

DROUGHT

Drought, Degradation and Desertification

Most of the areas prone to drought are open grasslands utilised by pastoralists who traditionally keep as many livestock as possible.

BY FELIX PATTON

While there has been much publicity about the devastating effects of the current drought in Africa on the human population, far less has been written and said about the effects on wildlife. Many wildlife species that are adapted to high temperatures and a lack of water are now struggling to survive, illustrating how serious the drought is.

In East Africa, Kenyan wildlife has borne the brunt of the drought with elephants, giraffes, Grevy's zebra, wildebeest and the hirola antelope reported to have died from dehydration and/or starvation despite being able to move across large areas. Species that move little such as impala, hippopotamus and buffalo have also suffered badly.

Human-wildlife conflict has increased. Elephants and livestock searching for food and water have moved to the same sources creating competition. Hungry carnivores do not discriminate between wild and domestic animals with cattle, goats and sheep an easy target.

Poaching for bushmeat is on the increase either for home consumption or for trading for items such as sugar and powdered milk which can be sold in Somalia.

Drought is one of the most destructive natural disasters, with associated losses such as crop failure, wildfires and water stress. In the two decades from 1995 to 2015, Africa suffered 136 droughts -- more often than any other continent -- of which 77 occurred in East Africa.

Today, droughts are more frequent and prolonged making survival difficult for

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Elephants on the move. Due to drought, many wildlife species have to move from their normal habitats in search of food and water increasing the chances of human-wildlife conflict. Over 200 elephants have died in the drought in Kenya. Some are reported to have travelled even as far as Tanzania, crossing the border in search of food and water.

Kenya Wildlife Service reported that, up to November, 512 wildebeests, 381 common zebras, 205 elephants, 49 Grevy's zebras, and 51 buffaloes had died in 2022 due to the drought.

