

**The  
Book**

**Global  
Biodiversity  
Festival**



“

“Humanity is part  
of Earth’s biodiversity.  
We are obliged by the deepest  
drives of the human spirit to  
understand our planet’s beautiful  
intricacy and inspire its protection  
to ensure we leave no  
species behind.”

”

**E.O. Wilson**

**Elizabeth  
Maruma Mrema**

Executive Secretary,  
Convention on Biological  
Diversity

[www.cbd.int](http://www.cbd.int)

The International Day for Biological Diversity celebrates the incredible variety of life that we have on our Earth. On this day, we pause to appreciate nature's innumerable contributions to our everyday lives and reflect on how it connects us all.

This year's theme, 'We're Part of the Solution', builds on the 2020 theme, but highlights that each one of us has a role to play in protecting our planet's rich diversity of life.

These are extraordinary times, and the COVID-19 crisis has underlined the urgent need for robust international cooperation to preserve nature, conserve biodiversity and protect human health for future generations. This will only happen if the relationship of our human actions with the natural world changes. Therefore, we all need to act now and adopt a way of life in balance with nature.

Much of the loss of life we have seen is a direct result of short-sighted human activities, including uncontrolled mining and infrastructure development, and unsustainable farming and deforestation. The resulting ecosystems degradation has created the conditions that lead to events like pandemics.

Now is the time for us all to become part of the solution and take the steps needed to incorporate biodiversity at the heart of a resilient and sustainable global economy. Millions of jobs in sectors such as forestry, fisheries, agriculture, tourism and pharmaceuticals are directly and heavily dependent on nature. Millions more are indirectly based on nature. Recovery plans need to build a transition to biodiversity-friendly economies in order to create more jobs and provide decent livelihoods.

As we do this, we need to think about and address equity and inequality. About one billion people live in extreme poverty in rural areas. Their household income is based on ecosystems and natural goods that make up between 50% and 90% of the so-called GDP of the poor.

Governments should use the occasion of comprehensive recovery plans to build economies founded on the conservation and sustainable use of nature in the equitable sharing of its benefits. This will help all, including the most vulnerable.

This year, governments continue to work towards an ambitious and effective post-2020 global biodiversity framework to be agreed at our next meeting of the Conference of the Parties, in Kunming, China. This framework can contribute to increasing nature's benefits for the people. The results will be extensive, including improved global nutrition and access to drinking water, resilience to natural disasters and nature-based solutions to achieve the Paris Agreement on climate change.

All of this is integral to the Sustainable Development Goals, which risk being undermined as a result of the pandemic. This pandemic has shown in clear terms that international cooperation is paramount for the health of our nature, our economies and our people.

Please join me in this endeavour and let us all be part of the solution.



**“We all need to act now  
and adopt a way of life in  
balance with nature.”**

- 02** Foreword  
**10** Introduction

## Speakers

### In alphabetical order

- 12** **Nicole Abanto**  
An Otter Point of View
- 13** **Jennifer Adler**  
Storytelling for Science
- 14** **Haitham Sulaiman Al Rawahi**  
Arabian Tahr – The Hidden Jewels of Oman’s Hajar Mountains
- 15** **VIRTUAL FIELD TRIP American Prairie Reserve**  
Building and Rewilding the American Prairie Reserve
- 18** **Ardiantiono**  
The Komodo Dragon: Adventure to the Lost World
- 19** **Tatiana Arias**  
Perspectives to Promote the Conservation of Neotropical Orchids
- 20** **Purnima Devi Barman**  
Community Conservation Model for Saving an Endangered Bird
- 21** **Kehkashan Basu**  
Protecting our Mangrove Ecosystems for Future Generations
- 24** **Pablo Borboroglu (POPI)**  
The Power of Penguins
- 25** **Cayte Bosler**  
What is the Wilderness Worth?
- 28** **Callie Broaddus**  
Reserva: The Youth Land Trust and the Dracula Youth Reserve
- 29** **Emma Camp**  
Building Great Barrier Reef Resilience Through a Globally-unique Partnership

- 30** **Cristiana Castello-Branco**  
The Dark Side of Bob: Unravelling the World of Deep-Sea Sponges
- 31** **Isabel Castro**  
Kiwi – A Weird, Wonderful and Endangered Ornithological Relict
- 34** **Stuart Chapman**  
Bringing Back the Roar
- 35** **Giovanni Chimienti**  
When Corals Create Forests: Tales from the Mediterranean Sea
- 38** **Andrew D. Corso**  
Antarctic Biodiversity – What Is It, How Is It Sampled, and Is It Changing?
- 39** **Adjany Costa**  
Mukissi: The Guardians of the River
- 40** **Ashlan and Philippe Cousteau**  
Antarctica 2020 and the Future of our Planet
- 41** **Céline Cousteau**  
Interconnected – You and the Indigenous Peoples of the Vale do Javari, Amazon
- 44** **Luis Cunha**  
Soil Biodiversity Signatures in Human-made Landscapes
- 45** **Joe Cutler**  
The Ogooue Megatransect – Exploring Africa’s Last Wild River
- 46** **Mariana Da Silva**  
Tooth Fairy Gone Wrong: Combating the Illegal Trade in Jaguar Parts
- 47** **Manuela Dal Forno**  
The Secret Life of Lichens
- 50** **Shekar Dattatri**  
The Power and Impact of ‘Narrowcasting’ in Conservation Advocacy

- 51** **David de Rothschild**  
Rewild Yourself
- 52** **Supraja Dharini**  
Successful Sea Turtle Conservation on the East Coast of India
- 53** **Stella Diamant**  
Discovering a New Whale Shark Hotspot in Madagascar
- 56** **Andrew Digby**  
Intense Conservation: Saving the Kākāpō
- 57** **Rod Downie**  
Walrus from Space
- 58** **VIRTUAL FIELD TRIP Duke Lemur Center**  
Field Trip to the Lemur Forest
- 59** **Sylvia Earle**  
Protecting Our Ocean
- 62** **Paula J. Ehrlich**  
The Importance of Protecting Biodiversity
- 63** **Mark Evans**  
The Oldest University on Earth
- 66** **Oliver Fankem**  
Elephants and Great Apes Conservation in the TRIDOM
- 67** **Finance for Biodiversity Pledge**  
Celebrating the Launch of New Signatories
- 68** **John Flynn, Neil Davis, Eric Quayson**  
Can We Save the Sea Turtles of Ghana?
- 69** **Pavel Fomenko**  
New Challenges in the Protection of the Amur Tiger in Russia
- 72** **Jane Francis**  
From Forests to Ice Sheets: Antarctica’s Transition from Greenhouse to Icehouse

- 73** **John Francis**  
A Forest in My Backyard
- 74** **Shari Gallop**  
The Science of Returning Freshwater to Estuaries
- 75** **Jamal Galves**  
Belize Manatee Conservation Project
- 78** **Celine Gamble**  
Restoring the UK’s Forgotten Oyster Reefs
- 79** **Marites Gatan-Balbas**  
Philippine Crocodile Conservation in Northeast Luzon
- 80** **Maria Gavrilov**  
In the Heart of the Arctic, Where Atlantic Meets Pacific
- 81** **Lauren Gibson**  
Not Just Tomorrow’s Leaders: Empowering Young People to Create Change Today
- 82** **Emanuel Gonçalves**  
Rise Up for the Ocean – A Blue Call to Action
- 83** **Benoit Goossens**  
Striving Towards Sustainability in the Lower Kinabatangan Floodplain
- 84** **Tim Gordon**  
Songs of the Sea: Using Bioacoustics to Help Marine Restoration
- 85** **Justin Grubb**  
Preserving Biodiversity through Village-led Partnerships
- 88** **Rosamira Guillen**  
Proyecto Titi: Protecting and Restoring the Home of Cotton-top Tamarins in Colombia
- 89** **Melvin Gumal**  
Orangutan Conservation in Sarawak

- 90** **Ghana Shyam Gurung**  
State of Conservation in the Face of Climate Change in Nepal
- 91** **Arianne-Elise Harris**  
Guyana: The Land of Many Wildlife Communities
- 92** **Vreni Häussermann**  
The Marine Animal Forests of Chilean Patagonia
- 93** **Daniel Hayhow**  
Tiny Forest – Super Tiny, Super Powerful
- 96** **Jill Heinerth**  
Into the Planet
- 97** **VIRTUAL FIELD TRIP Honolulu Zoo Foundation**  
Conservation at Honolulu Zoo
- 98** **Peter Houlihan**  
Collaborative Technological Approaches for Rainforest Conservation
- 99** **Shafqat Hussain**  
Protecting Snow Leopards with Community Participation
- 102** **Shah Redza Hussein**  
Saving the Malayan Tiger: The Royal Belum State Park Experience
- 103** **Greta Francesca Iori**  
Human-Elephant Coexistence
- 104** **Dereck and Beverly Joubert**  
The Visual Extravagance of Biodiversity
- 105** **Amanda Kahn**  
The Secret Lives of Sponges: Understanding Ancient Animals at their Own Pace
- 108** **Krithi K. Karanth**  
Transforming Human-Wildlife Interactions through Mitigation, Compensation and Education

- 109** **Lucy Kemp**  
Conserving Africa’s Thunderbird
- 110** **Clarine Kigoli**  
Using SMART to Improve Conservation Effectiveness – Case Studies in Kenya
- 111** **William Kostka**  
Building on Successes to Meet the Micronesia Challenge 2030 Goals
- 112** **Indira Dayang Lacerna-Widmann**  
Soaring High: The Plight and Success of Conserving the Philippine Cockatoo
- 113** **Marco Lambertini**  
Nature-positive by 2030: A Global Goal for Nature
- 116** **Liselot Roos Lange**  
Primates in Las Piedras, Peru
- 117** **Jeneria Lekilelei**  
Cultures of Coexistence: Mentoring the New Warriors
- 118** **Binbin Li**  
Protecting Panda Habitat from the Encroachment of Livestock Grazing
- 119** **Cara Lin**  
A Tropical Trifecta: Biodiversity in Connected Marine Ecosystems
- 120** **R. Isaí Madriz**  
Six-Legged Jewels of Patagonia
- 121** **Onkuri Majumdar**  
Wildlife Crime and its Links to Pandemics
- 124** **Juan Mayorga**  
A Global Blueprint for Ocean Conservation
- 125** **Moreangels M. Mbizah**  
Community-based and Locally Led Conservation is Key for Biodiversity

**126 Emily McKenzie**

The Economics of Biodiversity:  
The Dasgupta Review

**127 Rodrigo A. Medellín**

Our Nocturnal Allies: Why Bats  
Matter for Our Everyday Lives

**130 Patrícia Medici**

25 Years of Tapir Conservation  
Efforts in Brazil

**131 Prashant Mohesh**

Mauritius Under the Threat  
of Climate Change

**132 Cecilia Montauban**

Bats and Tech: Hidden  
Nocturnal Wonders

**133 Maritza Morales Casanova**

No Education Means  
No Conservation

**134 Ricardo Moreno**

The Jaguar in Panama

**135 Justin Mundy, Simon Zadek**

Conservation Finance

**138 Tiassa Samayin Mutunkei**

The Power of the Youth

**139 Luis Germán Naranjo**

Underground Realities

**140 VIRTUAL FIELD TRIP  
The National  
Kiwi Hatchery**

Saving our National Icon –  
One Egg at a Time

**141 Emma Nichols**

One Ocean, a Whole  
Lot of Plastic

**144 Mercy Njobvu**

My Conservation Story

**145 Geir Nordeng**

How to Address Global  
Challenges through Music

**146 Holly O'Donnell**

Life in the Amazon: Fieldwork,  
Frogs and Short-eared Dogs

**147 VIRTUAL FIELD TRIP  
Ol Pejeta Conservancy**

From the Brink of Extinction

**148 Hotlin Ompusunggu**

Healthcare Incentives to  
Save High Biodiversity  
Rainforest in Sumatra

**149 Peter Ong**

Project Monyet – Discovering  
and Sharing of Malaysia's  
Primate Biodiversity

**150 Luis Ortiz-Catedral**

Back from the Brink – Again:  
The Conservation of the Norfolk  
Island Green Parrot

**151 VIRTUAL FIELD TRIP  
Osa Conservation**

Live from the Top of the  
Rainforest Canopy and  
Osa Verde Farm

**154 Martina Panisi**

Learning with the Forest  
Giants (snails): A Story to Be Told

**155 Murilo Pastana**

How Many Fish Species Are  
There in the Amazon and Where  
Do We Find Them?

**156 Rolph Payet**

Addressing the Drivers  
of Biodiversity Loss

**157 Irene Margareth R. Pinondang**

The Return of Corina:  
Tigress of the Peatland

**158 Reynante V. Ramilo**

Saving the Mermaid of the Sea

**159 Jonah Ratsimbazafy**

Let's Save Our Cousins  
(Non-human Primates) from  
the Brink of Extinction

**162 Hana Raza**

Fighting for a Better Future  
for Persian Leopards in Iraq

**163 Mamy Razafitsalama**

Protecting Lemurs Using  
Community Conservation

**164 Kristin Rechberger**

Building Conservation Economies  
for a Regenerative Planet

**165 Karina M. Reyes**

Rainforests: More Than  
Biodiversity

**168 Mark Rose**

Our One Home:  
Five Breakthroughs to  
Protect and Restore Nature

**169 Paul Rose**

Pristine Seas

**170 VIRTUAL FIELD TRIP  
Rothera Research Station**

Diving into Antarctic Habitats

**171 VIRTUAL FIELD TRIP  
Rothera Research Station**

Water Sampling at the  
Bottom of the World

**174 Indah Rufiati**

Catalysing Community-based  
Marine Conservation in Indonesia

**175 Jodie Rummer**

What Can the Toughest Shark  
on the Great Barrier Reef Teach  
Us About Climate Change?

**176 VIRTUAL FIELD TRIP  
The Russian  
Geographical Society**

Live from Moscow and  
St Petersburg

**177 VIRTUAL FIELD TRIP  
SaintMarks Animal  
Hospital and Shelter**

Ireti: A Nigerian Pangolin Story

**180 Enric Sala**

Time for Action –  
A Natural Solution

**181 Paul Salopek**

Walking Through the  
Anthropocene

**182 Elisa Sandoval-Serés,  
Sichelesile Ndlovu**

How do African Wild Dogs  
Cope with Lions and Hyaenas?

**183 Francesco Sauro**

The Dark Continent:  
Caves as a New Frontier of  
Scientific Exploration

**186 John E. Scanlon AO**

The Interconnected  
Nature of Things – Environment,  
Economy and Health

**187 Pablo Schapira**

Bazaruto Archipelago  
National Park: Challenges  
and Long-term Vision

**188 Katie Schuler**

Pangolin Storytelling

**189 VIRTUAL FIELD TRIP  
Seychelles Islands  
Foundation**

Recording Aldabra's Incredible  
Green Turtle Recovery

**190 Gautam Shah**

Playing with Wildlife Science

**191 David Shukman**

Reporting from the Frontlines  
of a Changing Planet

**194 Colin Simpfordorfer**

Sharks in the Mangroves

**195 Rohit Singh**

Rangers and their Role  
as Planetary Health  
Service Workers

**196 Joe Smith**

A Twenty-minute Recipe  
for a Sustainable World

**197 Lillian Stewart**

Gulls and Garbage: Our Trash  
is Another Gull's Dinner

**200 Nicole Stott**

We Live on a Planet

**201 Paige Strudwick**

Coral Propagation and  
Out-planting Impact on the  
Microbiome of Corals on  
the Great Barrier Reef

**202 Gary Tabor**

Ecological Connectivity  
Conservation

**203 Harrison Talarico**

Using Bioacoustics to  
Investigate the Migration  
Timings of the  
Short-tailed Shearwater

**206 Gabby Tan**

Starting in Schools:  
Teaching the Next Generation  
to Protect Our Planet

**207 James Thornton**

Law to Save the Planet

**208 Arkadyi Tishkov**

Arctic Biodiversity and  
Climate Change

**209 Kristine Tompkins**

Why We are Rewilding  
the Americas

**212 VIRTUAL FIELD TRIP  
Toucan Rescue Ranch**

Live from The Toucan  
Rescue Ranch

**213 Sarah Toumi**

The Great Green Wall,  
a Nature World Wonder in Africa

**214 Anand Varma**

Exploring the Hidden  
Wonders of our World

**215 VIRTUAL FIELD TRIP  
Vava'u Environmental  
Protection Association**

Conservation in Vava'u, Tonga

**218 Justine Vaz**

Biodiversity Conservation  
in Penang

**219 Adriana Vergés**

Engaging Local Communities  
to Restore Underwater Forests  
and Meadows

**220 Ami Vitale**

Extreme Conservation

**221 Songlin Wang**

Saving China's Largest  
Remaining Eelgrass Bed with  
Small-scale Fishing Communities

**222 Ollie Wearn**

Saving the Small Apes from  
a Big Extinction

**223 Kanchana Weerakoon**

Gardens with Loving Kindness  
to Help Urban and Peri-urban  
Biodiversity in Sri Lanka

**226 Debbie Winton**

Plastic Pollution – An Untold  
Threat to Freshwater Biodiversity

**227 Siew Te Wong**

Novel Approaches for Sun  
Bear Research and Conservation  
in Sabah

**228 Doug Woodring**

When Spider Webs Unite,  
They Can Stop a Lion

**229 Erika Woolsey**

Sharing the Ocean



An endangered proboscis monkey (*Nasalis larvatus*) on a mangrove tree in Kubu Raya. The species is endemic to Borneo. © Justin Grubb

# Welcome to a defining perspective of the value of our biodiversity

COVID-19 was caused by our relationship with nature which is out of balance, meaning that the 2021 UN International Day for Biological Diversity was a global opportunity, and a particularly poignant moment, to focus on the work being done to:

Protect what we have.  
Restore what has been damaged.  
Reset our values.

Our way to emphasise this critical moment was to set up the Global Biodiversity Festival 2021: 173 scientists, finance experts, conservation leaders, explorers, photographers, and artists from 50 countries and all 7 continents, coming together to present their work for 75 hours non-stop and being joined by thousands of people from 82 countries.

This book has been provided free to all speakers, their organisations, and supporters, and can be downloaded by scanning the QR code below.



Scan the QR code to  
download the book.  
All the festival talks  
are available online via  
[www.globalbiofest.com](http://www.globalbiofest.com)

On behalf of the organisers and, symbolically, all the species on Earth, I'm pleased to welcome you to the second annual Global Biodiversity Festival.

With each passing year, the consequences for biodiversity can be seen as ever more dire.

Climate change is only the first of three biological crises humanity is bringing upon itself. The second – caused in part by climate change – is the worldwide growing fresh water shortage. And the third is the growing extinction of biodiversity, of life forms around the world. The destruction is occurring at multiple levels of biological organisation.

The approximately 2 million species known to science, and given a name, are estimated to be only about 20% of the species still living. Science needs far more experts, especially on insects and other invertebrate animals, on fungi and bacteria, and other micro biota.

As biology increases its basic knowledge of biodiversity, the analysis of ecosystems is going to grow in proportion, allowing conservation biology to study back and forth between species and ecosystems. Cutting deeper this way, biodiversity studies will increase in depth and exactitude.



### **E.O. Wilson**

Chairman of the  
E.O. Wilson Biodiversity  
Foundation  
Board of Advisors  
and the Half-Earth  
Council

Hello from Jane Goodall, to all of you attending the Global Biodiversity Festival. I'm so glad that you have decided to join this global exploration of biodiversity. I like to think of biodiversity of a given ecosystem – a forest, a wetland, a prairie and so on – as a sort of tapestry of life. And in this tapestry, each thread has a role to play in creating the finished picture.

It was when I was in the rainforest in Gombe, that I came to understand the importance of every single species, no matter how small, and seemingly insignificant. If one small species becomes extinct, how could that make a difference? Perhaps it was a major source of food for another species. Then that one also vanishes. Just imagine that every species represents one thread in that beautiful tapestry. As more and more threads are lost, the tapestry becomes increasingly tattered and this can lead to ecosystem collapse.

We must realise that we're all a part of nature, not separate from her. We depend on her for food, water, everything, but we depend on healthy ecosystems, rich in biodiversity. That's why from a practical point of view, we should work to protect biodiversity. But there's another reason; a connection with the natural world is important for our physical and mental well-being. There are many studies that prove this without doubt. For me personally, I feel a strong spiritual connection to nature when I'm alone in the rainforest.

But the important thing, the issue that this Global Biodiversity Festival is all about, is that for the sake of future generations, we must get together now before it's too late and each do our bit to protect and restore the wonderful diversity of animal and plant species of our planet, of planet Earth – our only home.



### **Jane Goodall, PhD, DBE**

Founder – The Jane  
Goodall Institute  
UN Messenger of Peace





### Nicole Abanto

Ecologist, conservation scientist and practitioner. Founder and scientific director of ComunaCIENCIA

## An Otter Point of View

Amazonian lakes have amazing wildlife. Inside each lake, slight changes in vegetation create contrasting environments with unique life forms in each. This might all be inconspicuous to our eyes but it is not to the largest predator in the water, the giant otter. With drone technology, however, these lakes can be mapped with extreme detail to study giant otter habitat from the otters' point of view.

Using the 'otters' perspective' we have a sharp view of the threat that gold mining represents to wildlife in this area: gold mining means that 40 tonnes of mercury per year are dumped into the Madre de Dios and 78% of the human population in the area have high levels of mercury in their body. The mining also means deforestation and we have lost 184 square kilometres of forest over the past 34 years.

We have learned that our method is a guidance for future conservation measures in the Madre de Dios basin and a replicable tool for conservation research of other aquatic animals. The only way for successful conservation is by including the human component. Let's maintain optimism in the conservation dialogue!



Impact of gold mining in the Madre de Dios basin. © San Diego Zoo Global Institute for Conservation Research



www.comunaciencia.org



### Jennifer Adler

Underwater photojournalist, National Geographic Explorer, AAAS If/Then Ambassador

## Storytelling for Science

I use my imagery to tell visual stories that communicate science and conservation. The goal of my work is to make science compelling and understandable to a wider audience and elevate the voices of female scientists and conservationists. I hope that my imagery can help achieve measurable conservation outcomes and inspire the next generation of women to pursue creative careers in science, technology, engineering and mathematics (STEM).

Although similar numbers of men and women now receive scientific doctoral degrees in the United States, men dominate news stories, keynotes, invited panels, and upper-level faculty positions. A content analysis of STEM characters in entertainment media by the Geena Davis Institute found that only 37% of them are women. Seeing women in STEM roles is crucial to the next generation of girls envisioning themselves in these fields.

My project seeks to show more women in these roles through 360° underwater videos that bring students diving to conduct fieldwork with female marine scientists.

To communicate on science, I like to tell a compelling story about the scientists themselves and their work in the field or lab. As a society, we're pretty disconnected from not only nature but the scientific process. Telling stories about scientists helps build trust in science and can help inspire the next generation of scientists and storytellers.



Rebecah Delp hangs pieces of staghorn coral (*Acropora cervicornis*) on a coral tree in Dry Tortugas National Park. The corals hang like ornaments on a Christmas tree – when a year is up, scientists return and cut the corals from the trees to plant on nearby reefs. © Jennifer Adler



www.jenniferadlerphotography.com  
jadlerphoto@gmail.com



### Haitham Sulaiman Al Rawahi

Wildlife biologist. Arabian Tahr Conservation Programme Leader, Office for Conservation of the Environment (OCE), Diwan of Royal Court, Sultanate of Oman

## Arabian Tahr – The Hidden Jewels of Oman’s Hajar Mountains

The Arabian Tahr (*Arabitragus jayakari*) is an endangered species, belonging to the *Bovidae* family and sub-family of *Caprinae*, and endemic to the Hajar mountain range of the Sultanate of Oman. Less than 2,500 individuals were estimated to be found worldwide. The conservation of this iconic species started in 1974 via the establishment of the tahr conservation project and an experimental reserve. Since then, advanced steps have been taken by the Office for Conservation of the Environment to study the habitat, distribution, and ecology of the Arabian Tahr. A systematic camera trapping survey showed that tahr prefer to live in steep, rugged mountainous habitats and three main hotspots with high density of tahr population were identified across the entire home range. Investigation of 17 tahr scraping behaviours – which help to establish the males mating rights, communicate reproductive status of both males and females, and signal the individual’s health – concluded that they are mostly associated with the two breeding seasons (October and February). Analysis of genetic samples across the entire Hajar found two separate tahr populations, while tracking data showed that tahr select areas with higher vegetation density during the summer. In contrast and during winter, males select the same habitat, but females use lower vegetation density places. Based on these studies, two new protected areas have been established and one proposed, and a new tahr conservation strategy (2020-2030) has been developed. However, previous outcomes were shared with experts via four refereed publications, the Oman Natural Heritage Lecture, Oman’s Environmental Forum (2017) and other formal lectures while delivered to the public through special awareness and education programmes including school environmental awareness, and more than 20 press articles, radio and TV interviews, and documentaries.

haitham.alr88@gmail.com

## American Prairie Reserve

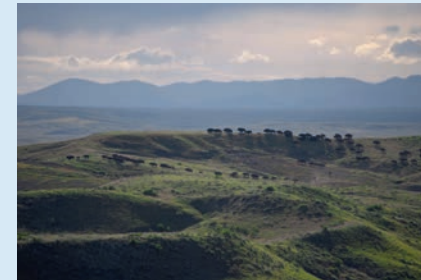


### Daniel Kinka

Wildlife Restoration Manager and Wild Sky Programme Manager, American Prairie Reserve

## Building and Rewilding the American Prairie Reserve

Despite being home to many of the planet’s remaining megafauna, temperate grasslands are one of the most threatened ecosystems in the world. In as little as 100 years, the menagerie of wildlife inhabiting America’s Great Plains suffered critical collapses while their ranges decreased dramatically. This is especially true for prairie species like American bison, black-tailed prairie dogs, swift fox, black-footed ferrets, and grizzly bears. Yet much of the grassland habitat of the Northern Great Plains remains intact, and while many species have been extirpated or are managed far below their carrying capacities, large tracts of untilled prairie and nearby wildlife populations make ecosystem-level restoration possible.



American Prairie Reserve. © David Driscoll

Pronghorn herd. © Dennis Lingohr

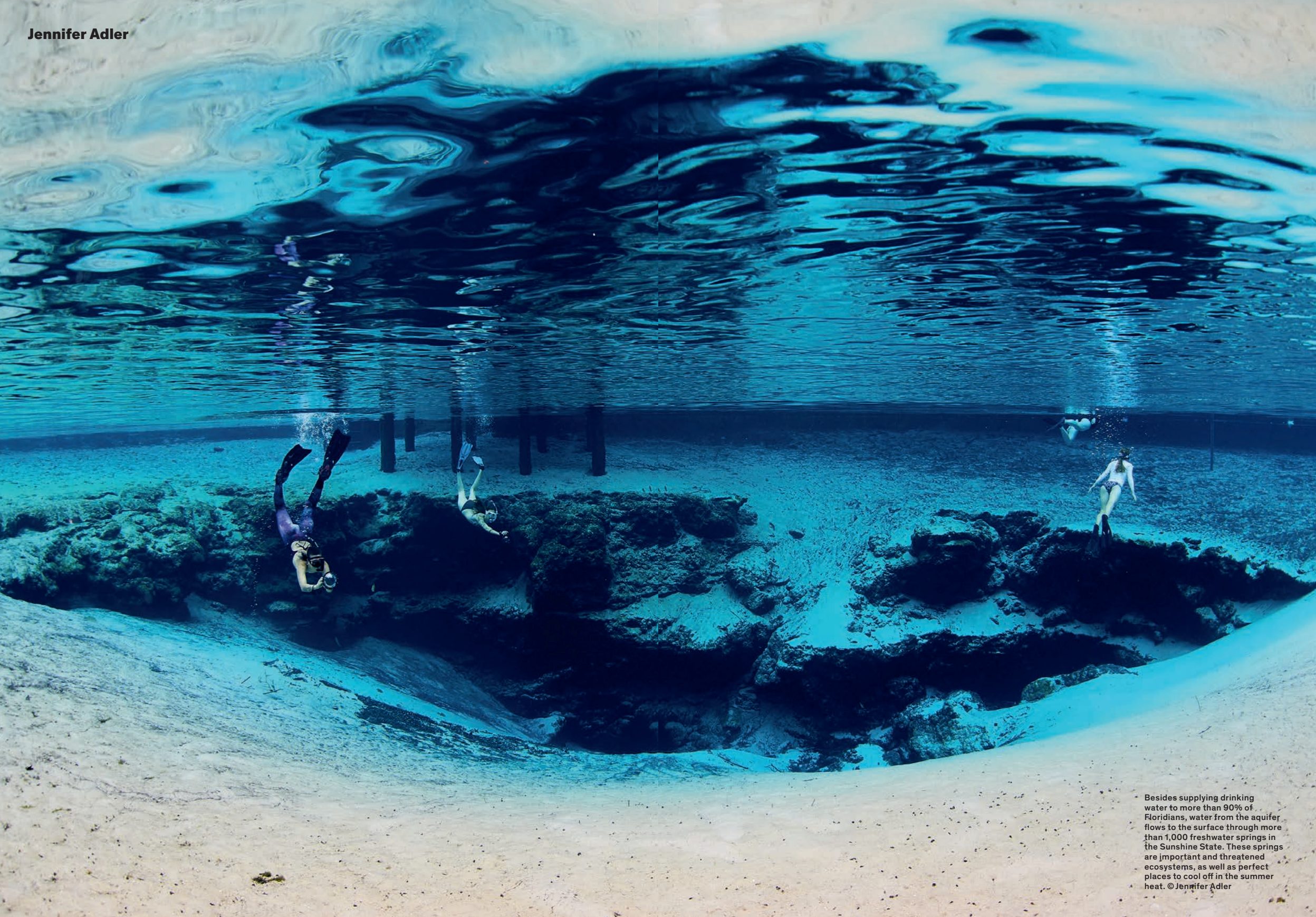


www.americanprairie.org  
daniel@americanprairie.org

The mission of American Prairie Reserve is to create the largest nature reserve in the contiguous United States, a refuge for people and wildlife preserved forever as part of America’s heritage. With support from donors and partners around the world, American Prairie is assembling and restoring habitat on a grand scale and welcoming wildlife to roam the land once again.

In order to restore a fully functioning prairie ecosystem, complete with migration corridors and all native wildlife, American Prairie Reserve will need to be around 5,000 square miles in size (roughly 3.2 million acres). By building on existing protected lands, the Reserve can buy a relatively small amount of private land and still achieve landscape-scale results. Using the American Prairie Reserve model, a patchwork of ownership transforms into a seamless, fully-functioning prairie ecosystem.

Jennifer Adler



Besides supplying drinking water to more than 90% of Floridians, water from the aquifer flows to the surface through more than 1,000 freshwater springs in the Sunshine State. These springs are important and threatened ecosystems, as well as perfect places to cool off in the summer heat. © Jennifer Adler



### Ardiantiono

Indonesian conservation scientist. PhD student, University of Kent, UK

## The Komodo Dragon: Adventure to the Lost World

Protecting the island's endemic top predator is very exciting, especially when we are talking about the largest lizard in the world!

In this talk, I will describe my experience working to conserve Komodo dragons; when I first saw the dragon (eating deer and fighting with boars!) in the forest and conducted my very first scientific research on the ecology of Komodo dragons (which involved intense eye to eye contact). I will also give some fascinating facts about the dragons while bringing you (virtually) to the beautiful Komodo National Park, which is your real-life Jurassic Park!

Then, I will share some of the amazing work which is done to protect the dragons within and outside the national park (yes they are not only on Komodo Island). Finally, I will close my talk by telling you how Komodo dragons, my first scaly crush, have brought me to where I am now.



A Komodo dragon in Komodo National Park. © Achmad Ariefiandy / Komodo Survival Program



Conducting a trapping study to estimate the density and survival of Komodo dragons. © Achmad Ariefiandy / Komodo Survival Program



<https://komododragon.org>  
ardiantiono.tjokro@gmail.com



### Tatiana Arias

Orchid researcher, The Colombian Orchid Society

## Perspectives to Promote the Conservation of Neotropical Orchids

Colombia has the highest number of endemic orchids in the world and new species continue to be discovered. Many species are highly specialised, having evolved in micro differentiated niches across the Andes, and as a result are threatened due to rapid habitat loss and low tolerance to climatic changes. As charismatic species, they are ideal organisms to promote the conservation of whole Andean ecosystems and their services such as water and pollination. Recently a peace agreement between Colombian and left-wing army FARC forces has opened up a new era of exploration and development for the country. My research combines the expertise and living collections of orchid veterans in Medellín, Colombia with natural history knowledge and applied genomic conservation strategies.

This talk communicates my experience and knowledge working on Neotropical orchids in Colombia. My team and I have been advancing phylogenomic studies focusing mostly on groups with high endemism and diversity in Colombia (*Cymbideae*,

*Pleurothallinidae* and *Lepanthes*). We have also developed long-lasting collaborations with Latin American botanists and their affiliated institutions. Together with the Colombian Orchid Society we are implementing a programme for the study and conservation of orchids in the cloud forest of La Reserva Orquídeas in Jardín, Antioquia. Lastly, we have been working with students and vulnerable communities in

Caquetá, Colombia, to explore orchid diversity and the potential for developing horticultural programmes through citizen science. Ultimately, these efforts will allow us to collect, curate, and analyse information for many orchid species in order to promote conservation and sustainable use of orchids as established in the Colombia orchid conservation strategy (Betancur et al., 2015).



