

THE GIPPSLAND FOREST DIALOGUE BACKGROUND PAPER



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INTRODUCTION



WHAT IS THE GIPPSLAND FOREST DIALOGUE?

Our forests need our help. Fire, pests, weeds, neglect, exploitation, and the changing climate are all taking a huge toll - but if we all work together, the future can be different. A group of Gippslanders and people who love Gippsland's forests are coming together so that the community can have a say on how we meet the challenges facing our forests and find ways forward.

It's called 'The Gippsland Forest Dialogue' and it's an opportunity to talk about how best to look after our forests, and to explore and discuss possible futures for forests in the Gippsland region.

The Dialogue is independent and local—we have no government funding, no preconceived decisions or agendas, and no collective association with peak bodies, interest groups, political parties or movements. We do not favour the interests of one group or sector and all options and opportunities are on the table. We want to learn from the lessons of the past and try to succeed where previous attempts have failed. We are working to build trust through discussion, shared learning and approaching forest management issues from every point of view. We will talk with Traditional Owners about cultural objectives for Country and prioritise self-determination. We will look across the landscape at all forest tenures—state forests, national parks, plantations, farm trees, and private land conservation.

We will consider biodiversity conservation, ecosystem services, recreation, timber production, and bushfire risk management as fundamentally interconnected and interdependent parts of our forests. The process is based on and supported by 'The Forests Dialogue' (TFD), an international organisation based at Yale University that brings together and supports groups of forest stakeholders to learn from each other, to trust each other, and to implement collaborative and adaptive land management.

TFD has facilitated more than 90 dialogues on contentious issues in forest management across the globe over the past 20 years. These are normally multi-stakeholder engagements over 1-4 days with a mix of field visits, presentations and facilitated discussions, working to identify common areas of agreement and disagreement (fracture-lines), discuss and hopefully break deadlocks and create real, meaningful change by giving participants the mandate to determine outputs and outcomes.

ABOUT THIS PAPER

This Scoping Paper provides background information on issues affecting Gippsland’s forests and has been prepared to assist in informing and briefing participants of the first Gippsland Forest Dialogue, to be held from 11-13 November, 2022 at Rawson. During the writing process, an advisory group of stakeholders steered the development of the paper, identifying possible areas for discussion, providing feedback and shaping direction.

The Advisory Group asked for the Scoping Paper to provide prospective participants in the dialogue with a baseline understanding of six intertwined elements that influence and shape our forests—climate change, fire, cultural landscapes, water, industry, and biodiversity—presenting information on why each element is important, the different values that shape our understanding of them, and the existing and future tools, policy and strategies that surround their management. These thematic areas combine to tell the story about how Gippsland’s forested landscapes are impacted by global issues, land-use and land management decisions and their effect on forest health and the associated well-being of the communities that depend on them.

The aim of the paper is to inform the identification of common ground and initiate the discussion of solutions, rather than dwelling on points of conflict. It forms a key element of The Forests Dialogue approach, outlined in the graphic below.



The Forests Dialogue three phase approach operates as follows:

Engage

Bringing together a diversity of interests to foster relationships and build around contentious forest issues, or 'fracture lines'.

Explore

Investigating the issues at hand and crafting a shared understanding of the objectives, challenges and opportunities ahead.

Change

Seeking change through consensus-based collaboration aimed at immediate action and long-term progress.

GIPPSLAND FOREST FACTS¹

1.43

million ha
native forests

1.2

million ha
formal conservation
reserves

72,000 ha

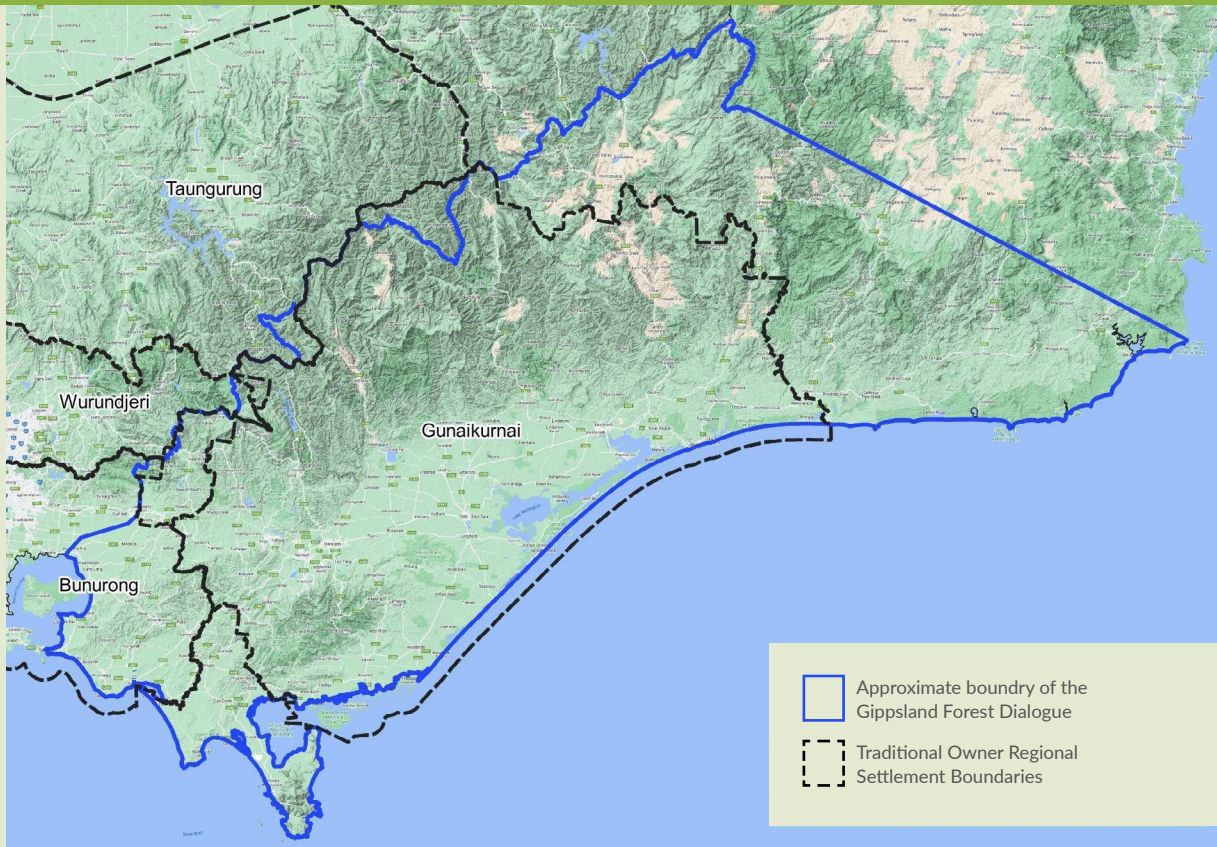
softwood plantations

18,000 ha

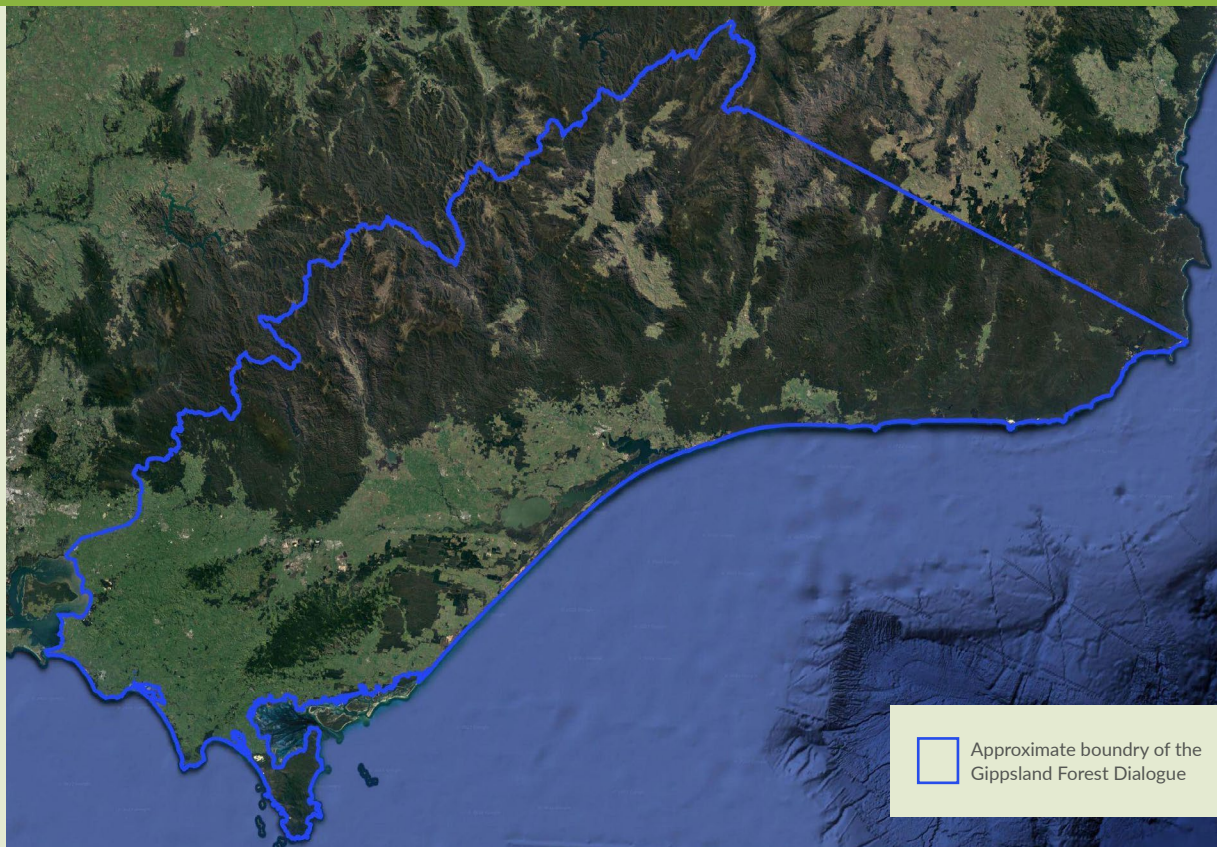
hardwood plantations

Privately owned forests,
farm trees and environmental
plantings

The Gippsland Forest Dialogue region



Forest coverage in Gippsland



BACKGROUND AND CHALLENGES

Gippsland people and its forests have always been intimately connected. Our spectacular forested landscapes are known for their towering trees, diverse flora and fauna, unique timber resources, high quality water and for providing a place of refuge and recreation for people across Victoria, Australia and the world. Gippsland forests and landscapes are the homes and places of great spiritual importance to Gunaikurnai, Bidwell, Bunurong, Taungurung, and Wurundjeri Traditional Owners, who have lived here and cared for Country for untold generations.

But many of Gippsland's forests have experienced widespread damage since European settlement. Large areas were cleared for agriculture, Indigenous cultural burning practices were curtailed, and introduced animals and weeds altered ecosystems and continue to threaten native flora and fauna. Now climate change is affecting our forests and the people, ecosystems, wildlife, industry, and food and water supplies that rely on them too. The region has also experienced several major wildfire events since 2000, compounding and exacerbating other threats. The Black Summer bushfires alone burnt across 1.5 million hectares across Gippsland.

In common with many regional communities, Gippsland has employment, industry sector, and social challenges, including the transition away from coal-fired power towards renewable energy. The Victorian Government also announced a plan in 2019 to phase out timber harvesting in public native forests by 2030 and invest \$110 million in new timber plantations. Federal government policy also supports more timber plantations across Australia, but a supply gap is forecast for intervening years and transition strategies are still undefined.

It seems increasingly likely that communities and forest managers may have to rapidly adapt to these challenging conditions. This may require new forms of land management and engagement between public land managers, researchers, Traditional Owners, environment groups, business, and local communities. This quest for engagement is set against a history of land management conflict, which extends to forest fire and pest management, industry, recreation access and conservation.

Bringing innovative, enthusiastic, optimistic, and forward-thinking people who are prepared to work together to engage, explore, and discuss possible positive futures for communities, people, trees, and forestry in the Gippsland region could be the first step to meeting these challenges.

Often, we don't come together
to workshop solutions.
That is what the Gippsland Forest
Dialogue wants to change.

ISSUES FOR DIALOGUE

Humans need forests. They are immensely valuable and worth fighting for, but what we value about them differs greatly from person to person, community to community and group to group. Forests generate strong emotional responses, and are intimately linked to identity, place and our relationship with nature.²

The ways in which people and forests interact are always changing and evolving. The values that are placed on forests in Gippsland may be viewed from at least three different lenses - the idea that forests are for production, the idea that forests should be protected, and the idea that forests are interdependent with human culture. These different ways of experiencing, valuing and relating to forests may lead to disagreement and discord if we don't work to understand each other.

As in many places across the world, there is a long history of conflict around Gippsland's forests and many Gippslanders are familiar with how hotly contested the governance and management of our forests has been.

In the 18th and 19th centuries conflict raged between Aboriginal Australians and British colonists, culminating in violence and the dispossession of First Nations Peoples. Although slow steps are being taken towards reconciliation and restitution, understanding and knowledge of Country and of kinship and Caring for Country and nature may often be missed or ignored by Western systems of natural resource management.

In the early 20th century, conflict between people wanting to clear land for agriculture and people wanting to preserve forests occurred, and since the 1970s, debate has raged about the management of native forests, pitting conservationists against the forestry industry. More recently, plantation expansion and appropriate strategies around bushfire risk reduction across all land tenures have created tensions.

The Forest Dialogue seeks to identify common ground, understanding and solutions to issues which have historically given rise to conflict over our forests.

² P. Kanowski, [Australia's forests: Contested past, tenure-driven present, uncertain future](#), Forest Policy and Economics, Vol 77, pp 56-68, 2017

ISSUES FOR DIALOGUE

Some of the most contentious current and historical issues include:

Bushfire

Fire has shaped the Gippsland bush, but how humans manage our relationship with fire is extremely complex. For example, some studies consider that forests become less flammable with time³ while other research maintains a need for regular burning to reduce fire risk⁴. Burning the bush to mitigate fire risk can have both positive and negative consequences for risk management and biodiversity⁵, a tradeoff which is becoming contested and can be difficult to navigate. The role of climate change versus management failures in driving current experiences of fire risk and wildfire outcomes is similarly contested. The amount, timing and location of planned burning is also widely debated⁶ and while discussions regarding reinstating cultural burning practices are gaining prominence, the means for achieving this, and at what scale, remain unresolved.

Timber harvesting

Current government policy prescribes that in Gippsland after 2030, harvesting from native forests will cease, with wood and timber supplies being predominantly sourced from plantations. How this will be implemented on the ground, is contested and unclear. Key questions that remain unresolved include: Can we source all our wood needs from plantations (if so, how and where)? What, if any, forms of timber harvesting might be allowed to continue in native forests (e.g. boutique timbers, ecological thinning for forest restoration, mechanical fuel reduction)? In what ways will the closure of timber harvesting in public native forests impact (both positively and negatively) upon Gippsland communities? Should there still be markets for wood that is not suitable for solid timber products?

