

## **Greening Australia's submission to the Bushfires Royal Commission**

### **Background**

*Our Vision: Healthy, productive landscapes where people and nature thrive*

Greening Australia is an environmental enterprise that thinks big to tackle the challenges facing Australia's unique and diverse landscapes in ways that work for communities, economies and nature. Greening Australia have been conserving and restoring Australia's landscapes since 1982. At Greening Australia, we work to solve bold and complex environmental problems through conservation on a massive scale, with programs and projects covering millions of hectares of land and protecting hundreds of native species.

We aim to bring life to landscapes and restore balance to the natural environment in significant areas across Australia.

Greening Australia works with experts and agencies to combine historical data and climate forecasting with our ecological and practical knowledge to plan and deliver our projects on the ground. Over the last ten years we've been working with fire ecologists, seed specialists, climate scientists and practitioners to view restoration through a climate lens and explore the practical onground actions that we can develop to improve long term resilience of Australia's vegetation. We call it climate-ready restoration.

### **THE NEED FOR A NEW APPROACH**

*Australia's recent fires were unprecedented in terms of their extent and impact on nature.*

*While many burnt areas will regenerate naturally, there are likely to be large areas where the unparalleled fire heat combined with ongoing drought may have destroyed the biological mechanisms by which many plants regenerate.*

Fire history, vegetation type and a changing climate means that some habitats will either never recover, or only partially recover towards their pre-fire state. Due to the unprecedented nature of the 2019-20 bushfires and the increased future frequency of such fires as a consequence of climate change, there is an urgent need for a new approach, both to mitigate risk and to improve long-term resilience of our landscapes.

In order to recover Australia's unique flora and fauna in bushfire affected areas we cannot keep doing what we have always done. We need to take evidence-based onground action that is both innovative and disruptive. We will implement new strategies and onground actions that have no precedent, and so we will set them up as experiments to ensure that at every step we will learn by doing.

Through the combination of science-led planning, innovative approaches to restoration in a changing climate, the development of national guidelines and the coordination of key stakeholders, we can harness the national energy, expertise and goodwill of stakeholders to improve the resilience of habitats as we move towards a future of changed conditions.

Based on our ecological knowledge we know that for a large number of plant and animal species and ecological communities, the impact of the 2019-2020 bushfires has been severe and may take decades to recover, or more likely, will never recover to their pre-bushfire state. These include fire sensitive species such as rainforest plants, or fire tolerant species such as Alpine Ash which have been burnt frequently and no longer have the capacity to reproduce between fires, thereby causing local extinctions. The culmination of this is that the Australian landscape has changed permanently after the 2019-2020 bushfires and will continue to change as the climate changes.

The Minister's Expert panel has identified 119 species of fauna heavily impacted by fires and requiring urgent management intervention. There have been 13 Threatened Ecological Communities with more than 10% of their habitat lost. State governments have also developed reports identifying loss of habitat for threatened species.

### **SPECIES AND COMMUNITIES IMPACTED THAT NEED HELP TO RECOVER**

*Plants – the building blocks of homes for animals – may be fire tolerant and have the capacity to regenerate after fire. But many species are intolerant of intense, hot fires. Recent fire history has impacted the ability of many plants to regenerate.*

### **THIS IS NOT REGENERATION AS USUAL –WHY WE NEED TO INTERVENE**

*There is often a perception that the Australian bush regenerates after fires, and that everything will return to the way that it was.*

However, we know that these fires were more intense and more widespread than anything we have ever witnessed. Fire sensitive vegetation like rainforests were extensively burnt and will not recover, and where they escaped burns, such as in gullies, they are highly likely to be invaded by other more fire-tolerant and drought-adapted species as the surrounding landscape is now exposed, including weeds.

For vegetation that can usually tolerate fire, the intensity of these fires are likely to have incinerated the seed stored in the soil, destroyed the above ground regeneration mechanisms, and for surviving plants, comes on top of an extended drought and increased fire frequency. Together these events significantly impede nature's ability to bounce back from this and future catastrophic events.

Below we present two case studies to articulate why this is not business as usual and why we need to combine climate modelling with onground interventions in this bushfire affected landscape in order to build the resilience of the Australian Bush to a changing climate.