*Odontoglossum crispum*.  
© Florencia Caqueta



<https://sco.org.co>  
tatiana.tatianaarias@gmail.com



**Purnima Devi Barman**

Wildlife biologist

## Community Conservation Model for Saving an Endangered Bird

Greater Adjutant *Leptoptilos dubius* is an endangered bird with an estimated global population of less than 1,200 birds. Habitat loss, poisoning and poaching were identified as major threats and the population was in a decreasing trend.

Assam is considered its last stronghold. This colonial-nesting bird makes colonies in the Brahmaputra Valley, in mostly privately owned trees within thickly populated villages. In recent years, many nesting colonies have been lost and the population was declining. Nest tree owners used to cut the trees to earn their livelihood and to avoid rotten and smelly nest-fall materials and excreta of this carnivore bird in their backyards.

A conservation project was initiated in 2007 involving community development, education and outreach in order to research the birds' links with traditions and then develop capacity-building projects for local communities, as well as a rural women's conservation group called *Hargila Army* with more than 10,000 rural women. Using various community conservation tools and interlinking the bird with local traditions and cultures instilled a very strong sense of pride and ownership for this bird among the villagers.

Cash incentives were deliberately avoided and livelihood schemes were introduced for villagers protecting the birds. In return, the Greater Adjutant population has increased in this nesting colony, from 27 nests in 2007–2008 to 250 nests in 2021 during the breeding season, in the villages of Dadara, Pachariya and Singimari – making it the largest breeding colony in the world.



Purnima educating Hargila Army women in the village of Dadara.  
© Anupam Nath

**Aaranyak**

www.aaranyak.org  
purnima.aaranyak@gmail.com



**Kehkashan Basu**

Founder-President, Green Hope Foundation.  
National Geographic Young Explorer. United Nations Human Rights Champion

## Protecting our Mangrove Ecosystems for Future Generations

Mangroves are a critical part of coastal ecosystems in the tropics. Home to a rich and unique variety of bird, animal, plant and marine life, they also play an essential role in protecting coastal communities by acting as a natural barrier against sea storms and cyclones. Plastics and other rubbish get washed away from the beaches onto the mangroves where they choke the roots of these plants, killing them.

Green Hope Foundation's mangrove regeneration project began eight years ago when I, then 12 years old, kayaked with my team to a belt of mangroves off the Abu Dhabi shoreline. We found plastics of all



Mangrove planting in Indonesia.  
© Green Hope Foundation

hues, metal cans, pipes, even car tyres all across the mangroves. Since then, we have conducted numerous clean-ups in the Middle East, Suriname, The Bahamas and Indonesia. Our teams have worked with local municipalities leading citizen awareness campaigns, educating beachgoers about how their litter is destroying these fragile ecosystems.

We run a different campaign in the Sunderbans, which is the world's largest mangrove forest, spanning Eastern India and Bangladesh. Villages in the Sunderbans have been repeatedly devastated by cyclones, since the depleted mangroves which previously acted as a barrier are now unable to do so. In these areas, we are not only working on reducing plastic pollution, we are regenerating them through extensive mangrove plantings.

Through these efforts, we have regenerated over 2,000 km<sup>2</sup> of mangroves globally, by planting over 5,000 mangroves, and our efforts were recognised with the Energy Globe Award.



www.greenhopefoundation.com  
kehkashanbasu@greenhopefoundation.com





## Pablo Borboroglu (POPI)

PhD Marine Biology  
and penguin conservationist.  
Global Penguin Society  
Founder and President.  
Rolex Laureate, National  
Geographic Explorer

## The Power of Penguins

We need the oceans. Life on Earth began in the ocean and the well-being of the planet depends on its health. We are all connected to the oceans evolutionarily, emotionally, spiritually, and to a great extent economically. Unfortunately, we have initiated an unprecedented age of alterations to marine systems.

Penguins are a species group particularly impacted by these phenomena. As top predators, penguins are key constituents of marine ecosystems, and are indicators of the oceanic and coastal ecosystem health. They are telling us a story that we need to hear: half of the 18 species of penguins are listed as threatened by IUCN. Pablo's presentation shows why penguins' fragile conservation status reflects the condition of the ocean and coasts they inhabit. He describes the features that make penguins particularly vulnerable to the main threats they are facing: climate change, mismanagement of fisheries and pollution at sea, and human disturbance and introduced predators on land. Penguins can catalyse integrated ocean conservation allowing the protection of vast environments and many other species they coexist with.

Finally, penguins are the perfect tool to inspire behaviour changes in the international community while they help to garner political support to accomplish long-term conservation benefits. His presentation shows how the Global Penguin Society's global and local efforts are helping penguins cope with their main threats and shares the next main conservation challenges.



Social interaction is a very frequent activity on penguin species, as shown by this group of king penguins on South Georgia Islands. © J. Deely



www.globalpenguinsociety.org  
info@globalpenguinsociety.org



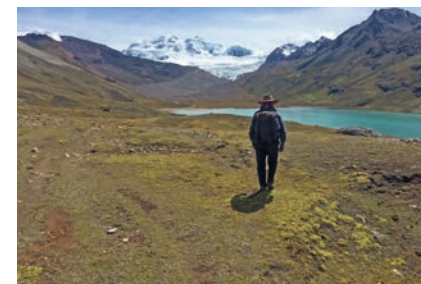
## Cayte Bosler

Investigative environmental  
journalist

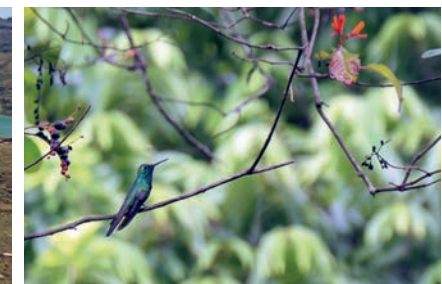
## What is the Wilderness Worth?

The planet's people and its countless species are being systematically exploited and murdered. Ecocide is accepted as legal and inevitable. 'Natural resources' are being depleted past their ability to regenerate and are unequally distributed through a global system of unsustainable economic trade. With their traditions, natural histories, and languages, the world's land-based communities are being exterminated. This is not inevitable. But the sustainability status quo as we know it places us in imminent danger by protecting profit over the planet.

I travel worldwide to map unsustainable human development and its links to ecological abuse in my investigative journalism career. I examine the rise of environmental economics and ask: what are the cultural and moral implications of putting a price on nature? I cover those fighting for the defence of the planet, the survival of other species, and the fading possibility of an inhabitable natural world for future generations.



A Peruvian elder from an indigenous Quecha community native to the mountains surrounding Laguna Sabinchoa, 4,873 metres above sea level, leads me to document the biodiversity. The region is threatened by rapid climate change and mining. © Cayte Bosler



A bee hummingbird in their native Cuba, the smallest bird in the world. We are losing vital pollinators worldwide; without pollinators, we don't eat. © Cayte Bosler

www.caytebosler.com  
caytebosler@gmail.com



The American Prairie,  
Bison. © Gib Myers / APR



Hargia nesting tree (top).  
© Purnima Devi Barman



After a long feeding trip in the vast ocean, a group of Macaroni penguins are drying and preening their feathers before going back to their nests.  
© J. Deely





### Callie Broaddus

Founder and Executive Director at Reserva: The Youth Land Trust

### Alice Marlow, Ian Clark, Lucy Houliston, Sathvika Krishnan and Zane Libke

Youth Council members at Reserva: The Youth Land Trust

## Reserva: The Youth Land Trust and the Dracula Youth Reserve

The most effective way to combat the combined challenge of biodiversity loss and climate change is to conserve habitat. And despite the fact that half of the world's population is 31 years old or younger, youth engagement in land conservation has historically been minimal, and usually limited to education programmes. Reserva: The Youth Land Trust builds on a model set by some of the world's most efficient international land conservation organisations – fundraising internationally to support projects owned and managed by in-country partners – but tries to design this approach entirely through the lens of youth empowerment.

Led by an international group of about 60 young conservationists, we are about to celebrate the completion of our flagship project, which we undertook with our partners Rainforest Trust and Fundación EcoMinga, as the first of what we hope will be a network of youth-funded reserves around the globe.

For the last 18 months, an international group of youth has been working to create the world's first entirely youth-funded nature reserve at a 244-acre site in Ecuador's threatened Chocó cloud forest that is home to an astonishing array of biodiversity. Five of these young conservation leaders present lightning talks featuring the species that inhabit this underexplored landscape with five topics: sloths and other weird animals, the importance of bird monitoring, the musicality of birdsong, the herps of the Chocó, and orchids as bioindicators.



Dracula Youth Reserve, Expedition 2020.  
© Callie Broaddus

**RESERVA**  
THE YOUTH LAND TRUST

www.reservaylt.org  
www.callie@reservaylt.org  
youth@reservaylt.org



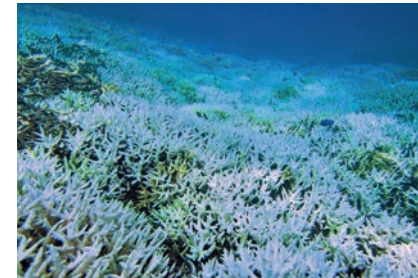
### Emma Camp

Marine biologist, University of Technology Sydney. United Nations Young Leader. National Geographic Explorer. Rolex Associate Laureate

## Building Great Barrier Reef Resilience Through a Globally-unique Partnership

The Great Barrier Reef (GBR) houses unprecedented biodiversity, generates AU\$ 6.4 billion per year (excluding Traditional Owner value), and is central to the Australian economy, way of life, and cultural heritage. Coral health entirely underpins these ecosystem services and values, but is drastically deteriorating due to cumulative impacts, in particular climate change.

Progressive loss of coral cover since 1984 has now been overtaken by catastrophic damage, whereby the GBR has lost more than 30% of all coral from mass bleaching in five years following repetitive marine heatwaves in 2016, 2017 and 2020. While traditional marine protected areas are still valuable for supporting reef health, there is now a global need to rebuild local ecosystems and aid stakeholder community resilience, through tailored methods to restore degraded reefs and buy time to solve climate change.



Bleached (top) and healthy coral on the Great Barrier Reef.  
© Emma Camp

In 2018, the Coral Nurture Program was established – a unique partnership between researchers at the University of Technology Sydney and Tour Operators (Wavelength Reef Cruises) to develop novel 'stewardship'-based management of economically high value GBR locations, with the goal to transform both ecological and social adaptation

to environmental change. As of April 2021, the Coral Nurture Program has established over 80 coral nurseries and out-planted more than 30,000 corals across the GBR. Over the next four years the goal is to exceed 100,000 corals and advance cutting-edge research to improve colony selection to boost natural reef resilience.



www.coralnurtureprogram.org  
emma.camp@uts.edu.au



### Cristiana Castello-Branco

Marine biologist, Postdoc  
Fellow at Smithsonian  
National Museum of  
Natural History

## The Dark Side of Bob: Unravelling the World of Deep-Sea Sponges

Marine sponges are one of the most diverse and abundant organisms in communities on the bottom of the ocean. However, the greatest part of what we know about them has been accumulated by looking at coastal and continental shelf species. Knowledge on deep-sea species (occurring deeper than 200 metres/650 feet) is still scant, consequently leaving behind a sharper consciousness about the need for their conservation.

Sponges play a key role in the ecosystem, filter-feeding dissolved as well as particulate organic matter, thus coupling resources on the water column to the bottom of the ocean. They also play an important role in the global cycle of nitrogen and silicates, and are hosts to a multitude of associated fauna and flora, living inside or on top of them. For these and many other reasons, deep-sea sponges should be better known. We urgently need additional information on their biodiversity in general, and in particular, to figure which species stand out as important builders of complex three-dimensional structures in an environment where large and monotonous sedimentary plains predominate.

Much remains to be done in order to allow us to understand all the ways in which sponges can provide the basis for ecological, bioprospecting and conservation studies, so that future environmental management decisions can be taken on science-informed, solid ground.



Detail of a glass sponge (*Aphrocallistes Beatrix*) surface. © NOAA Office of Ocean Exploration and Research



www.naturalhistory.si.edu  
www.ccastellobranco.com  
cristianacbranco@gmail.com



### Isabel Castro

Associate Professor,  
Massey University, New Zealand

## Kiwi – A Weird, Wonderful and Endangered Ornithological Relict

The kiwi is one exceptional bird and as such can teach us lots about how birds and other animals adapt to life on Earth. We know relatively little about them and I am a curious scientist that wants to find out as much as I can about the wonderful natural world around us. They evolved in an island environment where terrestrial mammals were not present in any numbers until about a 1,000 years ago when the first humans arrived. Their existence and evolution therefore followed a very different path to birds, including their relatives, in other parts of the world. The arrival of mammals in Aotearoa New Zealand marked the decline and extinction of kiwi species, with five surviving to date but dwindling in numbers. They are threatened by human activities and I would like to help protect this species and their habitat for future generations to enjoy.

I have been lucky to study this amazing species for the last 22 years. Part of my team consists of Aotearoa New Zealand native people (the Māori) and their contribution to the conservation of this taonga (precious) species is incredibly important. Every day in the field working with these beautiful birds is a high point for me. Being able to see them foraging at night, interacting with each other and thriving is the best feeling in the world. I believe that we care about our wildlife and we will manage them successfully into the future.



Kiwi. © Isabel Castro

www.avianz.net



*Bolitoglossa* (top).  
© Callie Broaddus

*Atelopus coynei*.  
© Callie Broaddus



Plate-billed Mountain  
Toucan. © Callie Broaddus



### Stuart Chapman

Lead, Tigers Alive Initiative,  
WWF International

## Bringing Back the Roar

Despite their ability to live in a wide range of habitats across Asia, tigers are now found in just 5% of their historic range. From a population of perhaps 100,000 a century ago, wild tiger numbers hit an all-time low of an estimated 3,200 in 2010. That same year, all 13 tiger range governments came together for the first Global Tiger Summit where they committed to double the number of wild tigers (TX2) by 2022, the next lunar *Year of the Tiger*.

Tiger populations are now increasing in Bhutan, China, India, Nepal and Russia. In stark contrast, the situation in South East Asia is critical with tiger populations at an all-time low, largely driven down by a snaring crisis.

Investing in protected areas, tiger population monitoring programmes, tiger prey management, anti-poaching strategies, community partnerships and habitat connectivity are a few of the strategies that have either created the enabling conditions for tiger conservation or are missing from countries where tigers are in decline. Continuation of these strategies for the next 12 years is essential to either build on hard-won conservation gains or to avoid the spectre of local extinctions.

As we approach 2022, and the long-awaited second Global Tiger Summit in Russia, a bold new vision is needed to frame future conservation strategies. Formulating a range expansion goal by identifying potential new habitat for tigers that could be repopulated through either natural dispersal, reintroduction or rewilding is one such possibility.



Two young tigers (*Pantera tigris*) at play.  
Ranthambore Tiger Reserve, India.  
© Richard Barrett / WWF-UK

One of the snares set and used by local poachers who snared a tiger back in 2009, in the Belum-Temengor forest complex, Malaysia.  
© Lau Ching Fong / WWF-UK



[www.worldwildlife.org/experts/stuart-chapman](http://www.worldwildlife.org/experts/stuart-chapman)



### Giovanni Chimienti

Zoologist and marine biologist,  
University of Bari, Italy.  
National Geographic Explorer

## When Corals Create Forests: Tales from the Mediterranean Sea

Certain corals do not have a rigid, calcareous skeleton and do not form coral reefs. The so-called sea fans and black corals, for example, can grow up to one metre in height, showing a peculiar arborescent shape. Under proper conditions, these tree-like corals can be present in large populations, forming true coral forests underwater.

At temperate latitudes, where coral reefs are not present, coral forests play a key role as a marine habitat particularly in the twilight zone, generally below 50 metres depth, where the light decreases continually. They represent a true

biodiversity oasis, where a lot of marine species find shelter, food and a place feasible for their reproduction. I've been experiencing in person how beautiful and diverse the Mediterranean can be: a small basin compared to the vastness of the ocean, but a true biodiversity hotspot full of colourful and astonishing forms of life. Coral forests represent one of the deep, beating hearts of the basin, supporting

a lush marine life and a series of ecosystem goods and services.

After the finding of a wonderful black coral forest, I am currently working with managers to protect this habitat against destructive fishing. This led me to the finding of other coral habitats all over the basin, but something worse than fishing is threatening them: global warming. We are experiencing a dramatic mortality event of corals at temperate latitudes and there is no protected area that can help. The only hope is a change in the way we live.



The red gorgonian *Paramuricea clavata* is a Mediterranean-endemic species and one of the corals most appreciated by divers.  
© Giovanni Chimienti



[giovanni.chimienti@uniba.it](mailto:giovanni.chimienti@uniba.it)

Stuart Chapman



A wild tiger using a biological corridor, captured on DSLR camera trap. Bhutan. © Emmanuel Rondeau / WWF-UK



### Andrew D. Corso

PhD candidate, Fisheries Department, Virginia Institute of Marine Science

## Antarctic Biodiversity – What Is It, How Is It Sampled, and Is It Changing?

Scientists working with the Palmer Antarctica Long-Term Ecological Research (Palmer LTER) programme have been studying marine Antarctic biodiversity since 1993. Annual sampling aboard research vessels and at Palmer Station, Antarctica, have provided countless ecological insights into the marine food web of the western Antarctic Peninsula. Scientists study organisms of all shapes and sizes, including marine bacteria, phytoplankton, zooplankton, sea birds, whales, and many more creatures!

Andrew is a member of the Palmer LTER team and works with Antarctic larval fishes for his PhD dissertation. This area of Antarctica has experienced significant environmental variability over the last century, partly due to climate change. Andrew and other Palmer LTER scientists are investigating how organisms are responding to these changes, such as decreasing sea ice and warming ocean temperatures. This research is critically important for understanding and preserving the unique biodiversity of one of the most pristine environments on Earth.



A larval white-blooded icefish (*Channichthyidae*), the only known vertebrate that lacks haemoglobin in their blood.  
© Andrew D. Corso



<https://pal.lternet.edu>  
[adcorso@vims.edu](mailto:adcorso@vims.edu)



### Adjany Costa

Co-founder, Mukissi Foundation. National Geographic Emerging Explorer

## Mukissi: The Guardians of the River

In the highlands of Angola, a water tower feeds the largest cross-border conservation area in the world, the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), enclosing 36 protected areas in five countries. Home to a quarter million animals, KAZA shelters the largest contiguous African elephant population in the world (200,000+), 24% of the world's remaining populations of wild dogs, around 4,000 species of flora and fauna and over 2.5 million people mainly living in rural areas. Although 17% of KAZA falls into Angola and benefits from a protection status, the actual sources of the Okavango and Zambezi, north of KAZA, have been kept away from any conservation efforts.



Mapping and empowerment activities with Chief Alberto Satchindamba, the Regional Traditional Leader in the Angolan highlands. © Adjany Costa

Over the past years, scientists have ventured into this long-hidden paradise to understand its ecological and hydrological function and uncover its biodiversity gems. From 24 new species to 16 source lakes that sustain life downstream, the importance of this area to the region and the world has been slowly unearthed.

But something just as important, or even more so, still needs to be understood: the local people and the conservation outcomes of their cultural beliefs. The Mukissi, the mythical guardians of the rivers, are the backbone to understanding why local people are and can continue to be the actual protectors of these important waterways. And how we can draw long-lasting, successful conservation lessons from this human-nature relationship.

@adjanycosta



## Ashlan and Philippe Cousteau

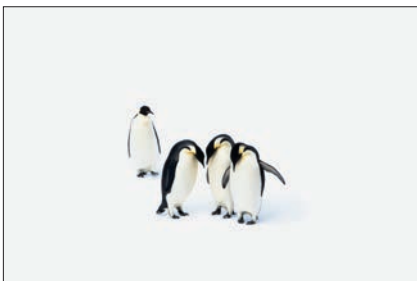
Explorers, filmmakers and ardent advocates for the ocean

## Antarctica 2020 and the Future of our Planet

We only have one Antarctica. The vast white continent and the ocean that surrounds it are vital for the healthy functioning of our planet that makes life on Earth possible. For example, Antarctica and the Southern Ocean are critical to stabilising our climate and circulating vital nutrients that sustain fish populations across the world. From the food we eat, to our daily weather and global climate, we all rely on the frozen continent for our very survival.

But Antarctica is under threat. In 2020, the Antarctic saw its highest ever temperature – over 20°C/68°F! These alarming temperatures, coupled with rising pressure from fishing and other human activities, directly threaten Antarctica’s amazing wildlife – penguins, seals, whales, albatross – that are struggling to adapt to the rapid changes to their home.

But we can do something. Through our work at EarthEcho International, we are building a global movement of youth who are going to change the future. In addition, we are part of a coalition called Antarctica 2020 that is working to establish three new Marine Protected Areas around Antarctica that would increase Southern Ocean protection by almost four million km<sup>2</sup> – the greatest act of ocean protection in history – allowing us to tap into the ocean’s incredible resilience and help ensure a hopeful thriving future for all life on Earth.



Emperor Penguins. © John Weller

ANTARCTICA2020



www.earthecho.org



## Céline Cousteau

Activist, storyteller, author, National Geographic Explorer

## Interconnected – You and the Indigenous Peoples of the Vale do Javari, Amazon

The Amazon Rainforest, its dense canopy, and maze of winding rivers, have been in my life for a very long time. When I was nine years old, I went to the Amazon on my grandfather’s expedition. This journey instilled in me a deep sense of respect for this ecosystem teeming with life and its indigenous communities. Thirty years later, after receiving an email from Beto of the Marubo tribe in the Javari Indigenous territory of the Brazilian Amazon asking me to help share his people’s story, I began a decade-long journey creating Tribes on the Edge.



© Céline Cousteau

More than a film, Tribes on the Edge is a catalyst and has led to the creation of an education curriculum with the Institute for Integrative Conservation with the College of William & Mary. In addition, we founded The Javari Project, a registered for-purpose organisation working with a coalition of partners and the indigenous communities of the Javari. The Javari Project identifies and

evaluates the current threats to the cultural and environmental assets of the Javari in order to sustainably support territorial rights, livelihoods and habitat.

Biodiversity plays a critical role in safeguarding our planet’s health and the fight against climate change. Knowing that indigenous peoples are frontline guardians to biodiversity globally and that the Javari was named as irreplaceable in terms of biodiversity by the IUCN, we are collaborating to best contribute to their livelihood and work as protectors.

www.tribesontheedge.com  
www.celinecousteau.com



TEST DATE  
6-14-14  
NEW  
ILY 0

Scientists retrieve a net trawl from the stern of the ARSV Laurence M. Gould that is used to sample Antarctic zooplankton and fishes. © Andrew D. Corso





### Luis Cunha

Assistant researcher,  
Centre for Functional Ecology,  
University of Coimbra

## Soil Biodiversity Signatures in Human-made Landscapes

I am deeply fascinated by the diversity and function of life found belowground (unfortunately, also highly neglected). In this talk, I focus on soil fauna and take you through a lost story since the end of the pre-Columbian era, but which has profound implications for the conservation of a megadiverse biome.

Once thought to hold an innate pristine wilderness, Amazonian rainforests are increasingly known to have been densely inhabited by populations showing a diverse and complex cultural background prior to European arrival. To what extent these societies impacted their landscape is unclear. Amazonian Dark Earths (ADEs) are fertile soils found throughout the Amazon Basin, created by pre-Columbian societies resulting from more sedentary habits. Much is known of the chemistry of these soils, yet their zoology has been neglected. These habitats have a unique pool of species, however, contemporary land use drives nutrient decay and threatens biodiversity.

Moreover, our findings support the idea that humans have built and sustained a contrasting high-fertility system with deep fingerprints that persisted until our days and irreversibly altered the biodiversity patterns in Amazonia. More importantly, they highlight the potential for learning from indigenous knowledge systems to inform resource management and aid conservation of Amazonian ecosystems.



The anthropogenic habitat holds a unique pool of invertebrate species. © Luis Cunha

George Brown and Luis Cunha in an ADE site.  
© Myrtle Shock



[www.luiscunha.xyz](http://www.luiscunha.xyz)  
[www.tpinet.org](http://www.tpinet.org)



### Joe Cutler

Freshwater ecologist,  
ichthyologist and  
conservation biologist,  
National Geographic  
Explorer

## The Ogooue Megatransect – Exploring Africa's Last Wild River

National Geographic Explorer Joe Cutler just completed the Ogooue Megatransect, rafting 1,000 kilometres across Gabon on Africa's fourth largest river, the Ogooue. Throughout the transect, Joe and his team surveyed freshwater biodiversity, collecting nearly 10,000 fish specimens and using iNaturalist to document the biodiversity and biogeography of the Ogooue. Joe has a PhD in Ecology from the University of California, Santa Cruz, and has been studying central African freshwater ecosystems for nearly a decade.



© Megan Sixt



[www.africaslastwildriver.com](http://www.africaslastwildriver.com)  
[jscutler1@gmail.com](mailto:jscutler1@gmail.com)



### Mariana Da Silva

Head of Research to combat illegal wildlife trade, Wildlife Conservation Society-Bolivia

## Tooth Fairy Gone Wrong: Combating the Illegal Trade in Jaguar Parts

Teeth being traded for money is real and a threat to jaguars; the traders are organised criminals instead of fairies. Hundreds of jaguar canines detected in Bolivia, on their way to Asia in 2014, brought back the international trade as a priority threat. According to the systematisation of illegal wildlife trade (IWT) data from 43 Bolivian institutions done by our Wildlife Conservation Society-Bolivia team, parts equivalent to at least 202 jaguars were confiscated since mid-2014, mostly canines (673), with 42% of the cases linked to Asian markets. Our investigation of the online jaguar trade revealed 27 additional cases.

We are collaborating with national and regional governments to strengthen the capacity, coordination and commitment of law enforcers (particularly police and prosecutors) to detect and convict wildlife criminals. We also work in jaguar strongholds and IWT hotspots with indigenous nations, park rangers, local businesses and authorities, who recently released public declarations against IWT. This is the main threat for jaguars in some areas, as it can decrease tolerance towards them and reverse the conservation gains of the last decades. As seen with tigers, IWT can quickly deplete populations; it also threatens human security and health, and weakens the rule of law. IWT is overwhelming and depressing, but jaguars give me hope and optimism as they bring people together from different continents and backgrounds to fight IWT, benefiting also other species. I celebrate these magnificent cats and the efforts to build a future where jaguars roam without the risk of being killed for their teeth.



Jaguar canines seized by authorities in Bolivia. The international trade in jaguar parts has emerged in recent years as a top threat for this species in some areas of its distribution.  
© Damián Rumiz



<https://bolivia.wcs.org/es-es>  
[mdasilva@wcs.org](mailto:mdasilva@wcs.org)  
[mxdasilva@gmail.com](mailto:mxdasilva@gmail.com)



### Manuela Dal Forno

Lichenologist

## The Secret Life of Lichens

I am a Brazilian-American researcher interested in multiple aspects of lichen symbiosis. My research has particularly focused on the discovery of new species, especially in the tropics, and how they are related to one another. I believe in utilising modern and historical approaches to establish species boundaries in lichens, which is the first step towards conservation and applied research.

Lichens are complex symbiotic units formed by a main fungal partner, a green algal and/or a cyanobacterial partner, along with a diverse

community of microorganisms. They represent an important and diverse biological group present in most terrestrial ecosystems, and a main nutritional strategy in fungi. Despite being classic examples of symbioses, lichens remain broadly unknown systems given their multifaceted interactions and controversial definitions. I have been studying lichens for almost 20 years and am constantly challenged

on how to properly unveil diversity in these enigmatic multi-species symbioses.

In my talk, I provide a broad overview of what lichens are and where they grow, especially covering the fun parts of being in the field as a lichenologist.



*Cora* (whitish) and *Cladonia* (grey-green with red) lichens growing together on a rock in Brazil. © Manuela Dal Forno

BOTANIC GARDEN



BOTANICAL  
RESEARCH INSTITUTE

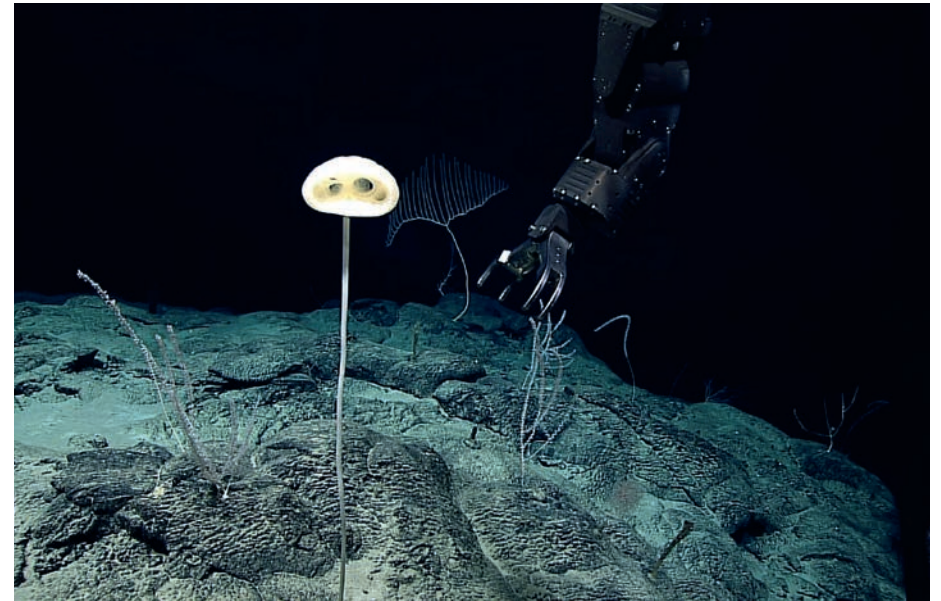
[www.manueladalforno.com](http://www.manueladalforno.com)  
[mdalforno@brit.org](mailto:mdalforno@brit.org)



Ryan Mathews retrieving a water sample in Ryder Bay. © M. Figielski



Field lab to identify aquatic insects in Patagonia (top). © R. Isai Madriz



E.T. sponge (*Advhena magnifica*) sampled close to the Marianas trench, Pacific Ocean. © Courtesy of the NOAA Office of Ocean Exploration and Research



### Shekar Dattatri

Wildlife and conservation filmmaker, India.  
Rolex Laureate

## The Power and Impact of 'Narrowcasting' in Conservation Advocacy

Twenty years ago I decided to move away from a successful career as a natural history filmmaker for television channels. I wanted to use my filmmaking skills instead for conservation advocacy. My decision was based on a strong personal conviction that television documentaries were largely unsuited to bringing about change on the ground. Since then, I have followed a very different path which has yielded tangible conservation gains despite miniscule resources.

Conventional wisdom leads us to believe that more is always better – more equipment to make a film, more money, more viewers. But what if you don't have hundreds of thousands of dollars at your disposal? And what if there's actually a more effective way of creating change than 'broadcasting' a film to a mass audience?

Using a real-life 'David vs Goliath' case study I would like to demonstrate that big bucks and millions of views are not essential

for effective conservation advocacy – if you embrace the power of 'narrowcasting'. When it comes to making an impact where it truly matters, my mantra is simple – less is more.

**“When it comes to making an impact where it truly matters, my mantra is simple – less is more.”**



### David de Rothschild

Explorer, environmentalist,  
eternal optimist

## Rewild Yourself

We are creatures of vibration. You only have to look under a microscope to see that all the cells in our bodies are constantly on the move, always in motion, pulsating, vibrating, and dancing wildly. Our cells vibrate so much, that on a nanoscale we are constantly humming, sending out an unheard human musical. But our vibrations aren't unique to us, they can be found across every part of our Home. Even in objects that appear to be solid, fixed and unchangeable there also resides an unseen but not unfelt frequency that's constantly vibrating, oscillating and resonating. Our Home, the unexplainable enigma, that holds the threads of our

quantum entanglement to each other, ourselves and all other species is almost mirrored identically.

We are Nature and Nature is us. We are a living system made up of interdependent living systems. Our circulatory system are the rivers and oceans that move oxygen and nutrients through the body, our kidneys and livers are just like the nutrient cycles

of the planet – cycling energy into a usable form, while pushing toxins and waste aside. Our respiratory system are the forests, circulating oxygen and carbon. Our skeletal-muscular system is the geological structure. Our digestive system is our soil, full of microorganisms that help us to absorb nutrients in order to grow and survive.

So, as we domesticate the world not only have we lost our understanding of how dependent upon Nature we really are but we lose our wildness. Therefore we must answer the question: what parts of the human character will be irrevocably lost when Nature is finally eroded? It's time to Rewild yourself.



Work by Svabhu Kohli.  
© Voice for Nature





### Supraja Dharini

Founder and Chairperson,  
TREE Foundation

## Successful Sea Turtle Conservation on the East Coast of India

TREE Foundation, an Indian-based NGO founded in 2002, with a primary focus on marine conservation, was inspired and guided by Dr. Jane Goodall DBE. TREE Foundation initiated a community-based marine conservation programme which uses a multi-disciplinary approach, involving people from all sections of society, but particularly unemployed young fishermen from economically disadvantaged artisanal fishing communities.

The 363 Sea Turtle Protection Force (STPF) members from 222 marginalised artisanal fishing villages spreading over 700 km in Tamil Nadu, Andhra and Odisha (east coast of India) have protected thousands of olive ridley sea turtle nests and released more than 2,600,000 hatchlings back to the sea.