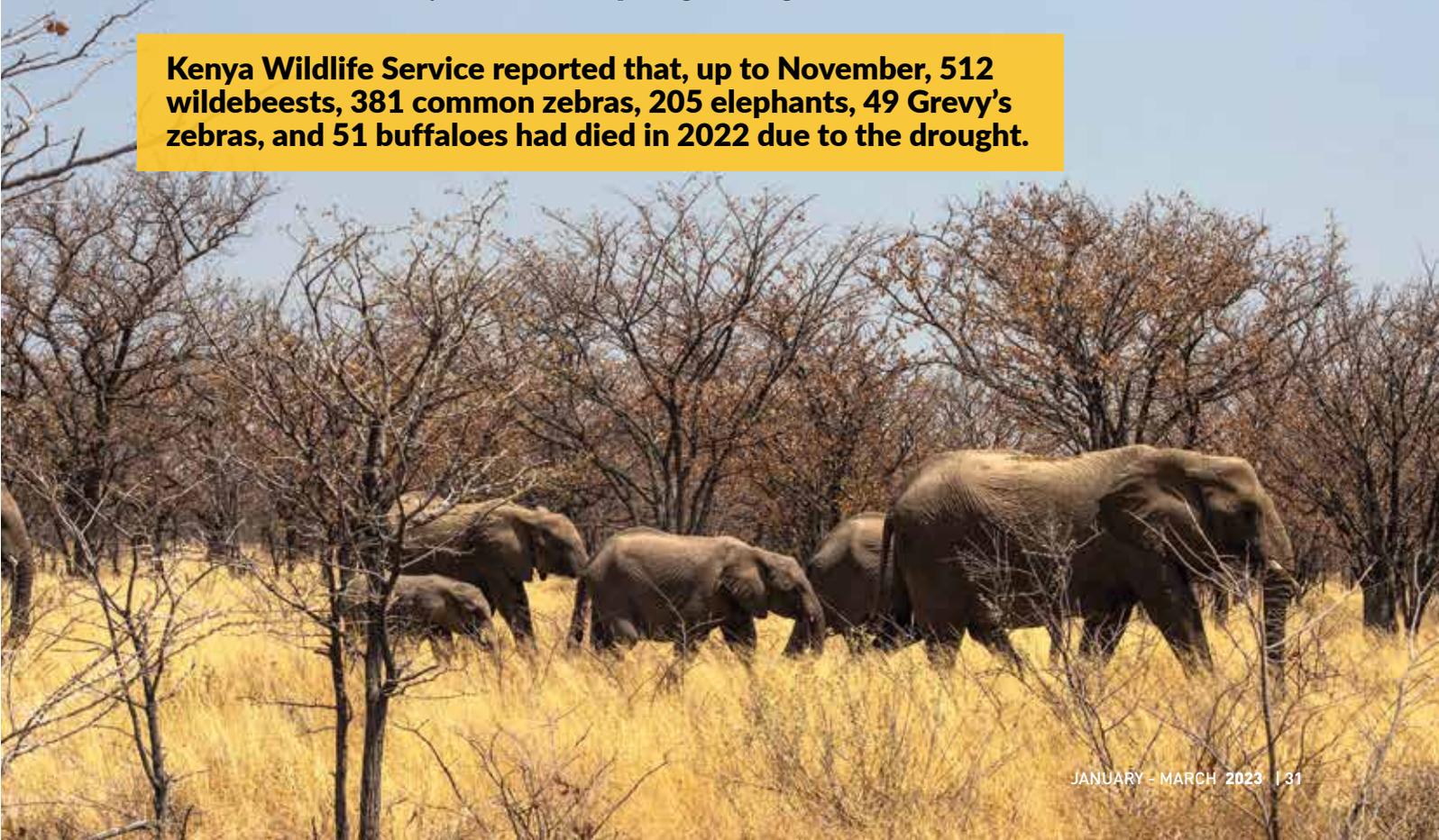




PHOTO BY TSAVO TRUST



PHOTO BY FELIX PATTON

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communities and wildlife. Water sources have become increasingly scarce, forcing families and animals, such as elephants, to walk longer distances increasing the opportunities for human-wildlife conflict.

Across East Africa, there is a significant area of Arid and Semi-Arid Lands (ASAL). In Kenya, for example, arid counties cover some 70 per cent of the country. Annual rainfall in arid areas ranges between 150mm and 550mm with between 550mm and 850mm in semi-arid areas.

Erratic rainfall, due to climate change, will lead to more frequent droughts (and floods), which will have serious consequences in areas that rely mainly on freshwater resources such as lakes, rivers, swamps, and springs as well as dams, water pans, and groundwater.

Prolonged dry seasons have led to significant declines in water levels in dams and other reservoirs leading to crop failure,

loss of livestock, and limited access to freshwater while flooding has led to soil erosion, disruption of water supply systems and freshwater resource contamination.

Drought risk is higher in regions that are extensively exploited for crop production and livestock raising due to the widespread loss of natural vegetation associated with these activities. Much of the area prone to drought is open grassland utilised by pastoralists who traditionally keep as many cattle as possible. They often prefer to build up their herds rather than sell or feed their families in times of drought, a practice which leads to overgrazing.

Having degraded their own land, the pastoralists move to find grazing and water closer to, or in, wildlife areas. If the cattle and wild animals mix, it could lead to competition between species for the scarce resources and, potentially, disease transmission, causing widescale animal deaths.

Previous strategies for overcoming the effects of drought utilised ad-hoc emergency measures to help in stricken areas but it is

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Large areas of degraded soils may be created by overgrazing livestock in drought situations to such an extent that they may never recover once rain comes.

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Degraded soils can be easily overtaken by invasive weeds which may only be fully eradicated by hand pulling.

clear that a more sustainable, long-term strategy, managing drought risk proactively, is essential. Predicting and preparing for a drought period before it occurred will be more effective and less costly than reacting to it. Many governments, including Kenya, have embraced this new approach.

By utilising modern Information Technology systems, data derived from satellite images coupled to local information such as weather, vegetation and soil cover, can produce drought indices as an early warning system to impending drought.

Central to any drought strategy is to ensure that when rainfall does occur, it is captured effectively. This is especially important when the rain causes flooding when much of the water is lost if it is not harvested due to lack of sufficient holding facilities such as dams and reservoirs. When more water sources are being planned, it will be essential to provide separate facilities for humans and wildlife to avoid conflict. Planners must also consider that some animals may be forced to migrate out of their normal areas to new grounds where the habitat may be better preserved.

Desertification

Water scarcity in general, and prolonged drought in particular, is common in the

process to desertification -- the conversion of land of one type of biome -- a large area of vegetation and wildlife adapted to a specific climate, (such as savannah), -- turning into a desert biome. Animals (wildlife) and plants (their food source) are unable to sustain their populations where desertification occurs.

While many areas of East Africa suffer from desertification, Kenya is particularly affected on some 80 per cent of its land area. Human-related activities such as overgrazing of livestock, the destruction of forest and other vegetation for fuelwood and unsustainable farming methods are also responsible for the degradation of former biomes. Where land has been degraded, there is a need for restoration and rehabilitation.

