Climate Change and Wildlife in Southwest WA

The southwest corner of Western Australia is highly significant [5] as it harbours Australia’s only biodiversity hotspot that is currently threatened by habitat degradation and loss [11]. Initially some 25 such ‘hotspots’ were described worldwide and, since 2004, the number has increased to 34 [12].

The recent report of the IPCC¹ shows that early predictions of global warming have been over-estimated and world temperatures are now not expected to exceed 4.8°C by the end of the century, and further sea level rises should range from 26-81cm. Average world temperature has already risen by 0.9°C and sea level by 19 cm in the past 100 years. Some see this as vindication for ‘climate sceptics’ but a sensible response is to view this as welcome news, giving the Shire more time to plan for highly probable changes in the future.

The enormity of the challenge facing biodiversity managers in such a diverse ecosystem as found in the southwest of WA is just beginning to be acknowledged and referenced against other Mediterranean ecosystems, such as the fynbos in South Africa [1, 7, 18]. There have been numerous efforts at re-introducing marsupials into former habitats that have been disturbed by development, but few of these have met with success [16], leading to proposals for translocating species to areas where they did not exist in the past, but where the climate may be suitable [17]. If ‘assisted colonisation’ is to be used in an effort to relocate plants and animals that are likely to become extinct in traditional locations, new policies and legal frameworks will need to be developed [4]. To date, only the Western swamp tortoise *Pseudemydura umbrina*, the world’s most threatened chelonian and Australia’s rarest reptile, has been considered for assisted colonisation and the most suitable site for translocation is on the Scott River plains in the Shire [10].

This highlights what will become a continuing problem for the Shire: pressure on its remaining natural habitats that will increasingly serve as critical refugia for plants and animals retreating from warmer and drier areas to the immediate north of the Shire. Recent studies, particularly with birds, have shown clearly what will happen as temperatures increase and habitats become drier. Wherever possible birds move towards the southwest of the State, seeking refuge in cooler, wetter areas² [14]. Already, birds that we associate with the wheatbelt, such as pink and grey galahs, are now resident in Augusta. All three species of black cockatoos - Carnaby’s, Baudin’s and the Red-tailed are now all found commonly in the Shire and all are listed as endangered by the Commonwealth³. The Shire is also home to many rare and endangered species of plants: Lodge’s Spider orchid (*Caladenia lodgeana*), for example, is listed as Critically Endangered (CE) and now only found

in one small area in the Donovan Street bushland. Other shallow soil endemics, such as *Darwinia ferricola*, *Lambertia orbifolia* 'Scott Plains' and the Scott River Boronia, *Boronia exilis* all have very limited distributions and will come under threat with drying and any drop in the water table.

Aquatic systems are also under threat and recent agricultural developments on the Scott River plains have led to a serious deterioration of water quality in the Scott River, with 10-fold increases in total nitrogen and phosphorus levels, due to dairy runoffs between 2000 and 2007. These have fuelled toxic algal blooms in the Hardy Inlet since 2005 which have been exacerbated by the eastern movement of the river’s mouth, leading to decreased flushing of the inlet [6]. The Shire’s response, in opening the cut to the ocean, appears to be working with heavy rain in 2013 substantially increasing water flow in the Blackwood and flushing of the Hardy Inlet.

There have already been harbingers of the impact of extreme weather events on wildlife with reported deaths of Carnaby’s cockatoos in the summer of 2009/10 due to disease and heat stress [15] and predictions of the decline of *Banksia* species in the southwest [19] and the likely loss of pollinator species [13].

Predicted changes that are likely to affect wildlife in the future are:

- Declining rainfall and river flows
- Warming
- Habitat loss
- Fire
- Disease

Most of these are interlinked: declining rainfall can lead to habitat loss through declining water tables; warming increases the chance of wildfire; too frequent fires lead to loss of fire-sensitive plant species; habitat degradation can spread diseases such as dieback, etc. The challenge for the Shire is to develop and implement policies that can in some way mitigate the impact of these changes on wildlife.

Western Australia has a large number of plant and animals species that are listed as threatened or endangered [3] and, where detailed research has been carried out on the reasons for their rareness, habitat loss stands out as the primary cause. A study drawing on the knowledge of fauna experts, and covering a total of 26 species of native animals, concluded that … “Habitat destruction was the factor most respondents implicated as the primary cause of range contraction of these species. These results suggest that the protection and retention of existing habitat areas is crucial for the long-term survival of most WA species, indeed 73% of species surveyed exist only in remnant areas of their former range.” [8]

Although there would appear to be a number of obvious options open to the Shire in the face of climate change, such as fire management and better water control, protection of habitat would appear to be the most effective in attempting to offset the impact of climate change on wildlife. In this the Shire is well placed with 167,265 ha, representing 67% of its land, still in a natural or relatively
undisturbed state\(^4\). National parks account for 30,690 ha (12.3%), State forest and local reserves 98,210 ha (39.4%); land protected under the local planning scheme 1,475 ha (0.6%) and residual native cover (which may contain some blue gum plantations) 36,890 ha (14.8%). These are the areas where most of the Shire’s biodiversity is concentrated.

There have been calls for more targeted research on the impact of climate change on wildlife [9], but this will not necessarily provide answers and solutions to the immediate practical problem of what can be done to protect wildlife [2]. Protection of and enhancement of habitat known to contain endangered species is a much more proactive and effective response to the likely impact of climate change and needs to be embraced by the Shire. The Shire has already introduced an innovative Conservation Incentive Scheme, whereby landowners are encouraged to preserve segments of native vegetation on their land, either through covenanting, or by concessions made to potential developers\(^5\). Initiatives such as this need to be expanded as part of an effort to both secure and increase the proportion of native vegetation and intact natural ecosystems in the Shire.

**Recommendations**

1. The Shire target habitat protection and creation as its primary goal in mitigating the effects of climate change on wildlife
2. Initiate an audit of undeveloped bushland within the Shire, both private and reserved, and identify other areas that could be further protected
3. Progress a planning initiative that would reward future developers for incorporating substantial areas of natural bushland into their planning scenarios
4. Encourage the planting of native gardens in the Shire and review the current policy of use of herbicides on road verges
5. Control the spread of weeds from adjacent farmlands onto road verges and reserves
6. Audit the current status of Shire ‘Flora Roads’
7. Co-operate with the Department of Water to reduce nutrient runoff from dairies on the Scott River Plain into the Scott and Blackwood Rivers
8. Encourage the prudent application of prescribed burning in protecting habitations and ensure that threats to wildlife are assessed whenever applied
9. Establish contact with the Nannup Shire in an effort to develop interlocking protocols for the protection of contiguous areas of natural bushland
10. Co-operate with Gondwana Link and other bodies working to increase the area of land under protection and establish linkages between currently fragmented ecosystems in the southwest

\(^4\) Data courtesy Jared Drummond, Sustainability Planning Officer, SAMR

\(^5\) Incentives Strategy for Conservation of Private Land within the Shire of Augusta-Margaret River

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References