STPF members, with the support of their families, are vital for TREE Foundation's conservation work. Being an STPF member gives a fisherman and his family a secure future income so he can send his children to school and also afford proper healthcare for his family. STPF members educate other fishermen about the importance of conserving turtles, retrieving ghost nets, reducing pollution and caring more for their ocean environment in general. They have become role models in their respective communities, encouraging all to participate in marine wildlife conservation.

Knowing that people who may have once intentionally hunted and killed turtles or poached eggs are now working to protect the very species that they once harmed, shows that with the right attitude and hard work the seemingly impossible can be made possible. Today, all fishermen release turtles entangled in fishing gear or ghost gear throughout the project areas.



Turtle entangled in a ghost net and stranded on Chennai Beach.  
© TREE Foundation



www.treefoundationindia.org  
treefoundation2002@yahoo.com



### Stella Diamant

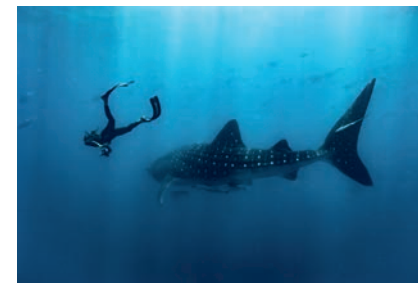
Founder, Madagascar  
Whale Shark Project

## Discovering a New Whale Shark Hotspot in Madagascar

I am a conservation biologist and currently lead the Madagascar Whale Shark Project (MWSP), an NGO that I founded in 2016. Initially a pilot project that focused on determining whether whale sharks in Madagascar were the same as those identified in Mozambique, our team has now identified more than 400 whale sharks, which have never been identified elsewhere in the world.

Whale sharks are the world's largest fish and are exposed to a range of threats through their life, such as plastic ingestion, collisions with boats, and illegal fishing. In Madagascar, one of the world's poorest countries, they are also a source of income for local communities, as whale sharks attract tourists from all over the world. To support the development of sustainable tourism, we have introduced a code of conduct that regulates interactions between sharks and humans, and initiated an environmental education programme for the Malagasy youth.

Our goal at MWSP is to inform policy and sustainable management in Madagascar through the collection of ecological and biological data on whale sharks and other endangered marine species, while empowering local communities and educating the general public. That way, whale sharks can feed undisturbed as required while in Madagascar, allowing them to thrive and ensure the survival of the species in future years.



Stella Diamant. © Nick Riley



www.madagascarwhalesharks.org  
stelladiamant@gmail.com





**Andrew Digby**

Science advisor, Kākāpō/Takahē, Department of Conservation (DOC), New Zealand

**Intense Conservation: Saving the Kākāpō**

The kākāpō is one of the world’s most unusual and rarest birds, with just around 200 individuals left, all of them in the wild on offshore island sanctuaries. But the population has quadrupled in the last 25 years thanks to intensive conservation which has rescued this *taonga* (treasured species) from extinction.

Kākāpō Recovery is a small team dedicated to the survival of the species, using advanced technology to monitor and protect kākāpō in situ. Every individual wears a ‘smart’ transmitter which, via island-wide data networks connected to the internet, allows remote monitoring of activity, mating and nesting. Lockable feeding stations with remote weighing scales enable each kākāpō to be fed individually to optimise breeding productivity. Nesting data loggers relay nest attendance data and smart eggs are used to enhance chick survival. Artificial insemination, with sperm transport by drone, is attempted to maximise fertility and genetic diversity. Targeted genetic management is achieved with genome sequences available for nearly every individual.

Yet kākāpō still face severe challenges, particularly from infertility, disease and limited habitat availability. Kākāpō Recovery works with experts in diverse fields from around the world to tackle these issues, providing technological and management solutions applicable to many conservation programmes. A primary goal is to reduce conservation dependence and restore the *mauri* (life force) of the kākāpō. This process of transitioning kākāpō conservation from extinction rescue to long-term, sustainable recovery provides important lessons for many threatened species.



Kākāpō chicks about to be fed while being temporarily hand reared, 2011. © Deidre Vercoe / Department of Conservation



www.doc.govt.nz/our-work/kakapo-recovery  
adigby@doc.govt.nz



**Rod Downie**

Chief polar advisor and Interim Director of Science, WWF-UK

**Walrus from Space**

Walrus are facing the reality of the climate crisis. With the Arctic warming more than twice as fast as the global average, their world is changing around them as sea-ice retreats. The Arctic Ocean is vast, remote and a challenging place for scientists to work, meaning that we simply don’t know enough about how many walrus there are, and how the climate crisis and industrial development is affecting them. This iconic species is culturally significant for Arctic people.

Jointly led by WWF and the British Antarctic Survey, *Walrus from Space* aims to use non-invasive high-resolution satellite imagery and the engagement of about half a million citizen scientists over the next four years to give scientists a clearer picture of the population of Atlantic and Laptev walrus. With the help of the crowd, we aim to count the numbers and movements of all Atlantic and Laptev walrus at every one of their terrestrial haul outs, from space, in each of the next four years. By contributing towards the understanding of walrus populations and trends, we hope to help walrus so they can have a healthy future.



**Peter Fretwell**

Senior scientist and Geographic Information Officer, British Antarctic Survey



Walrus (*Odobenus rosmarus*) in Spitsbergen, Svalbard archipelago, Norway, Arctic Ocean, September 2014. © naturepl.com / Franco Banfi / WWF

www.bas.ac.uk  
www.wwf.org.uk  
rdownie@wwf.org.uk  
ptf@bas.ac.uk

**Duke Lemur Center**



**Megan McGrath**  
Education Programs Manager

**Field Trip to the Lemur Forest**

The mission of the Duke Lemur Center (DLC) is to advance science, scholarship, and conservation through non-invasive research, community-based conservation, and education. By engaging scientists, students, and the public in new discoveries and global awareness, the Center promotes a deeper appreciation of biodiversity and an understanding of the power of scientific discovery.

The Duke Lemur Center SAVA Conservation project, founded in 2012, supports a community-based approach to protecting natural forests, using an array of project activities designed to protect the forest and to improve the lives of the Malagasy people. The DLC also works within a network of other accredited institutions in North America and Madagascar to advance lemur care and welfare, and to develop and adhere to Species Survival Plans (SSPs) that use carefully planned conservation breeding programmes to create a ‘genetic safety net’ for rare and endangered lemurs. In partnership with these institutions, we’re helping to ensure “the sustainability of a healthy, genetically diverse, and stable” population of lemurs for the long-term future.



Coquerel's sifakas. © Megan McGrath



[www.lemur.duke.edu](http://www.lemur.duke.edu)



**Sylvia Earle**  
President and Chairman of Mission Blue / The Sylvia Earle Alliance. National Geographic Society Explorer in Residence. Rolex Testimonee

**Protecting Our Ocean**

A balanced ecosystem has kept our planet habitable for four and a half billion years. And yet it has taken us only four and a half decades to significantly alter the nature of nature – inexorably making our blue planet increasingly uninhabitable. We’re putting more carbon dioxide into the atmosphere and we’re destroying much of the diversity of life that makes our existence possible. We remove in the order of 100 million tonnes of ocean wildlife every year, driven largely by a taste that has been acquired over recent decades for creatures that we generally refer to as seafood. We’re using techniques for extracting and marketing ocean wildlife on a scale that we simply know cannot be sustained.

**“Take away all the life in the sea, life on the land could not exist.”**

We must accept that we now know enough to make smart decisions, whilst at the same time knowing that we still have so much to learn. Only about 15% of the sea floor has been mapped with the same accuracy that we have for the

Moon and Mars. And take a moment to reflect on the fact that most of life on Earth lives in the dark, all of the time, because most of life on Earth lives below where sunlight penetrates, in the twilight zone and the great depths below.

The ocean is the primary driver of planetary functions and today is our turning point – the beginning of a decade of ocean exploration, a decade of enhanced ocean care.



[www.mission-blue.org](http://www.mission-blue.org)





Releasing turtle from trawler boat during Turtle Excluder Device (TED) trials. © TREE Foundation



Planting the Great Green Wall on the African continent, a compelling solution to the many urgent threats facing the planet. © UNCCD

Coral reef restoration in central Indonesia. © The Ocean Agency



### Paula J. Ehrlich, DVM, PhD

President and CEO,  
E.O. Wilson Biodiversity  
Foundation. Co-founder,  
Half-Earth Project®

## The Importance of Protecting Biodiversity

What will it take to protect the biosphere, and life on Earth? As E.O. Wilson wrote in the book *Half-Earth*, “The only hope for the species still living is a human effort commensurate with the problem.”

Half-Earth is a call to raise our conservation ambition and work together to protect half our planet’s lands and seas in order to address the looming extinction crisis and ensure we leave no species behind. Half-Earth now inspires several national and global conservation efforts, and the Half-Earth Project is informing collective action.

Dr. Paula J. Ehrlich, co-founder of the Half-Earth Project, will present a primer on Half-Earth and show how the E.O. Wilson Biodiversity Foundation is empowering Dr. Wilson’s call to action through the science of the Half-Earth Project Map.

“If we protect half our planet, we can safeguard the bulk of biodiversity, including ourselves.”



[www.eowilsonfoundation.org](http://www.eowilsonfoundation.org)



### Mark Evans

Executive Director, Outward  
Bound Oman

## The Oldest University on Earth

When identifying nature-based solutions to current and future challenges, it is easy to overlook the past. In his book *The Seven Pillars of Wisdom*, written 100 years ago, T.E. Lawrence described the humble fireplace as nature’s university, “around which problems have been discussed, solutions identified and disputes resolved for thousands of years”. My talk charts how, in today’s wired world, that same university is more important than ever.

In Oman, on the shores of the Indian Ocean and the edge of the largest sand desert on Earth,



Speaking around the fireplace, sharing and transmitting knowledge.

the Empty Quarter, lies an isolated sand sea known as the Sharqiya Sands where Outward Bound Oman uses that ancient platform to inspire and equip the next generation of planetary caretakers with the tools to step up and make a difference. In 2021, Outward Bound celebrates 80 years of operations around the world, using challenging journeys and immersive experiences in nature to

inspire the next generation of opinion formers and future leaders, an alumni that now numbers several million people.

Be it addressing mental well-being, inter-cultural peacebuilding and dialogue or addressing issues such as climate change, and biodiversity, that ancient fireplace has lost none of its magic and importance.

As Fridtjof Nansen, Nobel Laureate, diplomat and polar explorer said: “I tell you, deliverance will not come from the noisy, rushing centres of civilisation, it will come from the lonely places.”



[www.outwardboundoman.com](http://www.outwardboundoman.com)  
[mark@outwardboundoman.com](mailto:mark@outwardboundoman.com)





### Oliver Fankem

Cameroon's research coordinator, Zoological Society of London (ZSL)

## Elephants and Great Apes Conservation in the TRIDOM

Located in the south of Cameroon, the Dja Biosphere Reserve has a population of approximately 4,000 inhabitants in the core area and 40,000 inhabitants in the surrounding areas. The main ethnic groups include the Badjoué, Boulou, Fang, Nzimé and two semi-nomadic groups: the Kakas and the Baka pygmies. The Baka pygmies are free to hunt within the biosphere reserve using traditional methods. Other main economic activities include agriculture, fishing, animal husbandry, hunting, mining and the harvesting of plants for domestic or pharmaceutical use.

The Dja's unique ecosystem and wildlife are in crisis due to high levels of poaching and the expansion of extractive industries. Our approach is to:

1. Strengthen wildlife protection and surveillance in and around the Dja Biosphere Reserve to tackle the poaching pressure;
2. Monitor the progression of illegal wildlife trade cases and provide technical support throughout the prosecution process;
3. Develop the capacity of enforcement agents, prosecutors and courthouse staff to effectively apply wildlife laws relating to trafficked species;
4. Put rangers on the ground;
5. Create community surveillance networks which allow forest community members to collect and report information on illegal activities such as poaching, illegal mining and logging;
6. Establish village savings and loans associations which help individuals from partner communities save and access small amounts of money for sustainable livelihood initiatives developed by the communities themselves;
7. Support community members, especially women, to derive better and more sustainable revenue from non-timber forest products.



[www.zsl.org](http://www.zsl.org)



### Finance for Biodiversity Pledge

## Celebrating the Launch of New Signatories

We have the honour to celebrate the 18 new financial institutions that joined the Finance for Biodiversity Pledge during the Global Biodiversity Festival, a day before the International Day for Biological Diversity.

Philippe Zaouati, the CEO of asset manager Mirova, welcomed the new signatories on behalf of the founding signatories. Paul Rose interviewed Will McDonald (Director of Sustainability) of Aviva and Clarisse Simonek (Head of Responsible Investment and Sustainability) of Ossiam, on why biodiversity is important for the finance sector and why their organisation has decided to join the Pledge.



A total of 55 financial institutions have signed the Pledge, representing over €9 trillion in total assets from 15 countries. This was the third round of signatories to the Pledge, following the second round of eleven signatories in December 2020 and the launch that featured 26 founding signatories in September 2020.

By committing to the Pledge, financial institutions call upon world leaders to reverse nature loss this decade. They also commit to working together, engaging with companies on biodiversity, assessing their own biodiversity impact and dependencies, setting targets and reporting on biodiversity matters in relation to their own investment and financing activities by 2024 at the latest.

A new signatory round will be celebrated before the Convention on Biological Diversity (CBD COP15) in September 2021. We encourage other financial institutions to join!



[www.financeforbiodiversity.org](http://www.financeforbiodiversity.org)



**John Flynn**

Founder and Conservation Director, Wildseas.org



**Neil Davis**

Co-founder and Projects Director, Wildseas.org



**Eric Quayson**

Regional coordinator, Wildseas.org

## Can We Save the Sea Turtles of Ghana?

Sea turtles have been around for approximately 150 million years yet many populations are in steep decline in the face of overfishing, poaching, pollution and a host of other threats.

In our presentation we explore the species of sea turtles that can be found nesting on the beaches of Ghana in West Africa and also offshore in Ghanaian waters in the Gulf of Guinea. We look at the threats they face illustrated through our first-hand experience in protecting sea turtles and how we can attempt to mitigate these threats.

We consider the evolution of the conservation programme, from protecting 10 km of nesting beach into working alongside national authorities and gaining the support of hundreds of boats in the Ghanaian traditional canoe fishing fleet.

You will hear from the Wildseas Country Head for Ghana, Eric Quayson, who was runner-up in the 2020 Boat International Ocean Awards and was named one of the top 100 Young African Conservation Leaders for 2021. He will be explaining briefly his vital role in protecting sea turtles and will show viewers the type of boats the fishing fleets we work with use.

The presentation concludes with some questions and a short overview of our successes to date. And yes, we can save the sea turtles of Ghana. It will take ongoing effort by all of us in the Wildseas team but every turtle saved and given another chance at life is its own success story in the bigger effort.



www.wildseas.org



**Pavel Fomenko**

Wildlife biologist

## New Challenges in the Protection of the Amur Tiger in Russia

A changing world brings new challenges and threats to the wildlife. Even in my relatively short work on tiger conservation in Russia, which I have been doing for almost 30 years, the threats to the survival of the species have changed dramatically.

My work on tiger conservation at WWF began at a very alarming time for Russia and its wildlife, as the former USSR and all its institutions were defeated by 'perestroika'. Wildlife poaching and smuggling started to flourish. The demand in tiger parts was high. The impoverishment of the population and the destruction of the system of natural resource management put the rarest predator on the verge of extinction.

In 1994, WWF became the first international organisation to offer its assistance in the conservation of the tiger and its habitat. Over time, the Russian state authorities, together with public organisations, levelled the decline in the tiger population but another problem appeared – the destruction of the predator's habitat as a result of poorly controlled logging. Fortunately, now the government has taken control of the situation.

Yet, a new threat has emerged – African swine fever has destroyed over 50% of wild boars in tiger habitats in Russia. This is much scarier than COVID-19 is for humans because animals can't be forced to wear medical masks and there is no vaccine against the disease. How can we deal with all this? Is it possible in these conditions to guarantee the long-term survival of the Amur tiger? I believe it is.



Pavel Fomenko.  
© Antonio Olmos



www.wwf.ru  
pfomenko@wwf.ru



Anchor Island in Dusky Sound, Fiordland – one of the main kākāpō breeding islands.  
© Andrew Digby / Department of Conservation



Project Patagonia Azul, Rewilding Argentina (top).  
© Kristine Tompkins

Eyelash Viper on Osa peninsula.  
© Andy Whitworth



**Jane Francis**

Director, British Antarctic Survey

## From Forests to Ice Sheets: Antarctica's Transition from Greenhouse to Icehouse

Antarctica has not always been a land of ice and snow. For the past 100 million years the continent has sat over the South Pole but fossil leaves, wood and flowers, along with dinosaur bones show us that the polar climate was once warm and the land was covered with lush forests, the ancestors of today's Southern Hemisphere vegetation. Dinosaurs roamed through these forests on their travels across the landmass of Gondwana. The warm climate was most likely due to high levels of CO<sub>2</sub> from volcanoes.

Gradually CO<sub>2</sub> levels naturally decreased and, as the climate cooled, the first glaciers formed on Antarctica about 40 million years ago. The last forests survived in the cold as tundra shrubs. The continent became isolated within the icy waters of the surrounding Southern Ocean and massive ice sheets covered the land. Only special plants and animals that can tolerate the intense cold survive on Antarctica today.

Now the ice is melting. Warming ocean waters are finding their way under the ice shelves around Antarctica, melting the ice from below. As the ice shelves melt, huge amounts of freshwater from the ice sheets may be released, raising sea levels across the planet. We ignore Antarctica at our peril.



Fossil fern and green ammonite.  
© Jane Francis



www.bas.ac.uk



**John Francis**

Vice President, National Geographic (retired)

## A Forest in My Backyard

I grew up with a forest in my backyard. Nature came easy. Steps out the door and I was building camps out of ferns and fir boughs, having fights with clods of rotting stumps, remains of old second growth forest having passed through time.

At age 13, the nearby hospital expanded and my backyard retreat was levelled. We played nonetheless, digging in bare dirt and using discarded plywood for shelter, trying to make a new home. It wasn't the same. Fast forward to college and a lucky chance to study seals in Alaska, the Channel Islands, and, with National Geographic support, the Juan Fernandez Islands. Putting satellite tags and Crittercams on the seals gave me glimpses of a world that had evolved over millennia. A film about this work and producing others taught me how to share a love of nature which was disappearing faster than anyone realised. And my following role funding explorers grew this mission and call for action. Building on my backyard discoveries, I developed a 10-year series of BioBlitzes leading up to the National Park Service Centennial. Scientists supercharged kids with unforgettable revelations.

I learned that feeling is believing and at National Geographic, not just storytelling, but physical travel is the untapped lever for change. Curiosity is the driver, seeing nature intact is the teacher, being a global citizen is the goal, and funding locals is the answer.

The truth is, we all can be engines for biodiversity conservation, whether through citizen science, sustainable travel, or other devices. We just need to expand peoples' backyards.



Centennial NPS BioBlitz,  
100,000 observations in more  
than 100 parks nationwide.  
© John Francis

johnfrancisngs@gmail.com



### Shari Gallop

Senior Lecturer, University of Waikato, Tauranga, Aotearoa New Zealand

## The Science of Returning Freshwater to Estuaries

Estuaries occur at the interface of land, river, and sea. They are among the most diverse and productive ecosystems in the world. The unique estuarine environment is fundamentally underpinned by freshwater inflows. The quantity, quality, and timing/seasonality of freshwater inflow into estuaries are critical for estuarine ecosystem health.

However most estuaries are affected by upstream manipulation of their freshwater inflows by dams, diversions, withdrawals, and changes in land use that affects runoff patterns. In some cases, there has been catastrophic habitat loss due to reductions in water flows by being cut off from the sea and/or rivers, such as for land reclamation. I will discuss estuarine restoration attempts by returning freshwater inflows, with a focus on the current Aotearoa New Zealand example of Te Awa o Ngātoroirangi (the Maketū Estuary). Here, the major freshwater source (the Kaituna River) has been partially returned to the estuary over the past year, after being diverted out in 1956.

A major driver of this redirection is to restore the mauri (life force) of the estuary, and enable tangata whenua (Māori people of the land) to gather kaimoana (sea food) once again. I will also discuss how in this research I am leaning to bridge mātauranga Māori (Māori knowledge, the indigenous knowledge system of Aotearoa New Zealand) and Western science.



Shari doing field work in Te Awa o Ngātoroirangi, holding up a tuangi (cockle), one of the important shellfish in this estuary.  
© Chris Loufte / L'Oréal



[www.waikato.ac.nz/staff-profiles/people/sgallop](http://www.waikato.ac.nz/staff-profiles/people/sgallop)  
[shari.gallop@waikato.ac.nz](mailto:shari.gallop@waikato.ac.nz)



### Jamal Galves

Programme coordinator, Belize Manatee Conservation programme. National Geographic Explorer

## Belize Manatee Conservation Project

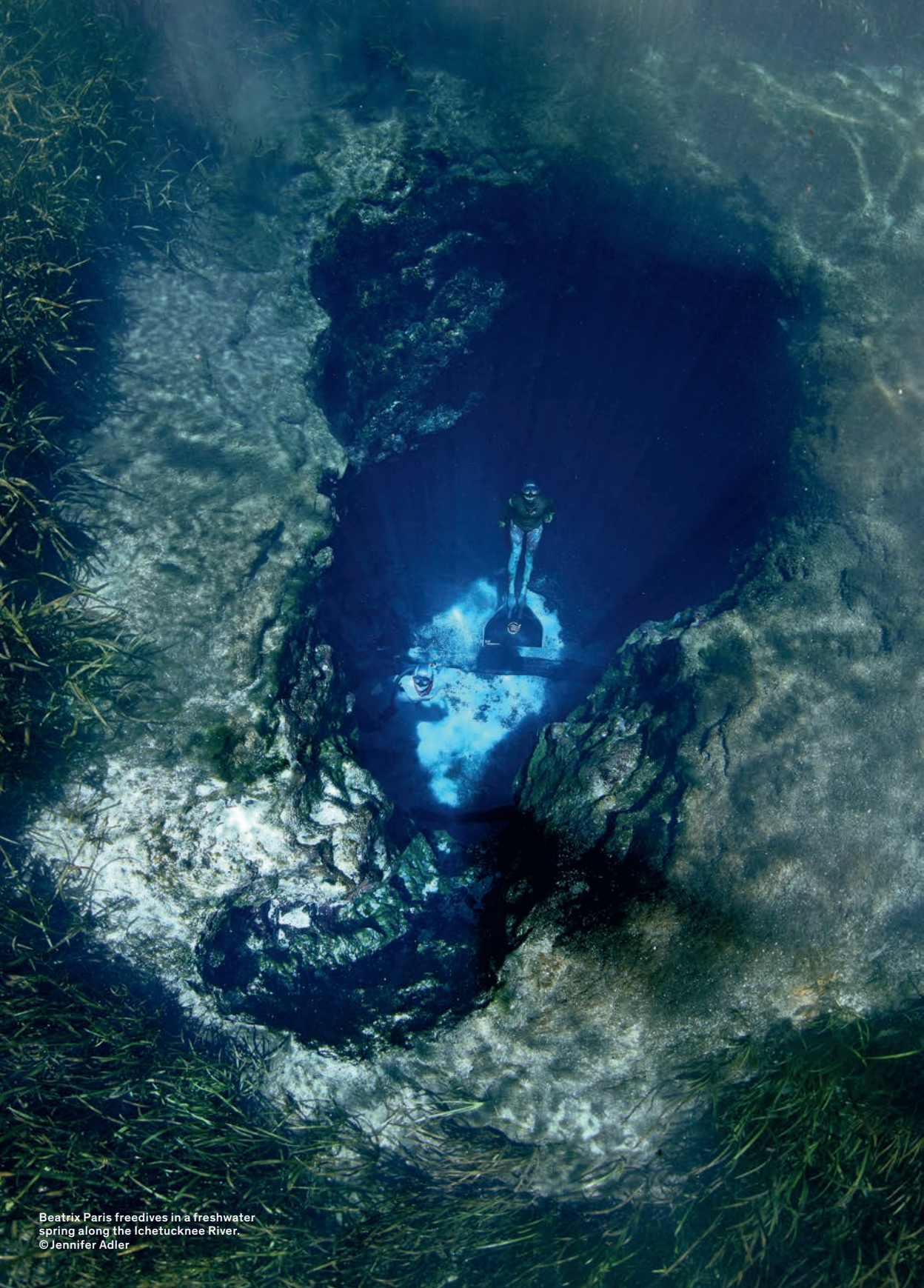
I have been passionate about manatee conservation since I was 11 years old, and later jumped at the opportunity to join manatee scientists at Sea to Shore Alliance to assist with manatee capture and health assessments. In my time at Sea to Shore, I have risen in the ranks from field assistant to eventually becoming programme coordinator for the Belize Manatee Conservation programme, where I am happily known as the 'Manatee Demon'.

These beautiful animals are facing a number of threats including watercraft collisions, destruction of habitat, development projects in the mangrove areas, entanglement in fishing gear and garbage pollution. Our job is to put measures in place to create an environment where the manatees are fully protected and they remain safe. We also have a goal to inspire future generations to continue this work.

I have just returned from my journey with the Panama Ministry of Tourism transcontinental expedition, where we travelled from the Pacific to the Caribbean by canoe and hiking. The physical demands in this region of extraordinarily high biodiversity was a defining experience for me. The high peaks, deep valleys, birdsong and forests opened my eyes to the value of biodiversity and so it is wonderful to share this with you here at the Global Biodiversity Festival. The expedition has also strengthened my resolve to protect our manatee.

[www.mission.cmaquarium.org/research-institute/manatee-research/belize-manatee-conservation](http://www.mission.cmaquarium.org/research-institute/manatee-research/belize-manatee-conservation)





Beatrix Paris freedives in a freshwater spring along the Ichetucknee River. © Jennifer Adler



A gar swims in the clear waters of a north Florida river (top). © Jennifer Adler

Manatees swim in Florida's Ichetucknee River. During the chilly winter months, the manatees swim into the 72°F springs when the ocean drops below this temperature. Unlike seals and whales, they lack a true blubber layer, so they have to stay in warm water to survive. © Jennifer Adler



**Celine Gamble**

Project Manager, Marine Habitat Restoration, Zoological Society of London

**Restoring the UK's Forgotten Oyster Reefs**

With oysters most commonly associated as being served in a seafood restaurant with a glass of champagne, the ecosystem services that oysters provide are often overlooked or simply unheard of. Healthy oyster habitat can provide us with a vast number of ecosystem services, including removing excess nutrients and improving our coastal water quality, providing a home for other marine wildlife and increasing biodiversity. European native oyster populations have declined by over 95% in the past 150 years. With this decline, a habitat that was once abundant in the UK is becoming lost from living memory. Given the current climate emergency and biodiversity crisis, now more than ever it is vital that we provide nature with the helping hand that it needs in order to bounce back.

My presentation showcases the oyster restoration efforts taking place in the UK to restore this incredible marine habitat, including The Wild Oysters Project and how ZSL has been working with partners to champion marine habitat restoration.



Oysters being cleaned.  
© Celine Gamble / ZSL



www.wild-oysters.org

SPEAKERS



**Marites Gatan-Balbas**

Chief Operating Officer, Mabuwaya Foundation

**Philippine Crocodile Conservation in Northeast Luzon**

The Philippine crocodile (*Crocodylus mindorensis*) is endemic to the Philippines, and is not found anywhere else in the world. Historically it occurred on most islands of the Philippines. It is now extinct in most of its former range, except in south-western Mindanao and northern Luzon where small wild populations remain. The total population is estimated at less than 100 mature individuals. The Philippine crocodile is therefore listed as 'Critically Endangered' on the IUCN Red List and is probably the rarest crocodile species in the world. Habitat loss, hunting, and killing are just some of the threats to Philippine crocodiles.



Philippine crocodile juvenile.  
© Merlijn Van Weerd

The Philippine crocodile has a very negative image in the country. It is regarded as a 'pest' monster and a ferocious animal. But these are misconceptions. The Philippine crocodile is relatively small, shy and beautiful and does not attack unless provoked.

The Mabuwaya Foundation uses a community-based conservation model to save the species from extinction. It tries to change the negative perception of the people towards the crocodiles through extensive communication, education and public awareness campaigns, engagement with communities and the local government in crocodile conservation. It helps support community capacity in environmental management, law enforcement and land-use planning. This has led to the establishment of local crocodile sanctuaries and an increase in the wild crocodile population.

Being part of the conservation of the Philippine crocodile is something to be proud of!



www.mabuwaya.org

SPEAKERS



### Maria Gavrilov

Open Ocean Project Leader, Association Maritime Heritage. Leading research scientist, Arctic and Antarctic Research Institute, Saint-Petersburg, Russia

## In the Heart of the Arctic, Where Atlantic Meets Pacific

The Arctic Ocean is the smallest and youngest among the oceans. It is home to the few native species which have managed to adapt to its harsh and unpredictable conditions. This magnificent and fragile environment has evolved under the protection of ice and remoteness from human impact. It is here, in the centre of the Siberian shelf, where the last great geographical discovery on the planet has been made. The large archipelago, now known as Severnaya Zemlya, was discovered only in 1913. Equally distant from the Atlantic and Pacific gateways to the Arctic, it is a vital area for the study of global change, a refuge for Arctic endemic species, where Atlantic and Pacific marine biotas meet and some survived the Last Glacial Maximum.

This encouraged us to organise, under the Open Ocean Project, a multidisciplinary three-week expedition aimed at the inventory of Severnaya Zemlya marine biodiversity and the study of its coastal ecosystems. We revealed that many existing statements about desert environment and scarce biodiversity just do not meet reality. We found that the archipelago coastal zone is a holistic ecosystem, which can be rated as a high-Arctic core area with unspoiled habitats where Arctic biota undergoes natural evolution.

For me personally, it was a great meeting with the place where I started my career as an Arctic explorer some 30 years ago, and I was happy to find this land healthy and pristine. Furthermore, I would like to make more effort to protect this area and bring it the status of a World Natural Heritage Site.



Little is known about coastal underwater life around Severnaya Zemlya Archipelago. The Expedition O2A2-2019 (top) surveyed for the first time many sites around the archipelago and found bottom habitat diverse and benthic life surprisingly rich. Here, Rough hookear sculpin (*Arctedillus scaber*) is portrayed within the kelp forest. © Andrey Kamenev / Open Ocean Project.

www.o2a2.ru  
m\_gavrilov@mail.ru



### Lauren Gibson

Environmental Education PhD student, Youth Engagement specialist, National Geographic Young Explorer

## Not Just Tomorrow's Leaders: Empowering Young People to Create Change Today

We often hear that young people are our future leaders. But why should today's youth have to wait for this nebulous 'future' to become leaders for the environment?

I know, both from personal experience and from social science research, that there is no magic age for impact. As a middle schooler, I started a small grant programme focused on empowering other young people in my community to design and lead their own environmental projects. Students as young as five came to us with ideas for making their community a better place for all who called it home – humans and non-human animals alike. Together, the dozens of funded projects had a massive impact on our city, directly getting over 1,000 students involved in environmental action and reducing our city's carbon dioxide emissions by hundreds of tonnes a year.

Now, as a doctoral student, I am studying how these types of youth-led environmental efforts might impact other members of the community. Can environmentally literate kids, for example, affect their parents' thoughts on the environment? How about their local officials' thoughts? How far do these ripples extend?

In my talk, I discuss some of the evidence that demonstrates the power of young environmental changemakers as well as some tips on how to engage with young people in meaningful, effective ways.



In the forest in southern Dominican Republic, Lauren Gibson records data to help her and her collaborators learn more about the habitat of the endangered Hispaniolan solenodon. © Alexis Mychajliw

www.ncsu.edu



## Emanuel Gonçalves

Chief scientist and member of the Board of Directors, Oceano Azul Foundation

## Rise Up for the Ocean – A Blue Call to Action

RISE UP presents an ambitious 10-year agenda that would set the ocean on course for recovery, through 29 priority actions that governments and businesses must take to address: marine biodiversity and biomass loss, decarbonisation, circular economy, social inequality, and international ocean governance. RISE UP aims to increase political will of decision makers by showcasing the ocean as our biggest ally in a sustainable and inclusive future.

With currently over 500 organisations from all sectors and geographies signed on in support, RISE UP represents a unifying voice for the ocean to collectively drive progress and call for transformative change. For too long the ocean has been absent from discussions at the international policy, economic and social levels, and so, as we enter the Decade of Ocean Science for Sustainable Development, we must ensure the ocean's important role in our lives is celebrated, protected and promoted.



RISE UP Key Image. © Andy Mann



www.oceanoazulfoundation.org  
www.riseupfortheocean.org  
egoncalves@oceanoazulfoundation.org



## Benoit Goossens

Professor at Cardiff School of Biosciences, Cardiff University, UK. Director, Danau Girang Field Centre, Sabah, Malaysia

## Striving Towards Sustainability in the Lower Kinabatangan Floodplain

I set up the Danau Girang Field Centre (DGFC) in July 2008 to gather information critical for the viable persistence of tropical species in the highly fragmented and oil palm-dominated landscapes of the Kinabatangan floodplain, the largest wetland in Sabah, Malaysian Borneo.

