Social values

This section includes the following Montréal Process indicators:

* Indicator 6. 3a – Area of forest available for general recreation/tourism
* Indicator 6.3b – Range and use of recreational/tourism activities available
* Indicator 6. 4d – The importance of forests to people
* Indicator 6. 5a – Direct and indirect employment in the forest sector
* Indicator 6. 5b – Wage rates and injury rates within the forest sector
* Indicator 6. 5c – Resilience of forest-dependent communities to changing social and economic conditions

**Indicator 6.3a: Area of forest available for general recreation/tourism**

This indicator measures the area of forest available for use by the community for recreation and tourism. This provides an indication of the emphasis placed by society on the management of forests for recreation and tourism.

Analysing the area and quality of forests actively used for recreation and tourism assists in understanding future priorities for the Victorian RFA regions. It provides information on how forests within the RFA regions are utilised for the recreational needs of all communities and on what contribution the forests make to the tourism sector. An area of forest is considered available for tourism and recreational purposes if there are no formal prohibitions on access for recreation and tourism activities.

Victoria’s State forests are managed in accordance with a range of values, including recreation, tourism, conservation and timber production. State forests are zoned for the management of multiple forest uses. The areas available for recreation and tourism uses in the RFA regions are made up of State forests, parks and reserves (DEPI 2014d).

As reported in the initial CRAs, the Central Highlands had a State forest coverage of approximately 389,800 hectares, while East Gippsland had approximately 637,000 hectares, Gippsland had 806,000 hectares, the North East had 718,700 hectares, and West Victoria had 411,000 hectares.

According to VSOFR 2018, Victoria has 7. 89 million hectares of public land (excluding marine and coastal areas). Parks and reserves account for 3.7 million hectares and State forests account for 3.2 million hectares; both have approximately 3 million hectares of forest cover (Commissioner for Environmental Sustainability Victoria 2019). In Victoria, about 97 per cent of parks and conservation reserves and 99 per cent of State forest are available for recreation purposes. From 2004 to 2018, overall available areas for recreation and tourism activities increased by approximately 12.4 per cent (Commissioner for Environmental Sustainability Victoria 2019).

The area actively utilised for recreation and tourism by the public is much less than the 99 per cent available, due largely to the topography, remoteness, and lack of road and trail infrastructure in State forests (DEPI 2014d and Commissioner for Environmental Sustainability Victoria 2019).

Table 106: Forest area available for recreation and tourism in Victoria for years 2000, 2008, 2013 and 2018

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Forest area | 2000 | 2008 | 2013 | 2018 |
| Multiple-use forests (‘000 ha) | 663 | 3,049 | 2,964 | 3,100 |
| Nature conservation reserve (‘000 ha) | 2,957 | 3,230 | 3,214 | NA  |

Data Source: State of the Forests Reports

There has been some minor change of land use from State forest into protected areas, although this has caused minimal impact on the amount of land available for recreational and tourism purposes (Commissioner for Environmental Sustainability Victoria 2019).

Recreational activities may be temporarily or permanently restricted in state and multiple-use forests for a variety of reasons. Temporary closure may occur due to the protection of flora and fauna, prescribed burning, harvesting activities, public events, protection of water catchments and infrastructure, biosecurity control, harvesting operations, and in response to natural disturbances. Permanent closure may be for reasons such as scientific research, conservation areas, water catchments, significant Aboriginal cultural heritage sites and defence training areas.

Forest management zones were originally developed in the forest management plan for each RFA region completed as part of the CRA assessments.

The recreational activities permitted in each area depend on the specific management zone objectives. Most recreational activities are allowed in GMZ. In SPZ and SMZ certain restrictions can apply for natural and cultural management purposes.

Forest management plans relate to State forest. They outline the types of visitor and community activities that are permissible and the general conditions of use that apply. In forests that are not covered by a forest management plan, the responsible forest management agency will set the policies and indicate the types of permitted recreation and tourism activities and the conditions of use (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018). DELWP has commissioned market research into State forest visitor numbers (currently under way). This has been focused on what visitors want from State forests and how satisfied they are with their visit. Market research into four-wheel-drive use in State forest has also been commissioned by DELWP for 2019. These studies have been commissioned to address a gap in existing understanding of visitor numbers to State forest.

**Indicator 6.3b: Range and use of recreation/tourism activities available**

This indicator assesses the range and number of recreation and tourism facilities provided in forests, their level of use and their contribution to the broader tourism sector. Appropriate and well-managed facilities help to optimise visitor satisfaction as well as minimising environmental impacts associated with recreation and tourism. The type of recreation and tourism infrastructure that is available in a forest may influences the forests’ volume of use and accessibility and the type of experience it provides.

Analysis of the range and use of forests available for recreation and tourism assists in understanding what emphasis society places on managing forests for recreation and tourism uses. It also helps in understanding the extent to which forest management is providing for the recreational needs of local and regional communities.

There are a number of different recreational and visitor activities undertaken in Victoria’s forests. According to the 2017–18 Parks Victoria Annual Report, in that reporting, 14 million people took part in at least one nature-based activity (Parks Victoria 2018).

Victorian State forests provide for a wide range of recreation and tourism activities and typically provide for opportunities that are free-of-charge to the public (Montréal Process Implementation Group for Australia and NFI Steering Committee, 2018). There is an absence of visitor and use data for State forests, therefore the most accurate way to understand the demand for various activities is through the number of facilities provided for recreation and tourism activities (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018).

In 1994–95 the total number of visitor days to State forests was just over 3 million, with the CRAs reporting that there was a strong public view that forests should remain in reserves and not be converted into national parks in order to allow greater access for recreational use. In 1995–96 tourism contributed about 4 per cent of Victoria’s gross state product, and the Central Highlands, for example, accounted for 5.1 per cent of visitors to Victoria’s forests.

The CRAs reported that the West RFA region was the most popular tourist destination, with over 3.5 million visitors in 1995, and the Central Highlands receiving over 2.5 million visits in 1994–95. The North East RFA region received approximately 1.5 million visitors in 1995. The Gippsland RFA region received 937,000 visitors in 1995, and the East Gippsland RFA region received approximately 600,000 visitor days in 1995–96.

Victoria’s forests, particularly those within the RFA regions, provide for a broad range of recreation and tourism activities (Table 109). Some of the most common across the state include walking, mountain-bike riding, camping, fishing, picnicking and four-wheel driving (DEPI 2014d). There are various facilities that cater for these recreational activities, such as campgrounds, day visitor areas, walking tracks, mountain-bike trails, visitor information infrastructure, roads and parking areas (Commissioner for Environmental Sustainability Victoria 2019).

Table 107: Recreation sites and tracks within State forests across RFA regions

|  |  |
| --- | --- |
|  | RFA |
| East Gippsland | Gippsland | Central Highlands | North East | West |
| No. recreation sites | 21 | 67 | 104 | 134 | 48 |
| No. recreational activities accommodated at these sites |
| Camping | 8 | 51 | 68 | 93 | 24 |
| Picnic | 17 | 54 | 49 | 59 | 39 |
| Horse riding | 1 | 1 | 4 | 2 | 1 |
| Trail bike | 0 | 1 | 9 | 1 | 4 |
| Heritage sites | 6 | 12 | 12 | 12 | 4 |
| Fishing | 5 | 7 | 9 | 38 | 6 |
| Hang-gliding | 0 | 0 | 0 | 3 | 4 |
| No. recreation tracks | 32 | 52 | 58 | 33 | 38 |

Data source: Recweb\_sites spatial layer. Corporate Spatial Data Library (CSDL)

Over the reporting period of the ASOFR 2018, the number of all Victorian tourism and recreation facilities increased by an average of 9 per cent, except for roads promoted as touring routes, which saw a notable increase. There were also notable increases in tracks for horse riding and dog walking and sites used for fishing (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018). According to the VSOFR 2018, there has been an increase in the network of mountain-bike trails due to greater investment driven by the increased popularity of mountain-biking (Commissioner for Environmental Sustainability Victoria 2019). Victorian State forests have also seen a significant increase in four-wheel-driving tracks and touring routes, largely due to better promotion of existing roads and attractions (Commissioner for Environmental Sustainability Victoria 2019).

Recreational users of State forests also contribute to feral species management control. In 2017 an estimated 106,275 deer were harvested in Victoria during the deer-hunting season by recreational hunters (Commissioner for Environmental Sustainability Victoria 2019).

The *Victorian 4WD strategy 2017–2021* (DELWP 2017e) aims to increase the recreational and regional economic benefit that four-wheel driving delivers to greater Victoria by better utilising our extensive and nationally significant 45,000 kilometres of recreational roads and tracks. The vision for the strategy is: ‘Four-wheel driving in Victoria provides fantastic benefits for people, communities and nature.’

The strategy will guide the work of Victoria’s ministerially appointed Four Wheel Drive Advisory Committee and all partner organisations over the next five years in delivering the strategic vision for four-wheel driving in Victoria. Five initiatives have been identified to achieve the strategic outcomes:

1. Providing a 4WD ‘Experience’
2. Effective education
3. Strengthening partnerships
4. Strategic marketing and communications
5. Sustainable solutions.

Table 108: Activities recorded within Victorian State forests for years 2003, 2008, 2013 and 2017

|  |  |
| --- | --- |
| Activity | Year |
| 2003 | 2008 | 2013 | 2017 |
| Day visitor areas | 300 | 227 | 261 | 250 |
| Camp grounds  | 280 | 226 | 249 | 255 |
| Total recreational sites  |  |  | 398 | 389 |
| No. short walks (<3 km)  | 53 |  | 113 | 91 |
| No. medium walks (3-8 km) |  | 44 | 51 |  |
| No. day trails (8-12 km)  | 14 |  | 12 | 15 |
| No of overnight walks (>12 km) | 17 |  | 11 | 6 |
| Walking trails (km) | 550 | 715 | 742 | 787 |
| Mountain-biking trails (km) |  |  | 334 | 423 |
| Horse-riding trails (km) |  |  | 71 | 112 |
| Four-wheel-driving touring routes (km)  |  |  | 251 | 2,128 |
| Scenic drives (km) |  |  | 403 | 449 |
| Trail-bike touring routes (km)  |  |  | 58 | 340 |
| Fishing (no. of managed sites) |  | 33 | 54 | 67 |
| Driving (km of roads)  |  | 1,700 | 620 | 2,917 |
| Events or festivals  |  | 152 | 195 | 170 |

Data Source: Commissioner for Environmental Sustainability (2019)

There was major investment in forest tourism and recreation from 2008, through re-building infrastructure following the bushfires in 2009 and major floods in 2010–11. Roughly 20 per cent of State forest visitor assets were replaced as a result of the 2009 bushfires (DEPI 2014d).

