PAPACO

Newsletter from African protected areas

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Editorial

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OPENING THE DEBATE IS ALREADY A GOOD START...

In March of this year, Kenya embarked on a broad reflection regarding possible options for the "consumptive use" of wildlife in some natural areas (private or community -owned). This would mainly include hunting or breeding wildlife for slaughter, activities that had been banned in Kenya since 1977, favoring “vision tourism” activities instead.

This thought process is certainly difficult to carry out because it raises not only technical questions (how to "value" best the wildlife population of the country?) but also and most essentially a philosophical one (should we or should we not kill wild animals?).

Obviously, if this topic comes up today, it is because it has its promoters. The Ministry of Tourism and Wildlife highlights the possible contribution of wildlife use to food security, to the country's overall income (GDP), to job creations and to livelihoods improvements for the local populations involved. The ministry also stressed that this would reduce human-wildlife conflict.

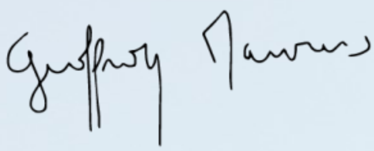
But if the topic is being discussed, it’s obviously because it also raises opposition. Voices are rising, particularly within some conservation associations, to dispute each of the previous arguments. These voices also worry about the difficulty of controlling such an activity without impeccable governance, about its high technicality which puts it out of reach for communities, about the risk of creating hidden markets and thus increasing poaching. Also being discusses is its possible impact on Kenyan culture, which is currently very favorable to "non-predatory" conservation.

At least, supporters and detractors share a common diagnosis: the observed and gradual degradation of biodiversity conservation conditions in the country comes with the almost mechanical disappearance of wildlife. Causes are well-known and, as everywhere, essentially related to the growing pressure on natural resources. Infrastructure, agriculture, livestock farming, behavioral changes ... all these factors inevitably reduce the space available for use by wildlife, most of which lives outside protected areas.

This debate is lively and we will undoubtedly return, in a forthcoming NAPA, on the results of these exchanges, seeing as the decisions made will bear consequences beyond Kenya’s borders.

Yet what is notable about this approach is precisely the fact that this debate exists and that the government has chosen to raise the issue publicly. A multidisciplinary task-force was formed in April, comprising environmentalists from the private, public and non-profit sector, to study the feasibility of such an evolution. And to present objectively the pros and cons. On the basis of this report, a public consultation was launched last August, including several meetings organized to gather the opinion of citizens. It is on the basis of all these exchanges that the government is committing to make its decision.

Is this enough? Is this ideal? I do not know. But the simple fact that the opportunity to speak out is given, in Kenya, to those interested in the future of wildlife is already a remarkable step forward. Compared with recent examples of national parks being allocated to conservation NGOs or other actors without any form of consultation of citizens, or even of their representation in parliament, this is a situation that should be underlined and that Kenya deserves to be congratulated for.



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Featuring this month

About "Protected Area Governance and Management"

Protected Area Governance and Management presents a compendium of original text, case studies and examples from across the world, by drawing on the literature, and on the knowledge and experience of those involved in protected areas. The book synthesises current knowledge and cutting-edge thinking from the diverse branches of practice and learning relevant to protected area governance and management. It is intended as an investment in the skills and competencies of people and consequently, the effective governance and management of protected areas for which they are responsible, now and into the future.

The global success of the protected area concept lies in its shared vision to protect natural and cultural heritage for the long term, and organisations such as International Union for the Conservation of Nature are a unifying force in this regard. Nonetheless, protected areas are a socio-political phenomenon and the ways that nations understand, govern and manage them is always open to contest and debate. The book aims to enlighten, educate and above all to challenge readers to think deeply about protected areas—their future and their past, as well as their present.

The book has been compiled by 169 authors and deals with all aspects of protected area governance and management. It provides information to support capacity development training of protected area field officers, managers in charge and executive level managers.

The entire book is freely accessible online in English on the Australian National University's website.

The French translation is currently ongoing and only the first four chapters are currently online.

Chapter 3: Earth's natural Heritage (excerpts)

Bastian Bertzky, Monika Bertzky and Graeme L. Worboys

Introduction

Earth is a very special place. It may seem large, maybe even infinite in size, but when viewing images captured by remote robots from Mars early in the 21st century, we quickly appreciate how Earth is just one bright dot in a vast expanse of space. From Mars, Earth is dwarfed by an immensity of the Milky Way Galaxy and the Universe beyond, and images like these are what help us appreciate that Earth really is a finite ark of life. Earth hosts extraordinary natural wonders, formed over 4.5 billion years of geological and evolutionary change. It is a dynamic world exhibiting breathtaking geological events; oceanic and atmospheric turbulence and turmoil; a relentlessness of forces of weathering, erosion and landform development; and of course, it hosts a remarkably rich assemblage of life forms with their own dynamics of adaptation, evolution and critical contributions to a healthy, livable planet.

