

“NATURAL DISASTER FROM FIRES, FLOODS TO CYCLONES WHAT YOU CAN EXPECT”

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INTRODUCTION TO NATURAL DISASTERS IN AUSTRALIA

Australia has always experienced natural hazards or disasters such as floods, bushfires, severe storms etc. However, with the increase in population and the changes this brings to the landscape through overstocking, vegetation loss, dams, groundwater and irrigation schemes coupled with the impacts of climate change, the frequency and impacts of these disasters is increasing.

According to the Council of Australian Governments (COAG 2004), scientific research indicates that more extreme weather events, and large-scale single events with more severe cyclones, storms and floods, are expected in the future.

Some natural hazards have the potential to occur anywhere in Australia (e.g. severe storm, earthquakes) whilst others occur only in certain regions (e.g. tropical cyclones generally occur in the northern, tropical regions of Australia; riverine flooding is generally limited to low-lying areas close to water courses). Many natural hazards are governed by topography (e.g. storm tide is limited to lower lying coastal areas; bushfires spread faster when travelling upslope; the wind speed from cyclones and severe storms increases in areas of high relief; landslides are common in hillside areas). Some hazards have the potential to occur at any time of year (e.g. tsunami or earthquake) while others are often seasonal (e.g. thunderstorm, bushfire, or tropical cyclone).

Taking tropical cyclones as an example, the official tropical cyclone season in the Australian region runs from November to April (BoM 2012). (see Fig. 1)

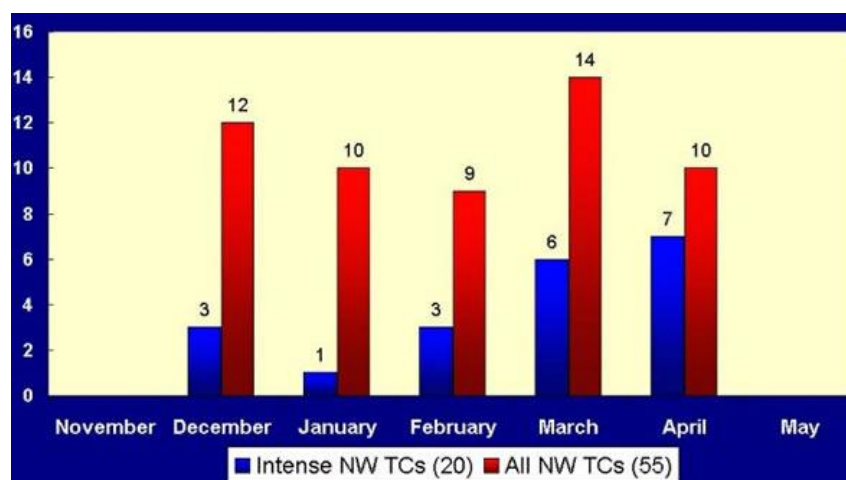


Figure 1: Monthly frequency of cyclones off northwest Australia 1988/89 - 2003/04 for all cyclones (red) and intense cyclones (category 4 and 5) (blue). (BOM 2012).

Compared with cyclones, bushfires are a much greater continent-wide hazard, although they occur mainly where particular prerequisite conditions converge, mainly being fuel loads and seasonal weather conditions that affect local growth and the drying out of vegetation. Due to climatic variations across the continent, bushfire seasons occur at almost every part of the year. For example, most fires in the southern parts of Australia occur in summer and autumn, while northern Australia has fires in winter and spring. NSW and southern Queensland have the greatest fire risk in spring and early summer (BoM 2012) (see Fig. 2).