Since its establishment, DGFC has provided capacity-building opportunities for international and local scientists paired with a close collaboration with the Sabah Wildlife Department and Cardiff University. In 13 years we have performed satellite telemetry studies on 13 species (including the

Bornean elephant, Sunda clouded leopard, proboscis monkey and the Sunda pangolin). We have also led the production of five species action plans, generated more than 140 publications and provided higher education opportunities for 14 Malaysian scientists (among many others).



Female Bornean elephant (*Elephas maximus borneensis*) with a GPS tag in the Lower Kinabatangan Wildlife Sanctuary. © Rudi Delvaux

The path ahead is to work more actively on restoration ecology and re-establish connectivity along the Kinabatangan River. For this, together with Cardiff University's Sustainable Places Research Institute and the local community organisation KOPEL, we launched Regrow Borneo to restore tropical forests logged for timber or oil palm agriculture in an ethical, transparent, and research-led manner.

Regrow Borneo offers practical, long-term responses to help address the climate and ecological emergency. From carbon sequestration, restoring degraded land into functioning ecosystems, to preventing future pandemics by restoring the buffers between people and wildlife, we take our role in restoring these lands, for nature, for wildlife, for local communities – and for all futures, very seriously.



www.dgfc.life  
goossensbr@cardiff.ac.uk



### Tim Gordon

Marine Science Officer,  
Mars Sustainable Solutions.  
Researcher, University of  
Exeter

## Songs of the Sea: Using Bioacoustics to Help Marine Restoration

The ocean is alive with sound. Whales, dolphins, fish and even invertebrates use sound to communicate, navigate, defend territories, find food, choose a mate and gain information about their surrounding environment – bioacoustics plays a vital role in the lives of marine animals. But recently, habitat destruction and climate change have dramatically altered the soundscape of marine ecosystems – as animals die and move away, they leave behind silent seas. My research addresses the likely impact of these acoustic changes, and how we can use sound to help monitor and restore marine ecosystems.

Working with the Mars Sustainable Solutions coral reef restoration programme, we are investigating exciting new methods for using bioacoustics to monitor and manage coral reefs. The range of buzzes, clicks, pops, whoops and snaps made by animals on a reef are indicative of the health of the ecosystem. We use underwater microphones to listen in on reefs, gaining new insights about changing patterns of biodiversity. We investigate the use of underwater loudspeakers to attract young animals towards reefs, to accelerate restoration progress. And we use the captivating sounds of underwater ecosystems as we work with filmmakers, documentary producers, podcasts and media to engage millions of people around the world with the plight of coral reefs and our opportunity to rescue them.

The symphony of the sea is changing at an unprecedented rate, but through bioacoustics we're discovering new tools to rewrite the future. Much can be achieved by learning to listen.



Underwater loudspeaker on a coral reef at Lizard Island, Great Barrier Reef.  
© Tim Gordon

UNIVERSITY OF  
**EXETER**

**MARS** | The world we want tomorrow starts with how we do business today

www.buildingcoral.com  
t.gordon3@exeter.ac.uk



### Justin Grubb

International Outreach  
and Programme Officer,  
Planet Indonesia USA

## Preserving Biodiversity through Village-led Partnerships

Indonesia has some of the world's most incredible biodiversity and interesting species. Elephants, rhinos, corals, orangutans, leopards, hornbills, and more. All call this rich ecosystem 'home', but all face similar conservation challenges. Planet Indonesia works to protect biodiversity by working with people and by supporting the many communities that live among at-risk habitats through an array of programming. These programmes are aimed at developing resilient livelihoods and address socio-economic inequality through new education opportunities, business programmes, farming and fishing techniques, scientific training and community-led ranger patrols, among others. This approach to conservation places these community members at the forefront of conservation by empowering them to participate in sustainable resource management. In addition, Planet Indonesia conserves Indonesia's ecosystems and wildlife through ex situ programmes such as addressing the root causes of the illegal wildlife trade

and building the nation's only songbird rehabilitation centre to acclimatise birds confiscated from the wildlife trade back to the wild.

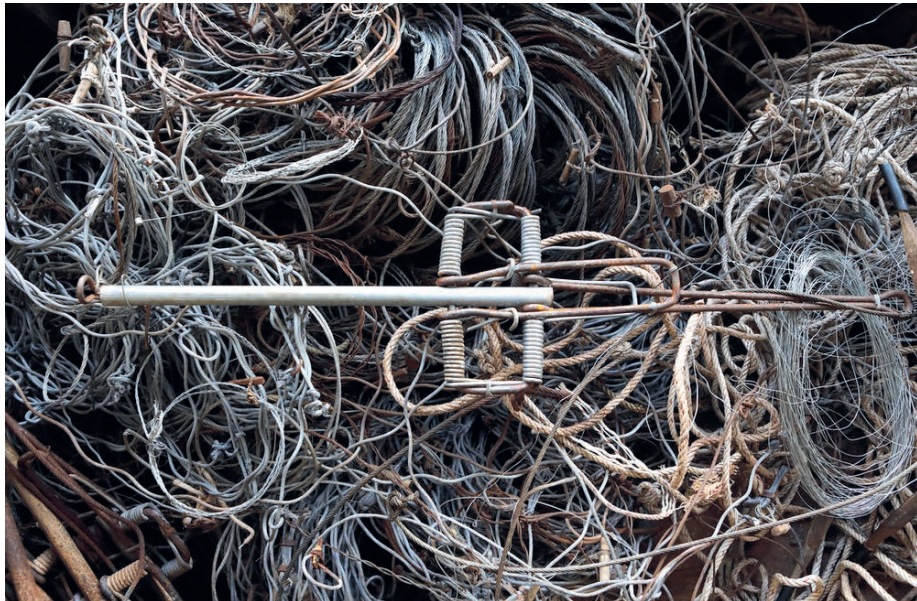
Over the course of the last few years, there has been an explosion in the popularity of these programmes among villages in West Kalimantan, Borneo, and Planet Indonesia has observed a significant decrease in deforestation and an incredible increase in the presence of wildlife across all project sites.



A village-led ranger patrol pauses for a quick break while patrolling the Gunung Nyuit Protected Forest, an area known for its population of helmeted hornbills, to protect it from illegal activity such as hunting and logging. © Justin Grubb

**PLANET  
INDONESIA**

www.planetindonesia.org



Guanacos (top). © PNP Tompkins Conservation

Tiger snares and traps. A series of ranger trainings sponsored by Lovenature kickstarted in Cambodia, aiming to strengthen enforcement levels to protect the Eastern Plains Landscape. This is also where there are plans by the government to reintroduce tigers back to the country. © Ranjan Ramchandani / WWF



The American Prairie, deer © Dennis J. Lingohr



### Rosamira Guillen

Executive Director,  
Fundación Proyecto Tití.  
National Geographic Explorer

## Proyecto Tití: Protecting and Restoring the Home of Cotton-top Tamarins in Colombia

Cotton-top tamarins (*Saguinus oedipus*) are small primates, about the size of a squirrel, that are only found in the tropical forests of northern Colombia, and which are critically endangered due to extensive deforestation and fragmentation of their habitat, and also due to their capture for the illegal pet trade.

Proyecto Tití works to secure a long-term future for this primate species by conducting field research, educating and creating awareness in local communities, providing income alternatives for locals, and protecting / restoring the forest that is home to these charismatic monkeys.

We collect seeds from local parent trees and propagate them in our nursery, to later plant them in forest corridors created in partnership with other local organisations, within the land of local farmers. This contributes to the forest connectivity, which cotton-tops need to find food and shelter for their subsistence, and to remain genetically viable in the long term.

Our forest conservation efforts have resulted in the protection of more than 13,000 acres of forest area to date and the creation of over 500 acres of forest corridors, improving the livelihoods of more than 180 local families, and the conservation of local wild populations of cotton-top tamarins.



Cotton-top tamarins.  
© Lisa Hoffner



[www.proyectotiti.com/en-us](http://www.proyectotiti.com/en-us)  
[rguillen@proyectotiti.com](mailto:rguillen@proyectotiti.com)



### Melvin Gumal

Head of Biodiversity  
Conservation and Research  
Division, Sarawak Forestry  
Corporation (Parks and  
Wildlife)

## Orangutan Conservation in Sarawak

Dr. Gumal has been working on orangutan conservation in Sarawak since 1988. Over the years, his work has included conservation awareness with the Iban communities in Batang Ai, working with these same communities on sustainable livelihood issues, field surveys and peer-reviewed publications on the distribution and population of orangutans, and stakeholder engagement to develop a critical mass of conservationists to help protect the species and their habitats. The stakeholder engagement included documenting traditional stories and taboos which helps to protect the orangutans. He is currently working with various stakeholders on developing action plans for the conservation and protection of the species for the next 10 years.

In 2014 Dr. Gumal won the Whitley Award for Conservation in Ape Habitats for his work on orangutan conservation. He also won the Whitley Continuation Award to further his conservation work on orangutans in 2017.



Melvin Gumal with field research  
team and villagers in Batang Ai.  
© Daniel Kong

In the presentation at this festival, Dr. Gumal will take us through a brief history of orangutan conservation from the late 1980s to 2021. He will also introduce his current work on protecting the species and its habitats and this includes connecting fragmented protected areas via wildlife corridors to enable the resident orangutans to have a long-term future in Sarawak.



[www.sarawakforestry.com](http://www.sarawakforestry.com)



### Ghana Shyam Gurung

WWF Nepal's Country Representative

## State of Conservation in the Face of Climate Change in Nepal

Growing up as a herder in the remote and rugged trans-Himalayan terrain of Upper Mustang, Ghana maintains a strong connection to nature and his childhood foe – the snow leopard. He was instrumental in establishing Nepal's first community-based livestock insurance scheme in the Kangchenjunga Conservation Area with support from the University of Zurich. This scheme, which aims to reduce herder-snow leopard conflict, is now being scaled up across the country and replicated in other snow leopard range countries, and is recognised and included in ATLAS as an innovative scheme. His conservation efforts for the species consequently led to his recognition as the 'Shepherd of the Snow Leopard' nationally and the 'Snow Leopard Champion' in the wider WWF network.

Believing strongly in the role of the next generation to carry forward Nepal's conservation legacy, Ghana is a motivational speaker and a mentor to many. He has helped establish over 35 scholarships for disadvantaged girls in the Kanchenjunga Conservation Area, managed by local women's groups, as well as five annual Memorial Scholarships through WWF Nepal to pursue higher education in conservation, in memory of the conservation heroes that lost their lives in the tragic 2006 helicopter crash.

As a believer in the power of new media, he authors informative pieces in national and international media highlighting the continued need to preserve the natural environment for people and nature. He has also been involved in an advisory capacity at various institutions, chaired national working groups on human-tiger conflict, and more. He holds a PhD in Natural Science from the University of Zurich.



### Arianne-Elise Harris

PhD student studying biodiversity of logged rainforests

## Guyana: The Land of Many Wildlife Communities

My interest in Guyana's many wildlife communities spiked my passion for wildlife conservation. Through my PhD research, I aim to focus on the biodiversity of Guyana's Iwokrama forest. In 2021, I concluded my field surveys and am currently in the process of analysis and writing. However, as a sneak peek of what I hope will be good news for everyone (not just me), we can testify to have witnessed and catalogued an amazing diversity of wildlife within the disturbed landscape. Our preliminary results reinforce the viability of sustainable harvesting practices, which I see as the way for future development and longevity of developed and developing nations alike. Guyana's land of many wildlife communities shows how resilient biodiversity can be, when given the respect and value it deserves. It shows how people and nature can co-exist when boundaries are set, and techniques are put in place, revisited, updated, and wildlife populations are monitored.



The capital city Georgetown at night.  
© Meshach Pierre Photography

Direct and indirect threats remain on many Guyanese conservationists' minds. At the forefront of discussions are the oil industry, illegal mining, and overfishing. These remain issues that could undermine conservation efforts already at work. Furthermore, invasive species, urban expansion and illegal logging are additional future areas of research towards understanding the threats to Guyana's biodiversity. Regardless of these challenges, there remains much hope in the land of many wildlife communities, and that hope stems from a team of researchers, both local and international, who are equally invested in seeing Guyana prosper while maintaining its unique biological diversity.





### Vreni Häussermann

Researcher at Universidad San Sebastian, Rolex Laureate

## The Marine Animal Forests of Chilean Patagonia

The Patagonian Fjord Region with its labyrinth of fjords, channels and islands is a biodiversity hotspot hosting unique and highly fragile ecosystems. Its coastline exceeds 100,000 kilometres, which makes it the largest fjord region in the world. However, it is still very poorly known with taxa such as sponges including large amounts of species still new to science. On the other hand, anthropogenic activities have been growing exponentially, including salmon farming as a high-impact industry, industrial and artisanal fisheries, and mussel harvesting and farming. Climate change has also become more and more noticeable with more frequent and stronger El Niño events and stronger and more frequent algae blooms (including the so-called HABs – harmful algae blooms).

In the last 20 years, we have been studying the marine benthic invertebrates of Chilean Patagonia and have described 11 types of marine animal forests; species that are ecosystem engineers constructing a three-dimensional habitat which provides others with shelter and food, thus increasing biodiversity. The most eye-catching of these are the cold-water coral banks and hydrocoral reefs, which we described from shallow water. During the last two decades, we also observed gradual degradation and eutrophication of the ecosystems with a decreasing abundance of many species and mass mortalities of different species, such as corals, hydrocorals, jellyfish, shellfish, sardines and whales. Chilean Patagonia still hosts many species, but if the trend continues, we are in danger of losing species and ecosystems before they are even described or understood.



The ophiurid *Astrotoma agassizi* and the gorgonian *Thouarella brucei* both present an interesting distribution pattern: while they live in waters down to more than 100 m deep in central and northern Chile, they emerge into diving depth in Chilean Patagonia.

Mussel banks of the species *Aulacomya atra* belong to the so-called marine animal forests. The mussel with its calcified shells creates a three-dimensional habitat which harbours many species. © Vreni Häussermann

www.anthozoa.info  
v.haussermann@gmail.com



### Daniel Hayhow

Research Lead – Urban Biodiversity, Earthwatch Europe

## Tiny Forest – Super Tiny, Super Powerful

With two thirds of the world's population projected to live in cities by 2050, humanity needs to urgently adapt to the climate crisis and biodiversity loss. Environmental issues such as flooding, heat stress and loss of biodiversity are increasingly affecting urban areas. As a researcher in conservation and biodiversity over the last decade, it has become increasingly apparent that nature actually has many of the answers we need.

Tiny Forests can play a part in facing this challenge – 600 diverse native trees planted densely in a tennis-court size plot, maximising

benefits per square metre of land. They bring the benefits of a forest – reconnecting people with nature and raising awareness, helping to mitigate the impacts of climate change, as well as providing nature-rich habitat patches to support urban wildlife – right into the heart of our cities and urban spaces.



Earthwatch is leading the Tiny Forest initiative across the UK. Pupils from a school bubble in Leicester plant a Tiny Forest. © Earthwatch

During the 2020/21 tree planting season, we have planted 16 Tiny Forests across the UK! Nearly 10,000 trees from Glasgow to London, and many places in between.

Earthwatch is an environmental charity with science at its heart. We drive the change needed to live within our means and in balance with nature. We do this by connecting people with the natural world, monitoring the health of our natural resources, and informing the actions that will have the greatest positive impact.



www.earthwatch.org.uk  
dhayhow@earthwatch.org.uk



Endangered sei whales beached on the Chilean coast after having fed on toxic algae bloom during a building El Niño in 2015. © Keri-Lee Pashuk



**Jill Heinerth**

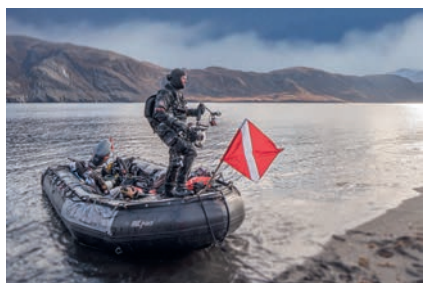
Explorer-in-Residence,  
Royal Canadian  
Geographical Society.  
National Geographic  
Explorer

**Into the Planet**

I am a cave diver, swimming through the veins of Mother Earth, exploring the shadowy recesses inside our planet. The dark doorways of underwater caves repel most people. Still, I am attracted to these constricted corridors, pressing my way through the blackness while relying on sophisticated technology for each sustaining breath. I work with biologists discovering new species, physicists tracking climate change, and hydrogeologists examining our finite freshwater reserves. Following the course of water wherever it guides me, my exploration has allowed me to witness new life forms inside Antarctic icebergs, skeletal remains of ancient civilisations, and geologic formations that tell the story of Earth's past.

Underwater caves are like museums of natural history. They are portals to the mythic underworld of indigenous cultures and windows to the aquifer from which we drink. As I swim through these caverns measureless to man, it is not my survival that I dwell on, but the survival of our water planet.

There is plenty of water on our big blue planet, but we are running out of clean freshwater we can afford. We all need to know where our water comes from, how we pollute it, and how we can protect it for future generations. We have to defend it from corporate interests whose success relies on selling it to the highest bidder. Clean water is not just our greatest treasure, it is a fundamental human right. Helping young minds understand and embrace their water planet is key to our survival.



Heinerth filming in Labrador, Canada.  
© Rick Stanley



www.intotheplanet.com  
jillheinerth@mac.com

**Honolulu Zoo Foundation**



**Charles Lee**

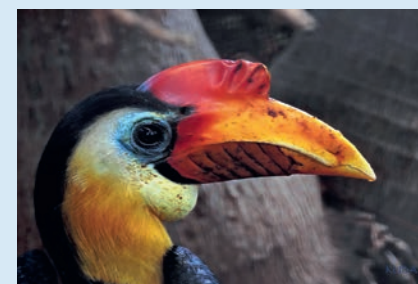
Educator, Honolulu Zoo  
Society

**Conservation at Honolulu Zoo**

The mission of the Honolulu Zoo is to inspire stewardship of our living world by providing conservation, education, and meaningful experiences to our community. The zoo emphasises our values of malama (caring) and hōokipa (hospitality) and is the only one within a radius of 2,392 miles (3,850 kilometres).

As an island zoo, it is ideally suited to contribute to the conservation of island species, which are highly susceptible to natural disasters and changes in their environment. One of the best examples is the Galapagos Tortoise. In 1953, the Honolulu Zoo became the first zoo to successfully hatch this species. In fact, some of their original generation of tortoises, collected in 1929, are still alive today! Dozens have since been hatched and sent to zoos around the world for breeding programmes.

This is one of the many protection initiatives at the Honolulu Zoo; others include the protection of the Wrinkled Hornbill – as it successfully became the first zoo to breed Asiatic hornbill species – and the Nene (Hawaiian goose), of which there were only 43 left before the zoo played a key role in a breeding programme that has led to a population of 2,000 to 3,000 in the wild.



Wrinkled Hornbill.  
© Honolulu Zoo Foundation



www.honolulu zoo.org



**Peter Houlihan**

Vice President of Biodiversity and Conservation, XPRIZE. Visiting Assistant Professor, UCLA Center for Tropical Research IoES. Adjunct Professor, Johns Hopkins University – Environmental Science & Policy. National Geographic Explorer

**Collaborative Technological Approaches for Rainforest Conservation**

Peter specialises in planning and leading expeditions into understudied and threatened rainforests all over the world, for conservation purposes. Regularly operating in more than 20 countries across Africa, the Americas, and Asia, Peter is passionate about working with local scientists and communities, and inspiring others to learn about our natural world.

He has lived and worked extensively throughout the tropics, where he has led nearly 50 large-scale expeditions and managed long-term conservation programmes, particularly in Borneo, Madagascar, the Amazon, Central America, and the Congo Basin.



A sloth in Parque Nacional Tortuguero, Costa Rica. © Peter Houlihan



Matus skillfully navigates stormy seas on Lake Tanganyika. © Peter Houlihan



www.peter-houlihan.com  
www.rainforest.xprize.org  
peter.houlihan@xprize.org



**Shafqat Hussain**

Professor of Anthropology, Rolex Laureate, National Geographic Emerging Explorer

**Protecting Snow Leopards with Community Participation**

I will be presenting about Project Snow Leopard (now Baltistan Wildlife Conservation and Development Organization or BWCDO) which is a community-based snow leopard conservation programme in Pakistan. The project has been running for the last 20 years and it promotes conservation based on the idea of coexistence.

There are three main components of the project. The first and the main component is a livestock insurance programme whereby the farmers buy insurance for their livestock against snow leopard predation. Farmers pay a small premium per head of livestock, and when they lose livestock to snow leopard predation, they are compensated. This ongoing project is based on the simple assumption that farmers are not irrational beings who take pleasure in killing snow leopards, but rather that killing snow leopards is the most efficient and logical recourse farmers have for dealing with the threat snow leopards pose to their livelihoods.

The second component is the construction of predator-proof corrals to reduce incidences of heavy losses of livestock due to corral invasion.

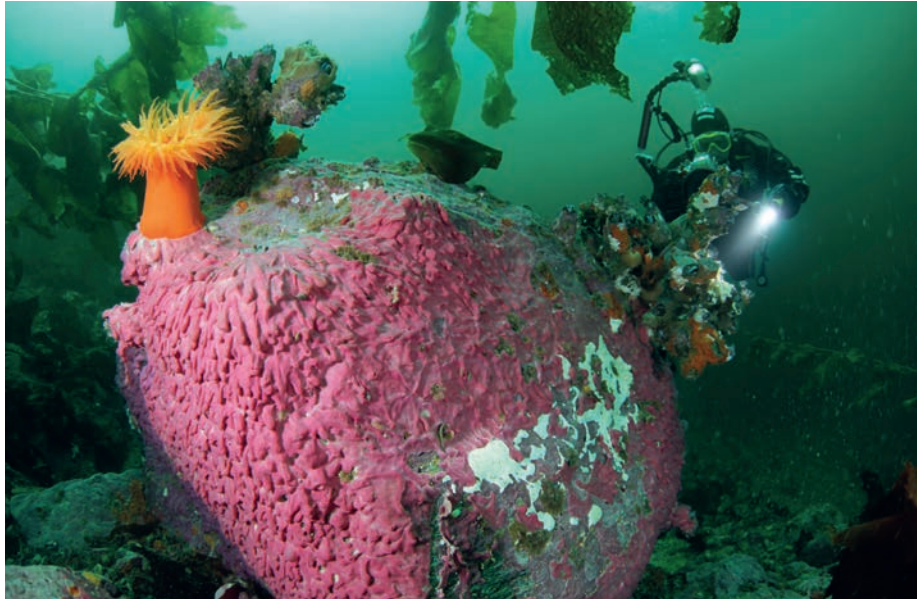
The third component is snow leopard population and diet monitoring. Our latest study shows that about one third of the snow leopards' diet in our area consists of domestic livestock.



One of the community members setting a remote camera. © BWCDO



www.bwcdo.org.pk  
shafqat.hussain@trincoll.edu



The channels of Central Patagonia host a large biodiversity including many eye-catching species such as this deep-water sea anemone *Actinostola chilensis*, and the pink sponge *Halisarca magellanica*. The diver is looking at the giant barnacles, *Austromegabalanus psittacus*, which grow up to 30 cm in length (top). © Vreni Häussermann

Remarkable formations in a Bermuda cave. © Jill Heinerth



Coral reefs are home to a diverse array of life, and sound plays an integral role in the functioning of the ecosystem. © Tim Gordon



**Shah Redza Hussein**

State Parks Director, Royal Belum State Park

## Saving the Malayan Tiger: The Royal Belum State Park Experience

The Royal Belum State Park in Malaysia is one of the most pristine and globally diversified tropical rainforests in the world. It is also one of the most important ranges and habitats for the Malayan Tiger, a critically endangered subspecies that exists only in the Malay Peninsula. The latest 2020 survey indicates a population of less than 200 individual tigers left globally. Besides habitat loss, the main threat for the species is organised poaching by syndicates involved in the international wildlife trade. In the last 10 years poaching has resulted in a more than 60% loss of the Malayan Tiger.

Within the Royal Belum State Park lives the Jahai indigenous community. In 2019 the State Park embarked on setting up the 'MENRAQ' Jahai Indigenous Wildlife Patrolling Team. Menraq means 'people' in the local Jahai language. The aim is to have a true community-based conservation programme that will ensure the indigenous community's buy-in to conserving the Malayan Tiger in particular, and biodiversity in general. Only through indigenous community participation utilising local knowledge, supplemented by technical training, knowledge and experience sharing, packaged with economic benefits to the community, can any long-term conservation protection work be sustainable and successful.



Awareness raising at the village (top) and MENRAQ Graduation Day. ©MENRAQ



[www.rimau.ngo/menraq](http://www.rimau.ngo/menraq)



**Greta Francesca Iori**

Director of Programme Development, Regional Lead Horn of Africa, Elephant Protection Initiative Foundation

## Human-Elephant Coexistence

As human, agricultural, industrial, and climatic pressures continue to increase on our natural resources – including the consequences of our structures of capitalism and consumption – the reality is that wildlife and nature will simply not congregate where we expect to find it. Wildlife, just like us, will continue to adapt to threats in order to survive, often ending in fatal encounters for both people and wildlife.

It's clear that we must seek transformative ways forward that are rooted in environmental, racial and social justice; strategies that acknowledge the severe inequality, poverty, and contested land use, which continue to expand in and around areas where humans and non-humans compete for resources to survive. We will never succeed if we only protect biodiversity for biodiversity's sake, or if we believe that we can create structures that move beyond the age of 'humans'. We must instead have the courage as conservationists, as leaders, as human beings, to define new ways of coexisting with each other.

No 'one size fits all', especially for how we mitigate and reduce human-wildlife conflict across landscapes, but what is certain is that we must influence policy, leaders, and systems to tackle the social inequality perpetuated by unequal access to natural resource management, sometimes fueled by the very protected areas we need to safeguard.



© Elephant Protection Initiative Foundation



[www.elephantprotectioninitiative.org](http://www.elephantprotectioninitiative.org)



**Dereck and Beverly Joubert**

National Geographic Explorers-at-large

**The Visual Extravagance of Biodiversity**

National Geographic Explorers-at-large, filmmakers, photographers and conservationists Dereck and Beverly Joubert have for 35 years used the word biodiversity almost as a mantra. In the large African landscapes in which they work, the contribution that each individual animal makes to the ecosystem, and by extension the continent's biodiversity, is extravagantly visual as wildebeest fall to lions, as gazelle are tumbled to the ground, and yet flourish in their millions.

Their combination of visual artistry, scientific experience, and understanding of biodiversity and how best to serve it so it can also flourish, comes out in this talk.



www.wildlifefilms.com  
 www.greatplainsfoundation.com  
 www.greatplainsconservation.com  
 production@wildlifefilms.co



**Amanda Kahn**

Assistant Professor, Moss Landing Marine Laboratories and San Jose State University

**The Secret Lives of Sponges: Understanding Ancient Animals at their Own Pace**

To effectively conserve something we must first understand it. My research aims to explore the secret lives of sponges – what they contribute to their ecosystems and the timescales they operate on, with a special focus on the deep sea. Sponges are animals. They eat microbes that are too small for most other animals to capture, creating a bridge between animal food webs and the microbial realm. In the deep ocean, that bridge allows sponges to act as oases for other animals in an otherwise food-starved environment.

Sponges are an exercise in contrasts. There is much we do not know about these often-overlooked animals, yet they form the foundation for whole, unique communities throughout the world's lakes and oceans – including vast sponge gardens and sponge reefs in the deep ocean. Sponges can grow into impressive, metres-tall structures with bodies supported by fragile glass skeletons.



Sponges like the cloud-shaped *Farrea occa* (bottom) and chalice-like *Heterochone calyx* (top) create unique reefs that support a variety of fish and invertebrates, including squat lobsters (orange). Hecate Strait glass sponge reefs, British Columbia, Canada (depth 170 m). © Sally Leys / Fisheries and Oceans Canada

They lack nervous systems, yet can sense and respond to stimuli. They do not have muscles, yet can move with organised behaviours. They can live for hundreds of years, yet are sensitive to subtle changes in the environment around them, including those caused by human activity. This is all done at their own slow pace: a sponge can contract to protect itself from disturbances but this process can take hours or even days rather than seconds. Just as with coral reefs, there is an entire community of biodiversity that relies on processes mediated by sponges.



**SJSU** SAN JOSÉ STATE UNIVERSITY

www.mlml.sjsu.edu  
 akahn@mlml.calstate.edu

SPEAKERS

SPEAKERS







### Krithi K. Karanth

Chief Conservation Scientist and Executive Director, Centre for Wildlife Studies. Rolex Laureate, National Geographic Emerging Explorer

## Transforming Human-Wildlife Interactions through Mitigation, Compensation and Education

India is a high-wildlife and high-conflict country, with ~100,000 incidents of conflict being reported. I will share how our award-winning conservation programmes Wild Seve, Wild Shaale, and Wild Surakshe are transforming human-wildlife interactions in the Western Ghats.

Wild Seve is designed to build tolerance towards wildlife and reduce incidences of human-wildlife conflict such as crop loss, livestock depredation, property damage, and human injury/death for people living around parks. Since Wild Seve's initiation in 2015, we have helped people from 600 villages file almost 18,000 claims.

Launched in 2018, Wild Shaale aims to increase environmental literacy, inculcate interest in and foster tolerance towards wildlife and wild places in rural children living around parks. In 18 months, the programme reached more than 20,000 children and 407 schools near eight wildlife reserves in India.

In 2020, we launched Wild Surakshe, our public health and safety programme which engages with frontline government department staff, grassroots community organisations, and leaders, to understand and cope with zoonotic diseases and human-wildlife conflict. Participants learn about public health and safety as well as coping with difficult situations. Up until now, we have implemented 150 workshops and interacted with more than 4,000 people from several organisations.

Together, these large-scale programmes have created multiple ways in which we have enabled communities to cope with losses, protect their lives and livelihoods, and inspired people to coexist with wildlife.

SPEAKERS



Wild Surakshe public health and safety programme. © Saritha / DL CWS



www.cwsindia.org  
krithi.karanth@cwsindia.org



### Lucy Kemp

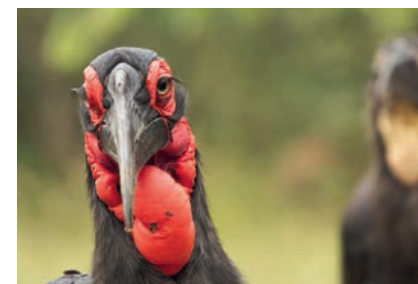
Conservation biologist, Project Manager of the Mabula Ground Hornbill Project, Co-Chair (Africa) IUCN SSC Hornbill Specialist Group

## Conserving Africa's Thunderbird

The Southern Ground-hornbill is both an ecological and cultural icon in Southern Africa. A top-order predator, it is well adapted to consume even the most venomous snakes like black mambas and puff adders. It is also known in the sub-Saharan African range as the rain or thunderbird by the people who share its landscape. Closely associated with the first good rains of the season and because of this perceived power, it is culturally protected in some of the range.

Our work is to restore populations of Southern Ground-hornbill in South Africa through the reintroduction of groups in areas where they were previously locally extinct. To do this we use artificial nests, incorporate indigenous knowledge systems into formal conservation planning, conservation education and awareness, and support capacity building for individuals and communities. We are harnessing the energy and love of all South Africans as both citizen scientists, and custodians, to ensure a future for this endangered species.

SPEAKERS



Picture of an adult Ground-hornbill and a juvenile in the background. © Hein Nel / Mabula Ground Hornbill Project



School learners wearing masks they made during our school education outreach programme. © Nthabiseng Monama / Mabula Ground Hornbill Project



www.ground-hornbill.org.za  
project@ground-hornbill.org.za



### Clarine Kigoli

Capacity trainer at Zoological Society of London, based in Kenya

## Using SMART to Improve Conservation Effectiveness – Case Studies in Kenya

I will be presenting on SMART which in full is Spatial Monitoring and Reporting Tool, a law enforcement and monitoring tool. SMART LEM enables the collection, storage, communication, and evaluation of data on patrol efforts, patrol results, and threat levels. When effectively employed to create and sustain information flow between rangers and conservation managers, SMART LEM can help to substantially improve protection of wildlife and their habitat.

The SMART approach for adaptively managing conservation areas is employed at more than 900 sites worldwide, most of them formal government protected areas. I will be showing how SMART has helped improve conservation effectiveness in Kenya, highlighting a few sites where SMART has driven significant organisational efficiencies and provided reliable, valid evidence that has been used to demonstrate impact and secure funding for conservation.



Photo taken after patrol in Sapo National Park, Liberia. © Clarine Kigoli



[www.smartconservationtools.org](http://www.smartconservationtools.org)  
[www.zsl.org/conservation/regions/africa/kenya-conservation-work](http://www.zsl.org/conservation/regions/africa/kenya-conservation-work)



### William Kostka

Executive Director, Micronesia Conservation Trust (MCT)

## Building on Successes to Meet the Micronesia Challenge 2030 Goals

Due to a rare combination of geographic isolation and biological diversity, the islands of Micronesia are exemplary microcosms for conservation, with some habitats and natural communities found nowhere else on Earth. Yet the features that make these islands exceptional continue to make them especially vulnerable to environmental threats such as unsustainable fishing practices, introduction of invasive species, unsustainable land-use practices and the ongoing effects of climate change.