Victoria launched an improved asset management system (RecWeb) for State forests in 2005. This system accurately captures spatial and textual data for recreational sites and tracks. The increased ability to capture existing sites and tracks largely explains the increase in recreational sites and of walking tracks captured between 2006 and 2013 (DEPI 2014d). This trend fell slightly in 2017, when the number of total recreational sites fell from 398 in 2013 to 389 in 2017 (Commissioner for Environmental Sustainability Victoria 2019). This decline is attributed to data maintenance issues that result in periodic changes to the dataset, with some sites being consolidated or added based on improved data captures. In some cases, sites are retired while others are added, which contributes to the minor changes in total number of sites (Table 109).

Table 109: Sites and tracks available in forests for recreation and tourism activities

|  |  |  |
| --- | --- | --- |
| Activity | State forest | Parks and conservation reserves |
| 2003 | 2008 | 2013 | 2017 | 2003 | 2008 | 2013 | 2017 |
| Day visitor areas | 300 | 227 | 261 | 250 | 790 | 668 | 752 | 757 |
| Camp grounds | 280 | 226 | 249 | 255 | 252 | 599 | 680 |  |
| Total recreational sites |  |  | 398 | 389 | 1,042 | 1,267 | 1,432 |  |
| Short walks (<3 km) – Number | 53 |  | 113 | 91 | 811 |  |  |  |
| Medium walks (3-8 km) – Number | 51 |  | 44 | 51 | 204 |  |  |  |
| Day trails (8-12 km) – Number | 14 |  | 12 | 15 | 50 |  |  |  |
| Overnight trails (>12 km) – Number | 17 |  | 11 | 6 | 35 |  |  |  |
| Walking trails (km) | 550 | 715 | 916 | 787 |  | 3,700 | 3,700 | 3,700 |
| Mountain-biking trails (km) |  |  | 334 | 423 |  |  |  |  |
| Horse-riding trails (km) |  |  | 71 | 112 |  |  |  |  |
| Four-wheel-driving touring routes (km) |  |  | 251 | 2,128 |  |  |  |  |
| Scenic drives (km) |  |  | 403 | 449 |  |  |  |  |
| Trail-bike touring routes (km) |  |  | 58 | 340 |  |  |  |  |
| Fishing (no. of managed sites) |  | 33 | 54 | 67 |  |  |  |  |
| Driving (km of roads) |  | 1,700 | 620 | 2,917 |  |  |  |  |
| Events or festivals |  | 152 | 195 | 170 |  |  |  |  |

Source: Commissioner for Environmental Sustainability Victoria 2019

Facilities in State forests are managed by DELWP. DELWP uses a Levels of Service (LOS) framework across public land sites and infrastructure to provide information for the strategic management of visitor services across the forest estate. This provides for better establishment and delivery of services and infrastructure to meet the needs of visitors. It also guides the management of public land (Commissioner for Environmental Sustainability Victoria 2019). A high LOS means a highly serviced site and a very basic LOS is a site with low ranger presence and supporting visitor infrastructure. Sites and tracks across State forests fall within the ‘mid’ to ‘basic’ LOS categories (Commissioner for Environmental Sustainability Victoria 2019). The recreation asset dataset describes assets related to recreation sites or trails (such as toilets, viewing platforms, picnic shelters, etc.) within State forest. This dataset provides valuable information to promote these assets for public use as well as assisting staff in their management of these assets. These assets are represented in Figure 59, according to RFA region.



Figure 59: Recreation assets within State forests across RFA regions

*Case study: ‘More to Explore’ app*

On 11 December 2018, Forest Fire Management Victoria released an app called ‘More to Explore’. The app aims to provide information to help people make the most of Victoria’s 3.2 million hectares of State forest and the network of roughly 400 visitor sites and 250 recreational trails. Visitors are able to access maps, site descriptions and opening times; get directions to the site; access GPS guidance; and download maps for offline use.

Due to the ‘More to Explore’ app, Victoria’s State forests have never been easier to explore. Even if visitor sites are likely to be in areas of limited phone range, users have the ability to download maps to their device to enable offline navigation and find their location using the device’s GPS functions.

In 2019 the app will receive additional improvements, such as:

* advanced search/filter options
* upgraded tips and safety information
* improved news and notifications information
* hunting information (to show where hunting is permitted).

The More to Explore app is an example of the government’s drive to develop intuitive ways to facilitate better visitor experiences through innovative technologies and better public communications.

**Indicator 6.4d: The importance of forests to people**

Social data collected through research programs or community engagement can identify the values of the public, which can then be incorporated in policy and management. Some examples of community engagement methods used to collect this data are:

1. Participatory mapping at a scale that enables local community members to identify special places (valued entities) and link these to valued attributes.
2. Value frameworks to record qualitative social data:
	* for example, in community drop-in sessions or focus groups, record responses under Valued attribute categories and
	* categorise the qualitative ‘reasons’ given in the online participatory mapping according to valued attributes.
3. Increase the efforts to understand Cultural valued attributes (Indigenous and Non-Indigenous), particularly contemporary activities and events that maintain cultural traditions.
4. Seek an understanding of future trends in Experiential and Recreational activities in forests through surveys and online Participatory mapping.
5. Increase efforts to understand Social-Economic valued attributes by updating the Social Impact Assessments (SIA) undertaken for the original RFA process, especially in areas likely to be affected by RFA decisions. This should include both quantitative analysis (e.g. demographic) and qualitative analysis (e.g. resident experiences) of social trends, impacts of past decisions and anticipated future impacts.

*RFA modernisation program and Forest Management System reform*

DELWP is engaging with all Victorians to support the delivery of the RFA modernisation program. This involves engaging with the community through a comprehensive, genuine and inclusive engagement process. This engagement aims to identify the diverse values of communities and uses of Victoria’s forests and will be used to shape the modernisation of Victoria’s RFAs and forest management system. This includes developing a vision and strategy for a future-ready, responsive forest management system. Outcomes of the engagement have informed the negotiation of the RFAs with the Commonwealth, the strategic direction for future forest management in Victoria and the reform of Victoria’s regulatory framework and forest management planning.

*Overview of the engagement process*

The Victorian and Australian governments want to understand the community’s views on opportunities to improve the five Victorian RFAs. Public input has directly informed this process.

*Independent consultation: modernisation of the Victorian Regional Forest Agreements* (Jackson 2019) was developed to provide an explanation of what the Victorian RFAs are, how they operate, and how effective they have been, in addition to recommending areas for their improvement. The Victorian and Australian governments have sought the views of the public on these and other areas for potential improvement by posing a series of overarching questions and more targeted questions. The questions from the survey are outlined in Table 110. They are to be answered with reference to the independent consultation paper (Jackson 2019).

Table 110: RFA modernisation engagement survey

|  |  |
| --- | --- |
|  | Survey Questions |
| General | What changes have you seen in the RFA regions? |
| What should the Victorian RFAs aim to achieve over the next 20 years? |
| What are the potential improvements you think should be made? |
| How could the potential improvements in the consultation paper help modernise the Victorian RFAs? |
| Do you have any views on which potential improvements are most important? |
| Theme 1 | EFSM |
| How do you use forests in your region |
| How could the RFAs better provide for multiple forest uses (i.e. recreation, conservation, livelihood and economy)? |
| What are your views on existing environmental protections afforded across the entire forest estate (including parks, reserves and State forests) through the RFAs? |
| How could the environmental protections be improved? |
| What opportunities could the RFAs provide to support access to and traditional use of forests by Traditional Owners and Aboriginal people? |
|  How could the RFAs enable the legal rights of Traditional Owners to partner in land management and seek economic and cultural opportunities to be realised in future forest management? |
| Theme 2 | THE LONG-TERM STABILITY OF FORESTS AND FOREST INDUSTRIES |
| How could the RFAs consider climate change and other large-scale natural disturbances (including bushfires)? |
| How could the RFAs better address industry sustainability? |
| How could the RFAs encourage investment and new market opportunities for forest-based industries (including the forests and wood products industry, tourism, apiary and emerging markets such as carbon)? |
| Theme 3 | GOVERNANCE AND MANAGEMENT OF VICTORIA’S FORESTS |
| How can the RFAs support the adaptive management of Victoria’s forests in response to emerging issues (e.g. major bushfires) and opportunities (e.g. emerging industries)? |
| What areas of research would better equip us to sustainably manage Victoria’s forests? |
| How could RFA monitoring, review (including five-yearly reviews) and reporting arrangements be improved? |
|  |  |

*Contextual research*

*Integration of community values into the RFA assessments*

The University of Melbourne’s School of Ecosystem and Forest Sciences conducted a number of research projects between 2002 and 2018 (Ford et al. 2009, Kendal et al. 2015, Ford et al. 2015, Ford et al. 2013, Anderson et al. 2018, Ford et al. 2017) on how the Victorian public values forests and public land. These research findings have been synthesised to inform RFA modernisation and forest planning. Values have become more prominent in social research and forest decision-making as a way of representing what is important about forests for members of the public and stakeholders. Over recent decades, there has been investment in research into the values of the public; this means there is now an evidence base which is relevant to modernising RFAs and forest management planning.

Values refers broadly to what is important to members of the public and how this relates to what is considered in decision-making. Through this research, values are defined at three levels – Core values[[1]](#footnote-1), Valued Entities[[2]](#footnote-2) and Valued Attributes[[3]](#footnote-3) – to explore people’s valuing of forests.