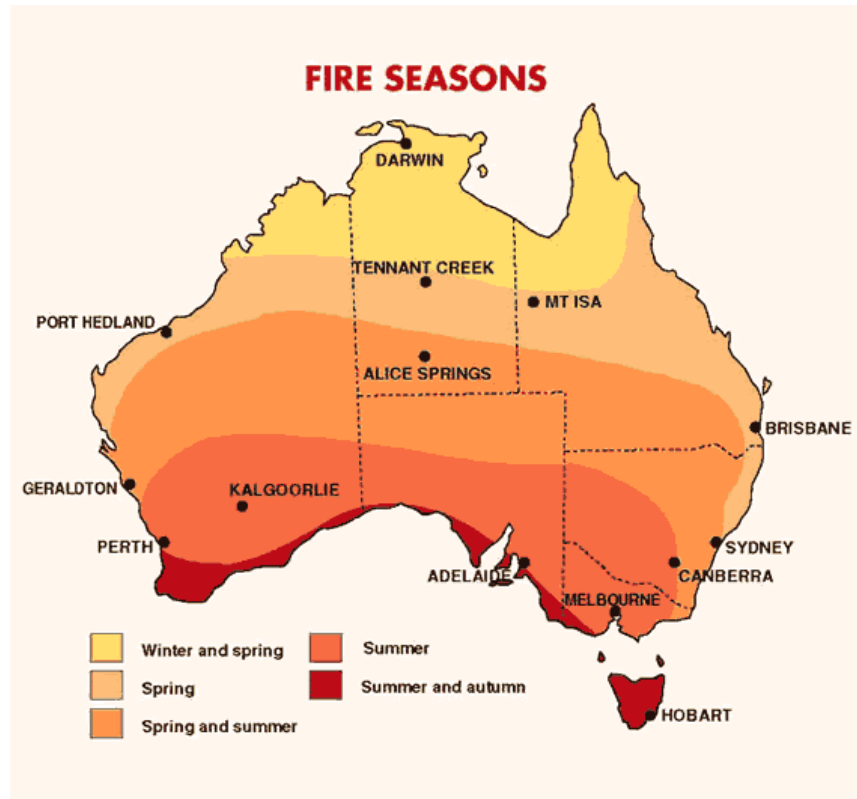


Figure 2: Fire season across Australia (BoM 2012)

The actual impact of any hazard will vary in terms of the frequency and intensity (eg bushfires may be relatively frequent and of a moderate impact, whereas an earthquake may be quite infrequent but potentially catastrophic). Similarly, some threats may have a long build up and provide early warnings (such as drought related fires or riverine flooding), while other hazards can be sudden (e.g. a hail storm or rock fall).

The future distribution, both temporal and spatial, of some natural hazards may also be affected by climate change which is described in more detail below.

Influence of climate change

In late March this year, the Intergovernmental Panel on Climate Change launched a report entitled “Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation” (SREX). The report took two and a half years to write by 220 expert authors and was reviewed by many more. The report foresees a warming world of more frequent disasters. Climate change is fuelling more extreme weather leading to an escalation of impacts on people and economies.

Average temperatures & rainfall

Earlier this year, the CSIRO released its' "State of the Climate" report (CSIRO 2012). This report provides a summary of long-term climate trends in the country. Key findings include:

- each decade has been warmer than the previous decade since the 1950s,
- the Australian annual average daily maximum temperatures have increased by 0.75°C since 1910
- Australian annual average daily mean temperatures have increased by 0.9°C since 1910
- Australian annual average overnight minimum temperatures have warmed by more than 1.1°C since 1910

It appears that extreme weather patterns are also changing globally. There is evidence including fewer cold days and nights and more hot days, hot nights and heatwaves globally in the past 50 years (CSIRO 2012).

Weather associated with high fire danger has shown a rapid increase in the late 1990s to early 2000s at many locations in southeastern Australia. Heavy rainfall has also seen an increase in frequency over some parts of the world. In Australia, the recent heavy rains and flooding have been attributed to strong La Niñas.

The CSIRO report found that "southwest Western Australia has experienced long-term reductions in rainfall during the winter half of the year. There has been a trend over recent decades towards increased spring and summer monsoonal rainfall across Australia's north, higher-than-normal rainfall across the centre, and decreased late autumn and winter rainfall across the south" (CSIRO 2012).

Sea temperatures and levels

The amount of heat stored in the oceans is considered to be one of the best indicators of changes in the climate. The CSIRO report states that "the heat content of the world's oceans has increased during recent decades, increasing the volume of ocean waters and contributing to sea-level rise". It goes on to say that sea surface temperatures have increased by about 0.8°C since 1910 and ocean warming is continuing, particularly in the top several hundred metres of ocean (where creatures we interact with, such as marine mammals and turtles, are generally found).

The global average mean sea level for 2011 was 210mm higher than the level in the year 1880 (CSIRO 2012). Rates of sea level rise, however, are not consistent around the world and vary each year. For example, in north and north-west Australia, the rate of sea level rise since 1993 has been two to three times higher than the global average whereas rates on the central east and southern coasts have generally been similar to the global average (CSIRO 2012).

Future changes in weather events

Climate change is likely to increase the risk of natural disasters in a number of regions of Australia. Bushfire, floods and storms are a feature of Australia's variable climate.

However, the influence of the greenhouse effect on climatic conditions is expected to increase the frequency and/or severity of extreme events (COAG 2004).

The CSIRO considers that the greatest risks come from climate variability and extremes, rather than being a direct consequence of mean climate change, the result being more extreme weather events and large-scale singular events.

Australian average temperatures are projected to rise by 0.6 to 1.5°C by 2030 with warming projected to be in the range of 1.0 to 5.0°C by 2070 when compared with the climate of recent decades (CSIRO 2012). These changes will result in an increase in the number of hot days and warm nights, and a decrease in cool days and cold nights.

Climate models predict long-term drying over southern areas during winter and over southern and eastern areas during spring with wet years becoming less frequent and dry years more frequent. Droughts are expected to become more common in southern Australia with the number of dry days across Australia as a whole increasing. Heavier rainfall is also expected during wet periods (CSIRO 2012).

Projections suggest that on average, it is likely that there will be less tropical cyclones in the Australian region but the quantity of intense cyclones is expected to increase (CSIRO 2012).

The CSIRO in their submission to the COAG (2004) report highlights the potential of shifting hazard zones, including movement of the cyclone belt further south and flooding of rivers and coastal zones previously not susceptible to flooding. These changes could have dramatic effects, as the traditional strategies for dealing with severe events may not be able to cope with the new patterns of impact (COAG 2004).

