Park is one of the wettest and most isolated remnants of the Atlantic Coastal Forest that once spread all the way from the Niger delta to Gabon. At least 326 species of birds are found in and around Korup, including the IUCN-listed red-headed rockfowl that nests below the park's characteristic large boulders. Korup also has over 40 species of terrestrial mammals, though the park has experienced intense poaching in the past. Forest elephants were hunted almost to extinction in the 1960s and 1970s.

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.





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 TANZANIA

The Udzungwa Mountains cover 10,000 square kilometers and contain outstanding levels of biological diversity and endemic species. The area contains 13 species of primates, including the Udzungwa red colobus and Sanje mangabey, and is considered one of the most important sites in Africa for primate diversity and conservation. The habitat outside the forest reserves has been heavily modified for human settlement and intensive agriculture, primarily the cultivation of sugar cane and rice. Established in 2008, Udzungwa was the first TEAM site in Africa.



CAXIUANÃ BRAZIL

The Caxiuaná TEAM site is located within the 33,000 hectare Caxiuaná National Forest. Because of its geographic isolation, the protected area has a rich biodiversity with minimal human pressure. Surveys have identified a diverse range of Amazonian ecosystems including terra firma forests, flooded forests, savanna-like vegetation, secondary vegetation and abandoned orchards. The black waters of Caxiuaná rivers are also rich in aquatic plants.

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.





SURINAME

The Central Suriname Nature Reserve covers about ten percent of the land area of Suriname. Established with support from Conservation International, it contains 1.6 million hectares of pristine tropical forest in the heart of one of the world's most forested countries. The Suriname site has been part of the TEAM network since 2005.

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.