In response to these threats, the executive leaders in the region launched the Micronesia Challenge (MC) in 2006 as a shared commitment to effectively manage and protect at least 30% of nearshore marine resources and 20% of terrestrial resources across Micronesia by 2020. Since then, the MC has served as a catalyst for a web of mutually reinforcing projects and peer-learning networks designed to improve the condition and management of ecosystems, and the natural resources



© Micronesia Conservation Trust (MCT)

Micronesians rely upon. Reflecting the region's diverse resource tenure systems and traditional management practices, national and sub-national government agencies with policy, regulatory, and enforcement mandates partner with NGOs providing conservation and community outreach and mobilisation skills. Together, they work with communities and traditional leaders to manage resources, conserve biodiversity, and increase ecosystem and community resilience to climate change. In 2019, the Micronesian leaders reaffirmed their commitment to these efforts by signing the Micronesia Challenge 2030 (MC2030) to protect at least 50% of nearshore marine resources and 30% of terrestrial resources by 2030.



[www.ourmicronesia.org](http://www.ourmicronesia.org)  
[www.micronesiachallenge.org](http://www.micronesiachallenge.org)



### Indira Dayang Lacerna-Widmann

Chief Operations Officer,  
Katala Foundation Inc.  
Whitley Award Winner,  
Gold Awardee, NEZS

## Soaring High: The Plight and Success of Conserving the Philippine Cockatoo

The Philippine cockatoo, known as ‘Katala’ or ‘Abukay’, is one of the most threatened parrot species globally, and the only cockatoo species which has its entire range in the northern hemisphere, found in the Philippines, to which it is endemic, as the name implies. It is listed by the IUCN as ‘Critically Endangered’. The main reasons for its collapse were habitat loss and poaching for the pet trade. In addition, it was persecuted as an agricultural pest in some areas.

In 1998 a group of people, which later founded the Katala Foundation, Inc. (KFI), started a comprehensive conservation programme to rescue the species from extinction. At its core remains the wildlife warden scheme which employs ex-poachers as protectors of the cockatoo. Benefits of this approach were threefold: firstly, poaching as one of the main threat factors was immediately removed; secondly, with the help of the ex-poachers, the programme gained valuable local knowledge on the biology of the cockatoo, location of nest trees, even how to treat and feed rescued birds; and lastly, ex-poachers, who often belonged to marginalised sectors in their communities received a small but stable income and developed pride in being a vital part of an increasingly acknowledged conservation effort.

The Philippine Cockatoo Conservation Programme (PCCP) employs a wide range of tools including the establishment and management of protected areas, conservation research and education, provision of alternative livelihood, habitat restoration, and reintroduction. Our strategies are replicated in the conservation of other flagship species that we work with.



Cockatoo. © B. de Laender



[www.philippinecockatoo.org](http://www.philippinecockatoo.org)  
[www.katalafoundation.org](http://www.katalafoundation.org)  
[kficacatua2016@gmail.com](mailto:kficacatua2016@gmail.com)



### Marco Lambertini

Director General,  
WWF International

## Nature-positive by 2030: A Global Goal for Nature

We have a clear global goal on climate, to address climate change. It's about limiting global warming to 1.5 °C by becoming a carbon-neutral, net-zero emissions society by 2050.

We also need a global goal to halt and reverse nature loss. Climate and nature are the two interdependent sides of today's ecological crisis, and both need to be addressed with equal ambition and determination.

A global goal of being nature-positive by 2030, achieved through net-zero loss of nature from a 2020 baseline, and reaching a net-positive result

“Climate and nature  
both need to be addressed  
with equal ambition and  
determination.”

by the end of the decade through a nature restoration agenda. In simpler words, we need to stop losing nature and restore what we can, so that by the end of the decade we have more nature than we have now, not less.

The goal could be measured through metrics based on species extinction, wildlife populations, habitat extent and integrity. Such a shared and clear time-bound goal is key to align everyone to the same level of ambition so that governments, businesses, investors and consumers can all contribute towards, and be held accountable for, achieving it.

The science is clear. And the solutions are increasingly clear too. We must now agree on a bold and ambitious global action plan to reverse nature loss by 2030 and secure a nature-positive, carbon-neutral society as the foundation for a sustainable and equitable future.



[www.panda.org](http://www.panda.org)



A rhino is blindfolded to reduce stress during relocation. The goal is to protect the animal from poachers. © Beverly Joubert / Rhinos Without Borders

Minke Whale © John Weller



Bat Murcifruta.  
© Rodrigo Medellín



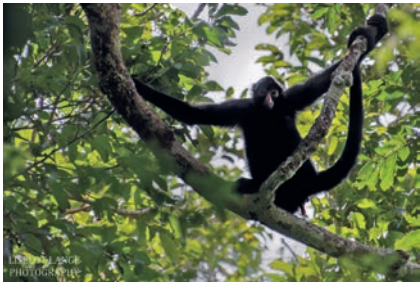
## Liselot Roos Lange

Owner and founder, MAQUISAPA E.I.R.L. Head of Operations, Junglekeepers Peru

## Primates in Las Piedras, Peru

It is probably safe to say that most people have heard of the Amazon rainforest, the lungs of our planet. But how many of us have an actual idea of what goes on in the Amazon? When I first travelled to Puerto Maldonado, Peru, I flew right over the Amazon. It suddenly became clear to me what news items had been trying to show me for years. I never really understood the scale of it, until I saw it myself: large strips of forest cleared for agricultural purposes; continuous stretches of desert-like areas, where gold miners left completely exhausted and contaminated ecosystems behind. I couldn't understand how this large-scale deforestation was not halted.

Even after five years of working and living in the Peruvian Amazon, I feel like my knowledge on the problematics and politics concerning the Amazon is only scratching the very surface. But I know we cannot blame the local people for the destruction which is mostly caused by international demands for gold, beef, timber, and soy. Working for the NGO Junglekeepers Peru and with my personal project MAQUISAPA, I'm aiding in the conservation of an important biodiverse area of the Peruvian Amazon, the Las Piedras region. Junglekeepers works with a team of Peruvian forest rangers who make sure that over 20,000 ha of Las Piedras are actively protected. With MAQUISAPA I create jobs for local and indigenous people and conduct environmental education projects in local communities. This is my contribution to conservation of the Amazon, and I strongly believe no matter how small or simple, every act helps. You can help too, by buying sustainable and recycled products and eating locally sourced meat!



Spider monkey (*Ateles chamek*) in Las Piedras protected forest. © Liselot Lange



www.junglekeepers.org  
liselotlange@gmail.com  
maquisapa.peru@gmail.com



## Jeneria Lekilelei

Director of Community Conservation, Ewaso Lions. National Geographic Explorer

## Cultures of Coexistence: Mentoring the New Warriors

I was born and raised where there is wildlife. But I never went close to it because I thought most animals were dangerous and often I didn't even notice them. I only saw the negative side of wildlife. I used to herd goats and cows and would see elephants and gazelles in the distance. I would see lion tracks and hyaena tracks but never liked them. I have changed so much now. I really love lions since I came to learn about their situation and how they are threatened. I have a passion for them. Lions are like my cows now. They are my driving force. If the lions need help, I can't say "I will do it tomorrow." That is the day I will help them – immediately. If I stop, and conflict happens, it would be very hard. This pushes me on.



Jeneria with Junior on the left (Jeneria's mentee transitions to become a warrior). © Ewaso Lions

I am a Samburu elder now. This is my land and this is my wildlife. I will always find a way to protect this land, its wildlife, my community and our livestock. I know there is a balance here and everything

I do is about finding this balance. It is my responsibility to do this. I don't do it with force – everything I do is through talking calmly with my community. We have to save these lions – lions are now in my bloodstream and I have to do everything I can.

We want to keep having lions in the future and to do so, we need to keep building community capacity and working with children. We are bringing new warriors on board – especially now as there has been a transition with new warriors coming and others like myself becoming elders. I want everyone to take ownership of lions and wildlife. It's not just about me and my team, it's the whole community. We ALL need to save lions.



www.ewasolions.org  
info@ewasolions.org



### Binbin Li

Assistant professor of Environmental Science, Duke Kunshan University. Explorers Club EC50

## Protecting Panda Habitat from the Encroachment of Livestock Grazing

Umbrella species have been an important element in conservation. Giant pandas are one of the most famous umbrella and flagship species in the world. With the vast amount of resources which have been put into the iconic and endangered giant panda conservation, we asked, would this benefit the other species or not? Our work showed that 96% of panda habitats overlapped with endemic centres in forests. By protecting panda habitats, we could protect 70% of endemic forest birds, 70% of mammals and 30% of amphibians.

However, livestock grazing has become the most prevalent human disturbance in giant panda habitats. In this project, we are looking at the impacts of free-ranging livestock in panda habitats, socio-economic drivers for increasing livestock in forests, and potential solutions. We are seeking a balance of local community development, use of sustainable natural resources and panda conservation.

“Livestock grazing has become the most prevalent human disturbance in giant panda habitats.”

www.dukekunshan.edu.cn  
bl113@duke.edu



### Cara Lin

National Coral Reef Management Fellow

## A Tropical Trifecta: Biodiversity in Connected Marine Ecosystems

In my experience in marine science and education, I have been so fortunate as to explore areas where coral reefs, seagrasses, and mangroves exist as connected ecosystems. Mangrove roots, seagrass blades, and corals all provide complex 3D habitat for organisms to shelter in. Many types of wildlife move between these habitats during different points of their life for food and shelter, such as rabbitfish, barracudas, and sharks. Some animals such as sponges, shellfish, worms, and snails also use seagrasses and mangroves as a surface to attach to or graze on. All three of these ecosystems work together to support fisheries and provide coastal protection by absorbing wave energy.



A land crab found among mangrove roots. Many crab burrows can be found in the sediment nearby.  
© Cara Lin

Seagrasses and mangroves are often overlooked compared to coral reef ecosystems despite their critical role in coral reef health. Poor water quality is often a major local stressor to coral reefs. Sewage input may increase rates of coral disease or spur the overgrowth of crown-of-thorns starfish, a voracious coral predator. Loose sediment, not stabilised by plant roots either on land or in water can smother corals. Seagrasses and mangroves both help to absorb pollution and trap and stabilise sediment particles. A ridge-to-reef approach to coral conservation incorporates protecting terrestrial forests, mangroves, and seagrasses to maintain proper water quality.

On a global scale, seagrasses and mangroves store large amounts of carbon, mitigating climate change, the greatest threat to coral reefs. In my fellowship work in Guam, I aim to enhance coral reef resiliency by supporting seagrass and mangrove health through research, education, and outreach.



www.guamcoralreefs.com  
www.hcas.nova.edu/fellows/index.html  
clin1@nova.edu



### R. Isaí Madriz

Entomologist, zoologist,  
National Geographic  
Explorer, Fulbright Fellow,  
solo expeditionist in remote  
Patagonia

## Six-Legged Jewels of Patagonia

I am an early career entomologist with expertise in the freshwater aquatic insects of Patagonia. My work requires me to transect some of the most remote and unexplored areas of Patagonia alone using a bamboo bicycle and a pack raft in search of some of the rarest insects on the planet. I carry over 30 kilos of equipment to document the unique biodiversity of Gondwanan insects of the region, while setting off to find and explore the last pristine forests remaining in Patagonia to better understand relict groups (living fossils).

To bring attention to the conservation of insects in this area of the world, I write stories on the diversity of vanishing insects, on exploration and science, using macrophotography to showcase the six-legged jewels of Patagonia. I develop free educational materials based on my findings for rural schools across the region.

My work aims to include insects in biodiversity protection programmes in Chilean Patagonia before Patagonia's endemic biodiversity is transformed forever.



In search of endemic aquatic insects in glacial-fed stream in Patagonia.  
© Anand Varma



This mayfly (*Chiloporter eatoni*) is the only surviving species of the subfamily Chiloporterinae. Endemic to Patagonia, this carnivorous nymph can only be found in well oxygenated rivers and large streams of southern Chile and Argentina. © R. Isaí Madriz



### Onkuri Majumdar

Managing Director, Freeland.  
National Geographic Emerging  
Explorer

## Wildlife Crime and its Links to Pandemics

The illegal wildlife trade is estimated at several billion dollars annually, and is dominated by international crime syndicates. This organised crime is largely unseen and unknown, even though it intersects with our lives in myriad ways – from a breakdown in governance and an increase in corruption, to economic losses, the unravelling of ecosystems, and the potential for spreading zoonotic diseases. It is largely a low-risk high-profit crime, with syndicate bosses amassing wealth and assets through their illegal enterprises.

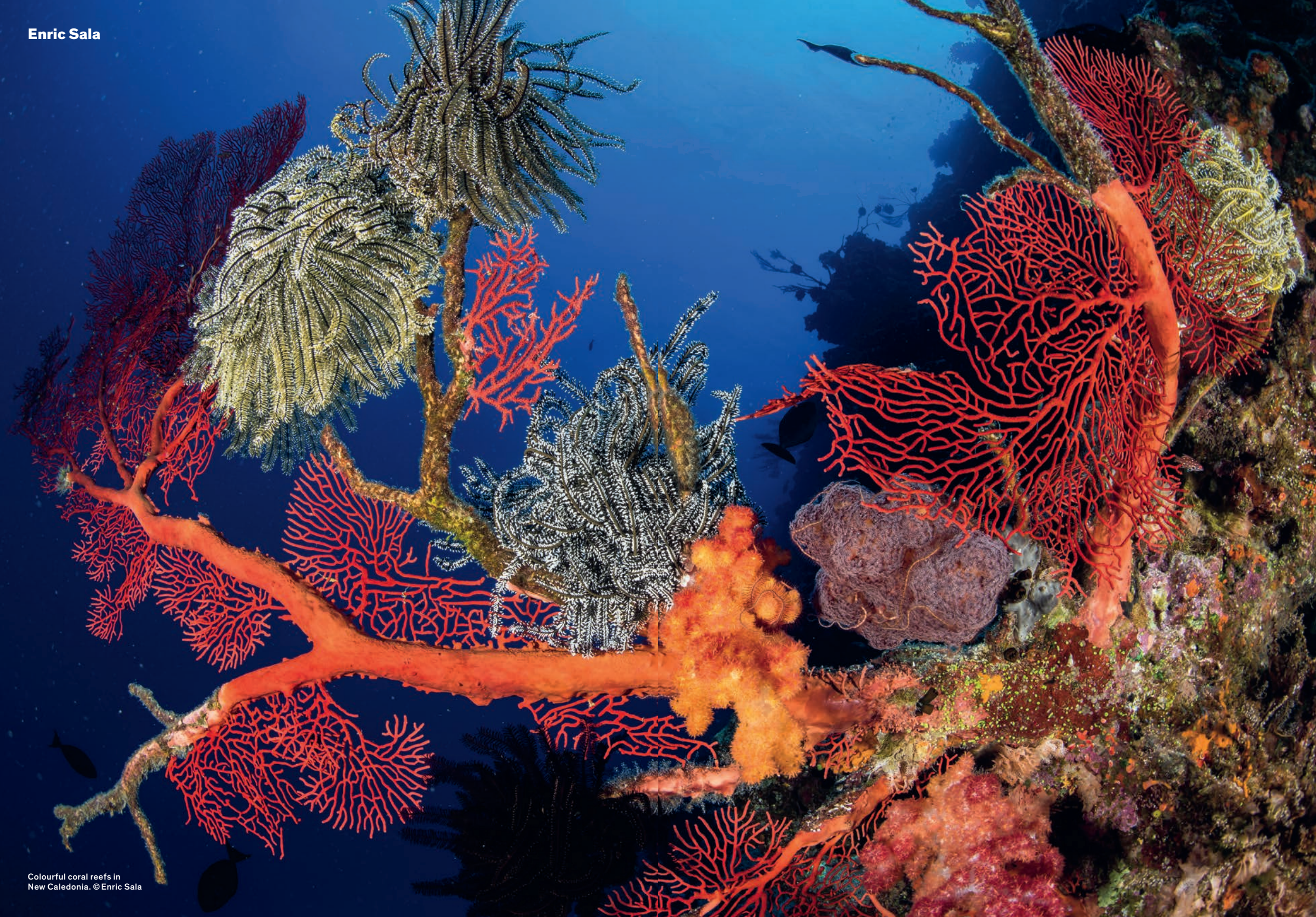
In my talk we will explore some of the drivers of illicit trafficking, its impacts, and potential solutions – with a particular emphasis on pandemics. We will look at ways of empowering civil society and law enforcement, of engaging with non-traditional sectors such as aviation and banks, and at technology tools that enable everyone to become a frontline reporter of wildlife crime.



Lion bones from Africa seized at airport, Thailand. © Freeland fo all

This is an urgent and immediate problem, and the cost of ignoring it could be more pandemics. COVID-19 and other novel disease outbreaks have been triggered by accelerated wildlife trade and decreasing wild habitat. Unless these root causes are duly addressed in post-pandemic response strategies, any stimulus package will amount to expensive 'band-aids' that need frequent changing because today's new vaccine will not work against tomorrow's new virus.









### Juan Mayorga

Marine scientist, National Geographic Pristine Seas and Environmental Market Solutions Lab at the University of California Santa Barbara

## A Global Blueprint for Ocean Conservation

The ocean is in big trouble and so are we. Overfishing, climate change, habitat destruction, and pollution are severely compromising marine biodiversity and, with it, the ocean's ability to provide us with two critical services: food and climate regulation. Marine protected areas (MPAs) are a proven cost-effective solution to give marine life a chance to bounce back, to increase the well-being of coastal communities through replenishment of fisheries and the development of non-extractive livelihoods such as tourism, and to safeguard the carbon that the ocean has been storing for millennia from re-entering the atmosphere.

“Marine protected areas are a proven cost-effective solution to give marine life a chance to bounce back.”

Political momentum – backed by consensus among scientists – is building to propose a global target to protect at least 30% of the ocean by 2030. But which 30%? The answer, as usual, is it depends. We have created a framework for decision makers to identify the most important places to protect given social preferences for three key objectives: conserving biodiversity, increasing food provision, and

safeguarding carbon. We find that it is possible to simultaneously achieve these objectives if we strategically place and properly enforce protected areas, and that all coastal nations have an important role to play to ensure humanity continues to enjoy a healthy, thriving, and bountiful ocean.



[www.nationalgeographic.org/projects/pristine-seas](http://www.nationalgeographic.org/projects/pristine-seas)  
[emlab.msi.ucsb.edu](http://emlab.msi.ucsb.edu)



### Moreangels M. Mbizah

Conservation biologist. Founder and Executive Director, Wildlife Conservation Action. TED Fellow, Mandela Washington Fellow

## Community-based and Locally Led Conservation is Key for Biodiversity

Although my career started off with a focus on understanding the ecology and behaviour of large carnivores, I quickly realised the critical role that local communities can play in biodiversity conservation. Therefore, my current work is mainly focused on finding the most sustainable and innovative solutions for coexistence between humans and wildlife, as human-wildlife conflict is a serious threat to the survival of many endangered species and the security and sustainability of community livelihoods. When I got a chance to give a TED Talk on the grandest stage in the world, I took the opportunity to spread the idea ‘How

community-led conservation can save wildlife’, where I highlighted the critical role local communities can play in winning the battle against biodiversity loss.



Setting up a camera trap to study abundance and distribution of large carnivores in a wildlife area in Zimbabwe. © Moreangels M. Mbizah

The reason I formed Wildlife Conservation Action (WCA) was to provide a platform for local conservationists and local communities to lead in conservation efforts, as I realised that there were very

few locally led and community-based conservation organisations in my country and indeed across Africa. WCA is working with local communities living alongside wildlife to build their capacity to protect and coexist with wildlife while protecting and improving their livelihoods. We strongly believe that conservation works best when local communities actively participate in conservation efforts and make decisions about the management and protection of their resources. An investment in conservation and leadership training of the next generation of Africa's conservation leaders is also critical for successful conservation outcomes on the continent.



[www.wildlifeconservationaction.com](http://www.wildlifeconservationaction.com)  
[www.moreangelsmbizah.com](http://www.moreangelsmbizah.com)  
[moreangelsm@gmail.com](mailto:moreangelsm@gmail.com)



### Emily McKenzie

Head of Evidence and Policy,  
Economics of Biodiversity  
independent review team,  
UK Treasury

## The Economics of Biodiversity: The Dasgupta Review

Biodiversity is declining faster than at any time in human history. These losses pose significant risks to our economies, livelihoods and well-being. The economic consequences of biodiversity loss are, however, still often misunderstood or overlooked. To help address this, in the Spring of 2019, the UK government Treasury commissioned an independent, global review on the economics of biodiversity – The Dasgupta Review – led by Professor Sir Partha Dasgupta, Emeritus Professor of Economics at the University of Cambridge.

The Review presents a new and comprehensive economic framework that accounts for humanity's dependence on nature, grounded firmly in ecology and the earth sciences. The findings of the Review lead us to a simple truth: our economies are embedded within nature, not external to it. In doing so, the Review sets out the parameters for truly sustainable development that protects and enhances our prosperity and the natural environment.

The Review argues that engaging sustainably with nature requires urgent action across all levels of society. We need to change how we think, act and measure success. The Review sets out three broad transitions that are needed: to ensure that our demands on nature do not exceed its supply, and that we increase nature's supply relative to its current level; to change our measures of economic success to guide us on a more sustainable path; and to transform our institutions and systems – in particular our finance and education systems – to enable these changes and sustain them for future generations.

Nature is our home. Good economics demand that we manage it better.

[www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review](http://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review)



### Rodrigo A. Medellín

Senior Professor of Ecology,  
Institute of Ecology,  
University of Mexico.  
National Geographic  
Explorer, Rolex Laureate

## Our Nocturnal Allies: Why Bats Matter for Our Everyday Lives

Bats provide ecosystem services across the globe, touching the lives of all humans on Earth. When you drink coffee or tea, eat rice or peppers, or any sugar or corn-based foods, or when you wear any cotton clothes, bam! You are connected to bats. Why? Because bats are the most important pest controllers of these and many more crops! Three out of every four bats are insectivorous, and there are over 1,400 species in the world. Mexico has 10% of them. Between 20 and 30 million Mexican free-tailed bats populate northern Mexico. Each million of these bats consume 10 tonnes of insects every night. Mind-blowing? You bet! Now imagine

what would happen if we lost bats overnight. In a matter of months, all those unconsumed insects would end up eating all of our crops!



Pollinivorous bats are crucial for the reproduction of many ecologically and economically important plants.  
© Marco Tschapka

Many ecologically or economically important plants depend on bats for their pollination. From durians in South East Asia to ceiba trees to the very important agaves, bats are essential pollinators. Our

tequila, mezcal, pulque, and more here in Mexico, are due to bats pollinating these agaves. We have joined forces with the industry to produce bat-friendly tequila and mezcal! In sum, although bats have the most unfair negative image in the public eye, we owe much of our everyday comfort to them. Next time you have a sip of tequila, make a toast to the health and long life of bats. Without them our world would be dramatically different, much more boring, and incredibly challenging!



INSTITUTO  
DE ECOLOGIA  
UNAM

[web.ecologia.unam.mx/medellin/index.php/quienes-somos/rodrigo-a-medellin](http://web.ecologia.unam.mx/medellin/index.php/quienes-somos/rodrigo-a-medellin)



Canopy Hang-out. © Carlos Pérez Naval



Dasgupta Review logo.  
© Emily McKenzie



The economics of biodiversity.  
© Emily McKenzie



The economy embedded in the biosphere. © Emily McKenzie



Beetroot watercolor.  
© Maritza Morales Casanova



### Patrícia Medici

Coordinator, Lowland Tapir Conservation Initiative in Pantanal. National Geographic Explorer

## 25 Years of Tapir Conservation Efforts in Brazil

Patrícia Medici dedicates her life to the protection of South America's lowland tapir. Throughout her work, Patrícia has increased the knowledge on this poorly understood species which she refers to as 'gardeners of the forest'. Together with the IPÊ, a Brazilian research institution, she leads a long-term research and conservation programme on lowland tapirs.

In 2008, Patrícia launched the nationwide Lowland Tapir Conservation Initiative (LTCI) in Pantanal, Brazil, and she has been expanding her project to other parts of the country ever since. A project that has become the staple of tapir conservation in the country. The overall goal of the LTCI is to have tapir research and conservation programmes carried out in all four Brazilian biomes where lowland tapirs are found – Atlantic Forest, Pantanal, Cerrado and Amazon – and biome-based Tapir Action Plans developed and implemented.

The LTCI uses tapirs as ambassadors for the conservation of the biomes where the species occurs, catalysing habitat conservation, environmental education, communication, training and capacity building, as well as scientific tourism initiatives.



Patrícia Medici. © LTCI



www.tapirconservation.org.br



### Prashant Mohesh

Founder and Expedition Leader, The Oceanic Project

## Mauritius Under the Threat of Climate Change

As the founder and expedition leader of *The Oceanic Project*, I use the power of storytelling to explore and educate people about my findings and take action to protect our ocean.

Mauritius, which is known as 'heaven on Earth', is under threat of climate change. Less than 2% of our native forest remains and this is contributing to ocean acidification, coral bleaching and flash floods at an alarming rate. Our oceans are in need of help yet we ignore them. There is a whole alien world, teeming with life under the surface of the ocean and yet only 5% of it has been explored.



Marine debris (fishing lines) that I have collected while leading an expedition. These lines were stuck in corals at 16 metres deep. As a diver with a Specialty Certification by Project AWARE, I have recorded the debris in My Ocean Community. © Courtesy Prashant Mohesh

My island is home to incredible marine life but it is disappearing. It has been protected throughout decades by coral reefs acting as buffering barriers, reducing the waves' energy. But with climate change, our actions and behaviours are directly disrupting centuries of well-maintained biodiversity.

This underwater world is vital to our survival and with every minute that passes, we are losing this protection. We are losing a big part of paradise and it's time for us to take action. I believe we need to protect the ocean every day, not just when an environmental catastrophe happens. We must respect what we have and protect what remains. What we do today will have a long-lasting impact for the future generations.



moreshprashant@gmail.com



### Cecilia Montauban

Bat Ecology PhD student,  
Global South Bats Ambassador,  
ecological consultant

## Bats and Tech: Hidden Nocturnal Wonders

There is a hidden world out there that few people get to explore. At night, pristine natural habitats and cities alike become alive with nocturnal creatures that reveal some of the coolest adaptations and life forms on Earth.

For the past five years, I have dedicated my life to studying and conserving bats. This has taken me on the wildest adventures of my life in places like the Peruvian Amazon rainforest, the savannahs of Kenya, miombo woodlands of Zambia, underground hot caves of Cuba and the wild meadows of Romania. As a bat biologist, you get to explore these places after sunset when the nocturnal world awakens and even the smallest sounds are magnified around you. Studying bats means delving into a constantly evolving realm of wildlife technology and tools that help us uncover the lives of these fantastic mammals even in complete darkness.

Join me to explore the wonderful world of bats and discover what acoustic detectors, cameras, tracking technologies, and thermal imaging can show us about these unique nocturnal fliers.



Leisler's bats during bat box monitoring in London.  
© Cecilia Montauban



### Maritza Morales Casanova

President and Founder,  
HUNAB. Rolex Laureate,  
National Geographic  
Emerging Explorer

## No Education Means No Conservation

The contemporary history of environmental education is younger than my grandmother. The reason might be a lack of awareness among modern generations. When I was 10 years old, I launched a movement called HUNAB, which stands for Humans United with Nature in harmony for Beauty, Welfare and Willingness. We have developed a philosophy for life, a unique methodology that empowers and allows children and teens to take action through their own early-life-project.

If, as a child, you want to be an artist or a sportsman, there are schools and clubs to polish your talent, but where can you receive training to be an environmentalist from childhood? There weren't any places. That's why since 2013 I have run the Ceiba Pentandra Park, a unique place where you can join a high-performance training to be a 'Hero for Grandma Earth'.



The Labyrinth of water culture is a performance where two children instructors transform everybody into water drops (with imagination) and dance through the different process and places that a real water drop visits when in Yucatan. © HUNAB

Are you an educator or conservationist still complaining about people affecting nature? Most environmental education activities are not pedagogical, in fact they have the wrong message for the wrong audience. Why are we teaching adults' concerns? Is your speech hopeless and negative? According to my experience, young people need to be inspired and not scared. Enquiry leads to observe, discover and develop criteria. Instructors should be careful not to contaminate children's ideas. Stop teaching kids about climate change and start inspiring them about climate sciences. The more we know about ecosystems, the more we consider them as part of our identity and culture. Children's hands may be small but their hearts are huge to protect Grandma Earth.



www.hunab.info  
maritza@hunab.info



### Ricardo Moreno

Yaguará Panama President and Researcher, National Geographic Explorer, Smithsonian Research Associate in Panama

## The Jaguar in Panama

The jaguar (*Panthera onca*) is listed as ‘Endangered’ in Panama for several reasons, but the most significant are the loss of forest cover, and the conflict with human beings – the main cause of its population decline.

The Yaguará Panama Foundation is a scientific organisation dedicated to generating information through camera traps and data with GPS collars placed on felines. We look for viable alternatives for farmers, and translate all the data we generate into education campaigns in all the existing communication media in the country in a virtual or face-to-face way.

We have collected data on a minimum of 368 jaguars killed between 1989 and 2021, almost always in retaliation for predation on domestic animals. To mitigate the conflict and counteract its effects on the jaguar population, it is necessary to work with different actors, in particular the government, ranchers and local communities, and implement various short-term and long-term conservation strategies. We have generated information with camera traps in more than 30 sites in Panama, and have realised that the probability of occurrence of the jaguar is low in several places along the Atlantic forest corridor. Simultaneously and in parallel with scientific research, we develop environmental education and awareness programmes to increase reach and thus raise awareness among more people; this is the key to the success of the preservation of jaguars. In addition, for several years we have been working on different alternatives that have been tested to improve the coexistence between humans and jaguars in Panama.



Placing a GPS collar on a jaguar.  
© Josue Ortega

Talking to ranchers about anti-depredation measures and farm management plans. © Erasmo De Leon



www.yaguarapty.org  
rmorenopan@gmail.com



### Justin Mundy

Environmentalist



### Simon Zadek

Chair, Finance for Biodiversity

## Conservation Finance

Much remains to be done to ensure that biodiversity conservation and restoration receives the funding it needs on a consistent and sustainable basis. Some key issues are easily identified, such as the removal of the \$500 billion of subsidies that negatively impact the environment to the tune of \$4–6 trillion per year, and increasing conservation finance from \$80 billion to the required \$140 billion per year. And, making sure that the much heralded ‘green’ recovery actually has some green in it!

Encouragingly the world’s financial architecture is starting to move towards providing a framework to reward green investment and to discourage a business-as-usual approach. Regulatory processes, such as the Task Force on Climate-related Financial Disclosures and the emerging Taskforce on Nature-related Financial Disclosures require companies to define and demonstrate action in reducing their climate and nature risks; and, new carbon and ecosystem service markets are evolving, which will need to be based upon data-driven science-based targets.

“The wise stewardship of the planet is not up to others, it is up to us, day by day, choice by choice.”

Increasing digitalisation and the resulting democratisation of consumer purchasing allows individuals to take responsibility for their consumer choices and increases supply chain transparency. This may be transformational, as it means that people can not only pressure governments and their pension funds to take more proactive action to protect the planet’s ecosystem, it also gives the consumer responsibility and the ability to in effect crowdsource environmental markets and to have clear sight of the positive impact of their choice. This means that the wise stewardship of the planet is not up to others, it is up to us, day by day, choice by choice.





### Tiassa Samayin Mutunkei

Wildlife conservation activist.  
Founder, Teens4Wildlife

## The Power of the Youth

I believe that we, as the young generation, should come together and take charge of wildlife and wildlands before it's too late. We are not waiting for older generations to hand the power down to us – we take it, because the time is now. I cannot tell my kids that I'm the reason elephants are extinct. We must all come together to protect our heritage. Animals are Africans too, and we should use our voices to speak up for them.

I grew up in Nairobi. Coming from the Maasai and Kikuyu tribes of Kenya, I know that it is in my blood to be connected to animals, and I fondly recall my grandmother's numerous night-time stories, all of which revolved around animals.

At school, I started a wildlife club to raise awareness about the poaching of elephants for ivory, and then founded Teens4Wildlife, at the age of 15, to create a space for Kenyan and other African youth to discover the value of wildlife, and take action to protect it. We need to inspire young people and give them the tools they need to fight for wildlife conservation. We need to empower African youth to find and use their voices for wildlife.



© Sharon and Teddy Mitchener / Foto House

@Teens4Wildlife



### Luis Germán Naranjo

Conservation and Governance Director,  
WWF Colombia

## Underground Realities

As a birder, I have spent most of my life looking upwards, trying to capture the wonder of every single bird I come across. In the process, entire worlds have come alive before my eyes as every sight allows me to connect the dots of an ecological puzzle of which the life of birds is only a brilliant facet. Looking at them, I have learned about secret interactions among plants and animals, spied the camouflage of beetles and spiders, wondered about the lives of small mammals... And yet, I have remained oblivious to a whole universe lurking below my feet.

“Ecological processes taking place in the invisible forest underground are responsible for the biodiverse green world around us.”

Just within the unimaginable tangle of the roots of the trees and shrubs in my garden, thousands of small critters palpitate and work giving life to the wonders that absorb my attention above the ground. Earthworms, nematodes, Acari, Collembola, millipedes, spiders, woodlice, ants, and beetle larvae excavate tunnels through which air and rainwater penetrate. Some of them are predators, some others feed on roots and many more decompose the plant and animal litter coming from above. And all of them, together, combine inorganic and organic matter to renew the structure of the soil, ensuring its fertility.