The changes in Australian extremes likely to accompany anticipated future increases in atmospheric concentrations of greenhouse gases include (Nicholls 2008):

- Increase in frequency of days over 35°C by 2020
- Decrease in frequency of days below 0°C by 2020
- Increases in intensity of heavy daily rainfall events, although there appears likely to be considerable spatial variation in this
- Decrease over north-east Australia of the number of tropical cyclones, accompanied by an increase in intensity
- Decreased hail frequency in some places
- Increase in large hail (2cm diameter) and reduction in average recurrent interval for hail exceeding 6cm diameter in Sydney
- More droughts over most of Australia by 2030
- Increased frequency of extreme fire danger days (except Tasmania).

The size and period of natural hazards will likely be affected by climate change. The Fourth Assessment Report by the Intergovernmental Panel on Climate Change (as reported in Middelmann 2007) suggests bushfire events are likely to increase in southern and eastern Australia, as well as the frequency and severity of storms and coastal flooding, accompanied by sea level rises. Conversely, tropical cyclone and storm tide events may become less frequent but more severe.

Climate change will also affect biodiversity. Some of these changes will be more subtle

over time (eg, changes in vegetation and therefore habitat for wildlife) whereas in others, the effect is more immediate (eg Flying Foxes dying in heatwaves) (pers. obs.).

What to expect

It is quite clear from all the evidence that changes will occur to some natural hazards and their impacts. This will not only affect people and property, but also animals, companion animals, farm animals, and wildlife.

Wildlife is so widespread in this country that it is generally difficult to help them avoid being directly impacted during a natural disaster. The capture of wildlife takes a lot of time, is difficult and requires specialised skills and equipment. Agencies and workers involved in disaster relief rarely have the time or the desire to think about helping animals, let alone wildlife.

However, as wildlife carers and rescuers, this is usually our primary concern, often ahead of our own safety. But in order to be more effective, we need to be better prepared in dealing with animals suffering from the result of bushfires, floods, severe storm events, cyclones and so on.

Some of the more obvious results from these disasters are given below.

Bushfires:

- burns
- smoke inhalation
- trauma from trying to flee, eg from fences
- dehydration
- starvation – lack of available food after event
- predation following a fire due to lack of shelter, weakness etc
- disorientation, displacement etc

Cyclones:

- trauma
- starvation
- dehydration
- predation
- disorientation, displacement etc
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Floods:

- immersion
- fungal infections
- pneumonia
- trauma
- starvation
- dehydration
- predation
- disorientation, displacement etc

Disaster preparedness

The above may seem pretty obvious to most, but as wildlife carers, we need to think about what things we need to prepare for and how to prepare for it. Prior to even thinking about getting involved in a disaster, you need to think about your own situation first. You may like to consider the following questions:

- Have you identified the disasters likely to occur in your area?
- Are you in a flood/fire/cyclone prone area?
- How will you access supplies if you are all flooded out?
- Do you have a contingency plan for your own property/shelter?
- Have you identified when and where you will evacuate your animals?

There are many more things to consider but this should give you some ideas. In addition to the impacts on animals in the bush, a wildlife rehabilitator may find that their own facilities or property has been damaged. It has been evident from some of the more recent devastating disasters such as the 2009 Victorian Black Friday bushfires and the 2011 Queensland floods that there are many wildlife rehabilitators who will be directly affected by these hazards. And with the predictions becoming more dire, even places we previously thought were unlikely to be affected may not remain untouched as evidenced by the flooding of Brisbane in 2011.

As a wildlife carer, you may face the difficulty of responding to the plight of animals in your region while attempting to deal with trying to get your own shelter back up and operating and potentially dealing with the grief from loss of life or damage to property of those in your family and community. It is important to understand that in a disaster, you may not emotionally be in a position to help as much as you thought you would.

Having taken care of your own needs and recognising that disasters in Australia will continue, and in some cases, be of more impact, you then need to ask yourself how do you as a wildlife rehabilitator see your role in a disaster. What skills and expertise can you provide? What training do you need? What equipment do you have or need? Will you have access to a wildlife vet during a disaster? Where will you take in animals from the public and triage them? Do you have somewhere to hold an increased number of animals of different species? Is your foster care network available? There are many things that you need to consider in order to prepare for a disaster.

CONCLUSION

A changing climate is likely to result in a change in natural hazards with some increasing in intensity and others in frequency. With an ever-growing human population and the changes this brings to the environment, the impacts of disasters are likely to be felt by many more people and, at the same time, animals. The effect on wildlife will essentially depend on the type, intensity, size and location of the disaster, but it is logical to conclude that animals will feel the impact whether directly or indirectly.

In order to be better prepared as wildlife rehabilitators/rescuers for the types of challenges we may face in the future, we need to firstly identify the likelihood of particular hazards in our region and then ensure that we have the knowledge, skills, and training to be able to do something about it. And this includes having the relationships with the agencies responsible for response and relief prior to the event.

And finally, it also means doing our part to minimise the impact we as humans have on the planet by changing our lifestyle and educating our friends and family to, in the words of someone much wiser than myself, live more simply so that others may simply live.

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