Desertification can be reversed by restoration which aims to re-establish the previous ecosystem and all its functions and services, and rehabilitation which seeks to repair specific parts of the systems, in order to regain ecosystem productivity.

Due to their diverse fauna and flora, forests and woodlands are biologically important being vital as prime habitat for a host of species including elephant, buffalo, leopard and the very rare mountain bongo plus a diversity of small mammals, birds, snakes and butterflies. They are fundamental to water

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Large areas within forests have been cleared, mainly for farming or illegal logging. This reduces the potential of the forest to capture rainwater. It is therefore essential for these areas to be returned back to forest by replanting.



PHOTO BY INTERNATIONAL RHINO FOUNDATION

CONSERVATION

catchment, capturing rainfall to replenish rivers and streams and other water sources.

In areas of water scarcity, there are trees that are specially adapted to the harsh climatic and specific soil conditions where other types of tree species would not survive. Kenya was not blessed with a significant area of indigenous timber-producing forests so, with the demand for timber exceeding supply, in the early 1900s, large plantations of exotic trees, mainly eucalypts, were established. The exotic species grew at faster rates and were therefore more profitable.

However, in more recent years, there has been rapid planting of *Eucalyptus grandis* and *Eucalyptus camaldulensis*, two fast growing species introduced from South Africa. These are now said to be water hungry and, where planted near rivers, swamps and other catchments, have greatly contributed to depletion of water, particularly during drought. As such these trees are being cut down and replaced with suitable multi-purpose species including Grevillea, an agroforestry tree with many commercial benefits, including timber, firewood and fodder.

Choosing species to halt desertification and stem soil erosion has to be done with care. In the 1970s, the Central and South American *Prosopis Juliflora*, popularly known as the *mathenge* plant, was introduced to Kenya. It was quick growing in harsh and desert-like environments.

Today it is considered an invasive species. By growing fast and forming dense thickets and by releasing harmful substances other, particularly native, species are weakened and overrun.

To restore severely degraded lands where self-restoration processes may be limited requires different management techniques such as the planting of seeds or seedlings. It is necessary to get fast growth of a broad dense canopy in order to shade out weeds and reduce the chance of forest fires while early production of flowers or fleshy fruits attracts seed dispersers to rapidly spread seeds throughout degraded sites.



PHOTO BY TREE NATION



PHOTO BY FELIX PATTON

Woody vegetation serves as soil cover and provides forage in the dry season for wildlife. It is also a renewable resource. Drought-tolerant, fire-resistant, and less-flammable tree species are preferable to drought-prone, fire-susceptible, and more flammable species.

For only moderately degraded areas, passive restoration management techniques may be applicable. Simply ceasing environmental stressors, such as farming or grazing, allows the land to recover. Where forests are degraded but where there are still valuable individuals, enrichment planting can be undertaken to introduce additional valuable species without eliminating those that are already there or when filling in forest patches that may not have enough wildlings to establish tree canopy cover within the desired time frame.

It is believed the effects of prolonged droughts due to climate change could result in the deaths of 20 times more elephants than poaching. Wildlife will have to wander further into less familiar habitats making their chance of survival more uncertain. Those animals which depend on other animals and plants to survive may become separated.

Creating more water sources, rehabilitating degraded soils and reforesting depleted forests will be vital if wildlife populations are to be maintained in the future. ●