Plantation expansion

Expanding plantations at a variety of scales may help meet the diverse needs of Gippsland's rapidly growing population, but will need the support and close cooperation of the community, as planting more trees for carbon storage or to increase timber available for harvesting has both benefits and costs. Projects may incentivise trees to be planted in unsuitable places, potentially reducing food production areas, water quantity and quality, and land availability, and raising the threat of bushfire close to homes, farms and communities. However, plantations are also associated with many positive outcomes for forest values, and may help mitigate some of the effects of climate change and increase biodiversity and habitat linkages across the landscape, in addition to benefits to industry and the economy.

Biodiversity conservation/management

Biodiversity is a key value associated with many forests in Gippsland and there appears to be broad agreement that biodiversity needs to be protected, however the best way to achieve this continues to drive debate. If, how, and the degree to which wood production activities in native forests can coexist with biodiversity conservation is recognised as one of the main tensions that arise from questions about how our native forests should be used. 'Lock it up' versus 'rotational harvesting' could be seen as the simplified management frameworks that create this fracture line, and are two viewpoints that exclude many other nuances - for example, how ecological thinning could potentially contribute to a variety of forest values.

If, what, and how much biodiversity management is required also remains largely unresolved. The concept of 'wilderness' and if forests can remain 'pristine' is subject to ongoing debate. Early attempts at forest conservation (such as the Franklin River in Tasmania) promoted an idea of forests and landscapes that were 'untouched' or in a 'natural state'. This idea gained significant traction but also fails(ed) to acknowledge the often active management of First Nations people or the need, in some circumstances, to undertake forest management activities in order to address the threat posed to biodiversity by invasive species and inappropriate fire regimes, for example.

³ P. Zylstra et al, [Self-thinning forest understoreys reduce wildfire risk, even in a warming climate](#). Environ. Res. Lett. vol 17(4), 2022

⁴ L. Volkova et al, [Impact of mechanical thinning on forest carbon, fuel hazard and simulated fire behaviour in Eucalyptus delegatensis forest of south-eastern Australia](#). For. Ecol. Manage. 405, 2017

⁵ Department of Agriculture, [Water and the Environment Fire regimes that cause declines in biodiversity](#) - DCCEEW, 2022

⁶ K Altangerel & C.A. Kull, [The prescribed burning debate in Australia: conflicts and compatibilities](#), Journal of Environmental Planning and Management, 56(1), 2013

⁷ Fletcher, M-S., et al. [Indigenous knowledge and the shackles of wilderness](#). 2021

FRAMEWORKS FOR RESOLUTION

The [National Forest Policy Statement \(NFPS\)](#) was (and is) an agreement between Commonwealth, State and Territory governments on broad goals for the management of Australia's forests. The goals embrace the concept of ecologically sustainable development, and the aim is to manage Australia's native forests to conserve biological diversity, heritage, and cultural values, and at the same time develop an internationally-competitive forest products industry.⁸ However, while this still represents the most current overarching vision for Australia's forests, it is now more than 20 years old.

The [Regional Forest Agreements](#)⁹ (RFAs) stemmed from the NFPS and are a policy planning framework that were designed to provide a mechanism for addressing and balancing forest values, however many believe that they have failed to do so¹⁰, having been subject to short-term political priorities. For example, despite increases to the conservation estate, concerns regarding forest health and biodiversity declines continue, while a decrease in sawlog allocations has led to less economic activity from timber harvesting¹¹.

Today, the management of our forests is siloed among different government agencies, the land itself is divided up into parcels and used for one purpose at a time and this management is often based on decisions made by people far away from Gippsland itself. Kanowski observes that "current Australian forest governance is characterised by a suite of primarily 'one tenure—one use' policies and programs, and by a national strategy that is nearly a quarter of a century old and was agreed only within and between governments".¹²

This single-use approach, which is directed by decisions from or between governments, doesn't appear to effectively accommodate a broader range of uses and interests. However, despite its failures, the outdated policy environment may provide an opportunity to move beyond acrimony and misinformation and forge a new, shared vision, and if forests can remain 'pristine' is subject to ongoing debate. Early attempts at forest conservation (such as the Franklin River in Tasmania) promoted an idea of forests and landscapes that were 'untouched' or in a 'natural state'. This idea gained significant traction but also fails(ed) to acknowledge the often active management of First Nations people or the need, in some circumstances, to undertake forest management activities in order to address the threat posed to biodiversity by invasive species and inappropriate fire regimes, for example.

It is time for Gippslanders to talk to each other, and just as importantly, to listen.

⁸ Commonwealth of Australia, [National Forest Policy Statement](#), 1995

⁹ Commonwealth of Australia, [Regional Forestry Agreements](#)

¹⁰ D. Lindenmeyer et al, [Regional Forest Agreements fail to meet their aims](#), Ecological Society of Australia, 2017

¹¹ W. Jackson et al, [Reshaping forest management in Australia to provide nature-based solutions to global challenges](#), 2021

¹² P. Kanowski, [Australia's forests: Contested past, tenure-driven present, uncertain future](#), 2017

DISCUSSION QUESTIONS

Appearing throughout this Scoping Paper, brief discussion questions are designed to prompt and stimulate discussion at the first Gippsland Forest Dialogue.

1

What do we want from and for our forests?

2

Is the current way of governing forests delivering those outcomes?

3

What might we need to do differently and how might we achieve this?

4

How could forest management bring collective benefits to the themes discussed below?

WHY ARE FORESTS IMPORTANT?



The following sections explore six key intertwined elements that influence and shape our forests—climate change, fire, cultural landscapes, water, industry, and biodiversity. Each part outlines information on why each theme is important, the different values that shape our understanding of them, and the existing and future tools, policy and strategies that surround their management.

These thematic areas combine to tell the story about how Gippsland's forested landscapes are impacted by land-use and land management practices and the effect of this on forest health and the associated well-being of the communities that depend on them. The information presented is by no means exhaustive or definitive but is included to provide a general overview to stimulate discussion during the Dialogue process, and will be revisited, reviewed, and revised as the Dialogue evolves.

TRADITIONAL OWNER CULTURAL LANDSCAPES



The concept of Cultural landscapes is a way of articulating the deeply intertwined relationship between Australia’s First Nations peoples and Country. It helps to demonstrate that Gippsland’s forests and landscapes co-evolved through the skilful management of the Gunaikurnai Traditional Owners, as well as Bunurong to the West and Taungurung and Wurundjeri to the North and Traditional Owner groups in the far east.

This management included the systematic and purposeful use of fire in ways that governed landscapes, species communities and vegetation features. Aboriginal people also modified rivers, wetlands and waterways to form fish traps and freshwater aquaculture systems and translocated plants.¹³

But the concept of cultural landscapes is more than simply the management of land, it also endows everything in the land with consciousness, life and interconnectedness.

From an Indigenous perspective, “Country is not a generalised or undifferentiated type of place, such as one might indicate with terms like ‘spending a day in the country’ or ‘going up the country’. Rather, Country is a living entity with a yesterday, today and tomorrow”¹⁴. There are many strong connections between indigenous custodians and their totemic connections with individual species¹⁵. These connections ensured that species and ecosystems would be preserved for the benefit of not only those species and ecosystems but also for food, resources and ecosystem services.

As such, Australia forms a tapestry of interwoven cultural landscapes that are the product of the skills, knowledge, and activities of Aboriginal land managers over thousands of generations and 60,000+ years of habitation.

Cultural landscapes are reflections of how Aboriginal people engage with the world and a reflection of the modification and management of Country for the maximum benefit to all inhabitants—both human and non-human¹⁶. There is no separation between nature and culture from this perspective, and the “health and wellbeing of Traditional Owners is directly influenced by both the health of the environment and the degree to which Traditional Owners can be actively involved in caring for it”¹⁷.

¹³ J. Alexandra, [Designer Ecosystems for the Anthropocene—Deliberately Creating Novel Ecosystems in Cultural Landscapes](#). Sustainability, 2022, 14(7)

¹⁴ D. Bird-Rose, [Nourishing Terrains](#), Australian Heritage Commission, 1996

¹⁵ F. Cahir et al, [Aboriginal Biocultural Knowledge in South-east Australia](#), CSIRO Publishing, 2018

¹⁶ J. Alexandra, 2022

¹⁷ DELWP, Central and Gippsland Region Sustainable Water Strategy Final Strategy, 2022

Why is it important to understand Traditional Owner cultural landscapes?

Understanding cultural landscapes is important to help frame the way we think about landscapes and people, not as separate but instead as co-evolved entities. This way of thinking helps us to recognise the undeniable contribution of people to nature and vice versa that occurs in all landscapes that are inhabited by people.

Approaching land management through the lens of cultural landscapes may provide a way to heal and restore degraded land, and address many of the issues facing our forests, including the climate crisis, and the threats of catastrophic bushfire, water pollution, biodiversity loss, and risks to industry. These solutions may take many forms, including restoring and promoting cultural fire, land, and water management practices, forest thinning, traditional and integrated farming, leadership by Traditional Owners in managing invasive and feral animals and plants, and traditional management of waterways and fish stocks¹⁸. However, any potential partnership and collaboration with Traditional Owners should be guided by the priorities of the original custodians.

European colonisation has had a devastating impact upon Aboriginal people and Country and continues to do so today. Families were taken from their homelands. Speaking language was made illegal as well as practicing the ways of the ancestors. The custodial relationship with Country was forced by Europeans to end¹⁹. Landscapes were cleared, and rivers were altered.

As First People of Australia, Traditional Owners have inherent rights that were never ceded .

The concept of Cultural landscapes could be used to start to bridge the differences between Indigenous and 'Western' world views, between Natural Resource Management (NRM) and Caring for Country. It enables a dialogue between Traditional Owners and government land managers within a framework that does not exclude one or the other world view, and it also "focuses on strategies that foster Indigenous livelihoods, enable communities, ensure sovereignty and get people back on Country"²⁰.

¹⁸ S. Bokessey et al, [Nature as a Climate Solution](#), University of Melbourne, 2021

¹⁹ DELWP, Central and Gippsland Region Sustainable Water Strategy Final Strategy, 2022

²⁰ S. Bokessey et al, [Nature as a Climate Solution](#), 2021

What values matter?

Western ideologies often see land in terms of something to be exploited for individual benefit, or something to be 'protected' from other humans—what is often thought of as 'wilderness.' Fletcher²¹ contends that "Aboriginal people in Australia view Wild Country – 'wilderness' – as sick country. Land that has been degraded through lack of care. Aboriginal ideas of 'wilderness' are in direct contrast to the romantic notion of 'wilderness' as "pristine" or "healthy" that remains a powerful narrative in conservation efforts across the world today". As Fletcher further points out, the 'wilderness' movement can be seen as furthering the disempowerment of indigenous and local peoples by not acknowledging human agency in the health and diversity of landscapes.²²

But (as can be seen from the conflict that has stricken Gippsland forests and its peoples since colonisation) the "governance of land has always involved power moves about whose priorities matter, with environmental management no exception"²³. The notion of management is seen by some as a Western and inherently colonial construct. "Management, as used in environmental management and forest management, infers a one-way relationship between people and the environment, with clear connotations of a master–slave relationship, placing the land as unknowing and unfeeling"²⁴.

The values missing from Western management regimes, as pointed out above, are the relationships Aboriginal peoples share with their Country, which are centred around notions of kinship and caring²⁵ and also include affective, custodial, future use, identity, place-based, practice-based, relational, social cohesion and well-being values. It is important to remember that Aboriginal groups that engage with government agencies in managing their own Country are still largely limited to working within systems of thinking and governing that are not their own.

First Nations voices have been largely absent from forest management since colonisation. Many branches of government, industry and the conservation sector are now looking at ways to better engage with TOs in forest management, but it will require change to traditional western structures, coupled with genuine listening and learning, to achieve.

²¹ M. Fletcher et al, [Indigenous knowledge and the myth of 'wilderness'](#), Science Matters, 2021

²² M. Fletcher et al. [Indigenous knowledge and the shackles of wilderness](#). 2021

²³ J. Weir, [Terrain](#), Borderlands, 20(1), 2021

²⁴ B. Williamson, [Cultural burning and public forests: convergences and divergences between Aboriginal groups and forest management in south-eastern Australia](#), Australian Forestry, 85(1), 2022

²⁵ Bird-Rose, 1996; Fletcher et al, 2021; Weir, 2021

Existing and future management tools, policy and strategies

The Victorian Traditional Owner Cultural Landscape Strategy is an important reference document for the Gippsland Forest Dialogue that can be used as a bridging tool and a guide for developing understandings of what is needed for genuine collaboration with Traditional Owners to address the complex task of healing and managing Gippsland's forests and the Country that they sit within.

The Cultural Landscapes Strategy has been formally adopted by Victoria's Department of Environment, Land, Water and Planning and now forms the basis for engaging with Victorian Traditional Owner groups on matters relating to public forest management and partnerships. The Strategy connects to a suite of other government policies: the Regional Forest Agreements, and Parks Victoria's Forest Management Plans and the Land Management Strategy.

The strategy provides pathways for Traditional Owners to "repatriate management practices and begin the complex task of restoring and redressing harms to Country and, in doing so, bring healing to Country and community"²⁶. It also suggests ways to address questions of legality and tenure, including how activities such as tree thinning and cultural burning can become rights enabled by native vegetation regulations and fire legislation, outlining a framework and tangible actions that will underpin work by DELWP and Parks Victoria on future forest and parks management and decision making, including policy and legislative reform.

The strategy also suggests adding 'culturally valued species' to Victoria's Flora and Fauna Guarantee Act, so that landscapes can be managed for that animal or plant, as well as the introduction of Reading Country programs, which would enable monitoring of seasonal and practice-based cultural indicators and the development of forested country assessment and planning.

Reading Country is a bridging tool to permit the "respectful integration of Indigenous oral cultural practices of knowledge protection and transfer (e.g. dreaming stories) and Western applied research"²⁷. There are two main components to the Cultural Landscapes Strategy—firstly, that cultural values are identified and recorded. "These values may be cultural heritage, intangible heritage—as song, dance, stories, places—and living bio-cultural values—such as culturally significant plants and animals. These values are examined through narrative and yarning with Elders, mentors, peers or knowledge keepers"²⁸. The second part is the data analysis, interpretation and sharing as knowledge that then becomes the priorities and actions required to heal and maintain the health of Country, including how mechanisms such as cultural fire, ecological watering, and feral predator management can heal and nurture Country for the benefit of all.

However, it is a toolkit, not a pathway. Understanding the objectives, values and uses for Country requires discussion with the Traditional Owners of whose Country it is.