In the most recent study (Ford et al. 2019), in-depth interviews were held with 36 individual members of the public who held diverse views about natural forests in Victoria. Results from these interviews were then used in developing a large-scale survey that was distributed throughout Victoria and completed by 915 people. Interviews enabled a detailed understanding of the breadth of ways in which people value forests. The subsequent survey then measured the relative importance of these values within a larger population.

The results, in descending order of importance, are the attributes of forests most valued by the community, according to Mean and Standard Deviation SD (Survey Rating between 1 and 7; n=915):

* Natural (Mean 6.3, SD 0.86)
* Experiential (Mean 5.5, SD 1.06)
* Setting (Recreation) (Mean 5.5, SD 1.06)
* Cultural (Mean 5.7, SD 1.04)
* Learning (Mean 5.7, SD 1.04)
* Productive (Mean 4.7, SD 1.40)
* Socio-economic (Mean 4.7, SD 1.40)

The results of the survey methods found that Natural Valued Attributes are rated most important on average (Mean 6.3) and have the lowest standard deviation (SD 0.86), meaning there is a level of consensus about the importance of this attribute. Productive/Socio-economic Attributes of forests are least important to members of the public (Mean 4.7) and have the highest standard deviation (SD 1.40), meaning views about the importance of this attribute are most diverse. Cultural/Learning and Experiential/Setting Attributes of forests are of similar importance and are positioned in between the higher importance of Natural Attributes and the lower importance of Productive/Social-Economic Attributes.

Explicitly comparing Valued Attributes of the public with the objectives of policies, and then incorporating the Valued Attributes with the objectives, can help to achieve inclusivity, transparency and accountability in decision-making. For RFA decision-making, these research resultsare an appropriate framework to incorporate in decision-making objectives.

**Indicator 6.5a: Direct and indirect employment in the forest sector**

This indicator measures the level of direct and indirect employment in the Victorian forest sector. Employment is an important measure of the contribution of forests to viable communities and to the economy.

*Direct employment*

*The forest and wood products industry*

According to a study by Schirmer et al. (2018), in 2017 the Victorian forest industry generated 14,475 direct jobs up to and including secondary processing. This analysis excluded the Green Triangle region that covers south-west Victoria and south-east South Australia, where there is a significant plantation estate of blue gum and radiata pine which was analysed in a separate report. Of the 14,475 direct jobs, 5,115 are attributable to primary production (jobs associated with growing and harvesting forests) and primary processing, where logs are first processed into products such as sawn timber, woodchips, pulp and paper. The remaining 9,360 jobs are generated through secondary processing, where those primary products are sold for value adding into a range of products such as furniture, wooden framing, cabinets or joinery and paper/cardboard packaging products). Of the 5,115 direct jobs generated up to the point of primary processing, 1,639 were generated by the native forest industry, 2,437 by softwood plantations and 457 by hardwood plantations.

When looking at the Green Triangle region, 611 of the 2,594 direct jobs generated by the forest industry, up to and including secondary processing, were based in Victoria (Schirmer et al. 2017). All of these jobs were dependent on the plantation sector.

*Employment trends over time*

For the period prior to 2009, there is limited employment data available for Victoria’s forest industries; however, ABS data from the census, held every five years, indicated an 8.5 per cent increase in employment between 1996 and 2001 and a fall by 2.1 per cent between 2001 and 2006 (Schirmer et al. 2013).

Census data from 2006 and 2016 showed that employment across the Victorian forest and wood products industry reduced from 26,587 in 2006 to 19,039 in 2016 (a decline of 28.4 per cent per cent) (Figure 60) (Schirmer et al. 2018).

This trend was not consistent across the whole forest industry. An increase in harvesting and haulage from hardwood plantations contributed to a 22 per cent increase in employment in the primary production part of the industry between 2011 and 2016. This compares with a 29 per cent reduction in employment in wood and paper product manufacturing across the same time period. These trends were also reflected at the national scale (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018).

Figure 60: Total employment in the Victorian forest and wood products industries for 2006, 2011 and 2016

The decline in employment across the Victorian forest and wood product industry has been the result of a number of changes in the industry. The collapse of the largest MISs and the associated restructure of the industry through changes to ownership in the plantation sector, along with improvements in processing and manufacturing efficiency through technological advancements (e.g. consolidation of processing facilities or increased mechanisation or automation) contributed to reduced employment across the industry.

Environmental impacts, such as major bushfire events (e.g. Black Saturday 2009) and the impacts to resource access and availability, are expected to have also contributed to job losses (Victoria SOFR 2013; Schirmer et al. 2013).

*Employment by RFA regions*

In seven local government areas (LGAs) (Alpine, Benalla, Colac–Otway, East Gippsland, Latrobe, Wangaratta and Wellington), over 2 per cent of the workforce was employed in the forestry and wood products industry (Schirmer et al.2018). These seven LGAs are within the RFA regions.

Table 111 illustrates the estimates from Schirmer et al. (2018) of the direct jobs up to and including primary processing that are generated by native forest timber harvested from Victoria’s RFA regions. It should be noted that not all primary processing jobs generated as a result of harvesting in a specific RFA region will be located in that region. Logs are frequently transported out of the RFA region they were harvested in to be processed.

Table 111: Estimated number of jobs dependent on native forest sourced from Victoria’s RFA regions

|  |  |
| --- | --- |
| **RFA region**  | **Employment generateda** |
| Gippsland | 190 – 210 |
| Central Highlands | 1,060 – 1,170 |
|  East Gippsland | 230 – 260 |
| West | 30 – 40 |
| North East | 70 – 80 |

a Dependent on resource availability (volume and type of logs harvested) (Schirmer et al. 2018)

Wood harvested from native forests across the RFA regions also generates employment opportunities in areas outside the RFA regions, mainly in secondary processing both within and outside Victoria (Schirmer et al. 2013, 2018). Both studies did not estimate the number of jobs generated in secondary processing specific to timber harvested from native forests.

Generation of jobs is dependent not only on the volume of wood harvested but also on the type of processing involved in value-adding of the wood into a specific product. For example, logs harvested for export woodchip production generate less employment than logs harvested for sawn timber or for domestic paper production (Schirmer et al. 2018).

*Indirect employment*

Indirect employment is defined as the jobs in industries that are generated by, and support, the forestry sector or benefit from the spending of forest businesses and employees, which in turn generate further spending throughout the economy. Examples are fuel, maintenance, retail trade, legal and accounting services.

Schirmer et al. (2018) estimate that an additional 10,581 ‘flow-on’, or indirect, jobs were generated in other industries as a result of activities up to and including primary processing (excluding the Green Triangle).

*Non-wood forest products and services*

Victorian forests, including both plantations and native forests, also provide for a variety of non-wood forest products and socio-economic activities sectors including grazing, beekeeping, ecotourism, mineral extraction and various recreational activities including bike riding, bushwalking, four-wheel driving and hunting.

Employment associated with these activities is classified by ABS in non-forestry categories that cannot be isolated.

*Future focus*

Schirmer et al. (2018) reported on a survey of forest industry businesses about market and business conditions. A major issue reported by over 88 per cent of all Victorian forestry businesses surveyed was the lack of suitably qualified and capable workers making it challenging to meet recruitment requirements. Analysis of ABS data also suggested the forest industry’s workforce is aging slightly more rapidly than that of other industries.

Forest industry businesses also reported that government regulation, rising input costs, increasing cost of labour, lack of investment in industry and issues with sufficient certification were significant challenges. The challenges facing forest businesses varied significantly depending on the industry sector: native forest-dependent businesses reported government regulation, softwood plantation-dependent businesses reported difficulty maintaining competitiveness with other businesses, and hardwood plantation-dependent businesses’ reported difficulty obtaining labour. These indicate that there is some uncertainty in the industry which may influence employment conditions and numbers in future.

**Indicator 6.5b: Wage rates and injury rates within the forest sector**

This indicator measures the level of wage and injury rates in the forest sector. A sustainable industry will ensure high levels of workforce health and welfare and wage rates that are comparable with national averages for other occupations.

*Wage rates*

Individuals aged 65 and under typically receive the majority of their income from a salary or wages earned from a job. Information on wage rates in the forest sector adds to an understanding of employment opportunities in the sector and the contribution that the sector makes to the economy.

Knowing about industry wage rates is also important to employers, including those who run commercial businesses. Earnings paid to employees typically represent a significant component of operating costs. Changes in wages can affect the productivity of a business and its competitiveness in a global market. Changes in average earnings can also reflect the impact of the economic cycle on the labour market, or sectors within the labour market (ABS 2016).

The national minimum wage is set at $740.80 per 38-hour week or $38,521.60 per year before tax (Fair Work Commission 2019). The original concept of a minimum wage was an income sufficient to support a wage earner in ‘reasonable and frugal comfort’[[4]](#footnote-4). Wage levels above the minimum wage provide individuals with more economic discretion. Individuals on higher wages have greater life choices than those on lower wages, including the opportunity to become financially secure more quickly.

Victorian forest industry workers in 2016 earned higher incomes compared to workers employed in other industries (Schirmer et al. 2018). While some of this difference was attributed to higher rates of full-time work in the forest industry compared to other sectors, forest industry workers are less likely to earn low incomes than those in other sectors.

*Information from the Victorian* State of the forests report 2018

As of 2016, workers in the forest industry generally earn a higher wage than the average salary for the region. Only 16 per cent of forest industry workers earn less than $649 per week; this is almost half the proportion of the overall employed labour force earning less than $649 per week. This can be considered largely due to the high percentage of full-time workers in the forest industry. However, when the workforce is narrowed to only full-time workers, forest industry workers were still less likely to earn a lower wage than in other industries (Commissioner for Environmental Sustainability Victoria 2019). Workers in the Green Triangle region earn higher incomes than the average in the rest of Victoria (Schirmer et al. 2018). A similar pattern can be found for workers who earn more than $1,299 per week: 38 per cent of workers in the forest industry are paid more than this amount, compared to 30 per cent of the overall employed labour force.