For all of these reasons Earth is a unique planet. It is in the interests of humans and all other species on Earth that its intrinsic values are understood, respected, and its life-support systems are protected and sustained. Securing Earth's natural heritage reinforces the role and importance of protected areas and conservation practice on Earth at a global scale. These areas and such action help to conserve Earth's natural heritage and the essential ecosystem processes, habitats and species that help support life. The moderating influence provided by protection and conservation is essential, given the voracious capacity of Earth's expanding human population to consume and alter natural resources at a rate that threatens the very planetary life-support systems.

For professionals tasked with managing protected areas, it is imperative that they have a broad understanding of the intrinsic natural values of our planet. In this chapter, we provide this overview. We describe some of Earth's natural processes and its exceptional geodiversity and biodiversity. Then we briefly introduce, at a global scale, the impacts that humans are having on Earth's natural heritage early in the 21st century. This helps to emphasise why protected areas of all types, including governmental, non-governmental, private, and Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs) are needed and why the efforts of each individual manager or ranger working in support of their local protected area or protected area system are so critical. Fundamentally, it is the sum total of these individual and local conservation efforts that is contributing to the retention of life on Earth.

Geological processes

The Earth's crust is the cool, brittle outer layer that includes oceanic crust and continental crust and is collectively referred to as the lithosphere. There are seven major tectonic plates covering the majority of this lithosphere and they are in constant motion. This movement is less observable on a yearly basis, but is clearly manifest over geological time, giving rise to the present-day continental distribution. The localised effects of a dynamic lithosphere may be witnessed in various global locations. Geological phenomena such as sea floor spreading, oceanic plate movement including downward movements below continents (subduction), mountain building, volcanism, earthquakes, weathering, erosion, solution and deposition are all processes affecting the Earth's crust. While these processes occur over geological time frames, protected areas may still be directly affected by them from time to time and especially by earthquakes, volcanism, weathering and erosion. Being prepared for potential geological effects and incidents by understanding the underlying causes for such events is paramount for managers responsible for such areas.

Many famous protected areas help to conserve geological evidence of Earth's dynamic crust (see Chapter 18). Outstanding examples of the effects of these geological processes are, for mountains, Mount Everest and the Dolomites; for karst, the immense caverns in Phong Nha- Ke Bang National Park in Vietnam; for grand, aesthetic waterfalls, Yosemite Falls, USA; and for volcanism, the active volcanoes on the Kamchatka Peninsula, Russia.

Sagarmatha (Mount Everest) National Park World Heritage Property landscape and site of ancient conservation practices.
Source: Ashish Kothari

Climate

We often take the Earth's atmosphere for granted and we may assume it has been and will always be the same. But we make this assumption at our peril, for the atmosphere is finite, it is dynamic and it has changed substantially over the 4.5 billion years of Earth's history. Most important is a realisation by humans that it is actually life on Earth that has created the conditions suitable for all other life forms dependent on oxygen. The oxygen in our atmosphere, the oxygen we breathe, has been produced by living organisms and it is this oxygen that continues to be sustained by life on Earth.

Atmospheric composition

In the 21st century, the atmosphere is dominated by nitrogen (about 78 per cent), oxygen (about 21 per cent) and argon (about 1 per cent), with a number of other gases including carbon dioxide and water vapour as well as dust and smoke particles. Oxygen was not present, however, on early Earth. About 3.8 billion years ago, the planet's early atmosphere was established by intense volcanic activity and outgassing that released nitrogen, carbon dioxide, water vapour, ammonia, methane and smaller amounts of other gases. There was no atmospheric oxygen, but water sourced from volcanic steam venting helped form the early oceans on Earth.

The composition of the atmosphere is dynamic, oxygen levels are sustained by life on Earth and human activities such as habitat destruction do affect this balance and process. Protected areas help to maintain healthy ecosystems that directly benefit oxygen levels in the atmosphere, ecological processes and the life-supporting health of our atmosphere.