²⁶ Federation of Victorian Traditional Owner Corporations, [Cultural Landscapes Strategy](#), 2022

²⁷ *ibid.*

²⁸ *ibid.*

DISCUSSION QUESTIONS

1

How can Traditional Owner cultural values and uses for Country be better heard to guide forest management in Gippsland

2

What do you think about the idea that our forests are interconnected across multiple landscapes, even those quite altered, and the concept of inter-relation between forests, lands and waters as integral to the health and wellbeing of all lifeforms?

3

What benefits can you see there may be for looking at our forests and how they are placed in our landscape more holistically?

BIODIVERSITY



Biodiversity in its simplest interpretation represents all life on earth.

More specifically, biodiversity can be broken down into three key categories—genetic diversity, referring to the diversity of genes of a species; species diversity, referring to the variety of species within a given area or region; and ecosystem diversity, which relates to the range of ecosystems within a given place, and includes the different ages of vegetation within those ecosystems.

Gippsland has 2.7 million hectares (or 61% of Victoria) of highly biodiverse forests, and this biodiversity contributes to many forest products on which people rely, including water, timber, seeds, food, oils, flowers and medicines,²⁹ which make significant but often undervalued contributions to our economic prosperity.

The region encompasses many places afforded some protection for their biodiversity values, including the Snowy River, Croajingalong, Avon, Alpine, Errinundra and Wilsons Promontory National Parks, and Gippslanders share our landscapes with more than 5,000 plant species and many hundreds of birds, mammals, insects, amphibians and reptiles.

²⁹ Commonwealth of Australia, [Australia's State of the Forests Report, 2018](#)

Why is it important to understand biodiversity?

Healthy biodiversity is vital for forests to function properly. A greater diversity of organisms facilitates natural cycles, such as the storage and breakdown of carbon and other elements, the creation of soils, the filtration and yield of water and the production of oxygen. Genetic, species and ecosystem biodiversity strengthen the resilience of our landscapes and reduce susceptibility to current and future threats, as well as increasing the health and value of ecosystem services³⁰.

But Australia's forest biodiversity faces many threats. As the recent State of the Environment report states, "pressures from climate change, habitat loss, invasive species, pollution and resource extraction can add together to increase impacts on the environment"³¹.

In Gippsland, these specific threats include historical legacies of agricultural land clearing, settlement and altered fire regimes. The loss of old-growth and hollow-bearing trees through fire and resource extraction, and a succession of introduced pests, such as deer, pigs, foxes, and cats have all played their part in reducing forest biodiversity. Climate change threatens biodiversity through severe fluctuations in weather patterns, such as drought, extreme flooding, increasing average temperatures and the number of days of extreme fire danger.³²

The Black Summer Fires impacted 70% of the forest cover in East Gippsland and 19% of forest cover in Gippsland³³. These wildfires affected both species and habitat³⁴. Over 240 species had 50% of their habitat burnt, including 43 that are rare or threatened. Nine Ecological Vegetation Classes (EVCs) had more than 50% of their extent burnt, including 78% of the Warm Temperate Rainforest extent. The wildfires have led to many species being added or upgraded in threatened status under the Federal Environment Protection and Biodiversity Conservation Act (EPBC Act) and/or Victoria's Flora and Fauna Guarantee Act (FFG Act) threatened species lists.

Today, the Gippsland area has 80 species that are listed Nationally under the EPBC Act including 13 mammals, 14 bird species and 39 plant species. East Gippsland has 52 species that are threatened with extinction under the EPBC Act, including nine mammal, nine bird and 27 plant species³⁵. Seventeen Ecological Vegetation Classes (EVCs) are considered Endangered across the entire region.

³⁰ DELWP, [Protecting Victoria's Environment – Biodiversity 2037](#), The State of Victoria Department of Environment, Land, Water and Planning, 2017

³¹ W Jackson et al, [Australia's State of the Environment Report](#), Commonwealth of Australia, 2022

³² CES, 2018; DELWP, 2017a; VEAC, 2017; DELWP, 2020b; DELWP, 2021b; [State of Victoria and Commonwealth of Australia](#), 2019

³³ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#), 2021b

³⁴ DELWP, [Victoria's bushfire emergency: Biodiversity response and recovery. Preliminary report Version 2](#), 2020a

³⁵ [State of Victoria and Commonwealth of Australia](#), 2019

What values matter?

The importance of biodiversity is visible in our cultural and spiritual ties to animals and landscapes. Each of us connects differently with forests and animals, often in ways that are not always fully understood or recognised. For many people, they provide immense intangible value beyond shelter or food. The overwhelming sense of life in every form and variation—biodiversity—is inextricably bound with our own lives and biodiversity's intrinsic and incalculable value stems from this.

From a Traditional Owner cultural landscapes perspective, the bio-cultural knowledge of indigenous land management in maintaining ecological, species and genetic diversity as well as ecosystem health and other important ecological attributes such as soil moisture and hydrology is deeply intertwined with spiritual, totemic connections to animals and landscapes across the Countries that Gippsland was layered upon.

Biodiverse ecosystems are also critically important for our health, livelihoods, and economies. Many individual species of plants and animals provide vital ecosystem services in Gippsland, and their ongoing existence is extremely important to the health of our forest landscapes and the many industries that rely upon them. This includes water, and the purifying function of biodiverse forests on our water supplies can be regarded as essential elements of natural infrastructure within water management³⁶.

The impacts of large and severe fires on threatened species and wildlife³⁷, and the consequences of severe fires on ecosystem integrity³⁸ are also important to consider, as is the risk to biodiversity values from other impacts of climate change such as the higher temperatures and more severe droughts that are affecting Gippsland's flora and fauna through changes to habitat suitability, changes to soil moisture and hydrology, changes to food supply, flowering and the interactions between species around competition and predation.

Each of us connects differently with forests and animals, often in ways that are not always fully understood or recognised.

³⁶ UNEP, [Natural Solutions for Water Security](#), 2013

³⁷ Wintle et al, [After the Megafires: What Next for Australian Wildlife?](#) Trends in Ecology and Evolution, 2020

³⁸ Boer et al, [Unprecedented burn area of Australian mega forest fires](#), 2020

Existing and future management tools, policy and strategies

There are many ways to maintain biodiversity and just as many threats that reduce it³⁹. These include positive actions such as cultural fire and habitat maintenance and negative pressures such as inappropriate fire regimes, climate change, invasive species, and land clearing.

Many national and state policy frameworks have been put in place that serve to try to maintain and protect biodiversity. The key governing Acts include the federal EPBC act, which aims to recognise and protect ecosystems and species threatened with extinction, and the Victorian Flora and Fauna Guarantee (FFG) Act, which promotes the conservation of biodiversity.

At present, two of the main biodiversity management mechanisms in Victoria are Biodiversity 2037 and the Strategic Management Prospects (SMP) system for applying management decisions.

Biodiversity 2037 focuses on active management to maintain and increase biodiversity. The strategy's methodology is guided by the SMP support tool to direct management to areas that will deliver the greatest biodiversity gains and change in suitable habitat. Active management within this strategy includes the control of pest herbivore, predator and weed control as well as revegetation. An example of the regional outcome targets for East Gippsland within this strategy is that "threatened animals are protected through sustained integrated predator control in 480,000 hectares of priority habitats."⁴⁰ The long term aspiration is a 100% net positive change in suitable habitat for threatened species in 50 years. However, the strategy omits the importance of indigenous burning or ecological thinning, and accepts that some individual species may face extinction in favour of a majority of species surviving.

A recent state parliamentary enquiry into ecosystem decline looked at the drivers of declining biodiversity in Victorian ecosystems⁴¹. Recommendations to address invasive species, climate change, threatened species and land management strategies were given. One major topic was the limitation of available funding to ensure a positive trajectory for biodiversity.

Outside of government strategies, there are various mechanisms to enhance biodiversity. For example, actively managing and protecting Gippsland's remaining old-growth forests is important to the conservation of hollow-dependent species, such as owls, parrots, gliders, and possums. Large trees are also more drought tolerant and it's been observed that trees with a larger diameter are more likely to survive bushfire in both wet and dry eucalypt forest types⁴². Since 1989, 98% of the disturbance to Victorian old-growth forests has been due to bushfires⁴³ - raising questions for forest managers about how best to protect this age class.

New forests are similarly important. In Gippsland, 94% of public land is covered by forest while on private land this figure is just 25%⁴⁴. Private property is the land tenure that has the greatest need for biodiversity value enhancement due to the impacts from land clearing, and many studies have shown that agroecology and agroforestry—if carried out appropriately—can enhance biodiversity on private property, leading to both environmental and economic benefits⁴⁵.

Cultural burning practices also have an important place in prolonging healthy biodiversity and the departure from cultural burning practices since European settlement has resulted in significant ecological changes to Victoria's natural environment⁴⁶. Many Australian species and ecosystems rely on the regular disturbance of fire⁴⁷ and cultural burning may create refuges, fresh food and reduce the extent and ecological impacts of bushfires.

³⁹ FFG Act 1988, DELWP, 2016; State of Victoria and Commonwealth of Australia, 2019

⁴⁰ East Gippsland Catchment Management Authority, *East Gippsland Regional Catchment Strategy*, 2022

⁴¹ Parliament of Victoria, *Enquiry into ecosystem decline in Victoria*, 2021

⁴² Trouve et al, 2021; Fairman et al, 2019; Allen et al, 2022

⁴³ Lindenmayer & Taylor, *Extensive recent wildfires demand more stringent protection of critical old growth forest*, 2020

⁴⁴ SVCA, 2019

⁴⁵ Salt et al, 2004; Alexandra, 2020

⁴⁶ TVTOCFKG, *The Victorian Traditional Owner Cultural Fire Management Strategy*, 2019

⁴⁷ Cheal, 2010; McCarthy et. al, 2003; Prober et. al, 2007; Steffensen, 2020

DISCUSSION QUESTIONS

1

What biodiversity values are important to you in the Gippsland area?

2

What examples are there of successful biodiversity enhancement in Gippsland?

3

How can we better manage biodiversity across all land tenures?

CLIMATE CHANGE



Victoria's forests are getting hotter and drier, and this is impacting biodiversity, fire frequency and intensity, industry, water and livelihoods.

There is now broad scientific agreement that climate change threatens the health of people and ecosystems around the globe, and Gippsland's communities and its forests are no exception. Urgent, effective and equitable mitigation actions are required, and managing and restoring forests is an internationally recognised mechanism to combat climate change, while also providing food, wood and other renewable resources⁴⁸.

Although Australia has always had a variable climate and our forests have evolved and adapted to this across the millennia, "human-induced changes in climate are likely to exceed historical ranges of variability and rates of change, and have effects on forests well beyond the experience of forest managers"⁴⁹. Understanding and acting on this rapid change is key to better preserving Gippsland's forests for every community, and to better managing fire, water, biodiversity, and industry in the region.

Our forests are a vital part of protecting the world from the worst effects of climate change. One third of the carbon dioxide released from burning fossil fuels is absorbed by forests every year. Two billion hectares of degraded land across the world offer opportunities for restoration. Scientists suggest that halting the loss and degradation of forests and promoting their restoration has the potential to contribute over one-third of the total climate change mitigation required by 2030.⁵⁰ Other benefits that may arise from activities designed to alleviate climate change in Gippsland include increased local employment, better biodiversity and soil quality, fire risk mitigation and more resilient ecosystems.

⁴⁸ IPCC, [AR6 Synthesis Report: Climate Change 2022](#), 2022

⁴⁹ Keenan, R., [Climate change and Australian production forests: impacts and adaptation](#), 2017

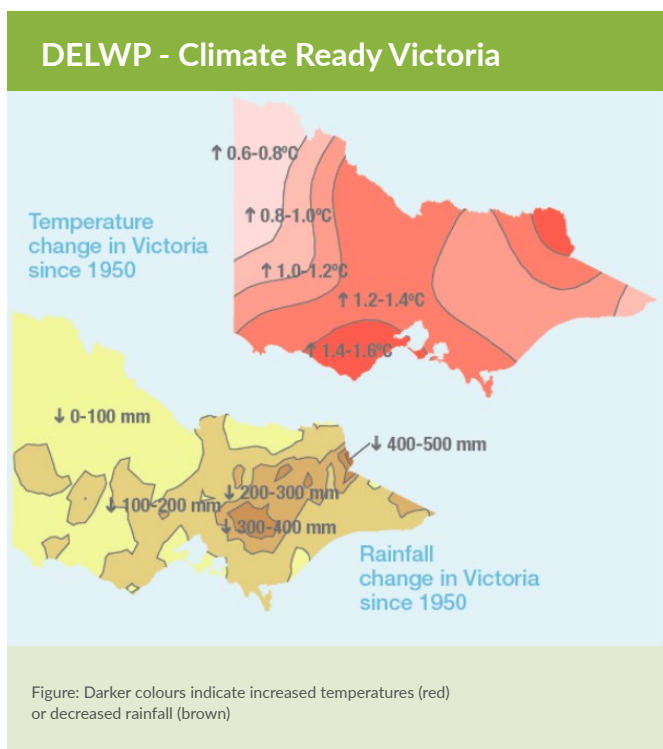
⁵⁰ IUCN, [Forests and climate change issues brief](#), 2021

Why is it important to understand climate change?

Gippsland is becoming hotter and dryer. Temperatures across Victoria have increased by about a degree since the mid-20th century, with the rate of warming increasing. On average, rainfall has declined since the 1950s, especially in autumn. In coming years, there will be more hot days and warm spells, fewer frosts, more frequent and more intense downpours, harsher fire weather and longer fire seasons and less rainfall in winter and spring south of the Great Dividing Range⁵¹.

The changing climate affects forests and the people in and around them in many ways—from the immediate socio-economic impacts of increased fire frequency and severity on industry and livelihoods, to the more gradual changes to soil hydrology that affect biodiversity and agriculture. For Gippsland's forestry industry, the warming climate may change the tree species that can be grown, the growth rates of forests, and impact the area suitable for forestry. The types of species grown commercially may need to be adapted to be more climate resilient and habitat friendly. Other impacts of climate change include earlier flowering and planting times, reduced water security, and changed distribution of pests and diseases. More frequent and severe fires are expected to cause tree mortality of certain species, and changes to regeneration and seed viability in the fire sensitive forest types.

As conditions get warmer and drier, these forests may store less carbon because they won't grow as fast. Secondly, as severe wildfires become more frequent, more trees will die and become dead wood⁵². Such changes are already being felt, with one clear example being the Alpine Ash forests of Gippsland. These forests have been burnt multiple times over the last 20 years and many areas were recently not capable of regenerating without human intervention. This forest loss represents a significant loss in carbon storage and sequestration potential. After the 2019-20 bushfires, a collaboration between DELWP, Parks Victoria, the forestry industry and expert consultants enabled active intervention aimed at recovering some of these forests, but not all were able to be treated and many remain at risk from future fire. Biodiversity is also at risk from climate change and the pressure on already threatened species is increasing. Higher temperatures and more severe droughts affect Gippsland's flora and fauna through causing changes to habitat suitability, increased fire frequency and intensity, changes to soil moisture and hydrology, changes to food supply, flowering and the interactions between species around competition and predation.