*Injury rates*

Work-related injuries have a wide-ranging impact at both an individual and macro-economic level.

Between 2011–12 and 2016–17 the total number of injuries in the forest industry decreased by about 23 per cent per cent, mainly due to a 50 per cent reduction in injuries in the paper and product manufacturing industry (Commissioner for Environmental Sustainability Victoria 2019). The wood product manufacturing sector led the rate of injuries, followed by pulp, paper and converted paper product manufacturing sector (Table 113). The number of claims in the forestry and logging sector remained stable, and the wood product manufacturing sector fluctuated, but broadly fell between 2011 and 2017.

Table 112 Number of injury insurance claims in the forest industry (forestry and logging, wood product manufacturing and pulp, paper and converted paper product manufacturing) 2011–17

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Industry sector | 2011–12 | 2012–13 | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
| Forestry and logging | 12 | 18 | 18 | 18 | 21 | 18 |
| Wood product manufacturing | 381 | 370 | 280 | 321 | 368 | 338 |
| Pulp, paper and converted paper product manufacturing | 205 | 146 | 124 | 135 | 129 | 107 |
| Total | 598 | 534 | 422 | 478 | 518 | 463 |

Source: Commissioner for Environmental Sustainability (2019)

Table 113: Comparison of serious injury claims in the forest sector with all other industries at a national level

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Serious claims (total number), by industry sector | Incidence rate (rate per 1,000 employees) | Frequency rate (rate per million hours worked) |
| Forestry & logging | Wood & paper | All industries | Forestry & logging | Wood & paper | All industries | Forestry & logging | Wood & paper | All industries |
| 2008–09 | 290 | 1,860 | 134,675 | 23.7 | 33.5 | 13.6 | 12.9 | 17.5 | 8.2 |
| 2009–10 | 270 | 1,845 | 131,170 | 21.2 | 33.1 | 13 | 11.8 | 17.5 | 7.8 |
| 2010–11p | 210 | 1,815 | 127,335 | 17.1 | 32.6 | 12.2 | 9.9 | 16.9 | 7.3 |
|  per cent change | 28 per cent | 2 per cent | 5 per cent | 28 per cent | 3 per cent | 10 per cent | 23 per cent | 3 per cent | 11 per cent |

Notes: p -2010–11 preliminary data. Includes claims in the reference year and accepted by the date at which the data was collected.

 per cent change – is the percentage reduction from 2008/09 to 2010/11

Source: Safe Work Australia (2013) Compendium of Workers’ Compensation Statistics Australia 2010-11

**Indicator 6.5c: Resilience of forest-dependent communities to changing social and economic conditions**

This indicator provides a measure of the extent to which forest-dependent communities can successfully respond and adapt to change. Resilient (forest-dependent) communities will adapt to changing social and economic conditions, ensuring they remain viable into the future.

This indicator considers only the dependence of communities on the forest and wood products industries, and not on other forest activities or services such as tourism or grazing.

The *Report on progress with implementation of the Victorian Regional Forest Agreements (RFAs) –period 3: 2009–2014* stated that: ‘the RFAs provide for increased certainty for … forest-dependent communities’ (DELWP 2017d, p. 1).

The VSOFR 2013 articulated that:

Forest dependent communities are generally found in close proximity to forests and are often relatively small. Larger population centres tend to have less dependency on a single industry or sector (and so greater resilience to economic change) because of their larger economic base, greater economic diversity and alternative employment opportunities.

(DEPI 2014d, p. 176)

*Contextual research*

*Case study: post-impact study of Orbost*

Orbost is a rural town in East Gippsland which depends on native timber harvesting and processing as the main industry of the area. Decreased industry access to native forests over time (Figure 61), as a result of changing policy directions, has caused a decline in the timber industry in Orbost.

Qualitative research was conducted in April 2019 (Saberton 2019) to understand how the people of Orbost have experienced and adapted to changes since the social impact assessment of the original East Gippsland RFA of 1997.The decline of the timber industry was considered the most significant event for the town, and it had flow-on effects for most people and businesses in Orbost. Other events that were considered significant for the town – including the creation of a bypass, the removal of public services and the extension of national parks – were all outcomes of government decisions. Most people responded to these changes by diversifying their income through taking on second jobs or changing industries. Lack of employment resulted in some people leaving the town in search of work and taking their families with them. This caused a reduction in house prices, which resulted in an influx of retired and elderly people moving into the town. Although many people spoke about tourism as a future major industry of the town, the change in demographics indicates that an older-age-friendly town is a more realistic future.

 Changes in industry access to native timber resources is a notable disturbance faced by forest-dependent towns. There is limited understanding in the literature of how past events have affected towns and the resilience of the people who live in them.



Figure 61: Changes in harvest volume (in ‘000 m3) of sawlog in Victoria and East Gippsland, compared to events and stages of societal groups of Orbost in the adaptive cycle

Note: (K = conservation, Ω = collapse and α = reorganisation).

Source: Saberton (2019).

*Independent reviewer’s report*

A key finding from the independent reviewer’s report for the third five-yearly review of the Victorian RFAs was that:

… the community has widely differing views with respect to desired outcomes from the native forests, and these competing views continue to cause debate and conflict over the management of the forests.

(Wilkinson 2017, p. 6).

This would indicate that there is a degree of uncertainty among the community on the level of dependence that is derived from the forests. There were also submitters to the independent reviewer’s report who believed the native forest industry did not provide many jobs.

*Socio-economic impacts of the forest industry Victoria*

In 2018, Forest and Wood Products Australia and the Australian Government Department of Agriculture and Water Resources commissioned a study on the socio-economic impacts of the forest industry in Victoria, excluding the Green Triangle. The report produced from this study provides some detail on the resilience of forest-dependent communities (Schirmer et al. 2018).

Until this report was produced in 2018, there was little information on the dependence of communities on the forest industry. The results of the report suggest that those living in regions with higher dependence on the forest industry are just as likely to rate their community as highly liveable, friendly, safe and aesthetically pleasant as those living in nearby communities with less dependence on the forest industry (Schirmer et al. 2018). They do not, however, view the forest industry as positively as they view other industries operating in their local community: while recognising the employment contribution made by the industry, few perceive the industry as having positive impacts on other aspects of community life, and a significant proportion report concerns about effects of the industry on roads and local landscapes (Schirmer et al. 2018).

Of those living in communities with higher dependence on the forest industry, most reported that the forest industry was important to their local community, including 60 per cent of those who lived in the Central Highlands and Gippsland LGAs of East Gippsland, Latrobe, Murrindindi, Wellington and Yarra Ranges; 47 per cent of those living in the North Central LGAs of Alpine, Benalla and Wangaratta; and 58 per cent of those living in the Western Victorian LGA of Colac–Otway (Schirmer et al. 2018).

As shown in Figure 62, those who lived in LGAs with high forest industry dependence were much more likely to identify the forest industry as an important industry in their local community than those who lived in regions with little forest industry activity (Schirmer et al. 2018).



Figure 62: Proportion of residents who views the forest industry as an ‘important industry’ in their local community

Source: Schirmer et al. (2018).

This report quantifies the employment and economic activity generated by the forest industry and identifies the communities in which the industry generates a significant proportion of local jobs. The analysis shows that, overall, the number of jobs generated by the industry has declined significantly since 2006, although employment generated by hardwood plantations has grown since 2012, as per Table 114 below (Schirmer et al. 2018).

Table 114: Forest industry employment recorded in the ABS Census of Population and Housing over time