Climates of the earth

Climate is the average pattern of weather determined over a very long time by measures such as temperature, precipitation, wind and atmospheric pressure. For any given protected area, the climate will also be influenced by the latitude, altitude, terrain, proximity to mountains and proximity to large water bodies. The broad climates of the world have been mapped using the Köppen-Geiger system of climate classification, which recognises 12 distinct climates for Earth (Table 3.1).

The climates of Earth do change. Meteorologists have used models enabling them to forecast changes in climates based on increased concentrations of carbon dioxide and they have identified broad patterns that include enhanced temperatures, more or less rainfall, enhanced droughts, and more frequent severe storm events. These climate change effects will challenge protected area managers and their conservation management of biodiversity as these climatic shifts may bring shifts in species distributions that cannot be captured by static protected area boundaries (see Chapter 17).

Oceans

The higher carbon dioxide levels in the atmosphere and their consequential higher temperatures are affecting both the average temperatures of the world's oceans and their acidity (given greater amounts of dissolved carbon dioxide and the formation of a mild acid). This in turn has affected life in the oceans including bleaching of coral reef systems and acidification impacts such as the rate of calcification or dissolution of marine organisms like corals, crustaceans and molluscs (see Chapters 17 and 20).

Bartolome Island, Galápagos Islands World Heritage Property, Ecuador
Source: IUCN Photo Library © Imène Meliane

Protected area managers need to understand these dynamic marine processes in addition to the conservation needs of the world's marine and coastal biodiversity. Many coastal and marine protected areas will feel the full force of climate-affected and turbocharged nature in the future. Anticipating and responding to these inevitable situations will require managers to integrate their knowledge of these forces and associated impacts using the prevailing science as well as their experience of local circumstances. Undoubtedly, these strategies will also be influenced by variable sociopolitical regimes and global attitudes to climate change.

Table 3.1 Twelve distinct climates of Earth

Tropical rainy climates	
For tropical rainy climates, the average annual temperatures are above 18°C, there is no winter season and annual rainfall is large and exceeds annual evaporation. They include:	
	Hot climates with year-round rain (the rainfall of the driest month is > 6 cm)
	Hot climates with monsoon rain (the rainfall of the driest month is < 6 cm)
	Hot climates with seasonal rains—tropical savannah climates (the rainfall of the driest month is < 6 cm and the dry season is strongly developed)
Dry climates	
For dry climates, evaporation exceeds the precipitation on average throughout the year. These climates include:	
	Steppe climates—characterised by grasslands (this is an intermediate climate between desert climates and more humid climates)
	Desert climates (these are arid areas where the annual precipitation is < 40 cm)
Mild humid climates	
Mild humid climates have both a summer and a winter, with the coldest month being less than 18°C but above –3°C and at least one month is above 10°C. These climates include:	
	Mild humid climates with no dry season (precipitation in the driest month is > 3 cm)
	Mild humid climates with a dry winter (where 70 per cent of the precipitation falls in the warmer six months)
	Mild humid climates with a dry summer (where 70 per cent of the precipitation falls in the six months of winter)
Snowy-forest climates	
The average temperature of the coldest month is less than –3°C and the warmest month average temperature is above 10°C. These climates include:	
	Snowy-forest climate with a moist winter (no dry season)
	Snowy-forest climate with a dry winter
Polar climates	
The average temperature of the warmest month is below 10°C and there is no true summer. These climates include:	
	Tundra climate (where the mean temperature of the warmest month is above 0°C but below 10°C)
	Perpetual frost climate (where the mean monthly temperatures of all months are below 0°C)

Source: Strahler (2011:260–2)

Geodiversity

Geodiversity is the term used to describe the geological component of abiotic nature and is defined by Gray as '[t]he natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landform processes) and soil features. It includes their assemblages, relationships, properties, interpretations and systems.'

Protected area management teams may include geologists or geophysicists or they may seek such expertise to assist with decision-making for a range of these dynamic Earth processes.

Biodiversity

Life on Earth is precious, reflecting ancient beginnings with the simplest of life forms billions of years ago to the past 600 million years of extraordinary evolutionary development. Life has endured five major extinction events and may be on the verge of a sixth—the first to be caused by humans. From the poles to the equator, from continent to continent, there is an immense diversity of life.

The distribution of plants, animals and other organisms is not even and is influenced by dynamic geological processes, the world's climates, its geodiversity and its geographical-based evolutionary development. In this section, we introduce this rich biodiversity including Earth's species and their major habitats.