⁵¹ DELWP, [Climate Ready Victoria](#), 2015

⁵² Fairman et al, [Australian forests will store less carbon as climate change worsens and severe fires become more common](#), 2021

What values matter

Our forests are part of the global jigsaw puzzle that is the carbon cycle—they are places that both store and sequester (absorb) carbon. Growing forests absorb carbon; carbon-neutral forests accumulate carbon through photosynthesis but lose carbon by dying or decomposing; forests subject to heavy soil disturbance or frequent wildfires release carbon⁵³.

One way to understand and balance these values is to consider this jigsaw and how it fits together.

Already, Victoria's Land Use, Land-Use Change and Forestry sector is a net sink of carbon emissions, except in years with major bushfires.⁵⁴ In 2017, an estimated 1.1 billion tonnes of carbon was determined to be stored in above-ground biomass in state forests on public land across Victoria's RFA regions; The estimated total value of carbon stock in forests across Victoria's RFA regions (for aboveground biomass) is around \$81 billion⁵⁵.

DELWP suggests that if well managed, this sector could protect stocks of stored carbon and increase sequestration in a much larger way. This could be done by sustainably managing forests to generate harvested wood products and store carbon, preventing soil erosion and increasing water storage, limiting large-scale severe fires, vegetation disease, the impacts of introduced species and human pressure, and through restoration programs such as revegetation and biodiversity conservation.

Living with forests in this way could also enhance agricultural resilience and food security by shoring up reliable water and healthy soils, as well as providing a range of renewable resources and restoring damaged landscapes. However, doing this requires a reconsideration of current practices and governance, integration with existing land-uses and the involvement of local communities and Indigenous people⁵⁶.

⁵³ DELWP, [Carbon Factsheet](#), 2019

⁵⁴ *ibid.*

⁵⁵ State of Victoria and Commonwealth of Australia, [Further Assessment of Matters Report](#), 2019

⁵⁶ IPCC, 2022

Existing and future management tools, policy and strategies

There is great potential for climate change mitigation from the improved management, conservation, avoided deforestation and restoration of forests.

The current [Victorian Climate Strategy](#)⁵⁷, which creates a path to reduce the state's greenhouse gas emissions from 2005 levels by 28–33% by 2025 and 45–50% by 2030, outlines several goals for assisting Victoria to meet its climate targets, including planting up to 30 million trees in shelterbelts and plantations, and restoring 100,000 hectares of biodiverse habitat by 2030. Other policies associated with the strategy include ending timber harvesting in native forests from 2030; growing the state's plantation estate; restoring and protecting natural landscapes and vegetation for carbon storage; and assisting farmers to plant trees. Closer to home, the [Gippsland Regional Plan 2020 - 2025](#)⁵⁸ identified that the region has unique potential for capturing and storing carbon through agriculture, forestry, industry and technology.

However, there remains limited evidence that current forest management practices are adequately addressing climate change in Australia,⁵⁹ even though, as Mario Boccucci, Head of the UN-REDD Programme, remarks, "Among nature-based solutions, the forest sector represents the largest, most advanced, shovel-ready and cost-effective solution [to mitigating carbon emissions]⁶⁰". For example, some forest scientists suggest that using appropriate silviculture to thin out fuel loads and help grow bigger trees quicker can not only assist with increasing carbon absorption and storage, but also help manage fire risks and offset drought impacts, but the feasibility of these measures remains hampered by lack of institutional support, uncertainty over benefits and trade-offs, weak governance, fragmented land ownership, and uncertainty over long timeframes. There is also concern that Australian policy decisions are only shifting emission activity overseas⁶¹, rather than creating genuine reductions.

Designing future forest management for climate change adaptation and mitigation will require consideration and integration of current and projected changes to society (our values, population growth and demand pressures) and more severe and frequent environmental events such as bushfire, drought and flood⁶². In some cases, there may be trade-offs between producing sufficient food, timber, heating, conservation, water and other socio-cultural needs.

⁵⁷ DELWP, [Victoria's Climate Change Strategy](#), 2021

⁵⁸ Gippsland Regional Plan Leadership Group, [Gippsland Regional Plan 2020-2025](#), 2020

⁵⁹ W. Jackson, Independent Consultation Paper - Modernisation of the Victorian Regional Forest Agreements, 2019

⁶⁰ UN-REDD, [Our Race to Zero: why nature can help us safeguard our planet and build a healthier future](#), 2020

⁶¹ Gan and McCarl, 2007; Ximenes et al, 2016

⁶² R. Keenan et al., [Forest management options for adaptation to climate change: a case study of tall, wet eucalypt forests in Victoria's Central Highlands region](#), 2016

DISCUSSION QUESTIONS

1

What changes might be needed to Gippsland forest management under a changing climate?

2

How can forest management be improved in Gippsland to address threats caused by climate change?

3

What are the biggest opportunities from Gippsland's forests to help address climate change?

4

What sorts of management interventions should we implement in Gippsland's forests to address climate change?

FIRE



Fire has always been a fundamental part of the Australian environment, driving the evolution of many native species and the composition of our landscapes⁶³. It can also be a destructive force, and Gippsland's forests, animals and people have faced many such bushfires, most recently in 2019-20, when almost three quarters of the forest cover in East Gippsland and 19% of forest cover in Gippsland was impacted.

Yet the relationship between fire and Gippsland's forests is not just about cataclysmic wildfires.

When contemplating Gippsland's forests, the totality of fire must be considered—both human and natural, planned and unplanned, high and low severity, its presence and absence.

There are some forests in Gippsland that rarely burn. For example, in some high elevation areas of Gippsland, and in the deep, wet gullies, fire can be so infrequent as to allow the development of temperate rainforest communities and the unique plants and animals that call them home.

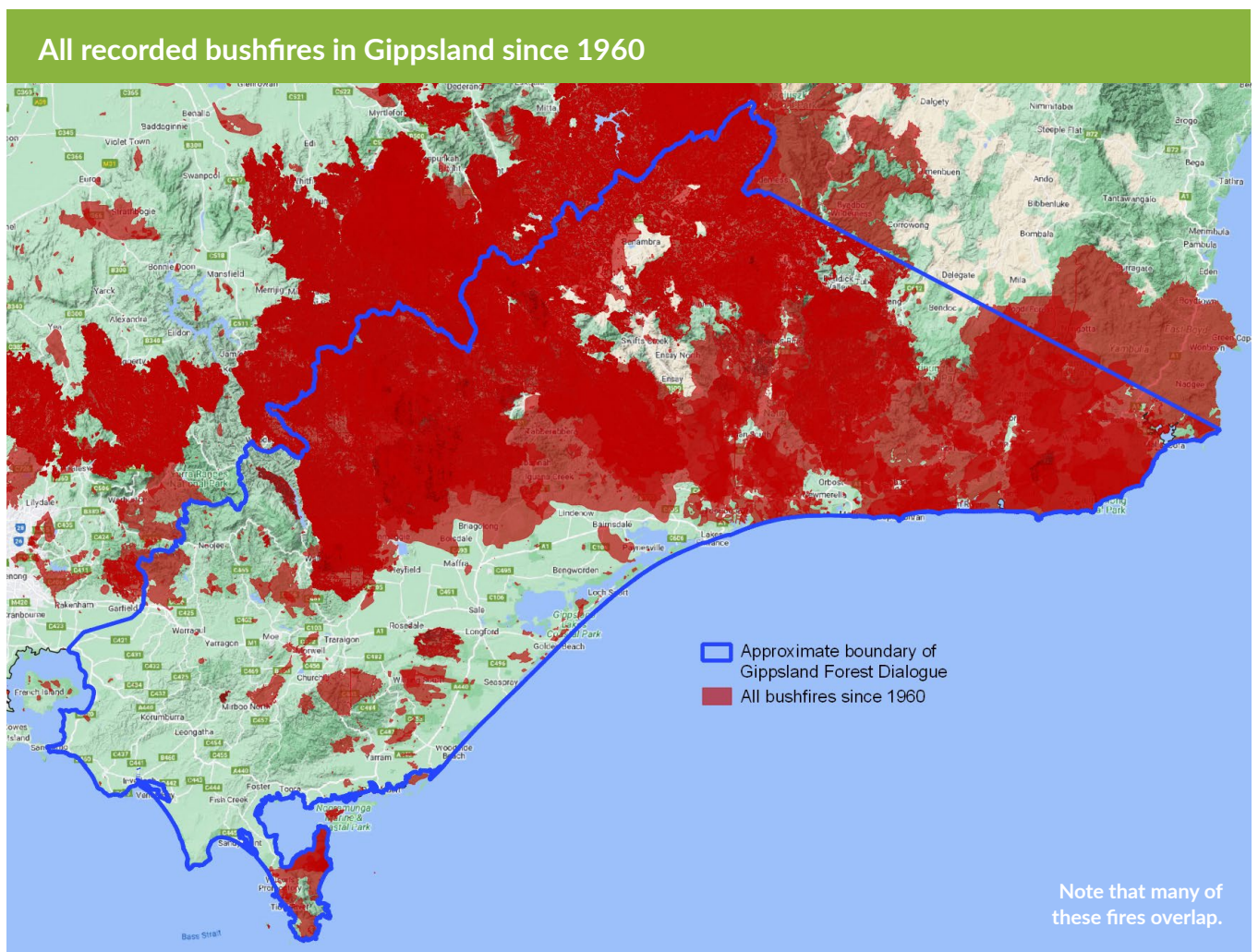
Attempting to control and manage fire is a hotly contested issue and a source of conflict across the region and beyond. It impacts our lives and the things we value, sometimes in devastating ways, and how it is applied or not applied, its benefits and its costs, is one of the great unresolved issues of modern Australian land management.

⁶³ [Bowman, 2000](#); [Keeley et al, 2011](#); [Pyne, 1991](#)

Why is it important to understand fire?

Given the many forms of fire in the Gippsland landscape, and the diverse ways it can relate to forests, understanding it is crucial to inform the Gippsland Forests Dialogue.

Fire is an intrinsic part of life in Gippsland, and notable, large scale bushfires have occurred in our forests over the years, including in 1851, 1898, 1939, 1944, 1965, 1983, 2003, 2007, 2009, 2014 and 2019-20—to name just some that have been recorded since European settlement. The frequency and intensity of bushfires can fundamentally shape the structure and composition of our forests, sometimes positively and sometimes negatively⁶⁴.

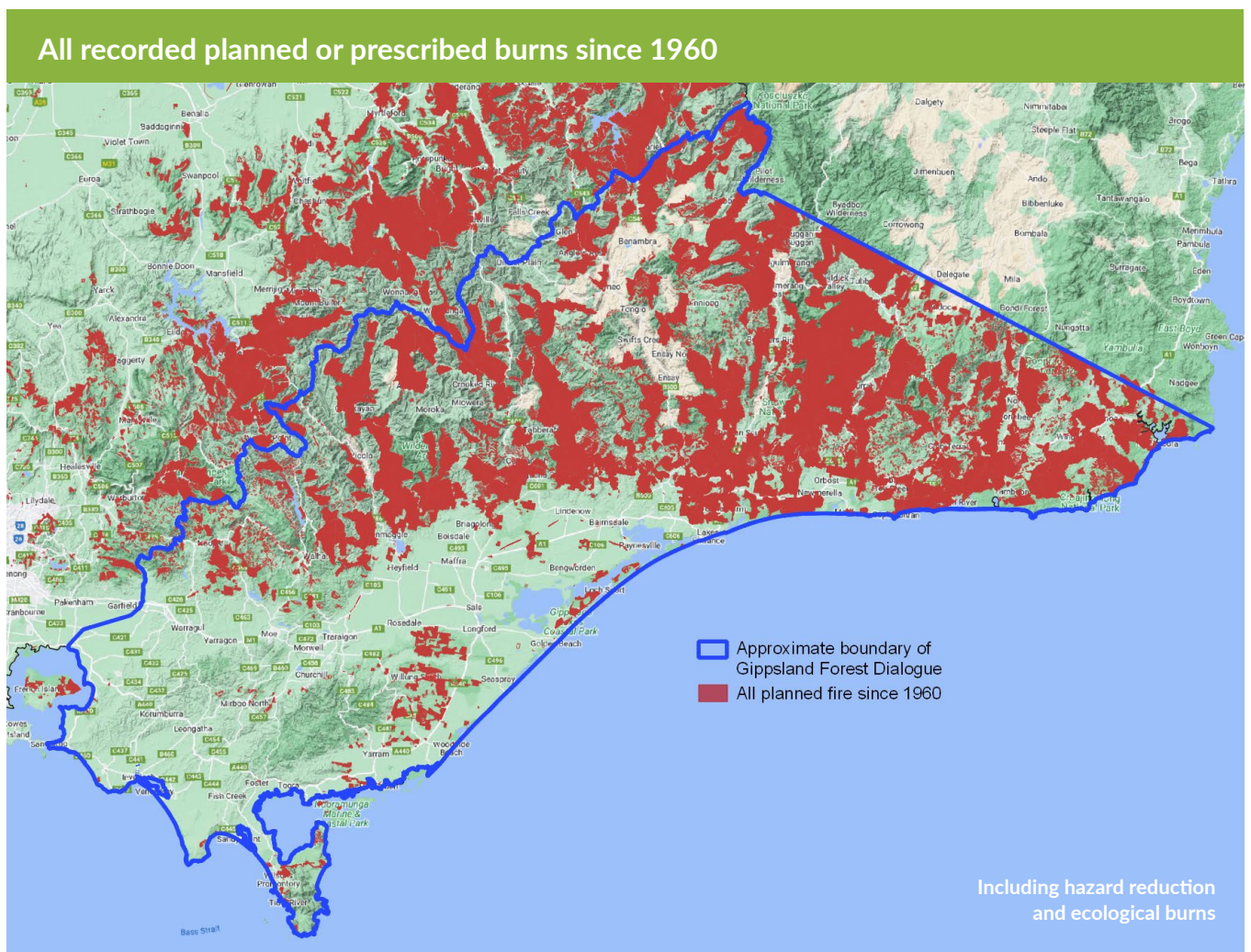


Source: DELWP spatial data

⁶⁴ Fairman, et al, [Too much, too soon? A review of the effects of increasing wildfire frequency on tree mortality and regeneration in temperate eucalypt forests](#), 2016

Fire also impacts people, communities, and the things that we value. Uncontrolled bushfires present a major risk to infrastructure and property⁶⁵, and smoke from planned fire and bushfires can impact public health⁶⁶. On the other hand, the application of fire and associated land management practices can also have a positive effect on biodiversity, landscapes and on the mental health and wellbeing of First Nations people⁶⁷.