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Region** | **LGA (2017)** | **Jobs in forestry, logging, services to forestry** | **Jobs in Wood and paper product manufacturing (primary and secondary processing)** | **Total forest industry dependent jobs recorded in Census (includes wholesaling)** |
| **2006** | **2011** | **2016** | **Change 2006-2011 (per cent)** | **Change 2011-2016 (per cent)** | **2006** | **2011** | **2016** | **Change 2006-2011 (per cent)** | **Change 2011-2016 (per cent)** | **2006** | **2011** | **2016** | **Change 2006-2011 (per cent)** | **Change 2011-2016 (per cent)** |
| Central Highlands and Gippsland | Bass Coast | 10 | 3 | 19 |  |  | 35 | 48 | 24 | 37 | -50 | 77 | 97 | 75 | 26 | -23 |
|  | Baw Baw | 68 | 55 | 83 | -19 | 51 | 200 | 171 | 166 | -15 | -3 | 288 | 263 | 288 | -9 | 10 |
|  | East Gippsland | 149 | 145 | 131 | -3 | -10 | 232 | 186 | 152 | -20 | -18 | 403 | 347 | 260 | -14 | -25 |
|  | Latrobe | 182 | 156 | 228 | -14 | 46 | 1,285 | 1,097 | 965 | -15 | -12 | 1,504 | 1,300 | 1,112 | -14 | -14 |
|  | Mansfield | 22 | 14 | 17 | -36 | 21 | 26 | 12 | 13 | -54 | 8 | 53 | 26 | 36 | -51 | 38 |
|  | Mitchell | 21 | 12 | 4 | -43 |  | 172 | 180 | 148 | 5 | -18 | 220 | 207 | 172 | -6 | -17 |
|  | Mornington Peninsula | 27 | 41 | 37 | 52 | -10 | 383 | 361 | 235 | -6 | -35 | 577 | 571 | 415 | -1 | -27 |
|  | Murrindindi | 62 | 47 | 35 | -24 | -26 | 134 | 45 | 36 | -66 | -20 | 215 | 95 | 78 | -56 | -18 |
|  | Nillumbik | 7 | 14 | 12 |  | -14 | 267 | 233 | 131 | -13 | -44 | 337 | 305 | 187 | -9 | -39 |
|  | South Gippsland | 28 | 32 | 20 | 14 | -38 | 64 | 67 | 58 | 5 | -13 | 106 | 116 | 80 | 9 | -31 |
|  | Wellington | 132 | 128 | 126 | -3 | -2 | 255 | 272 | 310 | 7 | 14 | 418 | 406 | 423 | -3 | 4 |
|  | Yarra Ranges | 85 | 94 | 92 | 11 | -2 | 810 | 703 | 481 | -13 | -32 | 1,156 | 1,028 | 787 | -11 | -23 |
|  | TOTAL | 793 | 741 | 814 | -7 | 10 | 3,863 | 3,375 | 2,721 | -13 | -19 | 5,354 | 4,761 | 3,912 | -11 | -18 |
| North Central | Alpine | 64 | 80 | 61 | 25 | -24 | 243 | 165 | 179 | -32 | 8 | 307 | 248 | 181 | -19 | -27 |
|  | Benalla | 12 | 17 | 21 | 42 | 24 | 173 | 175 | 152 | 1 | -13 | 185 | 199 | 182 | 8 | -9 |
|  | Campaspe | 11 | 0 | 3 |  |  | 63 | 70 | 35 | 11 | -50 | 90 | 76 | 48 | -16 | -37 |
|  | Greater Shepparton | 0 | 0 | 7 |  |  | 174 | 138 | 98 | -21 | -29 | 238 | 176 | 140 | -26 | -20 |
|  | Indigo | 11 | 8 | 9 |  |  | 90 | 81 | 64 | -10 | -21 | 104 | 92 | 59 | -12 | -36 |
|  | Mildura | 3 | 0 | 4 |  |  | 92 | 82 | 68 | -11 | -17 | 104 | 103 | 91 | -1 | -12 |
|  | Wangaratta | 36 | 30 | 32 | -17 | 7 | 220 | 201 | 225 | 9 | 12 | 266 | 237 | 269 | -11 | 14 |
|  | Wodonga | 18 | 16 | 26 | -11 | 63 | 272 | 195 | 187 | -28 | -4 | 301 | 229 | 231 | -24 | 1 |
|  | Other LGAs | 39 | 32 | 66 | -18 | 106 | 193 | 163 | 186 | -16 | 14 | 248 | 209 | 290 | -16 | 39 |
|  | TOTAL | 194 | 183 | 216 | -6 | 18 | 1,520 | 1,270 | 1,123 | -16 | -12 | 1,843 | 1,569 | 1,406 | -15 | -10 |
| West | Colac–Otway | 63 | 57 | 87 | -10 | 53 | 280 | 315 | 185 | 13 | -41 | 360 | 384 | 362 | 7 | -6 |
| Other LGAs | 156 | 131 | 209 | -16 | 60 | 1,761 | 1,768 | 1,140 | 0 | -36 | 2,228 | 2,208 | 1900 | -1 | -14 |
| TOTAL | 219 | 188 | 297 | -14 | 58 | 2041 | 2,083 | 1,429 | 2 | -31 | 2,588 | 2,592 | 1974 | 0 | -24 |
| Melbourne | TOTAL | 216 | 265 | 358 | 23 | 35 | 12,475 | 11,605 | 7,708 | -7 | -34 | 16,802 | 16,331 | 11,747 | -3 | -28 |
| TOTAL VIC | Excl. SW Victoria | 1,422 | 1,377 | 1,685 | -3 | 22 | 19,899 | 18,333 | 12,981 | -8 | -29 | 26,587 | 25,253 | 19,039 | -5 | -25 |

Source: Schirmer et al. (2018)

Table 115, which is sourced from the ASOFR 2018, shows the adaptive capacity of Victorian LGAs in comparison to other Australian LGAs, that are dependent on the forest and wood products industries, as well as changes since 2001. Communities which have direct employment in the forest sector that is greater than 2 per cent are considered to be dependent on the forest and wood products sector. In four LGAs in Victoria, employment in forest and wood products industries increased from 2011 to 2016, although total employment declined. Large proportional increases in forest and wood products industries employment occurred in south-west Victoria (Glenelg) (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018).

Table 115: Local government areas dependent on forest and wood products industries

| LGA | Number of people employed in forest and wood product industries, 2016 | Proportion of workforce employed in forest and wood products industries, 2016 | Change in forest and wood products industries employment (per cent) a | Change in total employment (all industries) (per cent) | Adaptive Capacity (2016) |
| --- | --- | --- | --- | --- | --- |
| 2001–06 | 2006–11 | 2011–16 | 2011–16 | Economic diversity indexb | Community wellbeing indexc | Capital resources indexd |
| NSW |  |  |  |  |  |  |  |  |  |
| Snowy Valleys | 903 | 15.84 | -2.3 | -4.3 | 1.7 | -7 | 0.44 | 0.72 | 0.55 |
| Oberon | 320 | 15.24 | 8.7 | -9.2 | -16.9 | -7 | 0.47 | 0.75 | 0.60 |
| Kyogle | 92 | 2.99 | -46.6 | 14.4 | -31.9 | -8.1 | 0.45 | 0.72 | 0.57 |
| Clarence Valley | 400 | 2.37 | 15.6 | -12.1 | -29.5 | -3 | 0.88 | 0.72 | 0.57 |
| Bellingen | 97 | 2.06 | -31.4 | 1\* | -8.5\* | 1.3 | 0.85 | 0.80 | 0.57 |
| NT |  |  |  |  |  |  |  |  |  |
| West Arnhem | 27 | 2.04 | -100\* | - | -12.9\* | -36.1 | 0.46 | 0.7 | 0.53 |
| Qld |  |  |  |  |  |  |  |  |  |
| Gympie | 627 | 3.76 | -0.1\* | -10.4 | -14 | -1.5 | 0.81 | 0.71 | 0.54 |
| SA |  |  |  |  |  |  |  |  |  |
| Mount Gambier | 1,143 | 10.18 | -3.3 | -20.1 | -6.5 | -0.1 | 0.86 | 0.72 | 0.53 |
| Wattle Range | 456 | 9.40 | -8.7 | -33.1 | -16.9 | -7.4 | 0.35 | 0.80 | 0.54 |
| Grant | 333 | 8.91 | -0.7\* | -15.9 | -8.5\* | -2.9 | 0.37 | 0.80 | 0.54 |
| Tas. |  |  |  |  |  |  |  |  |  |
| Dorset | 173 | 7.09 | 2.3\* | -51.9 | -20.3 | -5.6 | 0.3 | 0.67 | 0.51 |
| Derwent Valley | 212 | 5.77 | 0.6\* | -28.3 | -15.5 | -1.4 | 0.85 | 0.73 | 0.55 |
| George Town | 96 | 4.64 | -25.9 | 7.9\* | 41.2 | -12.3 | 0.72 | 0.69 | 0.53 |
| Circular Head | 144 | 4.18 | 14.9 | -17.9 | -38.5 | -4.2 | 0.30 | 0.78 | 0.54 |
| Central Highlands | 27 | 3.43 | -14\* | -22.4 | -28.9 | -2.6 | 0.19 | 0.66 | 0.49 |
| Huon Valley | 141 | 2.3 | -5.9 | 14.1 | -40 | 1.2 | 0.61 | 0.73 | 0.55 |
| Waratah/Wynyard | 112 | 2.19 | 0.4\* | -59.3 | 19.1 | -8.1 | 0.77 | 0.68 | 0.51 |
| Vic. |  |  |  |  |  |  |  |  |  |
| Alpine | 239 | 4.53 | -20.6 | -20.7 | -2.4\* | 0.8 | 0.76 | 0.85 | 0.60 |
| Latrobe | 1,189 | 4.19 | 11.0 | -14.5 | -4.9 | -4 | 0.75 | 0.62 | 0.54 |
| Colac–Otway | 378 | 4.14 | 4.6 | 8.8 | 2.4\* | -1.8 | 0.63 | 0.79 | 0.58 |
| Benalla | 178 | 3.29 | -29.9 | 2.1\* | -8.2 | -8.2 | 0.77 | 0.72 | 0.58 |
| Wellington | 443 | 2.58 | 43.7 | 3.9 | 9.9 | -1.9 | 0.64 | 0.74 | 0.56 |
| Glenelg | 190 | 2.4 | -10.4 | -55.8 | 52 | -7.7 | 0.58 | 0.73 | 0.55 |
| Wangaratta | 253 | 2.09 | -9.9 | -9.1 | 9.5 | -2.1 | 0.83 | 0.83 | 0.63 |
| WA |  |  |  |  |  |  |  |  |  |
| Nannup | 38 | 7.25 | 110.3 | -11.5\* | -29.6 | -10 | 0.44 | 0.83 | 0.61 |
| Manjimup | 274 | 6.85 | -43.9 | -22.7 | 0.4\* | -4.4 | 0.39 | 0.83 | 0.61 |
| Bridgetown-Greenbushes | 58 | 3.14 | -7\* | -30.1 | -37.6 | -3.1 | 0.53 | 0.83 | 0.61 |
| Donnybrook-Balingup | 66 | 2.75 | 13.4 | -23.7 | -7\* | 0.2 | 0.48 | 0.76 | 0.57 |
| Dardanup | 135 | 2.18 | 36.8 | -17.5 | 2.3\* | 3.6 | 0.78 | 0.76 | 0.57 |
| Wyndham-East Kimberley | 66 | 2.15 | 106.3 | 127.3 | -12\* | -14.9 | 0.73 | 0.71 | 0.56 |
| AUSTRALIA e, f | 51,983 | 0.51 | -3.4 | -14 | -24.2 | 3.9 | 1 | 0.75 | 0.55 |

Source: Montréal Process Implementation Group for Australia and NFI Steering Committee (2018)

Notes:

-, not calculated as previous value zero

\* Change of 10 or fewer individuals

a 2001, 2006 and 2011 data have been adjusted to align with 2016 LGA boundaries.

b The economic diversity index is calculated from ABS census data and measures the variety of employment sectors in an LGA on a scale between 0.0 and 1.0, with a score of 1.0 indicating the same diversity as the Australian economy (high diversity). Economic diversity index cannot be aggregated above LGA scale.

c Community wellbeing index scores from 2016 Regional Wellbeing Survey datasets rescaled to between 0.0 (relatively low wellbeing) and 1.0 (relatively high wellbeing).

d Capital resources index constructed by ABARES from 2016 Regional Wellbeing Survey data by averaging the scores under financial capital, human capital, institutional capital, social capital, physical capital and natural capital, for each LGA or region including the LGA (see Table 6.53). A score of 0.0 indicates relatively low capital and a score of 1.0 indicates relatively high capital.

e All LGAs in Australia, not just those dependent on forest and wood products industries.

f Employment changes for 2001–06 and 2006–11 differ to those reported in SOFR 2013 because of a change in industry classification for the forest sector.