Ecological processes taking place in the invisible forest underground are thus responsible for the biodiverse green world around us. Leaf buds in the branches of trees and shrubs are not only the result of photosynthesis: without the intervention of the myriad living beings in the soil, plants would not have the raw materials necessary for the production of the leaves, flowers and fruits on which birds, and birders alike, depend.



www.wwf.org.co  
lgnaranjo@wwf.org.co



## The National Kiwi Hatchery



**Emma Bean**

Manager, The National Kiwi Hatchery

## Saving our National Icon – One Egg at a Time

The flora and fauna of Aotearoa New Zealand evolved in isolation for 80 million years. Our species took on ecological roles that in other countries are usually filled by mammals, making them very vulnerable to predation by introduced mammals.

Just one hundred years ago, the kiwi numbered in the millions. Today, there are only around 25,000 brown kiwis left in the wild. An average of 27 kiwis are killed by predators every week – a population decline of about 2%. At this rate, the kiwi may disappear from the mainland in our lifetime.

The National Kiwi Hatchery is New Zealand's largest kiwi hatchery, hatching over 100 kiwi chicks per year – representing about 75% of all kiwi species hatched in kiwi facilities nationwide. We are a purpose-built kiwi incubation and hatching facility. Eggs are brought in from the wild, incubated, hatched and reared to a stoat-proof weight before being released back to where they came from as an egg. This increases chick survival rates from just 5% to 65%, growing wild populations and helping to achieve the national goal of reversing the population decline.

We have successfully hatched over 2,100 kiwi chicks since 1995, with an average hatch success rate of over 95%.



NGĀI TAHU Tourism

[www.nationalkiwihatchery.org.nz](http://www.nationalkiwihatchery.org.nz)



**Emma Nichols**

Marine Scientist,  
Adrift Lab Alumni

## One Ocean, a Whole Lot of Plastic

It's almost impossible to imagine a world without plastic. Yet, within just 70 years of mass production, the presence of this fossil-fuel-derived material now extends from the deepest ocean trench to the very air we breathe. Over 12.7 million tonnes of plastic enter the ocean annually through unregulated or ineffective waste management. Of this staggering amount, only a small proportion is found floating in the ocean's surface waters. So, where is the remaining plastic going?

Over time, some marine plastics can become beached on coastlines and islands. Remote and uninhabited islands where there are few (or no) direct human disturbances are then particularly valuable to researchers. These locations can provide important insights into the number of plastics that accumulate, the behaviour of ocean plastics, and how remote islands can act as indicators of marine pollution.



Henderson Island's East Beach littered as far as the eye can see with plastic marine debris.  
© Dr. Jennifer Lavers, 2015

Henderson Island is an extremely remote, uninhabited island in the South Pacific. I present the recent findings from a survey of plastics that litter one of the island's beaches and discuss how this pollution may be affecting the wildlife and marine life that inhabit it.

With increased awareness and education, we each can play our part in calling for positive change. Human activities that involve overfishing, invasive species introductions, pollution, and increased CO<sub>2</sub> emissions, have caused the ocean to tip outside of its natural balance. We, therefore, need more voices from around the world to stand up for the health of our oceans and, in turn, us.



[www.adriftlab.org](http://www.adriftlab.org)  
[ecn@utas.edu.au](mailto:ecn@utas.edu.au)





### Mercy Njobvu

Veterinary student, University of Zambia. National Geographic Young Explorer

## My Conservation Story

I am Mercy Njobvu, a National Geographic Young Explorer and a student of veterinary medicine at the University of Zambia. I grew up next to one of Zambia's premier national parks, South Luangwa. Upon learning about and seeing the impact of wire snares and poaching on wild animals, I decided to pursue a career in veterinary medicine to help save their lives. I am also interested in understanding the link between infectious zoonotic diseases in animals and humans, and the conservation of endangered wildlife populations.

In 2016, I took part in the Women in Wildlife Conservation Training Programme run by the Zambian Carnivore Programme. During this time, I gained experience in chemical immobilisation of large carnivores and herbivores for radio-collaring and de-snaring, large carnivore monitoring, community outreach and youth engagement activities.

My other interest is promoting the participation of young people, particularly young women, in science and conservation. My current project is focused on reducing the prevalence of rabies in eastern Zambia through mass vaccination of domestic dogs.



Vaccination of rabies of domestic dogs at Conservation South Luangwa. © Samson Moyo, trained photographer and filmmaker



### Geir Nordeng

Orchestra director, The Arctic Philharmonic

## How to Address Global Challenges through Music

The Arctic Philharmonic is the world's northernmost symphony orchestra and is based inside the Arctic circle, an area where climate changes represent early and visible consequences. Living in this area, the orchestra's awareness is also affected by this, both in programming and joint conversations within our organisation. How can music play a part in the public debate?

A good example is when we premiered the commissioned work *The Sound of the Arctic* at the Oslo Concert Hall in 2019. HRH The Crown Prince, several ministers and decision makers

were present. Before the concert we were able to address important issues in the current climate change debate. When Lasse Thoresen, the composer, visited Svalbard during periods over the years, he experienced climate changing close at hand. This inspired him to compose this extraordinary piece of music.



The Arctic Philharmonic at Svalbard: The orchestra co-hosts a yearly chamber music festival in the polar island. © Arctic Philharmonic

The Arctic Philharmonic often commissions new music, and through these commissions we focus on issues we consider important. The orchestra has a special focus on the Sami culture, and the importance it has in our region. The Sami population has a strong focus on sustainability in their culture and way of living. The orchestra often cooperates with Sami artists and organisations, and we are now preparing a production about Nils-Aslak Valkeapää, who focused on how art can create involvement around nature and the climate change people create.

Geir Nordeng had several years of experience as commander of The Norwegian Army Band, before he joined the Arctic Philharmonic as orchestra director in 2019.

Arctic  
Philharmonic

[www.arktiskfilharmoni.no/en](http://www.arktiskfilharmoni.no/en)



### Holly O'Donnell

Director of Research, ACEER Foundation. Expedition guide, Tamandua Expeditions

## Life in the Amazon: Fieldwork, Frogs and Short-eared Dogs

Every day I marvel at the vastness of life in the Amazon, one of the most biodiverse places on Earth. A place of wonder for those who love nature, adventure, and exploration. Jaguar, tapir, the giant anteater, rarely seen but leaving signs all around. Harpy eagles high above, hidden from view by the thick canopy. Bushmasters concealed under fallen palm fronds. Red-tailed boas curled on branches overhead. Screaming piha, perpetually present and yet always just out of sight.

But the Amazon faces more threats than ever before. The river that once felt remote is becoming busier each year with boats. Roads cut deeper into the forest. Truck after truck full of the threatened hardwood Shihuahuaco leave the rainforest unchecked. Peruvians have their land invaded by other Peruvians, desperate to make a living. Uncontacted tribes are emerging, facing the threat of oil exploration and timber extraction. Gold mining leaves craters in the earth: land left stagnant, contaminated, void of life. Protecting the forest means protecting people: providing alternative livelihoods, exploring sustainable resource extraction, engaging local stakeholders, and maintaining a healthy forest for future generations.

My journey as a conservationist began with a video of Jane Goodall, posted through the letterbox when I was 8 years old. She inspired me into believing that I could make a difference. As a researcher I hope to collect data with conservation value. As a storyteller and guide I hope to inspire people to care about the Amazon. Communication is key which is why events like the Global Biodiversity Festival are so valuable.



Kaypok Tree (top) and Amazon Horned Frog (*Ceratophrys cornuta*), also known as the Pac Man Frog, which feeds on rodents. © Holly O'Donnell



www.aceer.org  
hollyodonnell146@gmail.com

## OI Pejeta Conservancy



### Eva Kimani

Education coordinator



### James Mwenda

Ranger and northern white rhino keeper

## From the Brink of Extinction

Extinction has become an ever-present matter of global concern, a close reality to us here at OI Pejeta Conservancy. Various species sheltered in the conservancy and present in the region are listed among the 'Critically Endangered' or 'Vulnerable' by the International Union for Conservation of Nature (IUCN).

From the eastern black rhinos to the Grévy's zebra, these animals face a myriad of threats including poaching and habitat loss. In 1990, less than 300 eastern black rhinos roamed across Kenya, a significant decline from 20,000 in the 1960s, due primarily to poaching. Following rehabilitation and greater protection of the species through the Kenya Rhino National Strategy 2030, the number now stands at over 800. OI Pejeta Conservancy is home to 17% of the total population in Kenya, due to its conservation and high security efforts. It represents the largest black rhino sanctuary in East and Central Africa.

Following the death of Sudan, the last known male of its kind in 2018, the northern white rhino species has since been declared functionally extinct. Two last females remain. Mother and daughter, Najin and Fatu, are now the focus for scientists and conservationists running against time to bring back the subspecies of the white rhino. They have resorted to artificially assisted reproduction techniques, in-vitro fertilisation and stem cell technology, in a bid to secure the future of the subspecies.



www.olpejetaconservancy.org



### Hotlin Ompusunggu

Dentist. Co-founder, Alam Sehat Lestari. Founder and Director, Healthy Planet Indonesia. National Geographic Explorer

## Healthcare Incentives to Save High Biodiversity Rainforest in Sumatra

I am a licenced dentist from Sumatra. In 2007 I co-founded ASRI, (Alam Sehat Lestari), a non-governmental organisation in West Borneo, Indonesia. We combine conservation and health care in the 1,100 km<sup>2</sup> Gunung Palung National Park, in remote Southwest Borneo by giving local people healthcare incentives to preserve the globally important rainforest.

My goal has always been to work together with underserved communities as part of my commitment to community development and at ASRI I became increasingly passionate about conservation as well. In 2019 I started another NGO in North Sumatra, Healthy Planet Indonesia (HePI) to replicate the integrated healthcare-conservation approach that was pioneered in western Borneo. Wherever biodiversity is endangered human health is likewise threatened. This approach will be pioneered and adapted in two forest landscapes of northern Sumatra to reduce deforestation and forest degradation.

My passion lies at the intersection of human and environmental health as I came to believe that development is not complete without including the environment and ensuring sustainability of life. Not only can we have healthy people and a healthy environment, but the two are fundamentally interlinked.



Seedling from patient pays with non-cash payment. © Andy Gultom



<https://healthyplanetid.org>  
healthy-planet-indonesia-  
smartcommunity.hub.arcgis.com  
hotlinjro@gmail.com



### Peter Ong

Photographer and advocate.  
Founder, Project Monyet.  
Head of Outreach and Education,  
Roots & Shoots Malaysia

## Project Monyet – Discovering and Sharing of Malaysia’s Primate Biodiversity

It all began when Dr. Jane Goodall visited Malaysia in 2017 and asked the question “How are Malaysia’s primates doing?”

Apart from the orangutan, very little is still known of the 25 primate species we have in Malaysia. Some are still classified as ‘data deficient’ by the IUCN, and some have fewer than 10 usable hi-res photos. After much digging and as I became more aware of the threats our primates faced, I asked myself and some researchers what could be done to help as my background is actually in theatre, although I always had a passion for photography. And that’s

what was needed now: good hi-res photos and more outreach work to be done.

Many Malaysians have no idea how much biodiversity we have and most have never seen any other primate except for the orangutan and the long-tailed macaque. Many of our primates remain faceless and voiceless.



Gibbons, the lesser apes, are only found largely in South East Asia but for most part remain an invisible species, unlike their great ape counterparts. Many, like this Lar Gibbon, are highly trafficked in the illegal wildlife pet trade winding up in private zoos and collections as far away as the USA. All of Malaysia’s five gibbon species are endangered as a result of this illicit trade. Too little is known of many of their species around the region resulting in very little protection for them in the face of illegal poaching.  
© Peter Ong

And that’s how Project Monyet (‘Monyet’ means ‘Monkey’ in Malay) came about. These images are used by researchers to help with their outreach work and publications. Malaysian youths are also engaged via the Roots & Shoots Malaysia Award to volunteer and help spread awareness of our primates, as well as to introduce people to the wealth of Malaysia’s biodiversity.

Dr. Jane Goodall once said “The greatest danger to our future is apathy.” With our photography outreach campaigns, we hope to give Malaysians and the world more reasons to care about our primates and their disappearing habitats.



[www.rootsandshoots.my](http://www.rootsandshoots.my)  
peterylong@gmail.com



### Luis Ortiz-Catedral

Director, Oceania Conservation Programme, World Parrot Trust. Scientific Advisor, Directorate of the Galapagos National Park

## Back from the Brink – Again: The Conservation of the Norfolk Island Green Parrot

Throughout the South Pacific, plant communities are shaped by the feeding behaviour of parrots. These colourful winged gardeners depredate seeds. In doing so, they reduce the viable seed set of many species, making room for less competitive plants to establish themselves on the forest floor. Healthy ecosystems require large parrot populations. Parrots also shape the folklore and artistic expressions of the South Pacific.

Unfortunately, many parrot species in the region are critically endangered with small, isolated populations. If we lose parrot populations and species, we lose much more than their important ecological services: we also lose part of our history, of our identity.

An example of an endangered species is the Tasman parakeet, or ‘Griin paerat’ in Norfolk language. Tasman parakeets are restricted to a single population on Norfolk Island, and have declined close to extinction at least twice in less than 100 years. The biggest threat to Tasman parakeets, and indeed many species in the region, are introduced mammals. For nearly a decade, intense control of introduced mammals has been crucial for the population growth of the species – from approximately 100 individuals in 2013 to nearly 400 parakeets at present. The lessons learnt in the race to save the ‘Griin paerat’ can be extended to other species and populations, to rewild the forests of the South Pacific.



Tasman parakeet feeding on fruits and seeds. © Luis Ortiz-Catedral



[www.parrots.org](http://www.parrots.org)

### Osa Conservation



### Andy Whitworth

Wildlife conservationist, National Geographic Explorer. Executive Director, Osa Conservation



### Eleanor Flatt

Wildlife monitoring programme coordinator



### Maria Jose Mata

Restoration and rewilding programme coordinator



### Obed Azofeifa

Farm manager

## Live from the Top of the Rainforest Canopy and Osa Verde Farm

From the heart of Costa Rica’s ancient rainforests, the non-profit organisation Osa Conservation works to protect the globally significant biodiversity of the Osa Peninsula.

The Osa Conservation wildlife team climbs high above the rainforest floor to set camera traps and gather photos and videos of the elusive species that spend their lives in the canopy, including threatened or endangered species such as the Geoffroy’s spider monkey (*Ateles geoffroyi*).

The Osa Conservation restoration team works to research, collect and propagate rare and threatened tree species from the forest. The scientists trial different methods to regrow the rainforest using seeds from ancient mother-trees – many of which are endemic to the Peninsula – collected during expeditions. At this site of botanical innovation and discovery, the team works on cutting-edge restoration and rewilding experiments in the Costa Rican rainforest.

And on the Osa Verde farm land, conservationists work to incorporate food security and sustainable production into the ecosystem using organic farming practices. Initially a primary rainforest, this land was once degraded into unsustainable cattle pastures. Today, the team is committed to bringing health, nutrition and longevity back into the farm, converting it to a ‘food forest’.



[www.osaconservation.org](http://www.osaconservation.org)



Ricardo Moreno and Edgar Sanchez setting camera traps in the forests of Panama (top). © Peter Houlihan

Shari Gallop doing field work in Te Awa o Ngātoroirangi including measuring how the water is responding to more freshwater returned to the estuary by large-scale engineering. © L'Oreal / Chris Loufte



Menraq patrol in the Royal Belum State Park, Malaysia. © Shah Redza Hussein



### Martina Panisi

Conservation biologist and environmental educator, National Geographic Explorer

## Learning with the Forest Giants (snails): A Story to Be Told

As a conservationist, I have learnt from nature that behind every living being there is a story that only hopes to be told or heard. I have always been fascinated by invertebrates and motivated to encourage people to understand the value of their diversity and preserve them, despite their – often – low popularity. The Gulf of Guinea oceanic islands in Central Africa hold extraordinary biodiversity. While surveying the tropical forest of these islands, I learnt about the story of a giant snail while I was assessing its dramatic decline. Because of its cultural importance, this species was not only disappearing from native forests but from people's memory as well. On that day, my team and I created the Forest Giants project, committed to spreading the importance of biodiversity conservation by using as an example the story of this atypical threatened species.

As a researcher at Lisbon University, my aim is to investigate the ecology and conservation of terrestrial molluscs, exploring their relationship with the forest and people on São Tomé island. As an environmental educator I want to challenge people to be curious and see the value of nature, even from its smaller species, understanding that the role of each person is important for safeguarding our planet, from adults to children, no matter their size.



School children learn for the first time about the threatened Obô Giant Snail (*Archachatina bicarinata*) and their role to guarantee forest preservation. © Vasco Pissarra / Forest Giants Project



www.forestgiants.org  
martinapanisi@gmail.com



### Murilo Pastana

Sara E. and Bruce B. Collette Postdoctoral Fellowship in Systematic Ichthyology

## How Many Fish Species Are There in the Amazon and Where Do We Find Them?

The Amazon rainforest is the world's richest and most-varied biological reservoir, containing millions of species of animals, plants, fungi, and other forms of life. Fishes are no exception, and the Greater Amazonia has the largest ichthyological biodiversity globally. Its rivers, lakes, and wetlands are currently home to 2,716 valid species (1,696 of which are endemic) representing 529 genera and 60 families distributed within the largest hydrographic drainage system on Earth.

Despite these impressive numbers, estimates suggest that at least one fourth of the Neotropical freshwater fish fauna is still undescribed, with Amazon fishes representing the majority of the undescribed taxa. Understanding this fauna is urgent because many of these fish taxa are on the cusp of extinction before even receiving a name. Degradation of aquatic ecosystems in South America is occurring at an accelerated pace, and aquatic fauna are among the most threatened. Regional development, in particular dam construction and urbanisation, has changed the morphology, hydrology, and functioning of Amazonian rivers, drastically affecting the local ecosystem.



Waterfall on the headwaters of Rio Xingu basin, Pará State, Brazil. © Osvaldo Oyakawa

Conservation biologists and fishery managers depend on accurate taxonomic work and specimens deposited in collections to determine priority areas for protection and to establish management programmes. In this context, national and global inventory studies (such as the All Catfish Species Inventory, #0315963; the South American Characiformes Inventory, #11/50282-7; or the Diversity and Evolution of Gymnotiformes, #16/19075-9) are extremely important in cataloguing fish fauna and serve as bases for future protective measures and legislation.



www.naturalhistory.si.edu/staff/  
murilo-pastana  
pastanam@si.edu





### Rolph Payet

Executive Secretary for the Basel, Rotterdam and Stockholm Conventions Secretariat. Former Minister of Environment and Energy in the Seychelles and founder of the country's first university

## Addressing the Drivers of Biodiversity Loss

Pollution is one of the key drivers of biodiversity loss. Chemicals and wastes are ubiquitous in the environment and found all over the globe; they are 'invisible', yet they are part of our daily lives. Their global production as well as the distribution of chemicals-based products continues to increase. The Basel, Rotterdam and Stockholm Conventions address some of the most significant chemicals and waste pollution that has been identified over the last several decades and are thus contributing to the conservation and sustainable use of biological diversity.

Persistent Organic Pollutants (POPs) travel long distances, they are found around the globe, including close to industrial and urban settings, but also in remote locations such as the polar regions and the ocean abyss. The accumulation of POPs is associated directly with biodiversity decline.

Our management of waste has a direct impact on nature: the global amount of municipal solid waste is estimated to be around 2.1 billion tonnes per year with at least 33% not managed in an environmentally-sound manner. E-waste is growing with the 2019 estimate being 53.6 million tonnes and by 2030 it is expected to be 74.7 million tonnes per year. Plastic has become one of our most visible emblems of pollution with over 350 million tonnes of it produced since 1950 and only 9% of it being recycled.

To protect nature and our health, and that of future generations, we can start by recycling and reducing waste, and conserving energy at home.



www.brsmas.org



### Irene Margareth R. Pinondang

Mammal ecologist. PhD student, University of Kent

## The Return of Corina: Tigress of the Peatland

Corina is a female Sumatran tiger that was released into her initial habitat in the peatland forest in Kampar Peninsula, Riau, Sumatra. She is a wire-snare victim. Snares are the silent killers of animals as they will trap a target and non-target species, including humans, and are to be found in protected and non-protected areas alike. Tigers may escape the snares by means of self-mutilation but mostly they will suffer a slow, torturous death. Corina's release process involved multiparty and multifaceted assessments, including the tigress's health, tiger and prey population in the release site, her role in maintaining the population and community perspectives.



Corina during rehabilitation.  
© Irene R. Pinondang

Wildlife conservation has to focus not only on protected, but also on non-protected areas. The case of Corina is a tiger conservation lesson learned inside a privately managed area. The assessments made were scientifically based and according to expert advice, requiring commitment and collaboration from government, business, wildlife experts, wildlife rehabilitation institutions, and academics.

Corina is equipped with a GPS collar in order to study tiger movement and behaviour. Studies using GPS collars on Sumatran tigers typically face environmental hurdles, such as dense canopy cover and terrain. Fortunately, Corina was released in peatland with flat terrain. This work contributes to accurate tiger population monitoring and is a vital complement to camera traps and evidence of sightings in the area.

www.research.kent.ac.uk/gcdc/person/  
irene-margareth-romaria-pinondang  
imrp2@kent.ac.uk



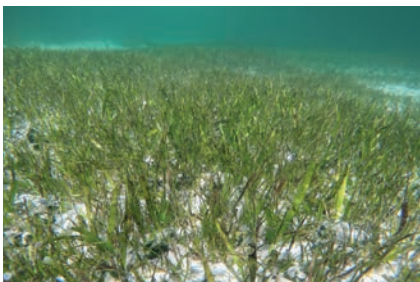
### Reynante V. Ramilo

Programme Coordinator,  
Community Centred  
Conservation (C3) Philippines.  
National Geographic Explorer

## Saving the Mermaid of the Sea

The dugong (*Dugong dugon*) is listed as ‘vulnerable’ on the IUCN Red List (Marsh et al, 2002) and ‘threatened with extinction’ under CITES Appendix I. Dugongs in the Philippines are understudied, thus the number of remaining dugongs in the Philippines is unknown, decreasing, sparse and scattered caused by habitat loss and degradation and fisheries by-catch. Palawan is one of the dugong’s last strongholds and the most promising hope for its national survival. On Calauit Island, Busuanga, Palawan, there are a few semi-habituated dugongs feeding on the seagrass beds also used by the indigenous Tagbanwa tribe. These individuals provide a unique opportunity to better study and conserve the species, employing standardised techniques (drones, boat and land-based surveys, seagrass surveys) to determine dugong core habitats, population and distribution as well as community perceptions and beliefs. These studies conform with the Palawan Council for Sustainable Development’s (PCSD) Strategic Environmental Plan for enhanced community-centred conservation of critical marine species and habitats in Busuanga municipality.

Using the results from research conducted by C3 Philippines since 2011, in May 2018 the Calauit Tagbanwas declared eight sites in their ancestral waters as Dugong Conservation Areas (DCAs), covering a total area of 617.36 hectares, and, with the assistance of C3, have created monitoring and management plans for the areas. The presentation will share the processes for the establishment of the DCAs in Busuanga, Palawan, which can serve as a model and guide for the replication of dugong conservation programmes throughout the region.



Dugong at Calauit Island. © C3 Philippines

Seagrass beds in Busuanga Palawan.  
© C3 Philippines



www.c3phil.org  
info@c3phil.org



### Jonah Ratsimbazafy

President of the Groupe  
d’Étude et de Recherche  
sur les Primates de  
Madagascar (GERP)

## Let’s Save Our Cousins (Non-human Primates) from the Brink of Extinction

Madagascar is recognised as the land of famous lemurs, that are currently on the verge of extinction. But my mission is to protect these iconic creatures and turn the tide on their loss.

I have spent my professional life advocating for lemurs, working tirelessly to protect their habitat and raise awareness of the animals’ plight. To achieve my goals, I oversee several conservation projects in Madagascar. I also teach primate ecology and conservation at the universities in Madagascar and leadership and community-based grassroots conservation for internship students at Houston Zoo in Texas, USA.



Jonah with teens. © Houston Zoo

Additionally, GERP, the association I founded, manages the Maromizaha Protected Area in eastern Madagascar and the Manombo Forest in south-east Madagascar. Other sites include Lake Alaotra in eastern Madagascar, and Sifaka Conservation at multiple sites.

I have also led the planning of the World Lemur Festival since 2014, spreading awareness about lemurs and their conservation in Madagascar and several countries around the world.

As President of the International Primatological Society (IPS), I have an international responsibility which is to ensure the development of research and the protection of the critically endangered primates in our beautiful world.



GERP

www.gerp.mg  
jonah@gerp-mg.org





## Hana Raza

Founder, Persian Leopard Conservation Programme

### Fighting for a Better Future for Persian Leopards in Iraq

Growing up in an area where instability and conflict were constant realities, I've always felt that my country has lost sight of the bigger picture; that species conservation, ecological stability, and biodiversity conservation are the unifying concerns of humanity for the planet's potential well-being.

The Persian leopard (*Panthera pardus tulliana*), was believed to have become extinct in Iraq after four decades of war and neglect, following the Asiatic lion and cheetah, until our team was able to record the first evidence of its existence in Iraq 10 years ago. This discovery rekindled optimism for making a real impact on the conservation front in Iraq.

The Persian leopard is classified as 'Endangered' by IUCN, with fewer than 1,300 adults remaining. People degrade the cats' habitat, deplete water supply, and kill them with weapons, cars, dogs, traps, and poison. In the Kurdistan region, locals have killed two leopards since 2020. Since much of the leopards' range is prone to human volatility, it can be difficult to direct resources, government policies, and funds towards conservation. Despite all that, we have been setting the groundwork for the leopards' conservation since its rediscovery, and we have discovered up to seven individuals in our research area since then.

The leopard presence in this region has acted as a catalyst for the establishment of a peace park between Iraq and Iran, to bring peace between two countries that have been at war for decades.



Qara Dagh Nature Reserve landscape. © Hana Raza

First photographic record of the Persian leopard in Iraq. © Hana Raza / Nature Iraq & CLP 2011



## Mamy Razafitsalama

In-country Director, Planet Madagascar

### Protecting Lemurs Using Community Conservation

Lemurs are the most endangered mammals in the world with over 95% threatened with extinction. In the midst of this conservation crisis, the people of Madagascar are also facing a humanitarian crisis, with over 40% of children malnourished and most people living well below the poverty line.

In Ankarafantsika National Park, people and lemurs live in the same forests. Both need the forests for their survival and livelihoods. Planet Madagascar works directly with communities in connection with lemurs to protect and restore

lemur habitat while improving the lives of people – building sustainable forest communities. The biggest threat to lemurs in our management zone is deforestation from fire. Fires are set in grassland by local residents to encourage growth of new grasses so that their cattle can feed. Sometimes these fires inadvertently burn down forest and impact lemurs.

I helped start Planet Madagascar back in 2015. My role as in-country director is to oversee the operation and implementation of all of Planet Madagascar's programmes including fire management, forest restoration, and community development.



Women cooperatives corn crops. © Planet Madagascar



www.planetmadagascar.org  
info@planetmadagascar.org



### Kristin Rechberger

Founder and CEO Dynamic Planet

## Building Conservation Economies for a Regenerative Planet

In 2020, all of humanity experienced the consequences of our broken relationship with nature through COVID-19. The pandemic revealed just how interconnected life is on our one home. And that we have converted too much of the land and taken far more biodiversity than our fair share, creating a huge risk to ourselves.

Scientists are telling us that we need to protect at least 30% of our planet by 2030. Other species have jobs, homes and families just like us. We benefit from their productivity and energy. What if we invested in them to do their jobs and continue providing for us?

A recent report suggests that expanding protection to 30% of the planet would require an annual investment of \$140 billion by 2030 – just a fraction of the government subsidies used to prop up industries that destroy nature. And the benefits would outweigh the costs by a factor of at least 5:1.

In addition to conservation, we need to sustainably manage the rest of the planet. If we do so we can support all of humanity. There are wonderful examples in responsible tourism, regenerative agriculture, and sustainable fishing, forestry and native aquaculture that can be scaled for local communities to

steward local resources, and build resilient supply chains from the ground and water up. The quicker we can provide technical assistance, bridge financing, and enabling policies to those at the base of supply chains, the more nature and people will benefit from an inclusive, resilient economy. But it all starts from the foundation of those that were here long before us that we all take for granted – all the other species that live on Earth.

“Other species have jobs, homes and families just like us. We benefit from their productivity... What if we invested in them to do their jobs and continue providing for us?”



www.ourdynamicplanet.com



### Karina M. Reyes

Political scientist, National Geographic Explorer. Co-founder, Centre for Sustainability PH

## Rainforests: More Than Biodiversity

The Centre for Sustainability PH, my local organisation, has spearheaded the legal establishment of the Cleopatra's Needle Critical Habitat in the Philippines. It is home to countless endemic and threatened species, including the #1 poached animal globally, the pangolin, and to the disappearing Batak tribe. But we are not stopping there, and are currently working on the protection of another key biodiversity area called Kensad, home to the Tagbanua tribe.

But we need to protect even more! It is precisely what 190 countries are currently negotiating with the post-2020 Global Biodiversity Framework at the United Nations Convention on Biological Diversity, including a push to protect 30% of our planet's land and water by 2030. Protecting one-third of our planet's wild places for biodiversity is the magic number global scientists say ensures clean drinking water and a stable global climate for humanity, now and in the future. Getting this done can be very simple: invest in Indigenous Peoples (IPs). IPs represent 5% of the global population, but protect 80% of global biodiversity! Indigenous lands represent 37% of global natural lands (there's our 30% on land!), and store 25% of the world's remaining aboveground carbon. Why else? It's simply cheaper. Research shows that IPs spend 16-23% of the budget of global conservation institutions with the same outcomes, and deforestation on their lands is half compared to lands managed otherwise.

Investing in IPs means: defend indigenous tenurial rights from relentless incursion; prioritise Indigenous and Community Conserved Areas to ensure IPs are recognised in environmental designations; give simple cash transfers (trust-based philanthropy) to IPs to spearhead conservation.



Indigenous Tagbanua forest ranger, parabiologist Noel Bungar on patrol at Cleopatra's Needle Critical Habitat. © Kyle Venturillo



www.centreforsustainabilityph.org  
karina@centreforsustainabilityph.org



Departing from Mahé, Seychelles' most populated island, the Pristine Seas team sailed 965 km to the remote Outer Islands, conducting rigorous surveys of the fish and coral species, notably this blotched stingray (top) and barracuda (next page top). © Manu San Félix / National Geographic Pristine Seas

In pristine areas sharks tend to inspect the odd human visitor carefully. These young blacktip reef sharks surrounded the Pristine Seas team as we waded across a reef flat in the lagoon of Millennium Atoll. © Enric Sala / National Geographic Pristine Seas



Over the course of three weeks in this remote stretch of sea, the Pristine Seas team dove several times a day – sometimes battling strong currents and powerful swells – to examine the marine life surrounding Rapa and Marotiri, France. © Manu San Félix / National Geographic Pristine Seas



**Mark Rose**

CEO, Fauna & Flora International

## Our One Home: Five Breakthroughs to Protect and Restore Nature

Last year Fauna & Flora International (FFI) launched the 'Our One Home' campaign, calling for a \$500 billion yearly funding commitment led by governments, and including the private sector, to support local conservationists in protecting the natural world.

FFI are now calling for a series of sudden, dramatic and important 'breakthroughs' that will move us swiftly from commitment to action.

Fauna & Flora International's 'Our One Home: Five breakthroughs to protect and restore nature': We must adopt nature-positive decision-making at all levels; deliver \$500 billion annually to protect and restore nature; devolve decision-making and funding to empower local-level conservation; recognise that the nature and climate change crises are inseparable; grow nature-positive impact through technological innovation.

The challenges we face are great, but we can be inspired by past advances as we seek to achieve new breakthroughs that could help save a world under threat.

These breakthroughs for nature represent our best chances of protecting and restoring the ecosystems on which we all depend, reversing the loss of the biodiversity that is fundamental to life on Earth and avoiding catastrophic climate change.



[www.fauna-flora.org](http://www.fauna-flora.org)



**Paul Rose**

Explorer, Expedition Leader  
Pristine Seas

## Pristine Seas

The ocean stressors are overfishing, pollution, climate change and extractive industries. Our response is to find, explore and help protect the ocean's last wild and pristine places.

We have completed 31 expeditions and partnered with 122 different organisations and agencies across 23 countries and territories to inspire some of the largest marine protected areas (MPAs) in the world, totalling over 6 million km<sup>2</sup>.

This success is due to the Pristine Seas team of scientists, filmmakers, communication and policy experts collectively working with host country communities and leaders to analyse the scientific case and political opportunity for each expedition target area. We then work hand-in-hand with the community to conduct comprehensive scientific surveys and communicate the values of protecting the area, with compelling media and published science reports.



A young Galapagos sea lion off Santa Cruz Island.  
© Eric Sala / National Geographic Pristine Seas

Satellite monitoring of vessel movements enables governments and the general public to witness when vessels enter an MPA and, since the establishment of the Port State Measures Agreement, they can not only just be seen, but they can be prosecuted. This is a real game changer and I am certain that within my lifetime I'll be celebrating the end of illegal fishing!