#### **Case Study 1: The role of fire history on the recovery of Snow Gum woodlands**

Researchers from the University of Melbourne<sup>1</sup> were interested to understand how the frequency of short-interval severe wildfires would affect the ability of Snow Gums (*E. pauciflora*) to resprout, and how the diversity of species in the understorey would respond.

Their work shows that Snow Gum Woodlands are already changing in response to increased fire frequency, including a loss of their resprouting ability and a shift in understorey dominance from shrubs to grasses. This work shows that fire-tolerant communities may not be able to

bounce back after these fires. These findings also highlight that in addition to understanding the current fire severity mapping that is being undertaken for the 2019-2020 fires, we also need to understand the impacts of fire history to understand how the Snow Gum woodlands will respond to the 2019-2020 fires.

### **Case Study 2: The role of future climates in the regeneration of Alpine Ash communities**

The tall wet forests of Alpine Ash (*E. delegatensis*) with their lush undergrowth are an iconic feature of the Australian Alps and cover nearly two million hectares of our landscape. Unlike the Snow Gum woodlands described above, Alpine Ash trees do not resprout after a fire.

When Alpine Ash is exposed to a fire the adult trees perish and the forest regenerates from seed falling from the canopy, resulting in even-aged stands. However, the Alpine Ash does not produce seed until they are around 15-20 years of age, making young stands that are burnt incapable of self-regeneration.

As such, Alpine Ash forests are particularly vulnerable to frequent and broadscale fire regimes like we have witnessed in recent years, and which will intensify in coming years with climate change. Since 1997, successive landscape scale bushfires (1998, 2003, 2007, 2009 and 2013 and 2019) have burnt more than 2.4 million hectares of the Victorian Alps. In 22 years – around the time it takes for Alpine Ash to mature and produce seed - large areas of Alpine Ash have been burnt multiple times, which has driven large scale local extinctions and a transition to other types of vegetation communities.

Historically the response to these events was to reseed areas with Alpine Ash seed, only to lose those plants again in coming fires. This is not a cost effective or ecologically effective approach. Greening Australia has been working with Parks Victoria and Melbourne University to better predict the potential loss of these forests as a consequence of increased fire frequency in a changing climate, and explore what we would do differently in response.

By combining fire history and climate forecasting mapping, we helped identify where in the landscape Alpine Ash communities would persist ('refugia'), versus areas where we would lose Alpine Ash in the future. Now that we are empowered with this knowledge, there are many actions to help nature adapt to a changing climate. In areas that are habitat refugia, we can consider protection activities (eg waterbombing, track access, watering points, planting design). We can also now experimentally test the effectiveness of activities in the areas that will be frequently burnt (eg planting design to reduce fire risk, horticultural interventions and seed selection to select for faster seed producing plants; sourcing lignotuber populations from Tasmania; trialling new species; or accepting the changed community type).

Using this knowledge and with sufficient funding, our next step will be to prioritise and trial these experimental interventions that support the adaptation of plant communities in a changing climate.

Attachment: *Climate Ready Bushfire Recovery, The Need for Intervention, Greening Australia 2020*

## **Recommendations to the Bushfire Royal Commission**

### **Preparation**

1. That there is investment in climate predictive modelling combined with ecological knowledge to predict future changes to the environment, including the identification of refugia and areas where fire frequency will likely result in a change and/or loss of habitats;
2. That there is investment in climate predictive modelling combined with ecological knowledge to identify refugia and to incorporate them into fire planning for protection during the preparation and response phases;
3. That there is investment in 'fast fail' experiments to start transitioning vegetation communities that are identified as no longer likely to persist in a changing climate (e.g. Alpine Ash);
4. That predictive modelling is closely tied to the restoration sector in order to enable the sector to start planning for changes in the environment;
5. Traditional Owners, fire ecologists and restoration practitioners work together to better understand the effectiveness of cultural burns in a changing climate in south eastern Australia.

### **Response**

6. That fire intervention such as water bombing is used to protect high priority ecological areas identified during the preparation phase.

### **Recovery**

7. That there is investment in infrastructure to enable large scale restoration after fires.