LGAs are considered to be dependent on the forest and wood products industries when direct employment in the sector is at least 2 per cent of total workforce employment, and the community contains more than 20 workers employed in these industries. The Australian Capital Territory is not listed because employment in forest and wood products industries is below 2 per cent of total workforce employment (there are no LGAs within the ACT).

Source: ABARES calculations based on ABS (2016b), ABS Customised reports on census data for 2001, 2006, 2011 and 2016, and 2016 Regional Wellbeing Survey data tables (canberra.edu.au/research/faculty-research-centres/ceraph/regional-wellbeing/survey-results/2016-survey-results/2016-results-by-rda-and-lga) Aboriginal employment in Victoria’s forestry industry

Victoria’s forestry industry has the lowest Aboriginal employment rate of all states and territories. In 2016, Victoria was the only state with less than 1 per cent Aboriginal employment in the forest industry, meaning that Aboriginal communities in Victoria are less reliant on the forestry industry than those in other states (ABS 2016).

This report defines forest-dependent Aboriginal communities as Aboriginal people living in LGAs with a *higher-than-state average of Aboriginal employment in the forestry industry, as a subset of total Indigenous employment in all industries* (Table 116). In Victoria, nine LGA’s were found to be forest-dependent Aboriginal communities, with five of these LGAs within the RFA regions (Table 117). These Aboriginal communities have all experienced a gradual decrease in involvement in the forestry industry and are less resilient to changes in the forestry industry than those in other regions, due to their previous reliance on the industry as a source of employment.

Table 116: Proportion and total numbers of Aboriginal employment in the forestry industry, by RFA region, 2006–16

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employment | Gippsland | East Gippsland | Central Highlands | North East | West |
| 2006 | 2011 | 2016 | 2006 | 2011 | 2016 | 2006 | 2011 | 2016 | 2006 | 2011 | 2016 | 2006 | 2011 | 2016 |
| Total no. employed – Aboriginal and/or Torres Strait Islanders | 7 | 3 | 10 | 14 | 15 | 12 | 16 | 4 | 38 | 13 | 13 | 38 | 23 | 31 | 34 |
| Total no. employed – non-Aboriginal | 2,135 | 1,872 | 1,973 | 365 | 336 | 285 | 6,676 | 6,668 | 5,219 | 1,561 | 1,278 | 1,454 | 5,718 | 5,827 | 5,136 |
| Proportion of Indigenous employment in forestry industry | 0.33 per cent | 0.16 per cent | 0.50 per cent | 3.69 per cent | 4.27 per cent | 4.04 per cent | 0.24 per cent | 0.06 per cent | 0.73 per cent | 0.83 per cent | 1.01 per cent | 2.55 per cent | 0.40 per cent | 0.53 per cent | 0.66 per cent |

Source: ABS 2016

Table 117: Proportion of Aboriginal employment in the forestry industry, compared to total Aboriginal employment in all industries, in 9 LGAs where higher proportion than state average was found

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RFA | LGA | 2006 | 2011 | 2016 |
| Central Highlands | Knox | 4.96 per cent | 2.80 per cent | 3.45 per cent |
| East Gippsland | East Gippsland | 7.49 per cent | 5.54 per cent | 4.11 per cent |
| West | Glenelg | 8.20 per cent | 7.84 per cent | 3.20 per cent |
| Hume | 4.02 per cent | 3.98 per cent | 1.97 per cent |
| North East | Wodonga | 2.68 per cent | 2.67 per cent | 1.95 per cent |
| Non-RFA | Greater Dandenong | 1.78 per cent | 1.30 per cent | 3.14 per cent |
| Monash | 1.88 per cent | 2.12 per cent | 1.49 per cent |
| Greater Shepparton | 0.78 per cent | 0.70 per cent | 1.39 per cent |
| Kingston | 5.13 per cent | 2.07 per cent | 1.31 per cent |
| Total employment all industries |  | 1.53 per cent | 1.13 per cent | 0.94 per cent |

Source: Commissioner for Environmental Sustainability Victoria (2019)

The *Victorian Aboriginal economic strategy 2013–2020* was developed by the Victorian Government to deliver stronger outcomes in education, training and employment across government and the private sector. Despite a significant increase in Aboriginal employment across all industries, this strategy has not produced any improvements in Aboriginal participation in the forestry industry.

Having access to native forests and traditional land has been recognised as improving individual wellbeing and community resilience by allowing Aboriginal people to practice and maintain cultural values. It is understood, however, that dependence of Aboriginal communities on native forests is variable based on local social, cultural and economic context, and therefore differs between communities.

**Summary and future management of social values**

Submissions made to RFA reviews and throughout the process to extend the Victorian RFAs demonstrate the range of views and values in the community relating to forests and the range of uses that forests are subject to. Forests are valued for income, job security, recreation and broader values such as renewable resources, biodiversity and the provision of clean air and water. Forests are important for recreational activities and attracting visitors to regional Victoria. Forest values have become more prominent in social research and forest decision-making as a way of representing what is important about forests.

In Victoria, 97 per cent of parks and conservation reserves and 99 per cent of State forests are available for recreation, and this area has been increasing over the last 15 years. The area actively used for recreation is much less than that available and while there has been changes in land use over the period of the RFAs, these have caused minimal impact to the amount of land available for recreation. Victoria’s forests offer a wide range of recreation activities, including walking, mountain-bike riding, camping, fishing, picnicking and four-wheel driving. A range of facilities caters for these activities, and the number of facilities has increased over the period of the RFAs. The promotion of certain roads as touring routes or four-wheel drive tracks saw a marked increase in their use. The Victorian Government has also developed a four-wheel drive strategy which aims to increase the regional and economic benefits from this activity up to and post 2021.

Victoria invested significantly in forest tourism and recreation from 2008 until 2011, particularly in relation to replacement of sites after the 2009 bushfires. Sites have been better captured in an improved asset management system and the Victorian Government has also released an app to promote recreation in State forests. Extended RFAs will support continued recreational activities on public land in Victoria.

Employment in the Victorian forest industry has decreased during the period of the RFAs due to a number of changes in the forest and wood products industry. The collapse of MIS along with efficiencies in manufacturing have had significant impact. Environmental impacts are also expected to affect employment. However, it is also important to note that wood harvested in forests within the RFA regions also generates employment opportunities outside the RFA regions, particularly in secondary processing. Forest industry workers in 2016 earned higher incomes compared to workers in other industries and were more likely to work full-time.

Those living in communities with a higher dependence on the forest industry identify that the industry is important to their local communities. Communities with a high dependence on the forest industry remain just as liveable as those with little dependence on the industry. The extension of RFAs in Victoria will continue to provide certainty for forest-dependent communities and continue to support community resilience and employment. Continued collection of socio-economic data is critical to supporting communities and ongoing policy development. The Victorian RFAs seek to maintain a stable regulatory environment and continue to ensure that Victoria’s forests remain accessible to a wide range of users.

Principles of ecologically sustainable management

As a party to the National Forest Policy Statement (NFPS), Victoria is committed to the principles of ecologically sustainable development. The Victorian RFAs define ecologically sustainable forest management (ESFM) as ‘forest management and use in accordance with the specific objectives and policies for ecologically sustainable development as detailed in the National Forest Policy Statement’.

For the purposes of this report, ‘ecologically sustainable management’ in para. (a) of the definition of ‘RFA’ at s. 4 of the RFA Act is taken to be synonymous with ESFM as used in the Victorian RFAs. The internationally agreed Montréal Process criteria and indicators for reporting on sustainable forest management were agreed to be the framework for reporting on sustainability in Australia (refer to clause 49 of the current West Victoria RFA, as an example). The framework for ESFM covers all of the matters listed in para. (a) of the definition of ‘RFA’ in the RFA Act, and therefore provides the performance criteria for the assessment in this report.

The Parties agreed in the five Victorian RFAs that ESFM is an objective that requires a long-term commitment to continuous improvement and that the key elements for achieving it are:

1. the establishment and maintenance of a CAR reserve system
2. the development of internationally competitive forest products industries
3. an integrated and strategic forest management system capable of responding to new information.

This section includes the following Montréal Process indicators:

* Indicator 7.1a – Extent to which the legal framework supports the conservation and sustainable management of forests
* Indicator 7.1b – Extent to which the institutional framework supports the conservation and sustainable management of forests
* Indicator 7.1c – Extent to which the economic framework supports the conservation and sustainable management of forests
* Indicator 7.1d – Capacity to measure and monitor changes in the conservation and sustainable management of forests
* Indicator 7.1e – Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services
* Indicator 3.1.a – Scale and impact of agents and processes affecting forest health and vitality
* Indicator 5.1a – Contribution of forest ecosystems and forest industries to the global greenhouse gas balance

**Indicator 7.1a: Extent to which the legal framework supports the conservation and sustainable management of forests**

This indicator outlines the support that the legal system gives to the sustainable management of forests. A legal system that ensures transparency and public participation in policy and decision-making processes supports the continuous improvements in sustainable forest management.

Forest management in Victoria is subject to both Commonwealth and state laws which have evolved as a result of ongoing work to improve the balance between environmental and economic demands, and in response to other factors affecting resource availability, and economic and social needs.

The NFPS, signed by the Commonwealth, and state and territory governments, has underpinned Australian forest policy. It outlines agreed objectives and policies for the future of Australia’s public and private forests. It aims to coordinate forest management while maintaining the tradition of managing public and private native forests for multiple uses.