[www.nationalgeographic.org/  
projects/pristine-seas](http://www.nationalgeographic.org/projects/pristine-seas)  
[www.paulrose.org](http://www.paulrose.org)

## Rothera Research Station



### Nadia Frontier

Marine biologist working with the British Antarctic Survey

## Diving into Antarctic Habitats

Polar ecosystems host some of the most understudied marine habitats, in which the resident animals conceal many secrets yet to be uncovered. Working as a year-round researcher in Antarctica provides a unique opportunity to ameliorate our understanding of Antarctic habitats, how they function and what roles species play in the ecosystem. One of my projects involves piecing together food webs involved in the breakdown of organic material such as macroalgae and understanding the fate of its carbon. Another aspect of my work is to collect data about the growth rates and diets of key benthic species such as sea cucumbers, brittle stars, urchins and bivalves and monitor fluctuations over the season.

Our small team uses SCUBA as a tool to access our underwater office. However, accessing our workspace is often challenging and largely dictated by wind, visibility and sea-ice cover. As a result, we are the only team diving on the Antarctic continent during the harsh winter months.

Polar ecosystems are largely structured by strong seasonal forces which drive sea-ice dynamics and iceberg impact. The marine science research at Rothera Research Station builds upon long-term oceanographic and biological data. These unique datasets will permit scientists to disentangle the influence of seasonal forces from inter-annual to multi-annual climatic variations. Understanding the fundamental ecology of Antarctic species is framed against the backdrop of assessing the ongoing impacts of climate change.

“Accessing our workspace is often challenging and largely dictated by wind, visibility and sea-ice cover.”



www.bas.ac.uk  
frontier.nadia@gmail.com

## Rothera Research Station



### Ryan Mathews

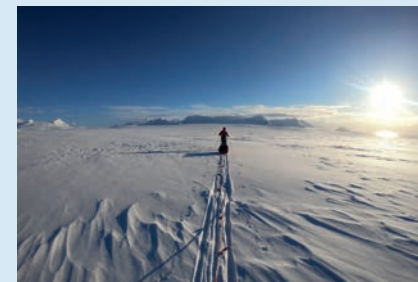
Marine Assistant, British Antarctic Survey

## Water Sampling at the Bottom of the World

There are very few places left on Earth that we have not yet explored, uncovered, photographed, inhabited, manipulated or damaged. The polar regions lie somewhere in-between photographed and inhabited. Most importantly, these regions remain largely untouched by direct human influence. This makes them an ideal region for long-term monitoring and identification of global ecosystem changes.

The Rothera Oceanographic and Biological Time-Series (RaTS) was initiated in 1997 at Rothera Research Station, Adelaide Island, on the western Antarctic Peninsula. The aims of the RaTS study is to: a) identify the relationship between the oceanographic parameters and biological processes, b) to understand how key ecological processes are affected by the seasonal temporal forces.

I am a marine field scientist working with the British Antarctic Survey. My work involves collecting and processing water and biological samples in Antarctica throughout the year using small powerboats and SCUBA.



Ryan Mathews about to descend on a dive in South Cove, Ryder Bay. © P.Hill



www.bas.ac.uk  
ryamat@bas.ac.uk





Ryan Mathews about to descend on a dive in South Cove, Ryder Bay.  
© P.Hill

Nasir Hassan Haji, who farmed seaweed for a decade, was the second person in Jambiani, Zanzibar to join the year-long sponge farming mentorship offered by Marinecultures. Over the past five and a half years, she has helped train nine of the 11 women who farm sponges, empowering many single women to run their own business on a traditionally Muslim island.  
© Jennifer Adler



Dr. Jordan Casey dives into the sun-striped waters of Tetiaroa, a remote Tahitian atoll. She and her collaborators were spearfishing for science, working on a project to better understand the complex marine food web.  
© Jennifer Adler



**Indah Rufiati**  
Fisheries Lead

## Catalysing Community-based Marine Conservation in Indonesia

Growing up in the largest archipelagic country in the world, Indah has always been obsessed with the sea that unites Indonesia. She studied fisheries science in Java's Gadjah Mada University and continued her studies in environmental science in Bali's Udayana University, focusing on coastal studies.

She has since dedicated her career to working with small-scale fishing communities across Indonesia, from Sumatra to Papua. As Fisheries Lead with Blue Ventures, Indah works alongside these communities providing technical assistance in fisheries monitoring and management. Indah is also an artist, her love of the marine environment inspires her paintings.

Her work developing strategic partnerships with fishers, the government, and NGOs increases the sustainability of small-scale fisheries in Indonesia. Indah currently focuses on supporting small-scale fishing communities to secure their marine tenure rights, as a foundation for locally led management and conservation in eastern Indonesia. This work includes revitalising traditional fisheries management practices, and working with the government to safeguard these customary institutions. Indah will discuss how a new approach to marine management is helping empower and inspire some of Indonesia's most vulnerable coastal communities to take steps to rebuild their fisheries.



Participatory fisheries monitoring conducted by the community of Banggai Laut, Central Sulawesi Province. © Garth Cripps / Blue Ventures

The community of Darawa in Southeast Sulawesi Province discussing the state of their fisheries. © Indah Rufiati / Blue Ventures

**blue ventures**  
beyond conservation

www.blueventures.org  
indah@blueventures.org



**Jodie Rummer**

Associate Professor of Marine Biology, College of Science and Engineering and ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia. Founder and Chief Investigator, The Physioshark Project (Australia and French Polynesia)

## What Can the Toughest Shark on the Great Barrier Reef Teach Us About Climate Change?

Despite 450 million years of evolutionary history and surviving five global mass extinctions, including the one that wiped out the dinosaurs, sharks are now facing new challenges and changes to their habitats that are occurring at rates that have never been documented in human history. While marine protected areas and sanctuaries can safeguard sharks and their relatives from fishing pressures, they do not protect them from climate change. For example, here on the Great Barrier Reef, waters have warmed by nearly 1°C due to human activities since the Industrial Revolution (1880s), resulting in unprecedented mass coral



Little predator epaulette shark.  
© kristianlainephotography

bleaching three times between 2016 and 2020. While warming of less than one degree may not seem like much, it has been enough to kill nearly two thirds of the corals on the largest continuous reef on the planet.

Sharks are important predators that keep ecosystems like coral reefs healthy, and without them, whole ecosystems can collapse. One tough, yet small, egg-laying 'walking' shark species only found on the Great Barrier Reef has been teaching us a lot about what it takes to endure climate change challenges. Are epaulette sharks tough enough? Will they adapt – change their DNA – fast enough to outpace the changes that are rapidly occurring in their reef habitats? If epaulette sharks cannot endure climate change stressors, what does that mean for other, less resilient shark species?

Healthy marine ecosystems need healthy predators like sharks. Those predators need healthy ecosystems. Our decisions today are determining what the oceans will look like tomorrow.

**PHYSIO SHARK**

www.physioshark.org  
www.jodierummer.com

## The Russian Geographical Society



### Vladimir Kolosov

Vice-president, Russian Geographical Society



### Sergey Katikov

International Affairs adviser to the President, Russian Geographical Society



### Olga Lapina

International Affairs coordinator, Russian Geographical Society



[www.rgo.ru/en/society](http://www.rgo.ru/en/society)

## Live from Moscow and St Petersburg

The Russian Geographical Society was established by the highest authority of Nicholas I in 1845. It is one of the oldest geographical societies in the world.

Nowadays, the Russian Geographical Society continues to follow the time-honoured traditions established by its founders. Geographers, ecologists, geologists, ethnologists, statisticians, photographers, mass-media representatives, travellers and those eager to learn about Russia and ready to help to preserve its natural riches cooperate with the Society.

Since its extraordinary XIII Congress in 2009, the number of expeditions organised by the Society has been growing rapidly: the multi-year project on the Arctic clean-up, five seasons of the Kyzyl-Kuragino archeological expedition, expeditions to the Novosibirsk Islands and to Lake Baikal, a series of studies to search and survey sunken ships and many other projects. Even more expeditions are organised by regional offices.

Today the Russian Geographical Society organises and supports such expeditions as the Arctic Floating University, the 'Hogland' expedition, 'Secrets of ancient artists of Siberia', 'Salvation of archaeological monuments at the bottom of the Sayan Sea', 'Akra, the ancient city of Bosphorus', 'Kostenkov', 'Tunnug 1 mound' expedition and many others.

In St Petersburg and Moscow we hold unique collections of expedition materials, objects, maps and books. We organise public exhibitions and events and there is always a warm welcome for everyone.

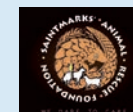
## SaintMarks Animal Hospital and Shelter



### Mark Rume Ofua

Veterinarian

**“The work at hand, daunting as it may be, is nevertheless boldly undertaken with hope.”**



[www.saintmarkvet.com.ng](http://www.saintmarkvet.com.ng)  
saintmark2003@yahoo.com

## Ireti: A Nigerian Pangolin Story

Ireti means 'hope' in the Nigerian language.

In recent years, Nigeria has been the epicentre of the news as a transit hub for the trafficking of pangolin scales. Indeed we have been linked to the highest seizures of pangolin scales worldwide. A cocktail of corruption, lax laws, poor attention to law enforcement, poverty, and lack of awareness, amongst others, almost certainly would mean a bleak future for the pangolin in Nigeria.

In the face of the challenges, shortcomings and struggles, the story of Ireti, the ninth orphaned pangolin that we have raised from infancy to release at our rehabilitation centre, as well as over 60 adults rehabilitated and released over the years, gives a heart-warming and most welcome beacon of hope for the Nigerian pangolin.

The work at hand which basically is building a system that encompasses rescue, rehabilitation release and monitoring of these graceful creatures, daunting as it may seem, is nevertheless boldly undertaken with hope. Ireti strengthens our hope. Join us as we tell our tale with Ireti.





### Enric Sala

Marine ecologist. National Geographic Explorer in Residence

## Time for Action – A Natural Solution

The climate crisis is edging our planet towards a point of no return. We know we need to phase out fossil fuels and replace them with renewable energies, but these solutions may come too far in the future to keep us from the tipping point. But there's something we can do right now to buy the time we need and correct course. A proven, cost-effective, and global solution. Healthy natural ecosystems are *the best* solution to slow down the warming of the planet and the acidification of the ocean.

When wild places are protected and allowed to self-restore, carbon is absorbed. Air is cleaner. Weather systems become more predictable. Protecting, restoring, and rewilding the natural world is the single most effective climate solution. But more biodiversity also means more benefits to humanity, including a stable supply of food, flood and fire protection, protection of coastal zones from storms, and less risk of global pandemics. All our technology cannot replicate the benefits that wild places provide.

However, today, only 15% of land and 7% of ocean are protected. But the science is clear – we need at least 30% of the planet protected by 2030 to start putting Earth back in balance. And by 2050, we need half of our planet in its natural state. Some say we cannot afford it, but the cost of protecting 30% of the planet is less than what the world spends today in videogames. And the economic benefits far exceed the costs.

We just need to get going.

“All our technology cannot replicate the benefits that wild places provide.”

NATIONAL GEOGRAPHIC  
PRISTINE SEAS

www.pristinenseas.org



### Paul Salopek

National Geographic Explorer. Founding Executive Director, Out of Eden Walk Project

## Walking Through the Anthropocene

Around 60,000 years ago, our ancient forebears began walking out of Africa and across the undiscovered world. The Out of Eden Walk Project is recreating that primal journey the original way, on foot, via a continuous storytelling trek that started in 2013 in Ethiopia and will stretch, eventually, to the tip of South America. Along the way, writer Paul Salopek and his local walking partners use multimedia storytelling to describe the major challenges of our time at boot level: globalisation, conflict, climate change, cultural endurance, inequality and the human-changed environment. The project's

storytelling appears regularly on the National Geographic Society's website. Thousands of students in more than 60 countries follow the journey remotely from their classrooms.

What do you see pacing off continents at 3 miles (5 kilometres) per hour? A planet drastically altered by human resource demands: an 'Anthropocene' globe where once vast panoramas of wilderness and their wildlife – the world as our ancestors knew it – have largely vanished. Through 'walked storytelling,' we are reconnecting our global audiences with the natural landscapes that still remain, and with the Indigenous peoples who inhabit and conserve those endangered spaces. In this way, the walk

increases awareness of the urgent need for biodiversity conservation, and becomes a bridge of understanding to traditional knowledge systems that have much to teach about land use.



Walking Ethiopia with Afar pastoralists. © Paul Salopek



Walking Uzbekistan with partners Tolik Begendikov and Aziz Khalmuradov. © Paul Salopek

OUT OF EDEN WALK COALITION  
*slow down. Take time to tell the story.*

www.outofedenwalknonprofit.org  
info@outofedenwalk.com



### Elisa Sandoval-Serés

DPhil in Zoology (student), WILDCRU, Department of Zoology, University of Oxford, UK



### Sichelesile Ndlovu

GIS Specialist  
Painted Dog Conservation,  
Zimbabwe



[www.wildcru.org/members/elisa-sandoval-seres](http://www.wildcru.org/members/elisa-sandoval-seres)  
[www.painteddog.org](http://www.painteddog.org)  
[esandovalseres@gmail.com](mailto:esandovalseres@gmail.com)

## How do African Wild Dogs Cope with Lions and Hyaenas?

African wild dogs are an endangered species with only 1,409 mature individuals left, and its population is in decline mainly due to habitat fragmentation and accidental killing by people (IUCN 2021).

I, Elisa, am interested in how animal behavioural ecology can help wildlife conservation. Before my DPhil, I participated in studies of felines, wolves, and meerkats. Now, going from the rainforest of Mexico to the Savannah in Zimbabwe, I am focusing my DPhil research on African wild dog competition with lions and spotted hyaenas in Zimbabwe. Lions and hyaenas can kill wild dogs (especially pups), steal their kill, and exclude them from prey-rich areas. Also, these two large predators can encourage wild dogs to move outside protected areas where they get exposed to human threats, such as snares and being killed on the roads. With my research I expect to find out how wild dogs cope with lions and hyaenas in an area of artificial water provision; to propose water management solutions to reduce competition between wild dogs and mortality, and give insight into their conservation.

I collaborate with Painted Dog Conservation (PDC), which is an NGO dedicated to conserving African wild dogs in Zimbabwe. They perform monitoring of wild dog packs, anti-poaching campaigns and education programmes. Sichele has worked in PDC since 2017 as their GIS specialist, where she helps to track wild dog packs, capture data and process it to map wild dogs' home ranges.

We believe that through a collaborative network, combining research with conservation actions, we can help wildlife conservation.



### Francesco Sauro

Speleologist, University of Bologna, Italy, Department of Biological, Geological and Environmental Sciences. Rolex Laureate

## The Dark Continent: Caves as a New Frontier of Scientific Exploration

Caves have been explored in all different terrains of the Earth, from classic karst to volcanoes, from ephemeral ice to timeless quartzites. All this subsurface realm is preserving proxies of ancient times when creatures evolved in extreme conditions to populate even the farthest corners of the planet.

Being in darkness, the underground has been always overlooked by scientists, but in the last two decades, thanks to new technologies and advanced documentation techniques, it has become clear that these environments could provide

unprecedented insights on the past of the Earth and the evolution of life. Speleothem formations in caves represent the best archives of palaeoclimate available at the moment, providing information on regions of the Earth where ice cores are not available, like the Amazon. Cave mineral formations are often the result of the interaction between microbial activity and chemical elements, allowing life to thrive in darkness.

The environmental conditions of the subsurface are promising for the exploration of caves on other planets, like the Moon or Mars. The Dark Continent teaches us that we need to look beyond the surface to get further in human knowledge of our planet and beyond.



Auyan Tepui cave exploration.  
©RobbieShone / Rolex Awards

Inside the Imawari Yeuta cave,  
Francesco Sauro observes an  
opaline formation created by  
an ancestral bacterial community.  
© Francesco Lo Mastro

[www.unibo.it/sitoweb/francesco.sauro2/en](http://www.unibo.it/sitoweb/francesco.sauro2/en)  
[cescosauro@gmail.com](mailto:cescosauro@gmail.com)





### John E. Scanlon AO

CEO, Elephant Protection Initiative Foundation.  
Chair, Global Initiative to End Wildlife Crime.  
Chair, UK Government IWT Challenge Fund

## The Interconnected Nature of Things – Environment, Economy and Health

The devastating pandemic that we are currently living through has been omnipresent over the past year – with governments struggling to stop it from spreading, striving to vaccinate us against it, and working to understand its origins. At some stage, we will get through it, but when we do, it won't be over. Far from it.

If nothing else, this COVID-19 pandemic has reminded us, albeit in a devastating way, of the interconnected nature of things, most particularly between economies, the environment, human and wildlife health and welfare.

We need to recalibrate our relationship with nature for many compelling, interrelated reasons, including to protect biodiversity, including wildlife, combat climate change, and to prevent future pandemics. This will require profound changes in how we regulate the taking, trade, and consumption of wildlife, how we combat wildlife crime, and how we manage and finance the protection of wildlife at its source.

Given the scale of the risks to people and the planet, we simply cannot stand by and watch wildlife continue to disappear without ratcheting up our collective response, including to our international wildlife laws and investment in wild places. We owe it to the world's youth to act boldly and swiftly to ensure we pass on a healthy and prosperous planet.



### Pablo Schapira

Field Operations Manager and Country Representative, African Parks

## Bazaruto Archipelago National Park: Challenges and Long-term Vision

At the end of 2017, the National Administration of Conservation Areas (ANAC) and African Parks started a long-term partnership with a shared vision: to restore, develop and manage Bazaruto Archipelago National Park as one of the leading and most productive marine protected areas in eastern Africa.

To achieve this, we must deliver and demonstrate conservation, biodiversity rehabilitation, and sustainable natural-resource use for the benefit of the economy and the people of Mozambique. It is easy to say, but difficult to achieve. The overuse of natural resources, illegal fishing practices and a poorly regulated tourism sector have had a negative effect on the diversity of the region, as well as the livelihoods of the local communities which rely on the marine resources of Bazaruto for their livelihood.

After three years of hard work, many challenges have been faced, but the Bazaruto Park, home of the last viable population of dugong on the East African coast, is getting in the right direction thanks to a motivated and well trained team, an aligned vision with the local and national authorities and, most important, full support from the communities through job creation, education, health and investing in social enterprise, while also working hand in hand with the tourism sector to help secure a more sustainable future for all who live here.



Bazaruto rangers on a morning training. © Andrew MacDonald



[www.endwildlifecrime.org](http://www.endwildlifecrime.org)  
[www.elephantprotectioninitiative.org](http://www.elephantprotectioninitiative.org)



[www.africanparks.org](http://www.africanparks.org)





### Katie Schuler

Conservation filmmaker, Pangolin advocate and National Geographic storyteller. Head of Production, Coral & Oak

## Pangolin Storytelling

An advocate for the planet's most at-risk species, Katie leverages over a decade of filmmaking experience on six continents to tell engaging stories that speak to our shared sense of empathy and compassion. Her films, which explore the challenges and rewards of living alongside nature, have garnered accolades, accrued millions of views, and inspired meaningful conservation victories across the world.

Her production company, Coral & Oak Studios, has partnered with many of the most recognisable names in wildlife filmmaking, including National Geographic, Smithsonian, BBC, HBO, and PBS. Katie's film, *Pangolin*, is the winner of six best short awards including Jackson Wild's 2017 Best Short category. Since its premiere, *Pangolin* has been translated into four languages, reaching over 80 million people while serving as an important tool for conservation.



Pangolin rehabilitation.  
© Coral & Oak

Two of her latest films, *Where Life Begins*, and *Nigerians Fight to Protect the World's Most Trafficked Mammal*, won awards at festivals in 2020.

Katie is a National Geographic Explorer, a graduate of the Corcoran School of the Arts and Design, a Henry Luce Fellow, and a member of the International League of Conservation Photographer's Emerging League.



www.coralandoak.com  
katie@coralandoak.com

### Seychelles Islands Foundation



### Luke A'Bear

Aldabra Science Coordinator



### Jeremy Raguain

Project Officer

## Recording Aldabra's Incredible Green Turtle Recovery

Aldabra Atoll, one of Seychelles' two UNESCO World Heritage Sites, is the longest continually protected green turtle nesting area in the Western Indian Ocean, with the population increasing significantly during the last 50 years. Yet, how does an organisation like the Seychelles Islands Foundation (SIF) monitor turtles and keep track of the population? Join us as we explore the simple but effective monitoring techniques SIF uses to track the green turtles' recovery on Aldabra. We'll see how the rangers on the atoll complete beach surveys every morning and then how this data can be used to see how the population is changing over time. Our talk will take you on a journey across Aldabra's Settlement Beach and end with a discussion whereby we'll highlight the advantages as well as the challenges that Aldabra's green turtles face. We want to share the beauty of the atoll and the conservation success story that is the recovery of the Aldabra green turtle population.



Green turtle. © Martin Van Rooyen / Courtesy of the Seychelles Islands Foundation



www.sif.sc  
aasc@sif.sc



**Gautam Shah**

Founder, Internet of Elephants

## Playing with Wildlife Science

Through the dedication of thousands of wildlife scientists and supported by continuously evolving technology, the conservation world is collecting an incredible amount of valuable data about our planet and its inhabitants. Hidden within that data are incredible, engaging stories of habitats, animals that live within them, and the people that study them. Yet, most of that data ends up in scientific journals or exclusive databases meant primarily for the scientific community.

Internet of Elephants exists to expose those stories to the public and drive empathy towards both the natural world but also those that have dedicated their lives to protecting it. And we use games and interactive experiences to make our audiences active participants in those stories, rather than just passive watchers.

If we want to truly turn the tide in the balance of nature, we will need to turn to modern channels and approaches to reach new audiences, on their terms.

In my talk, I discuss the power of games as a storytelling medium, and specifically how we turn real science data into compelling experiences that transcend geography, income, gender, and age.



Wildeverse, conservation augmented reality game. ©Internet of Elephants



www.internetofelephants.com  
gautam@internetofelephants.com



**David Shukman**

Science editor, BBC News

## Reporting from the Frontlines of a Changing Planet

It used to be said that journalists can provide a window on parts of the world that others don't get to visit. But given the staggering scale of environmental change, I believe our responsibility goes further: to highlight where things are going well and also where they're going badly.

The goal of our small teams – usually a cameraman, a producer and me – is to get to the sharp end of what's happening and to find the clearest ways of sharing what we discover.

My reporting over the past 40 years has taken me to more than 100 countries and I've seen how landscapes and lives have been transformed from the Arctic to the Amazon. Yes, it is sometimes depressing. Being face to face with the last of a species lowers the spirits. And toughest of all was pursuing a gang trafficking baby chimpanzees.

But what's uplifting is realising how so many determined and inventive people are trying to make a difference, and how our coverage can provide them not just with facts but also with inspiration.



A baby chimpanzee during a police raid on a gang of animal traffickers in Ivory Coast in 2017. A year-long BBC News investigation led to the country's first convictions for wildlife crime. But sadly, the tiny animal, called Nelmey junior, died in Abidjan zoo. © David Shukman



www.bbc.co.uk/news



A lone council worker attempts to clear plastic waste from a canal in Indonesia. Plastic is one of the most visible of humanity's impacts on the natural world. Recycling schemes are springing up and there are efforts to collect bags and bottles from rivers and oceans but there's a very long way to go. ©David Shukman.



### Colin Simpfendorfer

Adjunct Professor,  
Marine Biology, James Cook  
University, Australia

## Sharks in the Mangroves

Mangroves – the trees that live at the intersection of the land and the ocean – play an important role in the lives of some sharks and rays. This includes species of sawfish, requiem shark and stingray that have all been reported as having close relationships with mangroves. Understanding their relationships with mangroves provides an avenue to improved conservation for these species, some of which have very high levels of extinction risk.

Our research has shown that for many species it is the youngest individuals that inhabit mangroves, using their complex root structures as a refuge from predation by the largest sharks. We have yet to find strong evidence that these species take advantage of the food webs powered by the highly productive mangrove trees, although some species feed while inside mangrove forests. With the continuing loss of mangroves globally, there are added pressures on shark and ray species that use mangrove habitats and this may increase their risk of extinction.



A juvenile mangrove whipray (*Urogymnus granulatus*) tagged for visual and acoustic tracking swims through the mangroves at Orpheus Island on the Great Barrier Reef.  
© Ana Martins



### Rohit Singh

Director, Wildlife Enforcement  
and Zero Poaching, WWF  
Wildlife Crime ACAI

## Rangers and their Role as Planetary Health Service Workers

Rangers are responsible for safeguarding nature, cultural and historical heritage, as well as protecting the rights and well-being of present and future generations. They can play a critical role as planetary health workers through protecting and managing protected and conserved areas, in collaboration with local communities including those of indigenous peoples.

In light of the global COVID-19 pandemic, this need for a healthy, safe and clean environment has never been clearer. Despite their crucial role, rangers are, broadly speaking, inadequately trained, ill-equipped, poorly paid and often working under extremely dangerous conditions. More than 1,100 rangers have lost their lives in the line of duty since 2009. A professional ranger sector is not only better equipped to protect biodiversity but also to protect the rights and livelihood of the communities that depend on the forest and its resources. While our understanding of the challenges that rangers face is improving, there is still a lack of coordinated global efforts to recognise the wider role of rangers.



Indigenous Ranger in  
Cambodia with his family.  
© Ranjan Ramchandani

However, things are changing, the Universal Ranger Support Alliance (URSA), created after the ninth World Ranger Congress in 2019, is an alliance of eight conservation organisations with a global five-year action plan to accomplish lasting transformation. It aims to create a professional, responsible, and accountable ranger workforce that is properly valued, led, and supported. URSA itself and the action plan provide a global platform for individual conservation professionals, rangers, conservation organisations, and ranger employers to work together in supporting rangers – the first responders responsible for maintaining the health of the planet.



[www.ursa4ranger.org](http://www.ursa4ranger.org)



### Joe Smith

Director, Royal Geographical Society (with IBG)

## A Twenty-minute Recipe for a Sustainable World

Awareness of humanity's environmental impacts has been spreading like a wildfire, and it is unlocking a great tide of determination and innovation. But does it add up to a recipe for change? Give this a try in your own kitchen:

Five key ingredients:

1. A stable political consensus on key ideas that can be sustained, in democratic systems, through three of four election cycles.
2. Policies designed around the need to recognise responsibilities and protect against vulnerabilities. (This is a measuring cup challenge. We know how to do this and we can do it again).
3. Better pricing of goods, embedding our best guess at the full social and environmental cost of products, including, prominently, an end to fossil fuel subsidies and carbon taxation and/or pricing.
4. Revising some taxes and prices in ways that open up space to reduce others. A successful recipe isn't just about what you need to add in; it can also be important to recognise what you should take out, 'Carbon funded tax reductions' for example.
5. Supporting and rewarding experiments and successful innovation. Recognising that we need to take some risks in our sustainability kitchen – not everything is going to work and that's OK too. Serves 7 billion plus.

This is going to be good! Let's stop talking about sustainability being a diet of austerity and denial. Let's shout from the rooftops that "we're going to end up with something much more satisfying and enjoyable than what we're served up every day right now!"



www.rgs.org  
director@rgs.org



### Lillian Stewart

PhD Candidate, Adrift Lab, Institute for Marine and Antarctic Studies, University of Tasmania

## Gulls and Garbage: Our Trash is Another Gull's Dinner

Gulls are not only underappreciated, they're also under-researched. When we look past the 'trashy' and 'irritating' light they are often depicted in, we find a bird that has almost perfectly adapted to coexist alongside us, as we continue to urbanise the natural landscape.

The Pacific Gull (*Larus pacificus*) has a colourful culinary story to tell. Through the collection and dissection of hundreds of regurgitated Pacific Gull pellets known as 'boluses', my research uncovered the extent to which plastics and other anthropogenic items have become ingrained in their modern-day diet. We found that a staggering 95% of the boluses we sampled, contained at least one item of anthropogenic origin. Plastic dental floss picks, single-use plastic cutlery, rusty nails, plastic bags, Christmas decorations and broken glass; the list goes on. Not only are the gulls eating items that are likely hazardous to their health, but through regurgitating the boluses, they are acting as a transport mechanism, further dispersing anthropogenic waste items in the natural environment. This is not the fault of the gulls, but a further indicator that our consumer behaviour is impacting the natural world in more ways than we thought.



Pacific Gull bolus composed of a single-use plastic dental floss pick and purple sheet plastic.  
© Lillian Stewart

We can change this. We can choose to refuse single-use items where possible, and encourage those around us to consider the consequences of our everyday actions. Through cumulative small changes, together we can create a positive collective impact. The next time a gull bothers you for a hot chip, remember, it is our duty to create positive change!



www.adriftlab.org  
lillian.stewart@utas.edu.au





### Nicole Stott

Astronaut, artist,  
Earthling,  
Founder, Space for Art  
Foundation

## We Live on a Planet

Nicole is an astronaut and artist who creatively combines the awe and wonder of her spaceflight experience with her artwork to inspire everyone's appreciation of our role as crewmates here on Spaceship Earth. She believes we have the power to create a future for all life on Earth that is as beautiful as it looks from space.

A veteran NASA astronaut with two spaceflights and 104 days living and working in space as a crew member on both the International Space Station (ISS) and the Space Shuttle, Nicole's personal highlights of time in space are performing a spacewalk (10th woman to do so), flying the robotic arm to capture the first H-II Transfer Vehicle, working with her international crew in support of the multidisciplinary science onboard the orbiting laboratory, painting a watercolor, and of course the view out the window. In preparation for spaceflight, she was also a crew member on an 18-day saturation dive mission at the Aquarius undersea laboratory.

Nicole believes that the international model of peaceful and successful cooperation she has experienced in the extreme environments of space and sea holds the key to the same kind of peaceful and successful cooperation for all of humanity here on Earth. As the founder of the Space for Art Foundation, she focuses on uniting a planetary community of children through the awe and wonder of space exploration and the healing power of art.



Nicole Stott painting with little girl.  
©NASA



[www.nicolestott.com](http://www.nicolestott.com)  
[www.spaceforartfoundation.org](http://www.spaceforartfoundation.org)  
[nicole@spaceforartfoundation.org](mailto:nicole@spaceforartfoundation.org)



### Paige Strudwick

PhD Candidate, Future Reefs  
Research Group, Ocean  
Microbial Group, University of  
Technology, Sydney, Australia

## Coral Propagation and Out-planting Impact on the Microbiome of Corals on the Great Barrier Reef

Mass bleaching events on the Great Barrier Reef in 2016, 2017 and again in 2020 have contributed to the loss of more than 50% of the coral since the mid-1990s. This ongoing degradation is often compounded by anthropogenic pressures.

Coral propagation and out-planting efforts are growing worldwide including on the Great Barrier Reef, to increase coral cover at degraded sites and to expedite natural reef recovery. Corals host associated microbial communities that are integral to their overall health, yet how these microbial communities are impacted or changed throughout the process of propagation and out-planting has not yet been investigated.

I will talk about the biodiversity on the Great Barrier Reef, how microbes are integral for coral health, and briefly introduce my research investigating the dynamics of microbes during propagation and out-planting activities.



Paige Strudwick sampling coral  
fragments from a nursery frame  
on the Great Barrier Reef.  
© Carmela Isabel Nunez-Lendo



[www.coralnurtureprogram.org](http://www.coralnurtureprogram.org)



### Gary Tabor

President, Center for Large Landscape Conservation.  
Chair, Connectivity Conservation Specialist Group, IUCN World Commission on Protected Areas

## Ecological Connectivity Conservation

The Earth is a tapestry of interconnected large landscapes and seascapes that support the natural processes which maintain our climate, support animal and plant life, and determine the quality of our air, water, and food. Parks and other protected areas alone are not enough to sustain healthy wildlife populations in the face of a changing climate and increasing human development. More than 50% of the Earth's landscapes are highly fragmented. Working together, habitat fragmentation and climate change threaten wildlife survival. The world's wildlife populations have fallen 68% since 1970. The fabric of life is unravelling.

Ecological connectivity conservation is rapidly emerging as a critical approach to saving biodiversity and serves as a countermeasure to the forces of fragmentation. From wildlife corridor conservation to free-flowing river systems, connectivity conservation also enhances nature's resilient capacity to buffer the impacts of climate change.

As the world discusses more ambitious targets to save biodiversity through such efforts as 30x30 (protecting 30% of land and seas by the year 2030), increasing the size and number of protected areas will only go so far in saving the planet's biodiversity. We also need a strategy to connect protected areas through ecological corridors. Connected protected area systems, also known as ecological networks, increase the conservation effectiveness of parks. They also amplify the scale of conservation, as ecological networks are the architecture for large-scale landscape and seascape conservation.



Elephants walking in Amboseli National Park.  
© Gary Tabor



CENTER  
for  
LARGE LANDSCAPE  
CONSERVATION

[www.largelandscapes.org](http://www.largelandscapes.org)  
[gary@largelandscapes.org](mailto:gary@largelandscapes.org)



### Harrison Talarico

Honours student by research at the University of Tasmania.  
Member of Adrift Lab

## Using Bioacoustics to Investigate the Migration Timings of the Short-tailed Shearwater

During my talk, I give insight into the incredible life of the short-tailed shearwater and discuss how we can use bioacoustics to monitor its migration patterns. Short-tailed shearwaters are Australia's most numerous seabird and make an annual return migration from the North Pacific Ocean to their breeding colonies in south-eastern Australia.

The species has long been considered to be highly synchronous in their breeding timings, with anecdotal evidence suggesting you can 'set your clock' to their arrival in Tasmania in the last week of September. However, in the 2019/2020

breeding season, many shearwaters were late in returning to their colonies – in some cases, by up to two weeks.