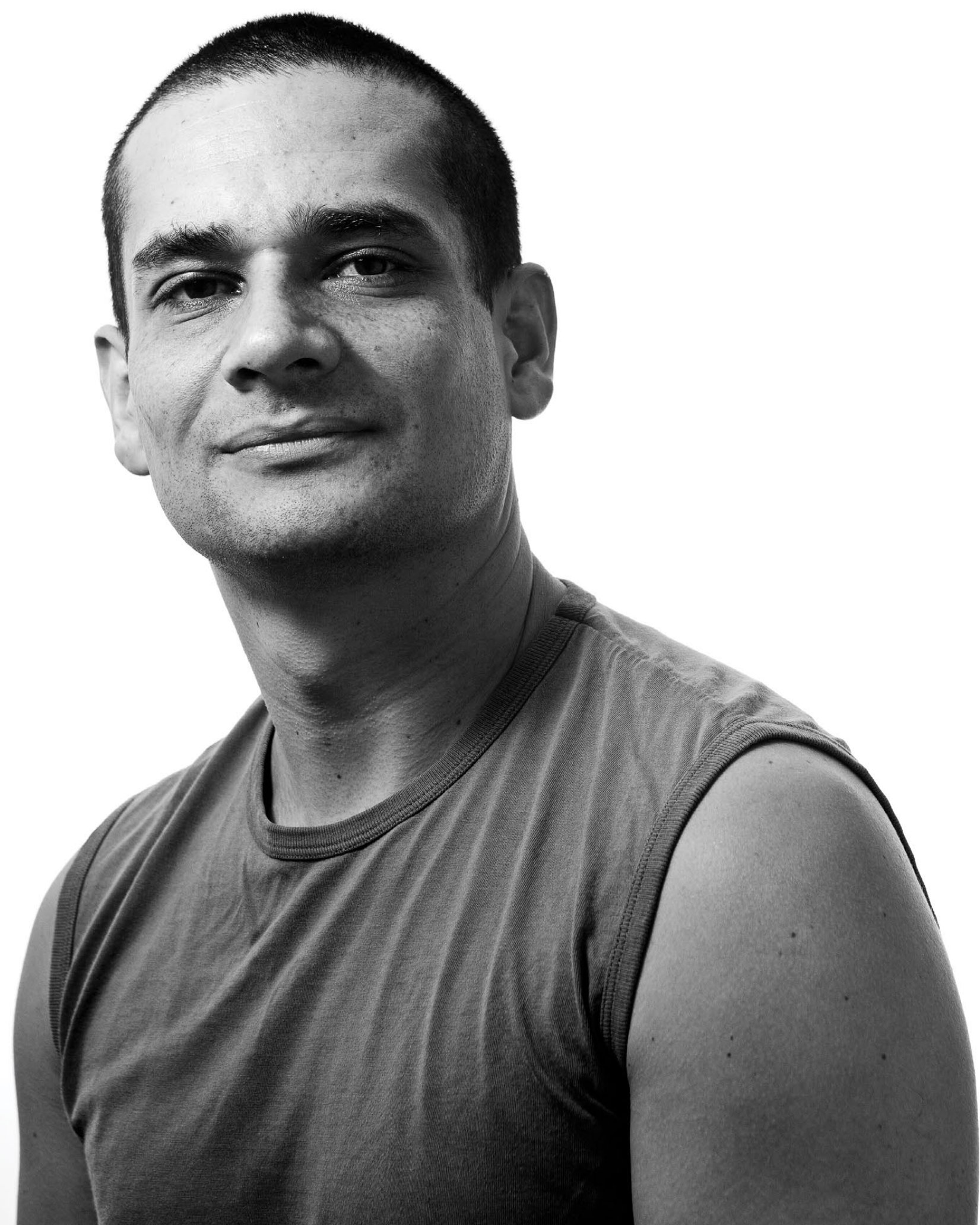
YASUNI ECUADOR

Located at the junction of the Andes and the Amazon basin, Yasuni's irregular terrain is among the most biologically diverse in the world. The fauna at Yasuni is essentially intact and includes many species of birds and mammals including the harpy eagle, white-lipped peccary, jaguar and tapir. Within Yasuni National Park there are extensive oil reserves that are ceded for prospecting and exploitation. Waorani indians also inhabit small settlements in the park and hunt heavily for bush meat.

PABLO JARRIN VALLADARES

Scientists come from cities. We are inept in the forest.

Yasuni is special because within Yasuni we have one of the most recently contacted groups of humans, called the Waorani. They are our neighbors. We live with them daily. There are several young Waoranis working at our TEAM site, and they are our best allies because the protocols require moving large distances and probing very deeply into the forest. The Waoranis are incredible at what we see as dangerous and uncomfortable. For them it's just their backyard. They know how to move. They know where to go and they take care of us. So we feel very comfortable having a Waorani guide. At the same time, I think they learn. A young man that lives in the jungle, very far from the city, has contact with science. This is a very interesting relationship.





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.

I've already got people lining up who want to be involved in TEAM and it's not just as a laborer. They really want to learn about what's going on and what the project's about. I think it brings a positive vibe to the community, knowing that people actually are paying attention to what's behind their houses.



PASOH MALAYSIA

Although surrounded by palm oil plantations, a diverse variety of living organisms thrive in this forest fragment, 70 km southeast of Kuala Lumpur. The total area of the reserve is 2,450 hectares, with a core area of approximately 600 hectares that is still covered with old growth forest. Though Pasoh now lacks big animals such as tigers and tapirs, there are recent records of elephants, and a high diversity of small mammals, primates and birds.



YANACHAGA PERU

Yanachaga Chimillén National Park encompasses an isolated mountain chain east of the main Andean cordillera. Almost all of the 110,000 protected hectares is primary forest. With great variability in life zones, altitudes, climate types and soils, the park is home to a variety of ecosystems, each harboring unique biodiversity. Close to 5000 species of plants, a quarter of the total in Peru, are found within Yanachaga Chimillén.

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.





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 ecosystems in Africa, with no permanent human settlement within and low populations in the surrounding areas. The park is home to populations of forest elephants, western lowland gorillas, chimpanzees, African leopard, bongo antelope, sitatunga, red river hog and many other endangered large mammals. It also boasts over 300 bird species and 1000 plant species, including a rich diversity of endangered, old growth African mahoganies.



DATTARAJA HAANDANEKERE

Everybody cannot work in the whole world.

TEAM is a team. We work together and we achieve together. That's what we need right now because I'm not able to work in Cameroon or Tanzania or somewhere else, but I can work in Mudumalai, and I can contribute from Mudumalai. The others can contribute from Madagascar or some other place. That's what I think we can achieve from TEAM.



MUDUMALAI INDIA

The Mudumalai Wildlife Sanctuary is located in the foothills of India's Nilgiri Mountains. Its terrain is undulating and plant species diversity is spectacular due to a strong rainfall gradient. The reserve has more than 625 species of angiosperm plants, 230 of which are trees. It's also home to over 60 species of birds and many large mammals, including several in danger of extinction, such as tigers, leopards, wild dogs, striped hyena and sloth bears.





RANOMAFANA MADAGASCAR

More than 90 percent of Madagascar's forest has been lost. At more than 43,500 hectares, Ranomafana National Park has some of the highest diversity of primates and land snails in the world. As in all Madagascar, bird species diversity is low. Ranomafana also contains a vast array of amazing frogs and reptiles.