*Commonwealth legislation*

Commonwealth legislation that supports the conservation and sustainable management of forests includes:

* the EPBC Act –which encapsulates and promotes the principles of ecologically sustainable development and provides for the Commonwealth Minister for the Environment to assess likely significant impacts to nationally protected matters
* the *Export Control Act 1982* (Cth) – which establishes a broad framework for the regulation of goods for export and recognises RFAs in allowing unprocessed wood and woodchip export when sourced from native forestry operations in an RFA region (this is also permitted from plantations which have an approved Code of Practice to satisfactorily protect environmental and heritage values)
* the RFA Act – which legislates for the creation and operation of RFAs; these agreements provide a streamlined approach to satisfying Commonwealth environmental legislative requirements for conducting sustainable productive forest management.

*Victorian legislation*

Victoria has a suite of 27 pieces of legislation supporting the conservation and sustainable management of forests. The core regulatory framework and primary legislation that supports forest management is:

The *Sustainable Forests Timber Act 2004* provides a framework for sustainable forest management and sustainable timber harvesting in Victoria’s State forests. The Act contains three key components for the management of Victoria’s forests:

* the *Sustainability Charter for Victoria’s State forests*, which sets the objectives for sustainable forest management in Victoria
* the VSOFR, which works to monitor and assess the state’s performance in achieving objectives for sustainable forest management in Victoria
* the AO, which provides for the sustainable allocation and use of timber resources from State forests.

The *Forests Act 1958* provides for the management of State forests, including the development of working plans (currently represented by forest management plans and fire management plans) to maintain and improve State forests, and for licensed occupations including grazing, beekeeping and the sale of forest produce.

The *Conservation, Forests and Lands Act 1987* provides a framework for a land management system and makes administrative, financial and enforcement provisions to protect land, water and wildlife prior to the commencement of harvesting or construction activities. The aims of this Act are met through the approval of the TRP process and compliance with the *Code of Practice for Timber Production 2014*.

The *Flora and Fauna Guarantee Act 1988* is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. It aims to conserve all of Victoria’s native plants and animals and provides for the listing of Victoria’s threatened plant and animal species, ecological communities and potentially threatening processes, including the requirement for the preparation of action statements.

The *National Parks Act 1975* establishes the statutory basis for the protection, use and management of national parks, state and wilderness parks and conservation reserves in Victoria. Under the Act, the key objectives of national and state parks are to:

* permanently protect the natural environment (including wilderness areas and remote and natural areas), natural biodiversity and particular features
* provide for scientific research and study
* protect certain designated water supply catchment areas and their water quality in specified national parks
* provide for the use of the parks for enjoyment, recreation or education consistent with conserving those values.

The *Parks Victoria Act 2018* replaces the *Parks Victoria Act 1998*. Previously Parks Victoria acted as a service agency to the Victorian Government. The new Act re-created Parks Victoria as a strengthened statutory authority with a broad range of direct powers, reporting directly to the Minister for Energy, Environment and Climate Change.

The *Traditional Owner Settlement Act 2010* establishes a framework that allows the Victorian Government to recognise Traditional Owners and certain rights in Crown land. To access these rights, Traditional Owner Groups can enter into a Recognition and Settlement Agreement with the state. This agreement provides a basis for provision for specific Crown land to be returned to Aboriginal ownership under a form of land title called Aboriginal title.

Collectively, these acts underpin the legislative framework for the forest management system in Victoria. In addition, the secondary legislation listed below has an impact on land management in Victoria:

* *Aboriginal Heritage Act 2006*
* *Aboriginal Lands Act 1991*
* *Catchment and Land Protection Act 1994*
* *Climate Change Act 2017*
* *Crown Land (Reserves) Act 1978*
* *Environment Effects Act 1978*
* *Environment Protection Act 1970*
* *Environment Protection Act 2017*
* Forests (Fire Protection) Regulations 2014
* Forests (Recreation) Regulations 2010
* *Forests (Wood Pulp Agreement) Act 1996*
* *Heritage Rivers Act 1992*
* *Land Act 1958*
* *Land Conservation (Vehicle Control) Act 1972*
* *Planning and Environment Act 1987*
* *Reference Areas Act 1978*
* *Road Management Act 2004*
* *Safety on Public Land Act 2004*
* *Victorian Plantations Corporation Act 1993*
* *Water Act 1989*
* *Wildlife Act 1975.*

**Indicator 7.1b: Extent to which the institutional framework supports the conservation and sustainable management of forests**

This indicator examines the institutional frameworks that support sustainable forest management. Institutional frameworks provide mechanisms for engagement of the wider community in the process of continuous improvement and sustainable forest management.

This includes institutional and administrative arrangements that have been put in place for enforcement and compliance with the legal regulatory framework, decision-making in relation to forestry resource management, and community engagement in the broader process of sustainable forest management.

This section outlines the Victorian Government’s overarching vision and strategic plan for sustainable forest management, the roles and responsibilities of relevant Victorian agencies and their respective policy mechanisms that contribute towards achieving this vision.

*Strategic planning*

Strategic planning for State forests in Victoria is reflected principally in DELWP’s forest management plans (FMPs). There are nine FMPs in Victoria, established under the *Forests Act 1958* and developed progressively as the RFAs were developed. The FMPs in Victoria are:

* Forest Management Plan for the East Gippsland Forest Management Area 1995 and amended by the East Gippsland Forest Management Plan Amendment 1997
* Forest Management Plan for the Midlands Forest Management Area 1996
* Forest Management Plan for the Central Highlands 1998
* Forest Management Plan for the North East 2001
* Forest Management Plan for the Mid-Murray Forest Management Area 2002
* Gippsland Forest Management Plan 2004
* Forest Management Plan for the Floodplain State Forests of the Mildura Forest Management Area 2004
* Bendigo Forest Management Plan 2008
* Portland and Horsham Forests: Forests Management Plan 2010.

Development of these FMPs was supported through the CRAs. The CRAs also directly informed the development of a CAR reserve system for Victoria through the RFAs.

Forest harvesting on private land must be consistent with the *Code of Practice for Timber Production 2014* (Code), and landowners must prepare a property vegetation plan for the removal of native vegetation on private land. The Code also incorporates Management Guidelines for Private Native Forests and Plantations 2014, which provide means for achieving mandatory actions and operational goals. Failure to follow the management guidelines does not itself constitute non-compliance with the Code; rather, the guidelines support or expand the Code. Local government is responsible for ensuring compliance with the Code and DELWP provides additional management guidelines to assist local government to interpret the Code and monitor Code compliance.

The *Code of Practice for Timber Production 2014*

The legislative framework for forest management is supported by regulatory instruments, including codes of practice, particularly the *Code of Practice for Timber Production 2014*.

The Code is the primary regulatory instrument that applies to commercial timber production in both public and private native forests and plantations in Victoria. The Code is made by the Minister for Energy, Environment and Climate Change, under Part 5 of the *Conservation, Forests and Lands Act 1987*.

The purpose of the Code is to provide direction to the managing authority for timber harvesting operations in State forest – notably, VicForests and its contractors – to deliver sound environmental performance when planning for and conducting commercial timber harvesting operations. It seeks to ensure that this is done in a way that:

* permits an economically viable, internationally competitive, sustainable timber industry
* is compatible with the conservation of the wide range of environmental, social and cultural values associated with forests
* provides for the ecologically sustainable management of native forests proposed for cyclical timber harvesting operations
* enhances public confidence in the management of timber production in Victoria's forests and plantations.

The Code applies to commercial timber harvesting on both public and private land in Victoria. Silvicultural tending, regeneration, rehabilitation and roading activities associated with commercial harvesting are also subject to this Code. Timber harvesting operations in State forests are required to comply with the Code.

The Code is based on ‘Code Principles’, which express the broad outcomes of the intent of the Code for each aspect of sustainable forest management. The six Code Principles were developed from the internationally recognised Montréal Process criteria and are consistent with the objectives of the *Sustainability Charter for Victoria's State forests*. The Code Principles are:

* Biological diversity and the ecological characteristics of native flora and fauna within forests are maintained.
* The ecologically sustainable long-term timber harvesting capacity of forests managed for timber harvesting is maintained or enhanced.
* Forest ecosystem health and vitality is monitored and managed to reduce pest and weed impacts.
* Soil and water assets within forests are conserved. River health is maintained or improved.
* Cultural heritage values within forests are protected and respected.
* Planning is conducted in a way that meets all legal obligations and operational requirements.

The Code incorporates the *Management Standards and Procedures for timber harvesting operations in Victoria’s State forests 2014* (MSP), which provide standards and procedures to instruct managing authorities, harvesting entities and operators in interpreting the requirements of the Code.

Timber harvesting operations in State forests are required to comply with the Code, including the MSP. This is required under licences and authorities issued under the *Conservation, Forests and Lands Act 1987*, the *Forests Act 1958* and the *Sustainable Forests (Timber) Act 2004*, as well as the Victorian Planning Provisions that require the Code to be considered as relevant (as specified in clause 14.01-3S). Compliance with the Code in State forest is monitored by authorised officers appointed by the Secretary to DELWP.

The *Planning Standards for Timber Harvesting Operations in Victoria’s State Forests 2014* constitute an appendix to the MSP and describe management actions for protection of values. Prescriptions in relation to threatened species protections, previously stated in FMPs and action statements, were transcribed directly into the Planning Standards with the revision of the Code in 2014. These standards provide non-binding guidance to the Secretary to DELWP in discharging its forest functions in respect of forest planning.

*Sustainability Charter for Victoria’s State forests*

The Victorian Government developed a Sustainability Charter for Victoria’s State forests in 2006. In accordance with the *Sustainable Forests (Timber) Act 2004*, the charter sets out objectives, consistent with the principles of ecologically sustainable development, for the sustainability of forests and the sustainability of the timber harvesting industry. These obligations have been aligned with the Montréal Process for sustainable forest management and the principles of ecologically sustainable development.