While big, landscape-scale bushfires gain the most attention, there are other kinds of fire that frequently take place in the Gippsland landscape. Small, low severity bushfires occur that are either naturally or artificially extinguished; there are also human-set fires. Before European settlement, this took the form of cultural fire by First Nations people, but dispossession severely curtailed this practice with subsequent changes to ecosystem health and condition.⁶⁸ These changes to burning practices also raise several questions for current day management, including whether the frequency of large scale bushfires has increased since indigenous burning practices ceased, if this has also resulted in more dense and fire-prone forests and whether cultural fire has a role in buffering forests from the impacts of climate change, issues that have been explored at length in Mariana’s recent research⁶⁹. In the 20th century, prescribed or planned fire undertaken by agencies or private landholders has fluctuated as an activity carried out to protect assets or life and property⁷⁰.



Source: DELWP spatial data

⁶⁵ Filkov et al, [Impact of Australia’s catastrophic 2019/20 bushfire season on communities and environment](#), Retrospective analysis and current trends, 2020

⁶⁶ Borchers Arriagada, N. et al. [Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia](#), 2020

⁶⁷ Burgess et al, [Healthy country: Healthy people? Exploring the health benefits of Indigenous natural resource management](#), 2005

⁶⁸ Fletcher et al, 2021a; Mariani, 2022

⁶⁹ Mariani, M. et al. [Disruption of cultural burning promotes shrub encroachment and unprecedented wildfires](#), 2022

⁷⁰ Morgan et al, [Prescribed burning in south-eastern Australia : history and future directions](#), 2020

What values matter

Fire is one of the most divisive topics in forest management. Humans intervening to mitigate bushfire risk can be seen as unnatural; for example, some studies consider that forests become less flammable with time,⁷¹ while other research highlights the need for regular burning for the reduction of fire risk⁷². Current bushfire management has developed within Anglo-Australian culture and emphasises an occupational health and safety culture.

When it comes to bushfire and its management in the Gippsland landscape, the value that is prioritised most highly is the protection of human life. This is reflected in the two primary objectives for bushfire management on public land in Victoria:

1

To minimise the impact of major bushfires on human life, communities, essential and community infrastructure, industries, the economy and the environment. Human life will be afforded priority over all other considerations.

2

To maintain or improve the resilience of natural ecosystems and their ability to deliver services such as biodiversity, water, carbon storage and forest products.

In the Code of Practice for Bushfire Management on Public Land, there are a series of principles for bushfire management that follow from this. These include:

- Protection of human life as the highest priority
- Ecosystem resilience
- Learning to live with bushfires – community involvement in bushfire management
- Consistency of purpose and clarity of command and control
- Bushfire management undertaken at landscape scale
- Decisions based on risk analysis
- Integration of learning and knowledge
- Shared responsibility

While human life and ecological resilience are generally prioritised, there are a range of other values that matter when considering bushfires. These include the role of Traditional Owners in the management of their lands⁷³.

The impacts of large and severe fires on threatened species and wildlife⁷⁴, and the consequences of severe fires on ecosystem integrity⁷⁵ are also important to consider. One of the major factors most recognised for the decline of biodiversity across Gippsland relates to changing fire regimes.⁷⁶ 'Fire regimes' refer to their average intensity, frequency, and seasonality. One prominent example of changing fire regimes is when there are abrupt changes to fire frequency. This is particularly relevant for Gippsland's forests given the extensive fires that have occurred in the region, particularly in the last 20 years.

Megafires in forests also threaten our water supplies. Following bushfires, rainfall washes huge volumes of ash and debris from burnt vegetation and exposed soil into rivers, potentially contaminating catchments⁷⁷. More frequent fire may also change the species of trees that grow in the headwaters of Gippsland's rivers, affecting water yields and flows to streams and rivers⁷⁸.

The forestry industry has also been badly affected by the catastrophic fires of recent years. VicForests estimated that 10 million cubic metres of standing ash timber worth \$600 million was burnt in the Black Saturday fires of 2009. Eleven percent of plantations were lost or damaged as a result of the 2009 bushfires in Central Gippsland⁷⁹. Fear of fire may also dissuade communities, investors and individuals from engaging with plantations or becoming involved with agroforestry.

⁷¹ Zylstra, et al [Self-thinning forest understoreys reduce wildfire risk, even in a warming climate](#), 2022

⁷² Volkova, et al. [Impact of mechanical thinning on forest carbon, fuel hazard and simulated fire behaviour in Eucalyptus delegatensis forest of south-eastern Australia](#), 2017

⁷³ Fletcher et al, [Catastrophic Bushfires, Indigenous Fire Knowledge and Reframing Science in Southeast Australia](#), 2021a

⁷⁴ Wintle et al, [After the Megafires: What Next for Australian Wildlife? Trends in Ecology and Evolution](#), 2020

⁷⁵ Boer et al, [Unprecedented burn area of Australian mega forest fires](#), 2020

⁷⁶ Woinarski et al. [Ongoing unraveling of a continental fauna: Decline and extinction of Australian mammals since European settlement](#), 2015

⁷⁷ McInerney et al, [How bushfires and rain turned our waterways into 'cake mix', and what we can do about it](#), 2020

⁷⁸ Lindenmayer et al, 2011; Donohue et al, 2011; Langford, 1976; Vertessy et al, 2001

⁷⁹ Stewart et al, [Socio Economic Impact of the Timber Industry in Gippsland](#), 2012

Existing and future management tools, policy and strategies

There is a spectrum of possible management strategies that are available to manage bushfires. The most common strategy is the application of planned fire, which seeks to reduce the levels of fuel, and may therefore mitigate subsequent fire behaviour. Planned burning has been shown by some studies to be effective in reducing subsequent fire severity in wildfires.⁸⁰ However, the effectiveness of planned burning generally decreases with time and with an increase in the severity of fire weather conditions. Climate change is posing a problem for planned burning regimes, as severe fire weather conditions increase in number across the year⁸¹, limiting the time available for safe burning and posing a challenge that fire managers must confront.

The use of mechanical fuel reduction is now accepted bushfire mitigation in some other fire prone nations. An analysis by Deloitte Access Economics in 2014⁸² found that the economic benefits of mechanically removing fuel from the bush, in combination with fuel reduction burning, could reduce the damage caused by bushfires and outweigh the costs. Wood fibre mechanically removed could also be utilised in a range of wood products, offsetting the cost of fuel reduction.

Other forest management techniques may also improve the resilience of forests under future fires. For example, ecological thinning –where the density of trees is reduced—and the application of prescribed fire can reduce the severity of subsequent fire substantially⁸³. Balancing such approaches with biodiversity conservation is important, as is monitoring of the effectiveness of such measures. Forested water catchments may be better protected by revegetating stream banks to help buffer the ash and sediment runoff, especially by planting native plants that don't burn easily; such as Blackwood⁸⁴.

Human intervention to re-seed forests in areas where fires have been too frequent is another possible management strategy. For example, alpine ash forests are fire sensitive and generally require a period of twenty years following one severe fire so that the regenerating trees can begin to produce seed again. Because so much young alpine ash forest had been generated by the severe fires of the early 2000s, when the 2019-2020 fires impacted alpine ash, extensive areas were at risk of regeneration failure—estimated to be in the order of 25,000 hectares⁸⁵. Collaborative intervention between land managers, industry and expert consultants enabled the restoration of these forests, however, seed was only available to restore 11,500 ha of alpine ash forest, and extensive areas remain at risk of regeneration failure if burnt again within the next 20 years⁸⁶.

It is one example of human intervention to restore landscapes that would have otherwise been irrevocably changed, re-establishing the environment's natural values and ecosystem services, but whether it can be effectively and economically scaled up as fires increase in size, frequency and intensity is, as yet, an unknown question.

⁸⁰ Nolan et al, [What do the Australian Black Summer fires signify for the global fire crisis?](#) 2021

⁸¹ Clarke et al, [Exploring the future change space for fire weather in southeast Australia](#), 2019

⁸² Deloitte Access Economics, [Scoping Study on a Cost Benefit Analysis of Bushfire Mitigation](#), 2014

⁸³ Keenan et al, 2021; Weston et al, 2022

⁸⁴ McInerney et al, 2020

⁸⁵ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#), 2021

⁸⁶ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#), 2021

DISCUSSION QUESTIONS

1

If current fire management approaches are no longer effective, what might need to change, and what should we keep doing?

2

How, where and to what extent should strategies like planned burning, cultural burning and mechanical fuel reduction be applied across Gippsland's forests?

3

What is needed to improve fire management in Gippsland's forests?

4

What sorts of management interventions, if any, should we undertake post-wildfire?

INDUSTRY



Gippsland's forests have always provided opportunities for prosperous and sustainable industry. First Nations peoples used wood, fibre, fruits and animals for shelter, fuel, tools, food, and ceremony, in an economy centred on communal self-reliance and stewardship. When Europeans came, they cleared forests in the more accessible parts of the landscape for agriculture and timber, and the discovery of coal, derived from Gippsland's ancient Gondwanan forests, has fuelled economic growth and wealth far beyond our region.

Today, Gippsland's timber, carbon, agriculture, water and tourism industries rely on healthy, sustainable forests.

The beauty and recreational opportunities for camping, walking, fishing, birdwatching, horse-riding, biking, skiing and relaxation they offer draw millions of visitors to the region every year⁸⁷. Biodiverse forests at the headwaters of our rivers collect and purify water for our catchments, indirectly supporting agriculture and many other industries; while timber and wood products derived from native and plantation forests remain central to the employment, economic output and social identity of many Gippsland communities.

While the pressure on forest-based industries across the world is intensifying as our populations grow and as we consume, per capita, more and more of this natural capital, carefully and sustainably managed forests may still provide a wealth of renewable resources. Alongside more traditional forest industries, technologies and markets for carbon sequestration, biomass, wood pellets and engineered products may help solve many current problems and contribute to building a strong and viable circular economy in the region⁸⁸.

⁸⁷ Destination Gippsland and Regional Development Victoria, Towards 2030: Destination Gippsland Management Plan, 2019

⁸⁸ Jackson, et al, Reshaping forest management in Australia to provide nature-based solutions to global challenges, 2021

Why is industry important?

Gippsland's forests provide significant economic benefits that sustain livelihoods across the region. The most recent Regional Forest Agreement (RFA) assessment process has placed per annum economic values on a range of ecosystem services generated by Victorian forests. However, some of these values are contested, as they depend on the methods of calculation used, and many of the numbers are not prepared in a way that allows for direct comparison. The knowledge base for certain products is also very opaque, and figures come from a variety of different sources that aren't necessarily complete or comparable - for example, in many cases it is unclear how timber products move through the supply chain.

Forest-based industry in Gippsland is greatly varied. For example, apiarists rely on flowering eucalypts in public forests to sustain their bees, and 13% of Victoria's licenced apiary sites are in the region, with the Gippsland RFA region particularly important to this business⁸⁹.

Carbon is another growth industry in Gippsland, and rewards farmers and other landholders for planting trees by allowing them to trade credits calculated from the carbon captured in the trees. However, there is criticism about the rules and regulations governing these schemes in Australia, which have been labelled as overly confusing, difficult to navigate, inflexible, risky and unfair⁹⁰.

Tourism and recreation-based businesses are also very important local employers. In 2015, a study estimated the economic contribution of tourism associated with Victorian parks added \$1 billion to the Victorian economy and supported 13,800 full-time equivalent (FTE) jobs.⁹¹ In Gippsland, national park tourism was estimated to contribute \$82 million to the local economy, and created 1,112 jobs in 2010-11.⁹²

The timber and forestry industry in Gippsland is also a significant local employer, predominantly in Maryvale, Heyfield, Yarram and Orbost, and demand for the products produced by this industry is on the rise. Indirect employment stemming from the forest industry (such as in building construction) is also extremely important, particularly in Melbourne .

⁸⁹ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#). 2021

⁹⁰ Reid, R. [Let's talk \(frankly\) about carbon](#), 2020

⁹¹ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#). 2021

⁹² Ibid.

The long history of native forest utilisation in the Gippsland community means there are families and businesses that have developed unique skill sets to manage the challenges posed by Gippsland forests. Most significantly, the industry in Gippsland has learnt how to use eucalyptus fibres in pulp and paper production. The techniques learned in Gippsland have led to Bleached Eucalyptus Kraft Pulp becoming a highly prized international commodity in fine paper production. Gippsland timber has been used in a wide variety of manufacturing applications including fence posts, engineered wood product beams, staircases, furniture, joinery, cladding, wooden floors, pallets, copy paper, packaging, and corrugated box paper, however since the 2009 fires and the closure of some local sawmills, almost all softwood leaving Gippsland plantations, including from trees grown for timber production, is now going to paper and packaging at Maryvale.

The current State Government has committed that Victoria will end timber harvesting in public native forest across the state by 2030 and transition wood production to plantations. However, uncertainty remains as to how this will occur and there is no clear, publicly available plan for this transition at the scale required to offset the timber currently sourced from native forests, placing further pressure on supply chains and timber and fibre supply needs. There are also outstanding questions about how native timber that is currently sourced from native forests will be replaced, as the current plantation estate is not designed for these uses. This policy may also drive local businesses towards importing timber from overseas, potentially increasing deforestation in other countries and offsetting any environmental gains made at home.

Gippsland forests and Australian wood flows⁹³



⁹³ The coloured segments in this diagram qualitatively show the industrial wood flows across Gippsland, other regions in Australia and overseas to serve local and export markets. The size of these segments does not reflect the comparative scale of these flows. Recent international trade difficulties have constrained industrial wood flows between Australia and other countries. However these constraints are not reflected here. Additionally, the diagram only reflects major industrial wood flows. Other networks of small farm forestry, wood salvage and timber processing enterprises are also active across Gippsland.

What values matter?

Cultural and social values are important to consider when thinking about forest industries.

The Victorian Traditional Owner Cultural Landscapes Strategy advocates for TO involvement in active forest management, including the economic opportunities arising from silviculture and cultural burning activities, in order to lead the process to heal and strengthen Country.⁹⁴ This process could not only generate economic activity, but may also provide ecological, cultural, social and health benefits.

Finding new ways forward for the forestry industry may also benefit communities that currently rely on timber harvesting for a large percentage of local employment. If the industry fails, towns like Morwell and Orbost, which are already some of the most socio-economically disadvantaged in the state, may suffer from further negative impacts, such as increased uncertainty, financial stress, and a sense of injustice.⁹⁵

Climate change has also been recognised as a threat to economic and industry values in forests. Droughts, changing rainfall patterns, floods and more frequent and intense wildfire stemming from climate change may affect the types, regenerative capacity and growth rates of trees grown for timber, as well as impacting water availability, carbon storage, tourism and recreation and other forest-based industries, such as bee-keeping. A Regional Forest Agreement Major Event Review conducted by the state government after the Black Summer fires recognised that the long-term stability of forests is being compromised by repeated short-interval, severe bushfires, and highlighted the need for greater adoption of active and adaptive forest management practices.⁹⁶

From a biodiversity perspective, if, how, and the degree to which wood production, recreation and other extractive industries in native forests can coexist with conservation is recognised as one of the main pressure points when attempting to balance economic, social and environmental values.