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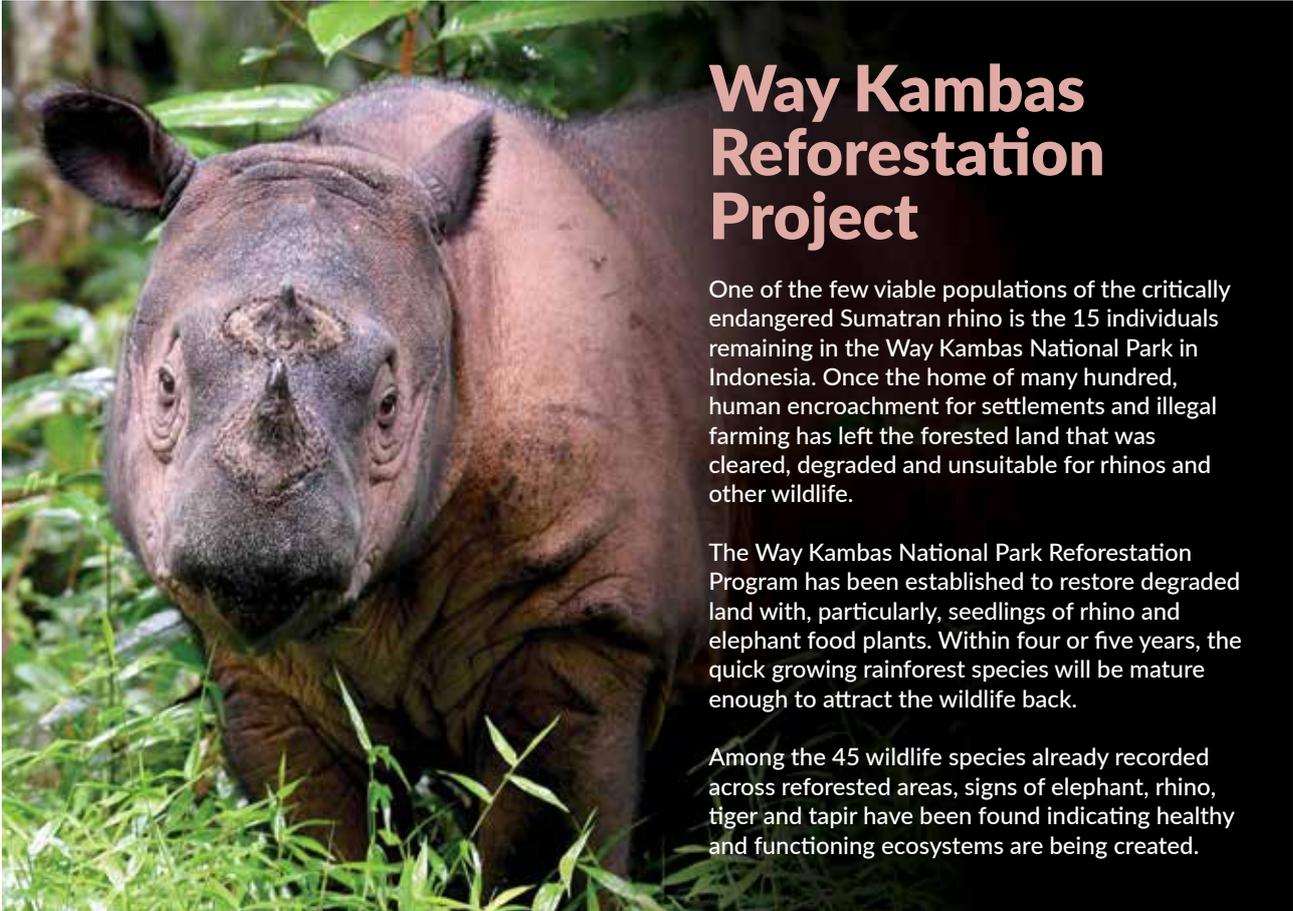
Buffaloes are particularly susceptible to drought. Lack of available food sources due to the prolonged drought has led to wildlife deaths in Kenya of over 1,000 individuals.

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Seedlings of *Grevillea robusta* ready for planting. *Grevillea robusta* is a fast growing tree. On suitable sites, *Grevillea* can attain a height of 20 m and diameter of up to 25 cm in 15 to 20 years.



FELIX PATTON is a wildlife ecologist with an MSc and PhD in conservation biology. He has been working in and writing about conservation in East Africa for over 20 years.



Way Kambas Reforestation Project

One of the few viable populations of the critically endangered Sumatran rhino is the 15 individuals remaining in the Way Kambas National Park in Indonesia. Once the home of many hundred, human encroachment for settlements and illegal farming has left the forested land that was cleared, degraded and unsuitable for rhinos and other wildlife.

The Way Kambas National Park Reforestation Program has been established to restore degraded land with, particularly, seedlings of rhino and elephant food plants. Within four or five years, the quick growing rainforest species will be mature enough to attract the wildlife back.

Among the 45 wildlife species already recorded across reforested areas, signs of elephant, rhino, tiger and tapir have been found indicating healthy and functioning ecosystems are being created.

The Hirola Restoration Project

With less than 500 critically endangered hirola antelope left in the world, it is considered the world's most endangered antelope. It is now only found in Kenya and Somalia.

In order to develop the population, it has been essential to create more habitat, (savannah grassland with less than 30 per cent tree cover), that is suitable for it. Over many years, much of the hirola's savannah habitat has suffered excessive tree cover, rendering it unsuitable. Overgrazing and drought have rendered other areas bare ground.

The Restoration Project core operating area is in the centre-east of Kenya. It involves the clearing of tree encroached areas to allow grass to re-establish, the planting of native grass seeds to renovate bare soils and the resting of hirola's core grassland habitats to allow for rejuvenation.

