



Post-visit PowerPoint Script

Amphibians and Climate Change – Trenton Garner (IoZ Senior Research Fellow)

There are 3 main problems for amphibians regarding climate change: they are ectothermic (cold blooded) so can't control their own body temp; they dry out easily; and they can't travel long distances to escape conditions. Amphibians are therefore very sensitive to change.

Chytrid fungus is a fungal disease associated with the decline and extinction of amphibians worldwide. Trenton Garner and his team at ZSL swab amphibians to diagnose whether they have chytrid fungus.

Trenton's experimental work has shown that extreme changes in temperatures increases the presence of chytrid fungus in amphibians, but at this stage they don't understand exactly how. Is the pathogen being affected (conditions favour the disease spreading) or is the host animal itself being affected (the amphibian is less healthy at extreme temperatures, so the disease has less 'work' to do)? This is something the research group needs to look into more.

Trenton and his team studied (between 2004-2014) the impacts of climate change on lake ice thaw at Lac Arlet in the French Pyrenees. Lac Arlet is montane habitat and is home to the midwife toad, common frog and common toad. The average temperature is increasing at Lac Arlet, so the lake ice is melting earlier each spring. Although the Midwife toad maintains a high prevalence of infection independent of the time of spring the thaw, there is a strong correlation between the earlier timing of the spring thaw and the increase of chytrid fungus in common frogs and common toads. This is resulting in increased mass mortality of amphibians at the lake, which will only get worse if the temperatures continue to rise. This is the first time a common frog has been seen to die from chytrid fungus!

The fact that a previously thought resistant animal is now susceptible, under different climatic conditions, illustrates the importance of understanding community-level dynamics when considering the impacts of infections. Trenton's research also provides a better understanding as to where and when amphibians are at risk from chytrid fungus and, indirectly, climate change. With these findings he can start developing mitigation strategies for those places/species.

Birds and Climate Change – Joseph Taylor (PhD Student of Reading University and ZSL)

Joseph's research is on how weather conditions impact 3 threatened bird species on the island of Mauritius: the Mauritius kestrel, echo parakeet and Mauritius fody. The extinction of these species has been prevented by dedicated conservation work, with the most spectacular recovery being that of the kestrel from only 4 wild birds in the 1970s to about 300-500 in recent years. To date, findings regarding the Mauritius kestrel are the clearest in Joseph's ongoing research.

Field assistants know all the breeding and nest sites of the Mauritius kestrel, Mauritius fody and echo parakeet. They visit these sites to track laid or hatched eggs. Once the legs of chicks are long enough, they are ringed (colour coded with a unique number) so that they can be easily ID'd when remotely tracked. Whilst being ringed, they are also weighed and checked for disease. Birds can then be remotely tracked with binoculars for their whole life.

The Mauritius kestrel is a falcon that usually inhabits forest and preys on small animals, preferring to hunt geckos. Since the 1960s, temperatures have been increasing and rainfall generally decreasing in Mauritius; however, rainfall is increasing where most of the kestrels occur. This is having various effects on the kestrel: temperature and rainfall affect the timing of breeding (possibly due to food availability for the female and chicks); increased rainfall during nesting lowers breeding success (perhaps due to lower food availability, poor hunting conditions and direct exposure to rain); and while the survival of adult kestrels is apparently not affected by weather conditions, juveniles suffer reduced survival when there is continuous rain for many days whilst they fledge during the cyclone season (perhaps due to lower food availability, poor hunting conditions and direct exposure to rain).

This study has wider implications. Extreme weather is an issue for both human society and wildlife on Mauritius; droughts and the increased severity of cyclones. Joseph can make recommendations to the Mauritian government based on his findings. These recommendations will help to reduce the impact of climate change, such as increasing forest so there's more habitat for birds and to help prevent landslides.