⁹⁴ Federation of Victorian Traditional Owner Corporations, [Cultural Landscapes Strategy](#), 2022

⁹⁵ Deloitte Access Economics, [Scoping Study on a Cost Benefit Analysis of Bushfire Mitigation](#), 2014

⁹⁶ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#), 2021

Existing and future management tools, policy and strategies

In support of the plantation industry and as part of the current government policy to transition away from native timber harvesting, the state has committed \$110 million to increase the plantation estate, and farm forestry initiatives have also been boosted.⁹⁷ Earlier this year, the federal government also announced \$86 million in timber plantation grants to help secure Australia's future timber needs.⁹⁸

However, the Gippsland Forestry Hub reports that by 2050, conservative modelling shows demand for products from Gippsland will expand by 34% on 2021 levels, requiring an additional 820,000 m³ of logs and fibre every year, by no later than 2045.⁹⁹ This means that the Gippsland region needs a significantly larger plantation base to secure its processing future and that there will likely be a supply gap of around 1.2Mm³ by 2030 and 2.1Mm³ by 2050.¹⁰⁰

The Victorian Government's post-Black Summer Regional Forest Agreement Major Event Review¹⁰¹ identified strategies "to maintain or enhance the sequestration and storage of carbon in forests and further investigate the mechanical thinning of dense regrowth forests, as a strategy to restore forest landscapes to a more open forest structure in order to enhance the resilience of forests to more frequent occurrence of severe bushfires."

Given this, there are likely to be opportunities to explore new silvicultural practices in existing forests to promote forest values and possibly create and market new low-carbon and carbon-negative fuels and engineered structural wood products.

The low-impact thinning of regrowth forests to wider spacings may allow native tree species to survive a drying climate with longer and more severe droughts for decades, if not centuries, into the future¹⁰², as well as making for a more fire-safe landscape and providing renewable biomass energy for heat and power.¹⁰³ Responsible stewardship of temperate forests could also address key challenges posed by climate change through sequestering carbon, producing low-carbon products, and mitigating climate risks.¹⁰⁴

'Restoration forestry'¹⁰⁵ holds huge potential both in the establishment of biodiverse native plantations but also in areas of degraded native forest where regeneration failure requires remediation and various other intervention opportunities exist - in fire management, for example. Other studies have identified large areas of suitable land for future plantations throughout the Gippsland region and suggested agroforestry as a key area for growth.¹⁰⁶ There is currently an estimated 100,000 ha of plantation in the region. Much is on public land and managed for both softwood and hardwoods products. The balance is on private land plantations owned by corporations and farmers. While there is no data available on the area of planted trees outside plantations, the numerous farm plantings of both native and exotic trees are likely to amount to a similar area, though many of the trees planted through government schemes do not permit their use for timber production. These trees provide a range of local and regional values including shelter, soil conservation, biodiversity and timber production. Expanding secondary forests may provide benefits not only to Gippsland's industrial sector, but also generate positive outcomes for other forest values, enhancing the region's natural capital.

⁹⁷ State of Victoria, [Plantations](#), 2022

⁹⁸ Australian Forest Products Association, [Federal Government's \\$86 million timber plantation grants will help secure Australia's future timber needs](#), February 2022

⁹⁹ Industry Edge, [Regional fibre security for a thriving forestry and wood products industry](#), 2021

¹⁰⁰ PF Olsen, [Investing in Gippsland's Sustainable Forestry Future](#), 2022

¹⁰¹ DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#), 2021

¹⁰² Haar, P. & Goeghegan, J. [Regenerative enterprise with trees and wood in South Gippsland](#), 2022

¹⁰³ Holmgren, D., [Bushfire Resilient Land and Climate Care](#), 2021

¹⁰⁴ Cabiyo et al, [Innovative wood use can enable carbon-beneficial forest management in California](#), 2021

¹⁰⁵ Pilarski, M., [Restoration Forestry](#), Rainforest Info

¹⁰⁶ PF Olsen, [Investing in Gippsland's Sustainable Forestry Future](#), 2022

DISCUSSION QUESTIONS

1

How can Gippsland's forest industry adjust its practice so it can continue to thrive and address growing environmental and social concerns?

2

Should on-farm timber production be scaled up to substantially complement existing supply chains? If so, what might that look like?

3

How can Gippsland forest and timber industries transition their operations towards alleviating the expected shortfall in locally produced construction wood by 2030, when native forest harvesting is proposed to end? What might that look like?

WATER

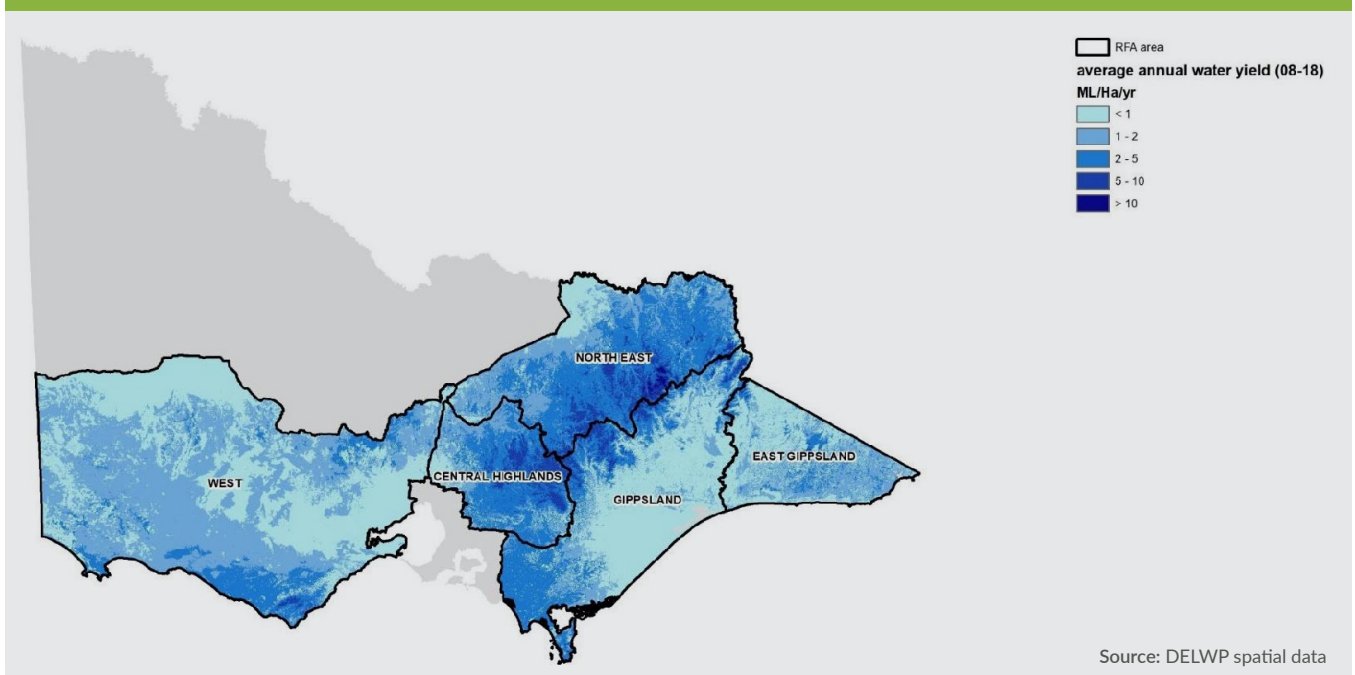


Forests provide clean water for people, agriculture, and the environment. They regulate stream flow and help recharge aquifers that store water and allow water to seep into streams and wetlands during dry times. They also help regulate the flow of floodwater and protect against erosion. Trees and forests are “multi-tasking water engineers”¹⁰⁷. The movement of water through vegetation and soil—or transpiration—“accounts for 62% of annual globally renewable fresh water.”¹⁰⁸

Gippsland’s rivers and aquifers deliver fresh water supplies for local towns and cities as well for Melbourne via the Thompson Dam. They also supply water for irrigation and other industries. In 2015, the “market value of water runoff supplied in nine of the highest yielding Victorian national parks was estimated at \$244 million each year”¹⁰⁹. Irrigation, household consumption, hydroelectricity, aquaculture, storage and purification services provided by Gippsland’s Alpine National Park were valued at \$110 million in 2005 alone¹¹⁰. Many of the headwaters of the rivers that provide these life-giving services spring from Gippsland’s vast, forested mountain country.

Many of Gippsland’s waterways, particularly lowland rivers, are in poor condition, impacted by historical clearing, modification from coal operations and agriculture and the introduction of feral animals. Many suffer from elevated levels of nutrients, which contribute to algal blooms in the Gippsland lakes. Climate change is threatening our water too, with stream flow declining by as much as 21% over the past decade across the region and predicted to reduce by up to 40% by 2065 because of decreased rainfall, higher temperatures and bigger and more intense and frequent fires¹¹¹. Despite this, it is estimated that Gippsland’s urban water supplies will need to double over the next 50 years to meet the needs of growing cities and towns¹¹².

Average annual water yield across Victoria’s RFA regions, 2008–18



¹⁰⁷ Muys et al, *What role do forests play in the water cycle?* 2022

¹⁰⁸ Secretariat of the Convention on Biological Diversity. *Drinking Water, Biodiversity and Poverty Reduction: A Good Practice Guide*. 2009

¹⁰⁹ DELWP, *Fact sheet 9: Forests and water*, 2019

¹¹⁰ *ibid.*

¹¹¹ DELWP, *Central and Gippsland Region Sustainable Water Strategy Final Strategy*, 2022

¹¹² DELWP, *Central and Gippsland Region Sustainable Water Strategy Discussion Draft*, 2021

Forests cannot exist without water.

Why is the water-forest relationship important?

Growing trees and young forests—after fire or forestry operations—are particularly thirsty and absorb a lot of water.¹¹³ As Gippsland's current draft water strategy notes: "Large-scale changes to land use, such as the establishment of plantations, can increase the amount of water intercepted and reduce water availability downstream. When trees replace pastures, grasslands or native woodlands, they take up water that would otherwise reach rivers, reservoirs and aquifers, and can also extract water directly from shallow aquifers."

But forests are also essential to delivering clean water and rain. "Forest canopies massively produce biological particles which serve as condensation nuclei for rain formation. And the evapotranspiration of forests recycles rain into clouds, impacting wind and weather patterns."¹¹⁴

This means local-scale actions can have continental scale impacts, "vegetation clearing results in transformative changes to river catchments and detectable and potentially significant changes to climate, including through reducing rainfall and increasing severity and intensity of droughts"¹¹⁵.

Trees and forests interact with water in other important ways. Roots and leaves provide erosion control, the energy trees use to absorb water extracts heat from the atmosphere and cools the air, forest root systems contribute to better soil water infiltration while leaf litter production leads to more soil carbon, improving both water retention in the soil and groundwater recharge¹¹⁶. When forests are lost, soil carbon levels plummet, and water runs off the land more rapidly instead of sinking down to recharge groundwater, making the environment more prone to drought, flood and wildfire.

Questions of how climate change will impact on stream flow in Gippsland are complex. The warming climate means autumn and winter rains are predicted to decline across Gippsland. Alexandra argues this is consequential "because (i) cool-season runoff generally ensured reliable water supplies; (ii) rainfall decline causes up to fourfold reductions in streamflow and (iii) drying increases the frequency of wildfires, inducing regrowth forests that further reduce runoff"¹¹⁷.

This uncertain future climate will create impacts that cascade through ecosystems, altering carbon and water relationships at landscape scales¹¹⁸. For example, more frequent higher temperature fires mean that vegetation communities in the headwaters of Gippsland's catchments could change entirely, affecting water yields and flows to streams and rivers¹¹⁹.

Forest ecosystem services in the water

Ecosystem Service Category	Forest Ecosystem Service
Supporting services	Canopy interception, Root uptake, Evapotranspiration
Provisioning services	Wood production, Drinking water provision
Regulating services	Climate regulation, Atmospheric cooling, Microclimate formation, Erosion control, Flood regulation, Water purification
Cultural services	Recreation, Ecotourism

Source

¹¹³ Cornish, et al, *Forest age-induced changes in evapotranspiration and water yield in a eucalypt forest*, 2001

¹¹⁴ Muys et al, *What role do forests play in the water cycle?* 2022

¹¹⁵ Alexandra, J. *Australia's landscapes in changing climate*, 2012

¹¹⁶ Muys et al, *What role do forests play in the water cycle?* 2022

¹¹⁷ Alexandra, J. *Navigating the Anthropocene's rivers of risk—climatic change and science-policy dilemmas in Australia's Murray-Darling Basin*, 2021

¹¹⁸ Alexandra, J. *Australia's landscapes in changing climate*, 2012

¹¹⁹ Lindenmayer et al, 2011; Donohue et al, 2011; Langford, 1976; Vertessy et al, 2001.

What values matter?

Decisions about water resources are often highly politicised and contested. Access to reliable water supplies is vital to local, state and national economic development. In Gippsland, agricultural, urban and industrial development, including coal fired electricity generation has historically been given priority.

As Gippsland moves away from its 20th century reliance on coal, new ways of thinking about water are emerging, “re-defining water’s economic, cultural and environmental relations in ways which challenge instrumentalist resource framings”¹²⁰. This includes valuing forests’ capacity to provide clean water and prevent sediment entering our waterways.

The environmental value of water, and its importance to biodiversity and healthy forests, cannot be underestimated. Some argue that because of the purifying function of biodiverse forests on water, “ecosystems should not be viewed as consumers of water, but rather essential elements of natural infrastructure within water management”¹²¹. Gippsland’s forests supply high quality water to many wetlands of national importance, which provide important habitat for native species, and have outstanding heritage or cultural significance, including 24 in Gippsland and 18 in East Gippsland¹²².

Beyond providing economic and environmental benefits, water also affords great cultural and spiritual value to Traditional Owners and other inhabitants of and visitors to our forests and waterways. In Gippsland and across Australia, “the value of water is central to Indigenous peoples’ being and culture”¹²³. Yet since colonisation, and despite evidence from Australia and the world “that the inclusion of ‘Indigenous Technical Knowledge’ in decision making about natural resources—whether fisheries, forests, wildlife or water resources—significantly improves the outcomes for everyone involved”¹²⁴, water has been subject to pumping, storage, diversion, extraction, pollution and market valuation without Indigenous people’s council.

