GOVERNMENT OF WESTERN AUSTRALIA

Draft Forest Management Plan 2024–2033

Fact Sheet: Climate change

Stressed trees in Boweling forest block east of Collie.

A key focus of the *Forest Management Plan 2024-2033* is to manage the south-west forests in a warming and drying climate. This is captured within the strategic goals of the plan.

Climate change is having a considerable impact on Australia's natural environment. The climate of the south-west region has become markedly drier and warmer over the last 50 years. These changes are placing some forest ecosystems under stress, affecting the survival of individual trees, whole stands of trees, and the overall health of the forests, including habitat and populations of plants and animals.

What changes have been seen and are predicted in the climate of the south-west?

The Mediterranean climate of the south-west – characterised by warm, dry summers and cool, wet winters – has seen a consistent trend of declining annual rainfall and increasing average temperatures since the 1970s.

There has been a shift in when rain is received, with a 20 per cent decline in winter rainfall since 1970 and a slight increase in summer rainfall in the eastern parts. Summer heatwaves and prolonged drought periods have also been more frequent.

While the rate and level of projected changes in rainfall, temperature and evaporation varies between different climate models and assumptions, there is agreement that the south-west has and will continue to experience drying and warming trends over the coming decades.

How will climate change impact on the forests and forest values?

Climate change presents significant challenges for maintaining forest health. The ability of the forests to withstand and cope with these changes will vary depending on factors such as soil type and depth, elevation and aspect, and the structure and density of vegetation.

The drier and warmer conditions will interact with other pressures affecting the south-west forests, such as fire, disease, weeds and pest animals, although the effects of these interactions are difficult to predict. Where climate-related extreme weather events occur such as heatwaves, higher bushfire intensities, or storms, they may amplify the impact of other pressures on native species and ecosystems.

Projected climate changes in the south-west

Rainfall

- Winter rainfall is projected to reduce by up to 15 per cent by 2030 relative to the 1981-2005 period.
- Rainfall declines are forecast to vary across the region, with the north-east of the Forest Management plan area likely to experience the largest proportional decline.
- The duration and severity of droughts are predicted to increase, along with potentially large fluctuations in the number and intensity of summer rainfall events.

Temperature

- Higher mean, maximum and minimum temperatures are expected.
- By 2030 the mean annual warming is projected to be about 0.5 to 1.1^{0} C above the average climate of 1986-2005.
- The temperature and frequency of very hot days are expected to increase, and heatwaves will get longer and more intense.
- There are likely to be fewer frost events across the region, but they may increase at a local scale.

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Climate change interacts with other pressures such as disease, weeds, pests and fire affecting the ability of forests to withstand these changes.

Observed and predicted consequences of climate changes in the south-west

Hydrology

The level of moisture stress varies across seasons and forest ecosystems. Surface water and groundwater-dependent ecosystems such as wetlands are highly vulnerable to hydrological changes.

Flora and vegetation

Ecological responses to changing climate have included landscape scale changes in the structure of vegetation communities, with increased tree mortality, and delayed or reduced flowering and seed production. When drought follows a fire event post-fire regrowth can be reduced. Vegetation associated with shallow groundwater, peats, streams and riverine areas will dry and contract.

Fauna

Species with restricted and/or fragmented ranges, low genetic variation, and reliance on a particular moisture regime or habitat are considered most vulnerable to climate change. The potential contraction or degradation of forest habitat may be an important aspect of climate-driven change for some mammals and a range of other threatened fauna species.

Carbon

Extreme climatic events and declining rainfall is expected to lead to long-term declines in the productivity of forest ecosystems, and hence the carbon carrying capacity of forests.

Fire frequency and behaviour

Climate change is affecting landscape dryness and fuel availability, and the frequency and intensity of extreme fire weather, causing the potential for bushfires to be more frequent. Drying makes ecosystems such as peats more vulnerable to burning. Changed fire regimes can interact with drought and heatwaves to reduce the resilience and post fire recovery rates of native plants and animals.

How is climate change addressed in the next Forest Management Plan?

Climate action generally falls into one of two categories: climate mitigation, meaning actions to reduce emissions that cause climate change, and climate adaptation, meaning actions to manage the risks of climate change impacts. The *Forest Management Plan 2024-2033* incorporates both climate mitigation and climate adaptation measures to deal with the impacts of climate change in the south-west forests.

Ecological thinning is a climate adaptation activity proposed in the plan to improve forest health and enhance the resilience of forests to a drying and warming climate. This involves selectively removing individual trees from an area to reduce moisture stress. Thinning is most beneficial in areas when tree density is high, often as a result of regeneration following historic harvesting. By thinning the density of trees in parts of the south-west forests, this increases the ability of the retained trees to grow and deal with future changes in climate.

Further reading

For more information on Climate Change refer to Intergovernmental Panel on Climate Change (IPCC). (2021): '*Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*.' https://report.ipcc.ch/

Intergovernmental Panel on Climate Change (IPCC). (2022): '*Climate Change 2022: Impacts, Adaptation, and Vulnerability*.' https://www.ipcc.ch/report/ar6/wg2/

The management of Western Australia's south-west forests will be outlined in the *Forest Management Plan 2024-2033*.
For more information visit our website at dbca.wa.gov.au/forest-management-plan

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