Defining biodiversity

The term biological diversity, or biodiversity, refers to the variety of life on Earth. This includes plants, animals, fungi and micro-organisms, the genetic information they contain, the ecosystems they form and the ecological processes that bind them across multiple scales. Biodiversity has been defined in Article 2 of the UN Convention on Biological Diversity (CBD) as the 'variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems'

A species is widely defined as a group of organisms with a shared, closed gene pool (for example, the giant panda, *Ailuropoda melanoleuca*, is a species), although speciation can also occur without genetic isolation.

Genes hold the information to develop and maintain an organism's cells and pass this information to offspring.

A habitat is the natural environment in which a particular organism lives (for example, temperate montane forests with dense stands of bamboo in China are the habitat of the giant panda), and an ecosystem is a community of living organisms together with their non-living environment (for example, a forest with its soils, a lake or river with its bed, or a coral reef ecosystem with its surrounding waters).

Measuring biodiversity

Biodiversity can be measured in many different ways. From a 'compositional' perspective, one of the most commonly asked questions is: how many species are there on Earth? Global species estimates vary greatly and, in the past, have ranged from three million to more than 100 million species. One recent estimate arrives at 9.9 million eukaryotic species—that is, 'higher life forms' that have a membrane-bound cell kernel, of which 19 per cent have been described. Another recent study estimates there are 8.7 million (±1.3 million) eukaryotic species globally, of which some 14 per cent have been described. Estimating the number of prokaryotic species, which do not have a membrane-bound cell kernel (for example, bacteria), is difficult and recent estimates still vary from as little as 10 000 to more than one million.

Many of the species described so far are considered threatened—that is, they are facing a higher risk of extinction as a result of human-derived or natural impacts. The IUCN Red List of Threatened Species provides a global standard for assessing

Three Parallel Rivers of Yunnan Protected Areas, China
Source: IUCN Photo Library © Jim Thorsell

and recording the conservation status of species, the threats affecting them and the conservation actions in place or required. At the beginning of the 21st century, 41 per cent of the world's amphibians, 25 per cent of the mammals and 13 per cent of the birds are recognised as being 'critically endangered', 'endangered' or 'vulnerable'. Plant groups with a high proportion of such threatened species include cycads (63 per cent), conifers (34 per cent) and cacti (31 per cent). Recent extinction rates have been estimated to be 100 to 1000 times higher than in prehuman times, and this has led to suggestions that the sixth major extinction event in Earth's history may be underway.

Distribution of biodiversity

Biodiversity is not evenly distributed across the Earth. The number and type of species and ecosystems present change with factors such as climate, altitude, latitude, available space, time and energy. Overall species richness, for example, increases from polar regions to temperate regions to the tropics. This also applies within most of the taxonomic groups (for example, there are more bird species in the tropics than in temperate regions) and within most similar ecosystems (for example, there are more species in tropical forests than in temperate forests).

Different approaches to biogeographic classification of the world's terrestrial, freshwater

