FACTSHEET

Climate Change and Animals

> This factsheet takes a look at some of the challenges that animals might have to face in the future. How does climate change affect them?

Introduction

One day can be hot and cloudy, the next cold and sunny - these day to day changes are the weather. The weather in the UK doesn't tend to stay the same for long. One day it's windy, the next it's raining, the day after that it's windy and raining then we might get some sunshine. So, weather is always changing. But now we regularly hear about climate change. Climate reflects long-term weather patterns, so when we talk about climate change, we're talking about long-term changes to the weather. Over decades and centuries, climate changes - places become drier, wetter, hotter or colder. Recently, we have become more and more concerned that the climate is changing faster than it would naturally and that it's our actions that are causing the acceleration in climate change.

Our weather often surprises us. 1976 was one of the driest years on record with some parts of the UK going without rain for 45 days. The hottest ever day was recorded in August 2003 as 38.5°C and the most rainfall in one whole day was recorded in 1955 when nearly 3 metres of rain fell - that's taller than the world's tallest man - what a downpour! More recently 2014 has been recorded as the hottest year on record.

We're well adapted to deal with such weather extremes and can hide in our houses from strong winds, we can build defences for floods and get shelter from the sun - but other animals aren't so lucky. This factsheet takes a look at some of the challenges that animals might have to face in the future. How does climate change affect them?

Frogs, Toads and Newts

Researchers in America have been looking into the effects of climate change on fifteen amphibian species.

Climate change predictions across the world suggest that temperatures will go hot and cold for some time, but ultimately the planet is becoming warmer. Frogs, newts and toads are particularly vulnerable to such changes in temperature and need very specific habitats to survive. Sometimes they need particular plants around them to eat or use to make nests, or their eggs will only develop in certain temperatures.

There can be many factors that make up an animals ideal living conditions. If, for example, temperatures rise and a species cannot survive, they will begin searching for cooler areas, but if the temperatures drop back they will return to their original homes - only to have to move again when the heat kicks in. In this way they may never find a better habitat and become extinct. Whether a species can survive changes in the climate depends on how strong they are and whether they can make it to more suitable habitats in time and continue to lay eggs or give birth to young.

An example of a toad species being affected by climate change is the story of the Golden Toad, which could be found in only one place in the whole world - Costa Rica. Golden toads flourished in a type of forest that is known as a cloud forest because of the mists and cloud that hang low in the sky providing moisture for the trees and animals. Only discovered by humans in 1966, in 1987 scientists counted thousands of golden toads. When they went back in 1988 they found ten, and in 1989 only one could be seen anywhere and they are now classified as extinct. So the population disappeared rapidly from several thousand to zero in just three years - why? A weather phenomenon known as 'El Nino' made conditions warmer and much dryer and the frogs could not survive. It is also believed that this change in conditions allowed a deadly disease known to affect 43% of amphibian species to spread and wipe-out all golden toads.

Out of the fifteen species of amphibians studied by the American researchers they predicted that over half of them could become extinct in the next one hundred years due to climate change. This is a worrying sign and could signal trouble ahead for an estimated 15-37% of all species on earth. One solution that is being considered is that we step in and move threatened animals to better areas ourselves before it is too late. But some suggest that the effects of introducing a species to a new area is unknown and could cause problems.

A Shrinking Feeling

Animals and plants are shrinking - but it's not a magic trick, it's the effect of climate change. Researchers have found that to cope with hotter weather and less rain, other animals and plants are not growing as big as they usually would.

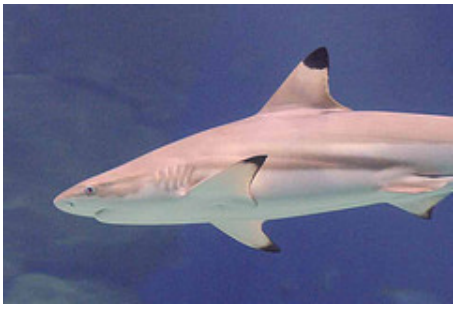
The world's climate is always changing but these changes are often very slow, gradually affecting life on earth giving organisms plenty of time to adapt to the new conditions. But due to human activity, which has increased the amount of greenhouse gases in the atmosphere, scientists believe that the climate is changing faster than ever, which may leave some animal and plant species behind. There are a few that have been quick to respond. Polar bears, toads, tortoises, blue tits and red deer are amongst the animals that are scaling down. But why would animals become smaller?