Table 91: Value of water yield from forest areas by RFA region (\$ '000'000)

RFA region	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Central Highlands	114	390	645	508	450	330	317	277	685	264	311
East Gippsland	10	12	37	120	156	116	76	123	158	4	11
Gippsland	59	214	358	216	262	258	168	144	604	113	95
North East	212	837	1,060	205	196	265	234	249	1,636	201	261
West	13	63	156	119	102	127	57	33	346	69	96
Total	408	1,515	2,256	1,168	1,165	1,096	852	826	3,429	651	774

Source: DELWP internal Ensym modelling

¹²⁰ Alexandra, J. *Water and coal – Transforming and redefining ‘natural’ resources in Australia’s latrobe region*, 2017

¹²¹ UNEP, *Natural Solutions for Water Security*, 2013

¹²² Commonwealth of Australia, *About the Australian Wetlands Database*, 2021

¹²³ DELWP, Central and Gippsland Region Sustainable Water Strategy Final Strategy, 2022

¹²⁴ *ibid.*

Existing and future management tools, policy and strategies

There are many laws and policies that affect water ownership, rights and management in Gippsland. These include Victoria's Water Act, the National Water Initiative (Australia's federal blueprint for water reform), DELWP's Water for Victoria plan, and the Central and Gippsland Region Sustainable Water Strategy, which was released in September 2022.

The Gippsland strategy proposes strengthening systematic monitoring and analysis of waterways and catchments to better quantify their health and values and manage risks to those values—be they cultural, environmental or economic. The strategy argues that there are no more rivers in Gippsland suitable for new dams, and even if there were, that there is not enough unallocated water to fill them. It also discusses tools to measure water take from plantations and dams, not managed under the Water Act, and recommends taking these uses into account in future decisions on water management and entitlements.

Equitably sharing water resources remains complex. Overall, the planning and management of water resources continues to evolve. Climate change adds to the complexities and requires new ways of thinking, making “static conservation paradigms and stationary hydrology models increasingly redundant” and rendering ‘predict and control’ strategies less useful¹²⁵.

Forests and water resources are intimately connected.

Focusing on the interconnectedness of all the elements and processes making up forests rather than separating them into discrete management areas for harvesting or water purification or wildlife may provide a way forward for landscape level management and climate adaptation.

More integrated approaches to catchment and forest management that have the ability to focus on multiple objectives including conservation and water resources planning may be the way forward, and should engage with and empower local communities to enable local responses.

¹²⁵ Alexandra, J. [Australia's landscapes in changing climate](#), 2012

DISCUSSION QUESTIONS

1

Is water from Gippsland appropriately valued?
If so, how should this value be recognised?

2

How can Gippsland's forests be best managed
for supplies of high quality and secure water
resources, including environmental water?

3

How can we better develop more integrated
approaches to managing Gippsland's forests,
rivers and lakes that recognise their intimate
interconnections?

NEXT STEPS



The first Gippsland Forest Dialogue will convene from 11-13 November 2022 in Rawson to discuss positive and inclusive solutions to the issues besetting our forests, how we might work together to implement collaborative management actions, and what types of actions we can take to protect and enhance the social, economic and environmental values our forests provide.

The first Dialogue is designed to support participants in finding common ground and allow for the investigation and discussion of the issues, crafting a shared understanding of the objectives, challenges and opportunities ahead.

It paves the way for further collaboration in the future - including further Dialogues; it can spark immediate action as well as long-term progress.

Although each Dialogue is unique to the place it's held, and the forests and communities that co-exist in each particular landscape, there are many examples of positive outcomes and inspiring, innovative and collaborative solutions that have stemmed from the Dialogue process, which can be explored here.

Often, diverse stakeholder groups do not come together to workshop solutions. That is what the Gippsland Forest Dialogue wants to change.

WHO WE ARE



We are committed to finding collaborative solutions and leading local, community-driven results.

The GFD is currently piloted by an inaugural central committee formed from people across the region, and across community, cultural, business and environmental sectors that are invested in seeing Gippsland's forests thrive.

The Dialogue is being conducted across the Traditional Lands of the Gunaikurnai, Bunurong, Wurundjeri Woi-Wurrung, Taungurung peoples, and into the lands of the First Nations of far East Gippsland. We pay our respects to Elders past, present and emerging and acknowledge that sovereignty was never ceded. We acknowledge Traditional Owners on whose land we tread as the original custodians of Country, that many of the issues we will discuss are the product of settlement, and that a seat at the table of the Dialogue is always open for Traditional custodians.

In addition to our commitments to Traditional Owners, we invite residents, farmers, tourism operators, timber businesses and business associations, bush stewards, tourists, land carers, environment groups, fire managers, community groups, and recreationists to be part of the Dialogue. Members of the Gippsland Forest Dialogue have no collective association with interest groups, political parties or movements. We are participating as individuals, and do not represent any organisations, companies or other bodies we may be associated with or employed by outside the Dialogue process.

Current GFD members include:

Jason Alexandra - Managing Director at Alexandra and Associates

David Bennett - Risk and Compliance Manager at PF Olsen

Liz Clay - Traditional Owner Land Management Board, Gunaikurnai, Land and Waters Aboriginal Corporation

Tom Crook - Councillor, East Gippsland Shire Council

Tom Fairman - Future Fire Risk Analyst at University of Melbourne

Liz Felker - Associate Director, The Forests Dialogue

Michelle Freeman - Forest consultant

Loulou Gebbie - Natural Capital Manager, EcoGipps

Paul Haar - Architect at Haarchitecture

Lisa Hocking - Policy and program manager, Gunaikurnai Land and Waters Aboriginal Corporation

Sandy Kam - Deputy Chair, Gippsland Forestry Hub

Rod Keenan - Chair Of Forest And Ecosystem Science, University of Melbourne

James Kidman - Botanist, Ecologist and Sawyer at Otway Tonewoods

Chris McEvoy - Managing Director, Radial Timbers

John Mitchell - John Mitchell Consulting

Jim Phillipson - Founding Director, EcoGipps

Rowan Reid - Co-founder, Otway Agroforestry Network

Ewan Waller - Land, Forest and Fire consultant

Abigail Wills - State Manager at Envite Environment

Alastair Woodard - General Manager, Wood Products Victoria

Daniel Wright - Director, Australian Sustainable Hardwoods

Wendy Wright - Professor of Conservation Biology, Federation University

Why I'm part of the Gippsland Forest Dialogue

"As a Gippsland architect and small farmer, I believe that our work with forests and wood can profoundly exacerbate or ameliorate the overwhelming climate and biodiversity crisis before us, depending on how it's done. As such, I'm deeply committed to understanding the ecological and industrial dynamics underlying this and to encourage my peers in construction to align their timber product selections to forest management and timber processing that secure the best outcome for Gippsland's forests and communities in the time ahead".

Paul Haar, Architect at Haarchitecture

"I see the Gippsland Forest Dialogue process as an important initiative which seeks to improve and ensure responsible stewardship of one element of Gippsland's Natural Capital – our land and all forest tenures. An effective dialogue will improve greater understanding of our forest assets and the many aspects of interconnectedness of our environment and economy. Enhanced understanding should in turn influence and improve natural resource management policy and operational settings for the mutual benefit of Gippslanders and all Victorians".

John Mitchell, John Mitchell, John Mitchell Consulting

"We need to be better at caring for our forests. Many of the challenges facing our forests are the result of different and often polarised human perspectives about how forests should be 'valued', 'used' or 'managed'. The Gippsland Forest Dialogue supports a way for we humans to come together. My hope is that by coming together to talk, we'll be able to understand each other and build trust. From here, we'll be better placed to make decisions for the benefit of the forests and their future".

Loulou Gebbie, Natural Capital Manager, EcoGipps

"I have spent many years researching, walking and living amongst Gippsland's forests, and from the dry eucalypts to the wet rainforests, I think they are some of the most unique and inspiring forests on the planet. But Gippsland's forests are more than just groups of trees – they're an intrinsic part of the Gippsland community, and all of the challenges facing our forests (from climate change to fire to windstorms to weeds) can only be faced if the community comes together to care for them. The Gippsland Forest Dialogue represents that opportunity".

Tom Fairman, Future Fire Risk Analyst at University of Melbourne

"The way things are being done currently can change but to make the change be about removing any opportunity for forestry to create better outcomes for forests is extreme. I believe that there is a more balanced way forward than can bring a holistic approach to forest management, indigenous management, ownership and economic independence and bring positive outcomes for forests, communities and culture. After understanding the framework of The Forest Dialogue, I have a lot of reassurance that it is the right platform to bring the diverse understandings of the issues together".

James Kidman, Botanist, Ecologist and Sawyer at Otway Tonewoods

"In Gippsland, we have not been good stewards of, or for, our forests - or the species that depend on them. I feel we have failed our forests. Arguments around how forests should be 'managed', 'used' or 'protected' have been polarised and unhelpful for decades. We need a new way forward; one which places the forests at the centre of the discussion; and considers them as interconnected living systems, with histories and futures. If the Gippsland Forest Dialogue approach can facilitate a better way for us to be in relationship with our forests, I want to be a part of that!"

Wendy Wright, Professor of Conservation Biology, Federation University

"Forest management in Australia is suffering from politicisation, ongoing conflict between different views and short-sighted and outdated policies for their governance. The voices of regional communities, such as Gippsland, who are intrinsically connected to these forests have been drowned out in the mire. Better management of Gippsland's forests is so important to ensuring healthy country and healthy communities, but this will need real, long-term solutions that reflect the needs and aspirations of the Gippsland community. We need a platform for regional voices to be in a position to influence better management of our forests into the future, and this is what GFD aims to provide".

Michelle Freeman, Forest consultant

"Conservation and multi-use forests are failing to successfully tackle our biodiversity and climate emergencies while balancing the varying needs of all. I'm here to find a way forward".

Daniel Wright, Director, Australian Sustainable Hardwoods

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About the author

Cara Schultz is co-founder of Impact Collective. She has over fifteen years of experience working at the intersection of science, research and communications, specialising in conservation, threatened species, climate change and the humanitarian sector.

REFERENCES

References - Introduction

- Altangerel, K. & Kull, C.A., [The prescribed burning debate in Australia: conflicts and compatibilities](#), *Journal of Environmental Planning and Management*, 56(1), 2013
- Commonwealth of Australia, [Regional Forestry Agreements](#)
- Commonwealth of Australia, [National Forest Policy Statement](#), 1995
- Department of Agriculture, [Water and the Environment Fire regimes that cause declines in biodiversity - DCCEEW](#), 2022
- Fletcher, M-S., Hamilton, R., Dressler, W. & Palmer, L. [Indigenous knowledge and the shackles of wilderness](#). *Proceedings of the National Academy of Sciences*. 118, 2021
- Jackson, W., Freeman, M., Freeman, B. & Parry-Husbands, H., [Reshaping forest management in Australia to provide nature-based solutions to global challenges](#), *Australian Forestry*, 84(2), 2021
- Kanowski, P. [Australia's forests: Contested past, tenure-driven present, uncertain future](#), *Forest Policy and Economics*, Vol 77, 2017
- Lindenmeyer, D., Jelinek, A., Sweeney, O., [Regional Forest Agreements fail to meet their aims](#), *Ecological Society of Australia*, 2017
- PF Olsen, [Investing in Gippsland's Sustainable Forestry Future](#), *Gippsland Forestry Hub*, 2022
- Volkova, L., Bi, H., Hilton, J. & Weston, C. J. [Impact of mechanical thinning on forest carbon, fuel hazard and simulated fire behaviour in Eucalyptus delegatensis forest of south-eastern Australia](#). *For. Ecol. Manage.* 405, 2017
- Zylstra, P, P. J., Bradshaw, S. D. A. & Lindenmayer, D. B. [Self-thinning forest understoreys reduce wildfire risk, even in a warming climate](#). *Environ. Res. Lett.* vol 17(4), 2022

References - Cultural Landscapes

- Alexandra, J. [Designer Ecosystems for the Anthropocene—Deliberately Creating Novel Ecosystems in Cultural Landscapes](#). *Sustainability*, 2022, 14(7)
- Bekessey, S. et al, [Nature as a Climate Solution](#), University of Melbourne, 2021
- Bird-Rose, D., [Nourishing Terrains](#), Australian Heritage Commission, 1996
- Cahir, F., Clark, I. & Clarke, P., [Aboriginal Biocultural Knowledge in South-east Australia](#), CSIRO Publishing, 2018
- DELWP, [Central and Gippsland Region Sustainable Water Strategy](#), The State of Victoria Department of Environment, Land, Water and Planning, 2022
- Federation of Victorian Traditional Owner Corporations, [Cultural Landscapes Strategy](#), 2022
- Fletcher, M., Hamilton, R., Dressler, W., Palmer, L., [Indigenous knowledge and the myth of 'wilderness'](#), *Science Matters*, 2021
- Weir, J. [Terrain](#), *Borderlands*, 20(1), 2021
- The Victorian Traditional Owner Cultural Fire Knowledge Group, [The Victorian Traditional Owner Cultural Fire Management Strategy](#), 2021
- Williamson, B., [Cultural burning and public forests: convergences and divergences between Aboriginal groups and forest management in south-eastern Australia](#), *Australian Forestry*, 85(1), 2022