To quantify these shifting migration patterns, we deployed acoustic sound recorders at eight shearwater colonies in eastern and southern Tasmania at the onset of their migration. Our goal is to determine whether acoustic activity can reliably detect the arrival/departure

of the birds at each colony and whether arrival/departure correlates with environmental variables such as latitude, wind speed, or wind direction. The study also seeks to address broader questions related to environmental change and the capacity of short-tailed shearwaters to adapt to these changes.



Song Meter SM4 Sound Recorder.  
© Harrison Talarico



[www.adriftlab.org/news/harrison-talarico-joins-adrift-lab](http://www.adriftlab.org/news/harrison-talarico-joins-adrift-lab)  
[harrison.talarico@utas.edu.au](mailto:harrison.talarico@utas.edu.au)



Kristine Tompkins



The gauchos of Patagonia. In Patagonia National Park, men who used to hunt pumas now act as their protectors, helping scientists track their movements. © Jan Vincent Kleine



### Gabby Tan

Founder, Tideturners. Student at Stanford University, National Geographic Young Explorer

## Starting in Schools: Teaching the Next Generation to Protect Our Planet

Gabby Tan has dedicated the past seven years to advocating for quality education, healthy oceans, and climate action, with various campaigns and organisations, including as an alumnus of the World Oceans Day Youth Advisory Council. Most recently, as a 2020 National Geographic Young Explorer, she is excited about developing Tideturners, an environmental education project dedicated to increasing awareness of key environmental issues and facilitating greater youth engagement in advocacy and solutions.

Along the way, Gabby Tan has brought a youth voice to conferences such as the UN Youth Climate Summit, World Urban Forum, SB50 Bonn Climate Conference, and EurOCEAN. She has also endeavoured to inspire others to act through writing for several publications and speaking to over 18,000 people at schools and events around the world, including the London School of Economics.

In order to take on the defining environmental issues of our time, we must first learn about them. Reflected in all-time high rates of youth environmental activism and public concern about climate change, a growing number of students, parents and teachers want topics like climate change to be taught in schools. Tideturners hopes to provide youth with the knowledge and skills to encourage solutions within their local communities and become advocates for the future they want.



TEDxVicenza speech on World Oceans Day 2019. © Tideturners



www.wearetideturners.com  
gabbytan01@gmail.com



### James Thornton

Founder and CEO, ClientEarth

## Law to Save the Planet

It's up to us to save civilisation. I use law – a thrillingly powerful tool. Used creatively, law lets you set the rules of the game. And hold governments and companies to account.

My rule of thumb about what we need to do is this trinity: *reduce, protect, restore*. Reduce emissions. Protect nature. Restore nature.

Here's how we go about it at ClientEarth, the environmental law group I started in the UK in 2008, which now has gone global.



Bialowieza, a vast woodland across Poland and Belarus, is the only remaining primeval forest in the EU, and a UNESCO World Heritage Site. It's home to some of Europe's most fragile species and habitats, like the three-toed woodpecker and the European bison. © James Thornton

*Reduce emissions.* We stop coal-fired powerplants, public enemy number one when it comes to climate. We prevent new ones and shut down old ones. Money then flows to renewables. We've stopped a generation of coal plants in Europe. Now we're working on this in China and South East Asia.

*Protect nature.* Natural systems are under threat even in Europe. We've helped save the Bialowieza Forest, Europe's greatest. Working with citizen groups across the spectrum, we stopped illegal cutting, and we're protecting the rare forest bison. We need to protect people too, from air pollution, toxic chemicals, plastic. We've won dozens of cases that help protect people. We've also trained Chinese judges and prosecutors, who have initiated more than 200,000 environmental protection cases.

*Restore nature.* The Convention on Biological Diversity will be rewritten later this year at COP15 in China. It could become the world's most effective nature law. We are working hard to make sure it will do its job. So it will be visionary and strong. And be enforceable.

### ClientEarth

www.clientearth.org  
jthornton@clientearth.org



### Arkadyi Tishkov

Russian Geographical Society Environmental Commission Co-Chair, IASC Commission Chair, Member of the RAS Polar and Ecology Scientific Commissions

## Arctic Biodiversity and Climate Change

Welcome to the Russian Arctic. This a beautiful, dynamic region; Russia is an Arctic state with roughly 20% of our land mass within the Arctic Circle. We have the world's longest Arctic coastline and 50% of people living in the Arctic live on Russian territory, along with approximately 80% of all Arctic species represented here. It is a wonderful place to study Arctic life sciences and as the Arctic is warming twice as fast as the rest of the world, it is an ideal region to research the effects of climate change that are occurring here and globally.

Our climate change research is comprehensive and covers all aspects of the science including: sea ice, fauna and flora, animal migrations, forests, permafrost, tundra and of course human activities and adaptations.

As in many parts of the world, the threats to our biodiversity are climate change, pollution and industry. We have made some good progress with new national parks, nature reserves and clean-up campaigns. The value of our Arctic ecosystem services is immense, the effects of climate change are accelerating, and so our work becomes even more vital.

I invite you to come to the Russian Arctic and enjoy the biodiversity.



www.rgo.ru/en



### Kristine Tompkins

President, Tompkins Conservation. UN Patron of Protected Areas

## Why We are Rewilding the Americas

*Who is missing?* At Tompkins Conservation, we pose this question when we set eyes on wildlands, from the grasslands of Chilean Patagonia to the shimmering wetlands of north-east Argentina and beyond.

Every day, our planet is losing some 200 species, each with its own unique character and brilliance. Some have never been studied or even named. With them also go key interactions in nature – with other species, the soil, and the very air we breathe. Like an invisible web, these exchanges constitute healthy ecosystems that uphold climate

stability and the delicate balance of life on Earth. When these natural processes are broken, it is time to step in to help nature do its job.

Rewilding is the answer.

It's about reseeding algae so that the coastal biodiversity can flourish, establishing a biological corridor for

Andean deer on the brink of extinction, breeding jaguars so they may roam wild where they had been exterminated, actions which renew our own connection with the wild in the process. This is rewilding. Bringing back the missing to reverse the destruction and collateral damage caused by humans.

The cause is urgent, but far from lost. It will take many of us, working all over the planet, to bring back the missing in meaningful and important ways.



Iberá Communities Carambola Canoe pulled on horseback. Natural parks, with their complete and functional ecosystems, are engines of local economies. In Iberá Park, entrepreneurs offer unique ways to experience the local culture of the wetlands. ©Beth Wald

www.tompkinsconservation.org  
info@tompkinsconservation.org



A hummingbird flying under a fog machine that illuminates the airflow around its wings (top). © Anand Varma

Diana Dombrowski swims above a limestone spring vent, silhouetted amongst the treetops. Water flowing from these springs will join the Santa Fe River, a tributary of the famous Suwannee River. © Jennifer Adler



A *Bruguiera gymnorrhiza* propagule collected in front of some fringing mangroves along the southern coast of Guam. This species of mangrove may be vulnerable since it relies heavily on a particular species of bird for pollination, which has unfortunately become locally extinct due to the invasive brown tree snake. © Cara Lin

**Toucan Rescue Ranch**



**Zara Palmer**

Marketing Manager, Fundraiser and Education Supervisor



**Ana María Villada Rosales**

Veterinarian Supervisor  
MVetSci Conservation Medicine



**Andrea Quirós Vargas**

Tour Guide and Manager of Natural Resources



www.toucanrescueranch.org  
zara@toucanrescueranch.org

**Live from The Toucan Rescue Ranch**

The Toucan Rescue Ranch in Costa Rica works with a model that focuses on conservation, education, and research to ensure a brighter tomorrow for wildlife.

Founded in 2004, the centre provides sanctuary while providing premier medical treatment, rehabilitation, and rewilding of healed animals.

As a steward of wildlife, the Toucan Rescue Ranch fosters the philosophy of a ‘One Health’ approach; an approach that nurtures the environment, animals, and communities. An integral part of our work at the Toucan Rescue Ranch is to educate people on methods for protecting wildlife in Costa Rica and beyond.

Wildlife rescue and conservation go beyond saving animals – it drives every one of us to save each other and to protect our home. Today and every day we stand for wildlife and invite you to join us to fight for a better tomorrow – not just for you or me, but for nature – for us.



**Sarah Toumi**

Monitoring officer, Great Green Wall Accelerator.  
Rolex Laureate

**The Great Green Wall, a Nature World Wonder in Africa**

Born in a French-Tunisian family of farmers, I had faced, smelled and seen how desertification can destroy farmers’ livelihoods, like it did with my grand-parents.

After ten years working in Tunisia fighting desertification with my social enterprise Acacias for all, I joined the One Planet Summit team to help set the strategy of the Great Green Wall Accelerator, and the United Nations Convention to Combat Desertification to support its implementation. A decade in and roughly 15% underway, the initiative is already bringing life back to Africa’s degraded landscapes, providing food security, jobs and a reason to stay for the millions who live along its path.



© UNCCD

One of the ways of realising the ambition is to connect grassroots communities, SMEs and environmentalists into impactful value chains in partnership with industrials, off-takers, carbon markets, researchers and international partners, all committed to

value eco-system services and fairly distribute economic benefits.

That’s why the Great Green Wall is no more about planting trees but about investing in agroecological value chains, restoring landscapes and sustainable management of soils and water resources, supporting access to clean energy, creating a favourable framework for security, stability and sustainability, and strengthening capacity building and advocacy.

When achieved, the Great Green Wall will become the biggest nature-based solution of the world, an African-made nature world wonder and a pride for humanity.



www.greatgreenwall.org  
stoumi@unccd.int



### Anand Varma

Science photographer,  
National Geographic Emerging  
Explorer

## Exploring the Hidden Wonders of our World

I spent my childhood wandering through the woods of North Georgia, turning over logs and exploring creek beds looking for nature's buried treasures. I learned from those adventures that the natural world is an endless source of surprise and mystery. I'm still on the hunt for new and delightful wonders, but now I bring a camera with me in the hope of sharing what I discover.

I have found photography to be just the right tool to help us notice those layers of complexity and beauty we tend to miss at first glance. I can't help but feel if we just hold our breath and gaze a bit closer at what's in front of us, we might just catch a glimpse of the secrets hiding in plain sight. I hope that with renewed attention to that complexity we so often overlook, perhaps we can build more respectful and resilient relationships with the natural world.

SPEAKERS



A close up view of a newly emerged honeybee. © Anand Varma



Parasitic barnacle larvae emerging from an infected crab. These parasites feminise male crabs, forcing them to grow a female anatomy and take on the maternal care of the barnacle's young. © Anand Varma

www.varmaphoto.com  
aavarma@gmail.com

### Vava'u Environmental Protection Association



### Lisa Fanua and Susana Ika

Community Conservation  
Managers, Vava'u  
Environmental Protection  
Association

## Conservation in Vava'u, Tonga

The Vava'u Environmental Protection Association (VEPA) was formed in 2009 by seven residents to conserve and protect the biodiversity and natural resources of Vava'u, Tonga. We work closely with communities through hands-on projects and knowledge exchange to ensure that cultural and traditional knowledge is at the forefront of programmes, and that biodiversity conservation is people centred, promoting sustainable livelihoods and economic activities that maintain healthy ecosystems. VEPA's programmes support the conservation of terrestrial and marine biodiversity and emphasise the connectivity and linkages between habitats and livelihoods.

Coral reef, near-shore, and pelagic habitats are critical to our biological, ecological, economic and social functions for biodiversity, livelihoods, and sustainable development. So our ocean project aims to increase community capacity and understanding of marine ecosystems and the benefits of marine protected and community-managed areas. The awareness programme has already reached over 39 communities and 18 schools and has successfully developed information material on near-shore habitats, sustainable fishing and gleaning, which is used in community discussions.



© VEPA

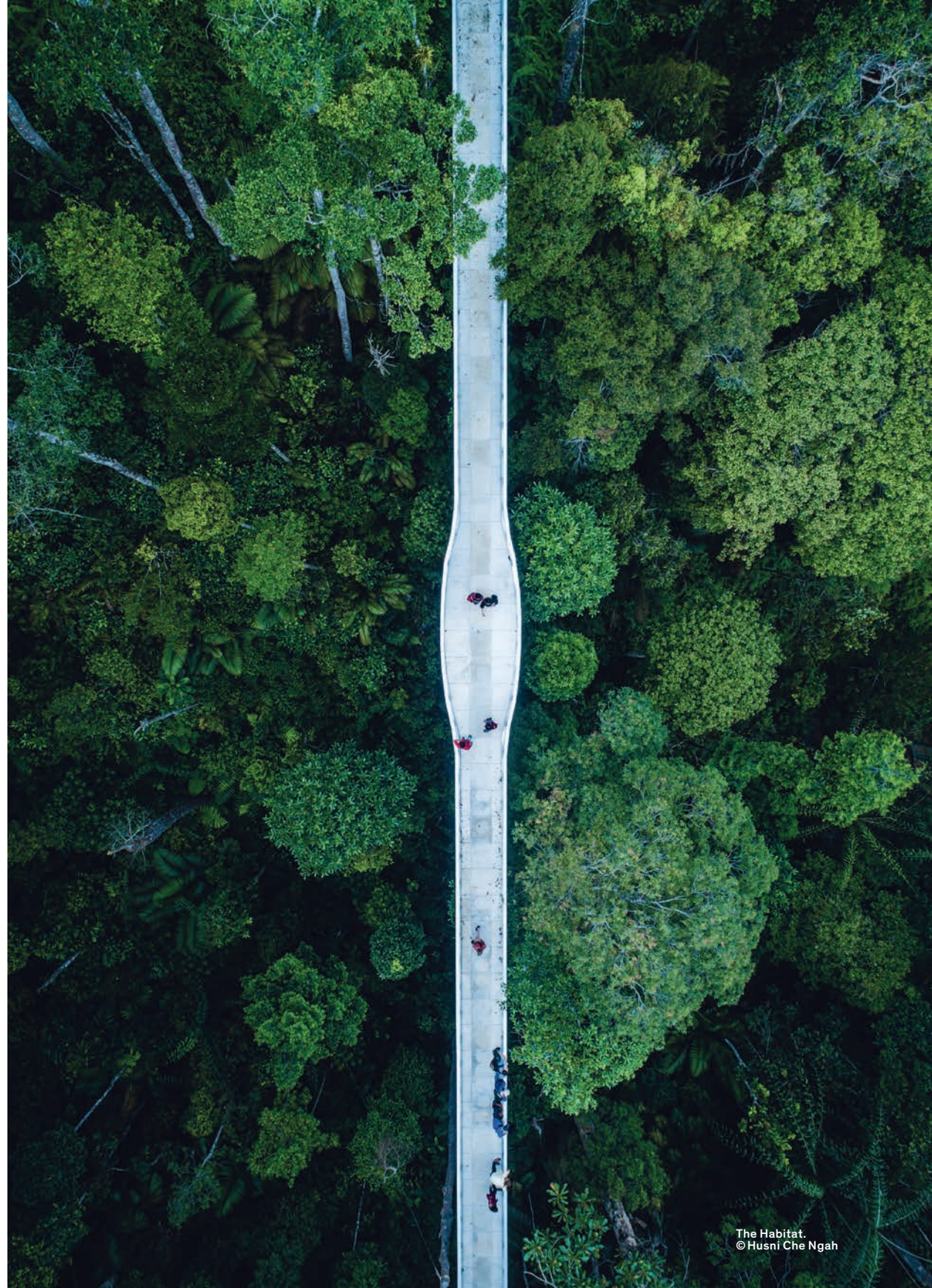
On land, the project aids in rat management and eradication on Mount Talau and two outer islands to protect the natural biodiversity and ecological process of these areas. Monthly bird counts are also conducted to monitor the population of the Tongan Whistler (Hengehenga).

www.vavauenvironment.org



The Habitat Penang Hill,  
dead leaf mantis, *Deroplatys  
desiccata* (top).  
© Husni Che Ngah

The Habitat, a *Heteropoda  
davidbowie*. © Husni Che Ngah



The Habitat.  
© Husni Che Ngah



**Justine Vaz**

General Manager, The Habitat Foundation

**Biodiversity Conservation in Penang**

The island of Penang, once celebrated as the ‘Pearl of the Orient’, is in fact an emerald isle! At The Habitat Penang Hill, it is our pleasure to introduce people to the pristine rainforest on our doorstep and, through The Habitat Foundation, this translates into support for conservation in Malaysia and elsewhere in the region. The forest of Penang continues to hold treasures of biodiversity and secrets about the intricacies of rainforest ecology still to be discovered. Today, this forest and a representative array of the island’s ecosystems have been nominated as a UNESCO Man and the Biosphere Reserve. How this came to be is a conservation fable for our times. In these dark days we are gripped by the challenge of safeguarding wild places and the natural systems that support all life, including ours. This quest is daunting indeed, but sometimes breakthroughs can be found in the magical intersection of individuals, communities, organisations, and institutions. Everyone can play a role in turning the tide. Each day is an opportunity to tip the scales in favour of something better.



The Habitat.  
© Husni Che Ngah



Jumping spider (*Hyllus diardi*).  
© Husni Che Ngah



[www.habitatfoundation.org.my/homepage/](http://www.habitatfoundation.org.my/homepage/)

SPEAKERS



**Adriana Vergés**

Marine ecologist at UNSW Sydney and the Sydney Institute of Marine Science. Co-founder, Operation Crayweed and Operation Posidonia

**Engaging Local Communities to Restore Underwater Forests and Meadows**

Seaweeds and seagrasses are the underwater forests that fuel entire ecosystems around the world. They absorb carbon dioxide and turn it into biomass, which produces dense and highly productive underwater forests providing vital habitat for thousands of species. Despite their importance, underwater forests are declining in many parts of the world, and these losses are happening out of sight and out of mind for too many of us. Operation Crayweed and Operation Posidonia are two Sydney-based projects that combine science and community engagement to restore seaweed and seagrass species in Australia.



Community planting of crayweed in Freshwater, Sydney. © Leah Woods

Crayweed (*Phyllospora comosa*) is a large seaweed that disappeared from the Sydney metropolitan coastline over 30 years ago, as a result of sewage pollution. Operation Crayweed has developed a method to reintroduce this species and has successfully restored self-sustaining populations to multiple reefs where they were once dominant.

Posidonia (*Posidonia australis*) is a slow-growing seagrass that is declining rapidly in eastern Australia, where it is listed as ‘Endangered’. Boat moorings that scour the seafloor and remove marine vegetation are one of its major threats. Operation Posidonia enlists local communities to collect seagrass shoots that become naturally detached following storms. These shoots are then planted in old boat mooring scars in a way that avoids damaging existing meadows while also engaging communities and increasing stewardship.



[www.operationcrayweed.com](http://www.operationcrayweed.com)  
[www.operationposidonia.com](http://www.operationposidonia.com)  
[a.verges@unsw.edu.au](mailto:a.verges@unsw.edu.au)

SPEAKERS





### Ami Vitale

Nikon Ambassador, National Geographic Explorer, Photographer and Filmmaker

## Extreme Conservation

In 2020 Rothschild's (Nubian) giraffes had become marooned on Longicharo Island, a rocky lava pinnacle, in the middle of western Kenya's Lake Baringo. Severe flooding turned the peninsula into an island, trapping the giraffes. In a dramatic rescue, conservationists from Save Giraffes Now teamed up with Kenyan wildlife authorities and local members of the community to transport the giraffes on a makeshift raft – lovingly called GirRaft – to a new sanctuary within the 44,000-acre Ruko Community Conservancy.

Today, fewer than 3,000 Rothschild's giraffes are left in Africa, with about 800 in Kenya. They have lost about 80% of their population in the last 30 years, making it one of the most imperiled giraffe subspecies. The hope is that this is just the first step of reintroducing them back to their historical home across the Western Rift Valley.

Stories like this can become our wake-up call. We are on this planet together and this too, is our shared life raft. These critters that inhabit the Earth are our fellow travelers, and our only friends, in this cold, dark universe. Our future happiness depends on them too. We need to give them a chance to succeed and then we can save our shared little life raft – our shared little GirRaft.



In a dramatic rescue, Rothschild's (Nubian) giraffes are transported across Lake Baringo, on a makeshift raft, also called the GirRaft to Ruko Community Conservancy. The rising lake levels inundated lush lands with water, turning a peninsula into an island and trapping the giraffes. Today, fewer than 3,000 Rothschild's giraffes are left in Africa, with about 800 in Kenya. © Ami Vitale

www.amivitale.com



### Songlin Wang

Founder and President, Qingdao Marine Conservation Society, 2021 Pew Marine Conservation Fellow

## Saving China's Largest Remaining Eelgrass Bed with Small-scale Fishing Communities

Eelgrass beds once flourished in the Yellow Sea ecoregion, an area along China's north-eastern coast that includes the Bohai and Yellow Seas. This indispensable inshore ecosystem provides an indispensable habitat for hundreds of species of invertebrates and fish, efficiently captures and stores carbon dioxide, improves water quality, and helps protect coastal communities by reducing wave intensity and shoreline erosion.

Over the past 30 years, however, eelgrass beds have declined as a result of human activities, including coastal reclamation, unsustainable fishing and aquaculture, and pollution.



Eelgrass illustration by Li Yuqiang. © QMCS

In 2015, China's largest eelgrass bed, spanning nearly 50 km<sup>2</sup>, was discovered in the Bohai Sea. Yet six years later, this habitat, known as the Bohai Bay eelgrass bed (BBEB), still has no legal protection status or systematic conservation plan despite facing various threats.

Wang Songlin and his team at Qingdao Marine Conservation Society will study the BBEB's ecological and socio-economic benefits, as well as its vulnerability to local stressors, to provide a scientific foundation for effective management of this ecologically rich marine habitat. Songlin will also work with local fishers, who rely on the BBEB for subsistence, to develop and promote eelgrass-friendly fishing practices.



www.qmcs.org.cn  
songlinwangqdcn@gmail.com



### Ollie Wearn

Wildlife biologist, Fauna & Flora International Vietnam Programme

## Saving the Small Apes from a Big Extinction

Gibbons almost need no introduction: the singing and swinging masters of the treetops. Despite this, you might not have heard of the cao vit gibbon (*Nomascus nasutus*). Or indeed the other six species of crested (*Nomascus*) gibbon. They live across Vietnam, into Laos, Cambodia and southern China, and today their songs are seldom heard by local people. The cao vit gibbon, for example, has probably declined to just a dozen family groups left on Earth.

Happily, that is now changing in Vietnam. Various conservation groups have, for the last two decades, been quietly working from the grassroots, gradually changing hearts and minds. It is a tried-and-tested approach: listening to the concerns of local people, encouraging more sustainable livelihoods, providing employment, persuading hunters to down tools, bolstering protected area capacity, and supporting (and sometimes cajoling) local government.

Through working for Fauna & Flora International (FFI) in Vietnam, I have seen first-hand the kind of results that this committed, long-term approach to conservation can generate. FFI's approach might well have saved the cao vit gibbon from extinction. And the conservation lesson over the last two decades has been that time is key. Time is often our most precious commodity in conservation, but to effect true change, it appears that there are no magic shortcuts, no conservation 'wormholes' and, like the old Chinese proverb says about planting trees, the best time to begin this kind of long-term work was indeed 20 years ago, but the second best time is today!



A 'gibbon festival' to encourage positive attitudes towards the cao vit gibbon.  
© Ho Hai Yen / FFI

A young cao vit gibbon (*Nomascus nasutus*) on the Vietnam-China border – the last place on Earth where this species still lives.  
© Nguyen Duc Tho / FFI



[www.fauna-flora.org/countries/vietnam](http://www.fauna-flora.org/countries/vietnam)



### Kanchana Weerakoon

Founder, ECO-V, Sri Lanka

## Gardens with Loving Kindness to Help Urban and Peri-urban Biodiversity in Sri Lanka

The Metta Garden in Colombo, Sri Lanka, run by Eco-friendly Volunteers (ECO-V), is the place for generating healthy food for people and a living space for many other animals and plants. It has become an inspirational training institute for many stakeholders who are trying to grow organic food and to get a better income through organic food in high demand.

Finding a space to grow food is a challenge in urban areas. Even though a space might be available for growing food, opening up this space not only for human beings but also for bees and butterflies is even more challenging for two reasons: one is overcoming

selfishness in sharing a very limited space with other living beings, the other challenge is attracting butterflies, bees, and other biodiversity to an urban set-up. But both these challenges have been overcome with our 'Metta Garden'.



Community awareness at Metta Garden. © ECO-V

The total area of the land (18 perch/450 km<sup>2</sup>) is situated in the middle of a semi-urbanised area, 12 km south of Colombo, the

commercial capital of Sri Lanka. In 2013 when this piece of land was bought, it was just an empty patch with degraded soil and a single coconut tree. It was my mission as the president of ECO-V to use this piece of land to bring back whatever biodiversity was available in the environment and to make it useful for the people living in the area. It's a very precious place for us, where we get mental well-being and space to get connected with Mother Nature.

[www.eco-v.org](http://www.eco-v.org)



Over the last few decades, orangutans have lost a significant portion of their habitat due to development and agriculture. Planet Indonesia works to protect these apes through reforestation and ranger patrols. © Justin Grubb



A wildlife ranger comforts Sudan, the last living male Northern White Rhino left on the planet, moments before he passed away March 19, 2018 at Ol Pejeta Wildlife Conservancy in northern Kenya (top). © Ami Vitale

Sloth Mom gets orthopedic surgery. © Toucan Rescue Ranch



### Debbie Winton

Research Manager, Plastic Pollution and Impact, Earthwatch Europe



Volunteer citizen scientist conducting a river litter survey. © Laura Alderson

## Plastic Pollution – An Untold Threat to Freshwater Biodiversity

Rivers and lakes occupy less than 1% of the planet's surface but contain 25% of all vertebrate species. With more than half of global river systems heavily affected by human activities, populations are dwindling rapidly, by up to 93% for migratory fish in Europe. Habitat loss, pollution, dams, overfishing, agriculture and climate change all play a part, and now there is a new threat – plastic. Our knowledge of how plastic impacts marine biodiversity is growing fast, but the impact on freshwater species is relatively unknown. Only 13% of published research on plastic pollution focuses on freshwater environments. 80% of the plastic that ends up in the oceans comes from rivers, but it is likely causing untold levels of environmental damage long before it reaches the sea.

The complexity, scale and urgency of the plastics challenge make it something we must tackle together. Our Plastic Rivers research programme provides practical, evidence-based steps to tackle the plastic pollution on our doorsteps, so everyone can be part of the solution. By stopping plastic reaching our rivers, we can safeguard freshwater ecosystems, and our oceans – protecting human health and wildlife for the future.

Earthwatch is an environmental charity with science at its heart. We drive the change needed to live within our means and in balance with nature. We do this by:

- connecting people with the natural world;
- monitoring the health of our natural resources; and
- informing the actions that will have the greatest positive impact.



earthwatch  
EUROPE

www.earthwatch.org.uk  
dwinton@earthwatch.org.uk



### Siew Te Wong

CEO and Founder, Bornean Sun Bear Conservation Centre

## Novel Approaches for Sun Bear Research and Conservation in Sabah

The Bornean Sun Bear Conservation Centre (BSBCC) was founded in 2008 in partnership with the Sabah Wildlife Department (SWD), Sabah Forestry Department, and LEAP in Sandakan, Sabah, Malaysian Borneo. The centre aims to conserve sun bears through holistic approaches that incorporate animal welfare, education, research, rehabilitation, community conservation, ecotourism, captive breeding and anti-poaching to address all the conservation challenges faced by the sun bears in Sabah.

To-date, the BSBCC has cared for 65 sun bears that were rescued by SWD across Sabah. The centre was opened to the public in 2014 and conducted a series of education programmes at the centre and education outreach programmes across Sabah. The BSBCC also hosted more than a dozen research projects on both captive and wild sun bears by local and foreign researchers. Ten sun bears have been successfully rehabilitated and released back into the wild.



Fitting a satellite collar on a rehabilitated sun bear before its release into the wild. © Jason Isley / ScubaZoo.com

Sun bear is the smallest and the least known bear species in the world. © Seng Yen Wah / BSBCC



www.bsbcc.org.my

Since 2014, a total of 415,221 tourists have visited the BSBCC from across the world, and the centre's operational costs have been fully covered by revenues generated from ticketing, merchandise and donations. These revenues have also partially covered projects on construction, conservation education, research, rehabilitation, and community conservation. The BSBCC is a novel example of a conservation project working alongside ecotourism, and incorporates multiple conservation actions to conserve sun bears in Sabah.



**Doug Woodring**

Founder, Ocean Recovery Alliance

## When Spider Webs Unite, They Can Stop a Lion

Ocean Recovery Alliance is focused on reducing plastic pollution at a global level, both on land and in the water, by creating strategic solutions for governments, industry and communities which lead to long-term, hands-on programmes which engage stakeholders and improve business practices. We purposefully design activities to educate, build awareness and provide solutions which inspire positive societal change at the community, national and international levels.

We created the Water Falling and Water Rising Festivals three years ago in villages along the Tonle Sap Lake near Siem Reap, and hosted the River Celebration to clean the downstream side of the river from Siem Reap, which all villages and fishermen still successfully and proudly manage. Since then, we have engaged over 15,000 local village individuals, village chiefs, monks and local government officials in bringing pride to the outdoors to help protect the waters they rely on, which are also overstressed from river dams, climate change, overfishing, and pollution.

The main focus of our programmes is plastic pollution reduction, both in the villages, and the waters. The goal is to continue education for all ages to improve sorting and waste creation at home, providing drop-off and collection points in village centres, pagodas and tourist locations. Overall, the focus is on both water recovery and improvement, as well as land-based education, reduction, and empowerment on reducing pollution on Cambodia's 'Inland Ocean', the Tonle Sap.



© Ocean Recovery



www.oceanrecov.org



**Erika Woolsey**

CEO and co-founder, The Hydrous. Visiting scholar and lecturer, Stanford University. National Geographic Explorer

## Sharing the Ocean

The ocean is overexploited, under protected, and out of mind. Scientific discovery has provided clear evidence on the effects of climate change, pollution, and overfishing on marine ecosystems like coral reefs, but how can we expect people to care about places they never see or experience?

To bridge this disparity between science and public understanding, The Hydrous uses engaging science-based experiences, scalable technologies like virtual reality, and multidisciplinary partnerships to inspire connection and marine stewardship. Led by co-founder and CEO Dr. Erika Woolsey, The Hydrous is an international community of scientists, divers, designers, filmmakers and technologists on a mission to create open access oceans. By harnessing ever-improving scalable technology to develop and implement engaging science-based experiences, we can take more people to places in the ocean that are totally underexplored or inaccessible.


Emotional connections to marine ecosystems are what lead to understanding and conservation of our blue planet. As Baba Dioum famously said, "In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught." We at The Hydrous would add to that: we can best learn through experience.



Join a virtual dive by following a QR code with your smart device. Make sure to have the YouTube app installed. Move your device around you, or drag with your finger, to experience the 360° effect.  
© The Hydrous



www.thehydro.us



“  
We live on a planet.  
We are all Earthlings.  
Thin blue line –  
the only border that  
matters.”

Nicole Stott, astronaut

# Global Biodiversity Festival – The Book

globalbiofest.com

## Design

Bontron & Co, Geneva,  
Switzerland  
Jérôme Bontron  
Sarah Muehlheim

## Layout

Bontron & Co, Geneva,  
Switzerland  
Simone Kaspar de Pont

## Proofreading

Jeanine Beck

## Printing

Courvoisier-Gassmann SA, Bienne,  
Switzerland

## Heartfelt thanks to

The speakers, for their inspiring talks,  
texts and courtesy images.

Joe Grabowski, who had the ambitious  
idea of the Global Biodiversity Festival.

The Exploring by the Seat of Your Pants  
team and hosts from around the world, who  
ran the three days brilliantly.

Keith Findlay, Matteo Poggio and Pablo  
Bonales of Klay Event Technology who  
provided the outstanding platform, flawless  
technical support and guidance.

Our friends and the organisations who  
generously activated their networks to bring  
the festival to life.

Rolex supported the 2021 Global  
Biodiversity Festival as part of its Perpetual  
Planet initiative. The Rolex Perpetual  
Planet initiative supports individuals and  
organizations using science to understand  
the world's environmental challenges  
and devise solutions that will restore  
balance to our ecosystems.

## Book development

Joëlle Bouchardy and Paul Rose

ISBN 978-2-8399-3283-7

© 2021 Global Biodiversity Festival



Back cover photo © Peter Houlihan  
Rainforest and coral reefs of Coiba National  
Park in the eastern tropical Pacific,  
a biodiversity hotspot of global importance on  
ancient volcanic islands originally formed by  
the Galapagos hotspot.



Cover photo © Jennifer Adler  
River cooters swim in the reflective waters of  
a Florida freshwater spring. As vegetation has  
disappeared from the springs in recent years,  
the turtles have lost their main supply of food.



myclimate.org/05-21-142502



All species shown here are protected by CITES





In May 2021, 173 scientists, finance experts, conservation leaders, explorers, photographers, and artists from 50 countries and all 7 continents, came together to present their work for 75 hours non-stop, and were joined by thousands of people from 82 countries. This was the second edition of the Global Biodiversity Festival.

Global Biodiversity  
Festival – The Book

ISBN: 978-2-8399-3283-7

ISBN 978-2-8399-3283-7



9 782839 932837 >