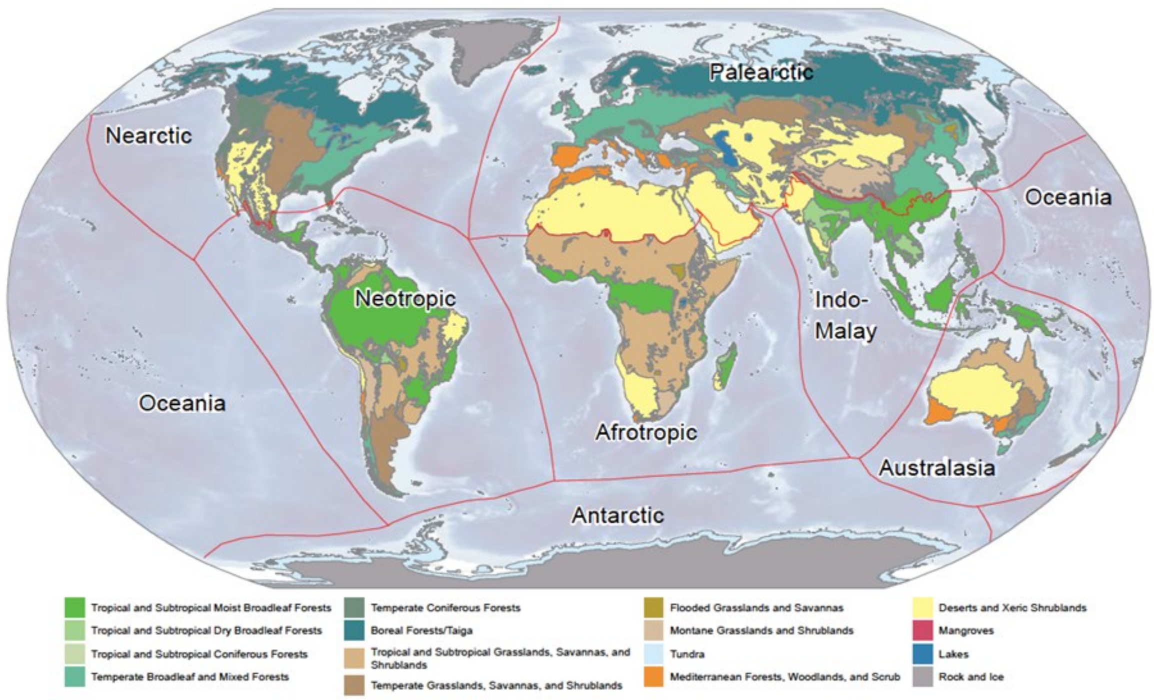

Figure 3.3 The eight biogeographic realms and 14 biomes of the world

Source: Modified from Olson et al. (2001)

and marine environments have been developed and refined over time, serving different purposes, and all of them have limitations. Some recent approaches make use of our ever-increasing but still imperfect knowledge of species distributions and the phylogenetic relationships of species to delineate biogeographic regions. Other approaches subdivide the world into major biomes and ecoregions based on the distribution of ecological communities.

Several of the last approaches have been developed specifically for, and found wide application in, the field of biodiversity conservation.

Terrestrial biomes

The 'terrestrial ecoregions of the world' system of Olson et al. (2001) is used here to describe in more detail the natural distribution of terrestrial ecosystems on Earth. It recognises eight biogeographic realms—large areas within which organisms have been evolving in relative isolation over long periods—and 14 vegetated biomes (Figure 3.3). While the realms are characterised by the related evolutionary history of the organisms they contain, the biomes represent major ecosystem types that are characterised by fairly similar climatic conditions and ecological communities. Major biomes such as forests, grasslands and deserts are easily recognised, including from space, and influence the distribution of species on Earth.

Human impact on the distribution of biodiversity

Human alteration of the global environment has caused considerable changes to the natural distribution of biodiversity. The human impact on the biosphere can be assessed in many ways. Recent estimates of the human appropriation of net primary production suggest, for example, that 24 per cent of the potential net primary productivity of the world's terrestrial ecosystems is consumed by humans.

Protected areas as safeguards for Earth's natural heritage

Effectively managed protected areas play a key role in the conservation of the Earth's natural heritage. Through associated ecosystem services, protected areas also support the livelihoods of more than one billion people worldwide, and

Table 3.5 Protected area coverage of terrestrial realms

Terrestrial realm	Total land area (km²)	Protected area (km²)	Protected area (%)
Afrotropic	21 630 400	3 558 059	16.4
Australasia	9 268 092	1 375 024	14.8
Indo-Malayan	8 543 097	829 286	9.7
Nearctic	20 472 280	2 534 229	12.4
Neotropic	19 386 026	4 633 935	23.9
Oceania	49 199	4 552	9.3
Palearctic	52 859 883	6 918 957	13.1

Coverage was calculated based on all protected areas shown in Figure 3.6, eliminating spatial overlaps of different protected areas.
Sources: Olsen et al. (2001); IUCN and UNEP-WCMC (2014)

contribute billions of dollars to local, national and global economies.

Global protected area coverage

By mid 2014, protected areas, comprising all nationally and internationally designated protected areas of all IUCN management categories and governance types (including 'unknown') except for UNESCO biosphere reserves recorded in the World Database on Protected Areas (WDPA), covered 15.4 per cent of the global land area (outside Antarctica) and 3.4 per cent of the global ocean area.

This included 8.4 per cent of the marine areas under national jurisdiction, here defined as extending from the shoreline to the outer limit of the exclusive economic zone (EEZ) at 200 nautical miles (370 kilometres), and 10.9 per cent if only near-coastal areas (0–12 nautical miles, or 0–22 kilometres, from land) are considered.

The global protected area network does not yet meet the requirement of ecological representativeness stipulated in Target 11, and several biogeographic realms, in particular the Oceanian and Indo-Malayan realms, are underrepresented (Table 3.5).

Greater coverage is also needed in a number of biomes, especially temperate grasslands, savannahs and shrublands, and tropical and subtropical dry broadleaf forests. At present, 350 (43 per cent) of the world's 823 terrestrial ecoregions outside the Antarctic mainland meet the 17 per cent target, and 78 (34 per cent) of the 232 marine ecoregions meet the 10 per cent target.