References - Biodiversity

- Alexandra, J., [Designer Ecosystems for the Anthropocene—Deliberately Creating Novel Ecosystems in Cultural Landscapes](#), *Sustainability*, 14(7), 2020.
- Allen, K., & Stewart, S.B., et al. [Reconstructing seasonal fire danger in southeastern Australia using tree rings](#), *International Journal of Wildland Fire*, 31(6), 2022
- Burns, E., Lindenmayer, D., Stein, J., Blanchard, W., McBurney, L., Blair, D. & Banks, S. [Ecosystem assessment of mountain ash forest in the Central Highlands of Victoria](#), south-eastern Australia. *Austral Ecology*, 40, 2014
- Cahir, F., Clarke, I., & Clarke, P. [Aboriginal bio-cultural knowledge in south-eastern Australia - perspectives of early colonists](#), CSIRO, 2018
- Cheal, D., [Growth stages and tolerable fire intervals for Victoria's native vegetation data sets](#). Fire and Adaptive Management Report No. 84. Department of Sustainability and Environment, 2010
- Commonwealth of Australia, [Australia's State of the Forests Report](#), 2018
- CES, [State of the forests 2018 report](#). Commissioner for Environmental Sustainability Victoria, 2018
- DELWP, [Flora and Fauna Guarantee Act 1988 Processes List December 2016](#). Department of Environment, Land, Water & Planning, 2016
- DELWP, [Protecting Victoria's Environment - Biodiversity 2037](#). The State of Victoria Department of Environment, Land, Water and Planning, 2017a
- DELWP, [Report on Progress with Implementation of the Victorian Regional Forest Agreements \(RFAs\) Period 3: 2009-2014](#), The State of Victoria Department of Environment, Land, Water and Planning, 2017b
- DELWP, [Ecosystem services from forests in Victoria - Assessment of Regional Forest Agreement regions](#). The State of Victoria Department of Environment, Land, Water and Planning, 2019
- DELWP, [Victoria's bushfire emergency: Biodiversity response and recovery. Preliminary report Version 2](#). Department of Environment, Land, Water and Planning, 2020a
- DELWP, [Threatened Species and Communities Risk Assessment Victoria's Regional Forest Agreements](#). The State of Victoria Department of Environment, Land, Water and Planning, 2020b
- DELWP, [Threatened Species and Communities Risk Assessment - Interim Protections and Management Actions - April 2021](#), Victoria's Regional Forest Agreements, The State of Victoria Department of Environment, Land, Water and Planning, 2021a
- DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#). The State of Victoria Department of Environment, Land, Water and Planning, 2021b
- East Gippsland Catchment Management Authority, [Draft East Gippsland Regional Catchment Strategy](#), 2022
- Fairman, T. A., Bennett, L. T. & Nitschke, C. R., [Short-interval wildfires increase likelihood of resprouting failure in fire-tolerant trees](#). *JOURNAL OF ENVIRONMENTAL MANAGEMENT*, 231, 2019
- Fletcher, et al, [Indigenous knowledge and the myth of 'wilderness'](#), University of Melbourne, 2021
- Jackson, W. et al, [Australia's State of the Environment Report](#), Commonwealth of Australia, 2022
- Jackson, W., Freeman, M. Freeman, B., & Parry-Husbands, H, [Reshaping forest management in Australia to provide nature-based solutions to global challenges](#). *Australian Forestry*, 2021
- Land for Wildlife, [Land for Wildlife Newsletter October 2015](#), 2015
- Lindenmayer, D.B. & Taylor, C. [Extensive recent wildfires demand more stringent protection of critical old growth forest](#), *Pacific Conservation Biology*, (26), 2020
- Lindenmayer, D, [Victoria must stop clearfelling to save Leadbeater's Possum](#), *The Conversation*, 2015
- Mariani, M., et al. [Disruption of cultural burning promotes shrub encroachment and unprecedented wildfires](#), *Frontiers in Ecology and the Environment*, 2021
- McCarthy, G.J., Tolhurst, K.G., & Chatto, K., [Determination of sustainable fire regimes in the Victorian Alps using plant vital attributes](#). State of Victoria, Department of Sustainability and Environment, 2003
- Parliament of Victoria, [Enquiry into ecosystem decline in Victoria](#). Legislative Council, Environment and Planning Committee, Parliament of Victoria, 2021
- Prober, S.M., Thiele, K.R., Lunt, I.D., [Fire frequency regulates tussock grass composition, structure and resilience in endangered temperate woodlands](#), *Austral Ecol* 32, 2007
- Salt, D., Lindenmayer, D. & Hobbs, R. [Trees and biodiversity - A guide for Australian farm forestry. Joint Venture Agroforestry](#), 2004
- State of Victoria and Commonwealth of Australia, [Victoria's Regional Forest Agreements - Assessment of matters pertaining to the modernisation of Victoria's Regional Forest Agreements 2019](#). Report jointly prepared by the State of Victoria and Commonwealth of Australia, 2019

Steffenson, V. [*Fire Country: How Indigenous Fire Management Could Help Save Australia*](#), Hardie Grant, 2020

Taylor, C., McCarthy, M. & Lindenmayer, D. [*Nonlinear Effects of Stand Age on Fire Severity*](#). *Conservation Letters*, (7), 2014

TVTOCFKG, [*The Victorian Traditional Owner Cultural Fire Management Strategy*](#). The Victorian Traditional Owners Cultural Fire Knowledge Group, 2019

Trouvé, R., Osborne, L., and Baker, P. J.. 2021. [*The effect of species, size, and fire intensity on tree mortality within a catastrophic bushfire complex*](#). *Ecological Applications*, 31(6), 2021

VAGO, [*Protecting Victoria's Biodiversity*](#). Victorian Auditor-General's Office, 2021

VEAC, [*Conservation values of state forests – assessment report*](#), Victorian Environment Assessment Council, 2017

References - Climate change

Carroll, M., Milakovsky, B., Finkral, A., Evans, A., & Ashton, M. S. (2012). [*Managing carbon sequestration and storage in temperate and boreal forests*](#). In *Managing forest carbon in a changing climate*, Springer, 2012

DELWP, [*Carbon factsheet*](#). The State of Victoria Department of Environment, Land, Water and Planning, 2019

DELWP, [*Climate Ready Victoria - Gippsland*](#). The State of Victoria Department of Environment, Land, Water & Planning, 2015

DELWP, [*Victoria's Climate Change Strategy*](#). The State of Victoria Department of Environment, Land, Water & Planning, 2021

DELWP, [*Gippsland Regional Climate Adaptation Strategy*](#). The State of Victoria Department of Environment, Land, Water & Planning, 2021

Fairman, T. [*Australian forests will store less carbon as climate change worsens and severe fires become more common*](#), *The Conversation*, 2021

Gan, J. & McCarl, B.A., [*Measuring transnational leakage of forest conservation*](#), *Ecol. Econ.*, 64 (2), 2007

Gippsland Regional Plan Leadership Group, [*Gippsland Regional Plan 2020-2025*](#), 2020

IPCC, [*AR6 Synthesis Report: Climate Change 2022*](#), Intergovernmental Panel on Climate Change, 2022

IUCN, [*Forests and climate change issues brief*](#), International Union for the Conservation of Nature, 2021

Jackson, W., [*Independent Consultation Paper - Modernisation of the Victorian Regional Forest Agreements*](#), The State of Victoria Department of Environment, Land, Water & Planning, 2019

Keenan, R.J., & Nitschke, C.R., [*Forest management options for adaptation to climate change: a case study of tall, wet eucalypt forests in Victoria's Central Highlands region*](#). *Australian Forestry*, 79, 2016

Keenan, R.J., [*Climate change and Australian production forests: impacts and adaptation*](#), *AUSTRALIAN FORESTRY*, 80(4), 2017

State of Victoria and Commonwealth of Australia, [*Further Assessment of Matters Report*](#), 2019

Stewart et al, *Socio Economic Impact of the Timber Industry in Gippsland*, 2012

UN-REDD, [*Our Race to Zero: why nature can help us safeguard our planet and build a healthier future*](#), 2020

Ximenes, F., Bi, H., Cameron, N., Coburn, R., Maclean, M., Matthew, D. S., & Ken, B., [*Carbon stocks and flows in native forests and harvested wood products in SE Australia*](#), NSW Department of Primary Industries, 2016.

Ximenes, F. A., George, B., Cowie, A., Kelly, G., Williams, J., Levitt, G., & Boer, K., [*Harvested forests provide the greatest ongoing greenhouse gas benefits. Does current Australian policy support optimal greenhouse gas mitigation outcomes?*](#) New South Wales Department of Primary Industries, 2012

References - Fire

- Boer, M. M., Resco de Dios, V. & Bradstock, R. A. [Unprecedented burn area of Australian mega forest fires](#). *Nat. Clim. Chang.* 10, 171–172 (2020).
- Borchers Arriagada, N. et al. [Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia](#). *Med. J. Aust.* 213, (2020).
- Bowman, D. M. J. S. [Australian Rainforests: Islands of Green in a Land of Fire](#). Cambridge University Press, 2000
- Brown, M. J. [Benign neglect and active management in Tasmania's forests: a dynamic balance or ecological collapse?](#) *For. Ecol. Manage.* 85, 1996
- Burgess, C. P., Johnston, F. H., Bowman, D. M. J. S. & Whitehead, P. J. Healthy country: [Healthy people? Exploring the health benefits of Indigenous natural resource management](#). *Aust. N. Z. J. Public Health* 29, 2005
- Clarke, H. & Evans, J. P. [Exploring the future change space for fire weather in southeast Australia](#). *Theor. Appl. Climatol.* 136, 2019
- Deloitte Access Economics, [Scoping Study on a Cost Benefit Analysis of Bushfire Mitigation](#), 2014
- DELWP. [Code of Practice for Bushfire Management on Public Land](#). 2012
- DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#). The State of Victoria Department of Environment, Land, Water and Planning, 2021
- Fairman, T. A., Nitschke, C. R. & Bennett, L. T. [Too much, too soon? A review of the effects of increasing wildfire frequency on tree mortality and regeneration in temperate eucalypt forests](#). *Int. J. Wildl. Fire* 25, 2016
- Filkov, A. I., Ngo, T., Matthews, S., Telfer, S. & Penman, T. D. [Impact of Australia's catastrophic 2019/20 bushfire season on communities and environment. Retrospective analysis and current trends](#). *J. Saf. Sci. Resil.* 1, 2020
- Fletcher, M., Romano, A., Connor, S., Mariani, M. & Maezumi, S. Y. [Catastrophic Bushfires, Indigenous Fire Knowledge and Reframing Science in Southeast Australia](#). *Fire*, 4 (61), 2021a
- Fletcher, M. S., Hall, T. & Alexandra, A. N. [The loss of an indigenous constructed landscape following British invasion of Australia: An insight into the deep human imprint on the Australian landscape](#). *Ambio* 50, 2021b
- Keeley, J. E., Pausas, J. G., Rundel, P. W., Bond, W. J. & Bradstock, R. A. [Fire as an evolutionary pressure shaping plant traits](#). *Trends Plant Sci.* 16, 2011
- Keenan, R. J., Weston, C. J. & Volkova, L. [Potential for forest thinning to reduce risk and increase resilience to wildfire in Australian temperate Eucalyptus forests](#). *Curr. Opin. Environ. Sci. Heal.* 23, 2021
- Mariani, M. et al. [Disruption of cultural burning promotes shrub encroachment and unprecedented wildfires](#). *Front. Ecol. Environ.* 1–9, 2022
- McInerney et al, [How bushfires and rain turned our waterways into 'cake mix', and what we can do about it](#), *CSIROscope*, 2020
- Morgan, G. W. et al. [Prescribed burning in south-eastern Australia : history and future directions](#). *Aust. Forestry*, 83(1), 2020
- Nolan, R. H. et al. [What do the Australian Black Summer fires signify for the global fire crisis?](#) *Fire*, 4, 2021
- Pyne, S. J. [Burning Bush: A Fire History of Australia](#). University of Washington Press, 1991
- Weston, C. J., Di, J., Hislop, S. & Volkova, L. [Effect of recent fuel reduction treatments on wildfire severity in southeast Australian Eucalyptus sieberi forests](#). *For. Ecol. Manage.* 505, 2022
- Williamson, B. [Cultural burning and public forests: convergences and divergences between Aboriginal groups and forest management in south-eastern Australia](#). *Aust. Forestry*, 85, 2022.
- Wintle, B. A., Legge, S. & Woinarski, J. C. Z. [After the Megafires: What Next for Australian Wildlife? Trends in Ecology and Evolution](#) *Trends Ecol. Evol.*, 2020
- Woinarski et al. [Ongoing unraveling of a continental fauna: Decline and extinction of Australian mammals since European settlement](#), *Biological Sciences*, 112 (15), 2015
- Volkova, L., Bi, H., Hilton, J. & Weston, C. J. [Impact of mechanical thinning on forest carbon, fuel hazard and simulated fire behaviour in Eucalyptus delegatensis forest of south-eastern Australia](#). *For. Ecol. Manage.* 405, 2017
- Zylstra, P. J., Bradshaw, S. D. A. & Lindenmayer, D. B. [Self-thinning forest understoreys reduce wildfire risk, even in a warming climate](#). *Environ. Res. Lett.*, 2022

References - Industry

- Australian Forest Products Association, [Federal Government's \\$86 million timber plantation grants will help secure Australia's future timber needs](#), February 2022
- Cabiyo et al, [Innovative wood use can enable carbon-beneficial forest management in California](#), *Environmental Sciences*, 118(49), 2021
- Deloitte Access Economics, [The economic impact of VicForests on the Victorian community](#), VicForests, 2017
- DELWP, [Victorian Regional Forest Agreements - Major Event Review of the 2019-20 bushfires](#). The State of Victoria Department of Environment, Land, Water and Planning, 2021
- Destination Gippsland and Regional Development Victoria, [Towards 2030: Destination Gippsland Management Plan](#), 2019
- Federation of Victorian Traditional Owner Corporations, [Cultural Landscapes Strategy](#), 2022
- Haar, P. & Goeghegan, J. Regenerative enterprise with trees and wood in South Gippsland. Bass Coast Landcare, 2022
- Holmgren, D., [Bushfire Resilient Land and Climate Care](#), 2021
- Industry Edge, Regional fibre security for a thriving forestry and wood products industry, Gippsland Forestry Hub, 2021
- Jackson, W, Freeman, M, Freeman, B & Parry-Husbands, H, [Reshaping forest management in Australia to provide nature-based solutions to global challenges](#), *Australian Forestry*, 84(2), 2021
- PF Olsen, [Investing in Gippsland's Sustainable Forestry Future](#), Gippsland Forestry Hub, 2022
- Pilarski, M., [Restoration Forestry](#), Rainforest Info
- Reid, R. [Let's talk \(frankly\) about carbon](#), YouTube, 2020
- Stewart et al, Socio Economic Impact of the Timber Industry in Gippsland, 2012
- State of Victoria and Commonwealth of Australia, [Further Assessment of Matters Report](#), 2019
- State of Victoria, [Plantations](#), 2022

References - Water

- Alexandra, J. [Australia's landscapes in changing climate](#), *Crop and Pasture Science*, 63(3), 2012
- Alexandra, J. [Navigating the Anthropocene's rivers of risk—climatic change and science-policy dilemmas in Australia's Murray-Darling Basin](#), *Climatic Change*, 165(1-2), 2021
- Alexandra, J. [Water and coal – Transforming and redefining 'natural' resources in Australia's latrobe region](#), *Australasian Journal of Regional Studies*, 23(3), 2017
- Commonwealth of Australia, [About the Australian Wetlands Database, Department of Climate Change](#), Energy, the Environment and Water, 2021
- Cornish, P.M. & R.A Vertessy, R.A., [Forest age-induced changes in evapotranspiration and water yield in a eucalypt forest](#), *Journal of Hydrology*, 242(1-2), 2001
- DELWP, [Fact sheet 9: Forests and water](#), The State of Victoria Department of Environment, Land, Water and Planning, 2019
- DELWP, [Central and Gippsland Region Sustainable Water Strategy Discussion Draft](#), The State of Victoria Department of Environment, Land, Water and Planning, 2021
- DELWP, [Central and Gippsland Region Sustainable Water Strategy](#), The State of Victoria Department of Environment, Land, Water and Planning, 2022
- Muys et al, [What role do forests play in the water cycle?](#) European Forest Institute, 2022
- Secretariat of the Convention on Biological Diversity. [Drinking Water, Biodiversity and Poverty Reduction: A Good Practice Guide](#). Convention on Biological Diversity, 2009
- UNEP, [Natural Solutions for Water Security](#), Secretariat of the Convention on Biological Diversity, 2013

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