It's not known exactly why plants and animals shrink but there are a few ideas. The earth's climate is getting warmer and in many areas this means there is less rain. For many plants a great way of dealing with this is to down-size, but this will affect the animals that eat the plant - they will have to eat more to get the energy they need and this may cause the animals to shrink, which will mean a smaller meal for carnivorous animals as well! Shrinking may be helpful because the smaller you are the less food and less water you need to survive. But how small can animals go? Researchers looked back at 65 million year old fossils and noticed the same change in insects such as beetles, bees and ants that became 50-75% smaller as the earth heated up. This doesn't mean that we'll soon need magnifying glasses to feed our hamsters - the changes are likely to be slow and we may not always notice.

But changes have been noticed in Scotland. Soay sheep on Soay Island have been getting smaller over the last 25 years as their winters are getting shorter and warmer. The effects of shrinking plants and animals aren't great for ecosystems or humans. One of the problems is that not all plants and animals will react in this way which will change the delicate balance of ecosystems and may even affect food supplies for humans. However research is underway to predict the consequences of these changes so that we can prepare for the future.

Surprising discovery of hybrid sharks

Scientists have discovered not one but fifty seven of the world's first hybrid sharks in Australia. When something is hybrid it means it is made up of two different things. Hybrid cars use two types of fuel for example. This shark is a hybrid of the Australian blacktip and the common blacktip - two separate species.



Multiple generations of this new shark were found in five locations along the Australian coast which means that the new hybrid is doing well. The Australian blacktip is the smaller of the two sharks that make up the hybrid. Measuring an average 2m this blacktip prefers warmer tropical waters. In contrast, the common black tip is larger at 2.5m and likes to swim about in the cooler sub-tropical regions.

Some say that this new hybridisation is a reaction to climate change and the changing temperatures of the sea, although it is impossible to know why these two sharks have chosen to team up. If this new breed of shark isn't a direct reaction to global warming, it is believed that its mix of genes will certainly make it stronger and better able to cope with environmental changes in the future.

These sharks aren't dangerous to humans but certainly look the part with their steely eyes, pointy heads and long sleek bodies. They're called blacktips because of the black tips on their dorsal and pectoral fins. How long these new sharks have existed is a mystery but it goes to show how much there is to discover out there!

The common blacktip shark is listed as near threatened on the IUCN's Red List. They live in shallow tropical waters which means that they often get caught up in fishing nets and with a low reproduction rate they could soon be under threat due to overfishing.

Tropical Birds

A new study has found that we could lose a whopping 900 species of tropical birds by the year 2100. The study has been researching the possible effects of climate change on tropical birds from rainforest, mountain, desert and coastal habitats around the world.

The world's temperature is set to rise as global warming traps the sun's heat in our atmosphere. At worst, it is predicted that we could experience an average global temperature rise of 3.5 degrees C within 100 years - this doesn't sound like much but it would lead to major disruptions for plants, animals, humans, weather and habitats. With this kind of rapid change, plants and animals would need to adapt to new conditions quickly or face possible extinction.

For birds that migrate, finding new suitable habitats is less of a challenge but most tropical bird species aren't migratory and stay in one small area all year around. If that area changes and becomes too hot or cold, or a food source disappears due to temperature changes, finding a new habitat could prove a real challenge. There are fears that species living near the sea may suffer from increasing numbers of hurricanes and increasing salt levels in the soil and air that may affect

plants, which provide vital supplies of food. Tropical birds living in mountainous areas may have to fly to higher altitudes - something that might not suit their little bodies. Others in dry areas such as deserts may suffer from a loss of water.

But what about other groups of animals, not just birds? When it comes to climate change, birds are thought to be the most resilient of creatures. For other ground dwelling or canopy living animals there may be even greater obstacles ahead.

Birds such as the scissor-tailed hummingbird in Venezuela, the regal sunbird from Africa and many species of manakins are particularly vulnerable. This new study hopes to predict the possible effects of climate change on animals and help find solutions to help save them - which may involve people moving animals to new areas.

Credits

Image: Climate Change and Animals by J. Michael Raby

Information sourced from:

The IUCN Red List of Threatened Species (2015), *Incilius periglenes* [online], Available from: http://www.iucnredlist.org/details/3172/0 [accessed 30/05/2015].

The Young People's Trust for the Environment is a charity which aims to encourage young people's understanding of the environment and the need for sustainability.

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