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.





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 Park. Volcán Barva spans an elevational gradient from 50 to almost 3000 meters above sea level on the Caribbean side. The 47,500 hectares features a mixture of lowland tropical and montane forest with more than 1850 species of plants, 350 species of trees, 448 species of birds, and approximately 500 species of ants.



NAM KADING LAO PDR

Nam Kading National Protected Area covers 169,000 hectares of mountainous and rugged terrain in central Lao PDR. Named after the largest river in the area, a tributary of the Mekong River, Nam Kading means “water like a bell.” The protected area is home to at least 43 species of mammals, including populations of highly endangered animals such as tigers, elephants and gaurs.

ALEX MCWILLIAM

One of the great strengths of the TEAM Network is that you’re not only a 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, Missouri Botanical Garden, and Smithsonian Tropical Research Institute. These are all different organizations that are ultimately working towards a common goal.





BUKIT BARISAN INDONESIA

Bukit Barisan Selatan National Park is the third largest protected area on the Indonesian island of Sumatra, stretching for 150 kilometers along the Barisan Mountain Range. The long, narrow park is surrounded by coffee and black pepper agriculture in one of the most densely populated provinces in Sumatra. Locally, the park provides an enormous range of economic and ecological benefits, such as maintaining water quality for communities. Wildlife in Bukit Barisan includes large mammals such as elephants, tigers, and rhinos, as well as six primate species and a diverse bird community, including six species of hornbills.



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.



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. It's already part of the TEAM vision, expanding more, having 40 sites. 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. The park supports at least 120 species of mammals, and is famous for its rare and endemic species. It contains about half of the world's mountain gorillas. As its name suggests, the landscape is extremely rugged, with steep ridges and narrow valleys. The only level areas within the park are swamps. Bwindi lies within a densely populated rural landscape, and tourism is a major source of revenue to park authorities and local people.

More about TEAM

PROTOCOLS

At each TEAM site, local scientists use standardized methods to measure five things: the diversity of trees and woody vines called lianas; carbon stocks; bird and mammal diversity; human-landscape interactions; and climate. TEAM is a network by design, with long-term measurements in landscapes that have been carefully selected to systematically span major environmental (e.g., latitude and precipitation) and anthropogenic (climate change and land cover change) gradients. TEAM uses a small, strategic and integrated suite of standardized protocols and metrics developed by more than 200 interdisciplinary scientists, and subsequently refined through an evidence-based, cost-benefit analysis of pilot data.

PARTNERS

TEAM is a partnership among 89 organizations in 18 countries. The core partners – Conservation International, Missouri Botanical Garden, the Smithsonian Institution and Wildlife Conservation Society – have made commitments to maintain the Network's core infrastructure and to provide capacity building.



Smithsonian Tropical Research Institute
Center for Tropical Forest Science

ANALYSIS

TEAM is benchmarking powerful new surveillance, analysis and mapping systems for analyzing and forecasting – at multiple scales, from a plot to the planet – critical changes to the health of tropical ecosystems. In partnership with the San Diego Supercomputer Center in the US, TEAM has developed cutting edge cyberinfrastructure and analytical tools that support – for the first time – near real time, open access to integrated data on climate, biodiversity, and ecosystem services in tropical forests. With the analytical framework, TEAM can quantify the contributions of ecosystem services to human livelihoods and the effects of human activities on the flow of services, and provide early warning of impending system collapse before it is irreversible.

LEARN MORE

For more information or to download data, go to

TEAMNETWORK.ORG

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

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 Dinâmica 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

PANAMA

Smithsonian Tropical Research Institute

PERU

Asociación para el Manejo de la Reserva Comunal Yanasha
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
Universidad Privada Antenor Orrego
Universidad San Antonio Abad Cusco

SURINAME

Department of Nature Conservation
Ministry of Land and Forest Management

Asia

INDIA

Indian Institute of Science

INDONESIA

Balai Taman Nasional Bukit Barisan Selatan
Directorate of Forest Protection and Nature Conservation, Ministry of Forestry
Universitas Indonesia
Universitas Lampung

LAO PDR

Bolikhmxy 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



TEAM
NETWORK



Facebook of the forest

TEAM's Terrestrial Vertebrate Protocol utilizes the world's largest system of camera trap arrays to monitor biodiversity. Each array consists of 60 camera traps at a density of one trap per two square kilometers. The cameras photograph passing mammals and birds.