Global biodiversity conservation priorities

Prioritising conservation action is necessary because the resources available for conservation are limited, and biodiversity and the threats to it are not evenly distributed. In short, prioritisation helps to decide where, when and how to act, with effective protected areas one of the key tools in our toolbox of conservation actions.

Several major templates for the identification of global priority areas for biodiversity conservation have been developed to guide the allocation of resources and actions. All these approaches, however, have their strengths and weaknesses—for example, with regard to their taxonomic or geographic coverage, criteria and thresholds used and practical value for designing effective and efficient protected area networks.

Introducing ecosystem management

We have briefly introduced Earth's abiotic and biotic natural heritage in this chapter. Protected area managers are at the frontline of managing for the protection and conservation of major ecosystems that help support life on Earth. Once the important biodiversity areas identified have been formally protected, they need to be effectively managed.

This management may include responses to threats such as habitat destruction and fragmentation, overexploitation, invasive alien species, disease, disturbance, pollution and climate change.

Protected area problems are, however, generally more complex than single issues. This complexity needs to be understood by managers and it is part of managing in a dynamic world (see Chapter 10). The root causes of threats to biodiversity need to be assessed and responded to strategically rather than in a reactive manner that may just deal with the symptoms of threats (see Chapter 16). One complex challenge is climate change. It is a major threat for all species (see Chapter 17), and strategic guidance has been provided for protected area management in the form of the following six guiding principles:

1. Maintain well-functioning ecosystems.
2. Protect a representative array of ecological systems.
3. Remove or minimise existing stressors.
4. Manage appropriate connectivity of species, landscapes, seascapes and ecosystem processes.
5. Eco-engineering may be needed to assist the transformation of some communities under climate change.
6. Genetic preservation must be considered in some cases.

Read the Chapter here : chapiter 3.

The New Holland honeyeater (Phylidonyris novaehollandiae) is a frequent, welcome and busy visitor to many southern Australian homes and gardens. It is one of Australia's 898 recorded bird species and is a native to habitats that include forests and woodlands, creek sides, and coastal scrubs and heathlands. It is shown here with one of its favoured nectar sources, the flower of a native Grevillea sp., a relic Gondwanan Proteaceae species (Gondwana is the ancient super continent that included Antarctica, Australia, Africa, India and South America). Some Australian birds illustrate convergent evolution to species elsewhere, with honeyeaters resembling northern hemisphere sunbirds.
Source: Graeme L. Worboys

Announcements

Launch of IUCN Green List of Protected areas process in Madagascar

In the context of the implementation of the Green List development strategy in Africa, on 27 and 28 March, IUCN-PAPACO, in partnership with the Malagasy government, organised a workshop to launch the IUCN Green List of Protected Areas. Several conservation partners present in Madagascar participated in the workshop, including Madagascar National Parks, the Ministry of Environment's department on Protected Area Systems, *Ecologie et Forêts*, Wildlife Conservation Society (WCS), the *Fondation pour les Aires Protégées et la Biodiversité de Madagascar* (FAPBM, or 'Foundation for protected areas and biodiversity of Madagascar'), and the West Indian Ocean Marine Science Association (WIOMSA).

The workshop bore the following results:

- The Green List standards and its process were shared.
- 15 protected areas to potentially be Green Listed were identified.
- 14 potential members of the Green List expert group were identified.
- A roadmap for 2018-2019 for the implementation of the Green List in Madagascar was drawn up.
- A commitment letter to the Green List from the Malagasy government was drawn up.

The Malagasy Green List expert group will be set up by the end of the year with the support of the World Commission of Protected Areas.

>> Project leader <<
Sahara Conservation Fund

Where? *Ouadi Achim, Chad*

Lead a new program, funded by the European Union (ECOFAC VI Program for Central Africa), to improve the management and governance of the Ouadi Rimé-Ouadi Achim Game Reserve in central Chad.

Full description: here.

>> Head of investigations <<
WCS Central Africa

Where? *Kinshasa, DRC*

With the programme countering wildlife trafficking, provide specialized technical assistance to map out the different trafficking supply chains and develop and implement an urban-based law enforcement strategy.

Full description: here.

>> Regional grants manager <<
WCS Central Africa

Where? *Rwanda, Uganda, Tanzania, Mozambique or Madagascar.*

The WCS is looking for a grants manager to oversee grant administration in the region.

Full description: here.

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