Through the charter, the DSE (now DELWP) and VicForests (the body responsible for timber harvesting in Victoria) committed to managing Victoria’s State forests in accordance with the following objectives:

* to maintain and conserve biodiversity in State forests
* to maintain and improve capacity of forest ecosystems to produce wood and non-wood products
* to promote healthy forests by actively managing disturbance
* to maintain and conserve the soil and water resources of State forests
* to maintain and better understand the role of Victoria’s State forests in global carbon cycles
* to maintain and enhance socio-economic benefits of State forests to Victorian communities
* to ensure Victoria’s legal, institutional and economic frameworks effectively support the sustainable management of State forests.

These commitments and associated obligations are reported on through Victoria’s five-yearly State of the Forests Report.

*Future of our forests: modernisation of Victoria’s forest management system*

The Victorian Government has committed to modernising its forest management system[[5]](#footnote-5) over the next four years. The program will deliver:

* a vision for the future management of our forests
* a strategy for the management of State forests
* modernisation and extension of the Victorian RFAs
* reform of environmental regulation of timber harvesting operations
* development of new FMPs across the state, including greater integration across tenures and between forest and fire management.

*Relevant Victorian agencies: roles and policy mechanisms*

The following Victorian agencies work towards providing the institutional framework that supports the conservation and sustainable management of the Victorian forested estate.

Roles and responsibilities of each of these agencies, including their respective regulatory, decision-making and other policy mechanisms, are broadly outlined below.

The **Department of Environment, Land, Water and Planning** (DELWP) is responsible for climate change, energy, environment, water, forests (including bushfire management), planning, and local government. It manages Victoria's 3.2 million hectares of State forest and provides policy guidance for a further 3.7 million hectares of parks and conservation reserves.

The **Department of Jobs, Precincts and Regions** (DJPR) brings together many of the areas driving Victoria’s economic development and job creation including transport and ports, investment attraction and facilitation, trade, innovation, regional development, small business and services to sectors such as agriculture, the creative industries, resources and tourism. It is also the department responsible for the administering the AO on behalf of the Minister for Agriculture and provides oversight of VicForests, including monitoring and advising on its compliance with corporate governance requirements.

**Parks Victoria** is a statutory authority designated under the *Parks Victoria Act 2018* and reports to the Victorian Minister for Energy, Environment and Climate Change. Parks Victoria manages an estate of more than 4 million hectares for the purpose of conservation of biodiversity. Parks Victoria is responsible for the management of the national parks estate, and for the purpose of the RFA process, the formal protected area component of the CAR reserve.

**VicForests** is a state-owned business responsible for the sustainable harvest, regrowing and commercial sale of timber from public forests on behalf of the Victorian Government.

**Emergency Management Victoria** leads emergency management in Victoria by maximising the ability of the emergency management sector to work together and to strengthen the capacity of communities to plan for, withstand, respond to and recover from emergencies.

**Local government** in Victoria administers private forest management. Policy support for private forestry is provided by **DJPR**.

The **Office of the Conservation Regulator** (OCR) was established by DELWP in early 2019 following an independent review of timber harvesting regulation in Victoria’s public native forests. The OCR oversees regulatory functions in conservation and environment in Victoria through:

* educating the community about the laws governing conservation and environment protection in Victoria
* providing guidance and support to encourage compliance
* monitoring compliance with regulatory requirements and taking enforcement action against non-compliance.

The Chief Conservation Regulator leads the OCR and is accountable for decision-making supporting the delivery of DELWP’s key regulatory outcomes including:

* protected natural and heritage values
* the equitable and safe access to public land and use of natural resources.

An Independent Regulation Advisory Panel has been established to provide the Chief Conservation Regulator with independent expert advice on best practice approaches to regulating.

**Indicator 7.1c: Extent to which the economic framework supports the conservation and sustainable management of forests**

This indicator examines the extent to which government policies support the conservation and sustainable management of forests.[[6]](#footnote-6) Government policies on investment, taxation and trade influence the level of investment in forest conservation, forest establishment and timber processing.

Many of the factors that affect the economic framework in relation to sustainable management of forests occur at the state or national level. These factors have been actively reported on over the life of the Victorian RFAs in five-yearly SOFRs, as well as in Victorian reporting.

*Investment*

Australia has stringent controls over land-use changes and industrial development that aim to protect environmental, cultural and amenity values. These controls generally apply equally to all land-use change and developments. Provided those values are protected, private investment in the forest and forest products industries in Australia is generally free from industry-specific legal and regulatory constraints. Australia’s foreign investment policy aims to encourage foreign investment that is consistent with community and economic interests. Foreign investment in Australia is regulated primarily through a regime established under the *Foreign Acquisitions and Takeovers Act 1975* (Cth).

*Competition*

Australia’s National Competition Policy has led to several reforms that affect the competitive climate for Australian forest-based industries, including that commercial state-owned forest entities be competitively neutral with the private sector. VicForests was established in 2003. It is a state-owned business and functions as a commercial entity in the competitive marketplace. VicForests is required to act in a commercially prudent manner, maximising long-term economic returns to the state rather than delivering short term profits, and report annually on profitability.

*Taxation*

Prior to 2002, the tax treatment of forestry activities as primary production created unintended inequities for small-scale private investments in forestry due to the seasonal and long-term nature of forestry, and its associated irregular cash flows. Key issues were:

* inability to offset upfront establishment payments in managed schemes in the payment year
* immediate tax liability created by forward contracts for timber harvesting rights
* tax bracket creep with no mechanism to average large harvest incomes over the plantation life cycle.

In 2002, a 12-month pre-payment rule was introduced to address the offset issue for investors in prospectus-based forestry schemes. This was the only significant tax treatment for forestry investments in managed schemes that was different to investment in other sectors at that time. This rule lasted until 30 June 2008.

*Managed investment schemes*

In July 2007, new taxation arrangements for investment in forestry MISs came into effect as a result of Plantations for Australia: the 2020 Vision, a strategic partnership between the Australian, state and territory governments and the timber industry. The aim was to enhance regional wealth creation and international competitiveness by increasing Australia’s plantation resources, trebling the 1997 area of commercial tree crops by 2020.

The global financial crisis proved the tipping point for this policy arrangement and precipitated a collapse of several large MISs in 2009 and 2010. Examination of the MIS period has exposed many flaws in the foundation and fundamental process of the scheme and provided valuable, if not costly, learning experience.

*Adjustment programs*

A joint Victorian and Australian government adjustment package of $42.6 million was provided to assist forest industry businesses to adjust to changes in resource availability in the transition to new arrangements under the Victorian RFAs. The four components of the package were:

* industry development assistance
* rescheduling assistance
* business exit assistance
* worker assistance.

A further program of industry adjustment was run by the Victorian Government, which allocated $80 million to assist forest workers and communities adjust to changes in resource availability. Industry adjustment support included a voluntary licence reduction program, industry transition taskforce and a workers assistance package which included an industry restructure package, training assistance, relocation assistance and job placement assistance.

Following further reservation of forest areas in the West Victoria and Gippsland RFA regions, the Victorian Government provided additional funding to facilitate improvements in the productive capacity of public native forests, establish hardwood plantations and support forest-based initiatives that generate significant employment opportunities in regional Victoria.

*Trade policies*

Throughout the RFA period, Australian trade policy has continued to support trade liberalisation to improve access for Australian exports in global markets, as well as Australian access to imports. Improved market access has been facilitated through global and multilateral efforts and through the use of free trade agreements. Australia is a member of the World Trade Organization, which facilitates multilateral trade negotiations and ensures that the rules of international trade are correctly applied and enforced. Free trade agreements are increasingly important to the forest-based industries.

*Investment in environmental services*

The Australian Government’s Emissions Reduction Fund (ERF), established under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), allows businesses to earn carbon credits for storing carbon or reducing greenhouse gas emissions. ERF project participants have an opportunity to sell their emissions reductions to the government through competitive reverse auctions.

*Effectiveness of the economic framework*

The effectiveness of the economic framework was not explicitly assessed on a holistic basis prior to the ASOFR 2013. The inclusion of these metrics with data from 2006 provided a baseline for future analysis of the effectiveness of the economic framework in relation to production forests, management of conservation reserves, bushfires and Indigenous-managed lands.

The majority of measures remained consistent between 2006 and 2016 with the exception of understanding and processes relating to Indigenous-managed land, and conservation reserve processes which showed decline. Notably no items were ranked below partially effective, and no items showed significant improvement in ranking over the period.

*State investments*

Since 2013, several state government investments have affected Victorian native forests. The Victorian Budget 2013–14 committed $13 million to improve tourism in national parks, State forests and on public land. There is no current assessment of the effect of private sector investment. In 2013–14, DJPR gave grants of $620,000 to a number of wood processing facilities as part of the Regional Growth Fund. Limited benchmarks and targets have meant that the only quantifiable outcomes for this initiative were in relation to financial returns or employment.

**Indicator 7.1d: Capacity to measure and monitor changes in the conservation and sustainable management of forests**

This indicator examines the capacity of forest owners and agencies to measure and monitor changes in the forest and the impact of forest activities. A comprehensive measurement and monitoring program provides the basis for forest planning to support sustainable management.

*Monitoring and reporting*

Victoria produces a five-yearly State of the Forests Report which reports on sustainable forest management in the state. This fulfils reporting requirements set out for the Secretary to DELWP in the *Sustainable Forests (Timber) Act 2004*, which states that the minister must determine criteria and indicators for sustainable forest management, and must determine the reporting requirements, including the frequency at which such reports are to be made, being a period not less than every five years.

Victoria has adopted a set of criteria and indicators for sustainable forest management to monitor and assess the State’s performance in achieving its objectives in relation to a range of environmental, economic and social indicators. These criteria and indicators are closely aligned with Australia’s Sustainable Forest Management Framework of Criteria and Indicators and the international reporting standards developed under the Montréal Process Working Group. This provides a framework that Victoria uses to evaluate progress towards the objectives set out in the Sustainability Charter and to improve openness, accountability and community engagement in forest management (DEPI 2014d).

The VFMP has been developed to assess and monitor the state and condition of flora and ecosystems of Victoria’s public forest estate and to help observe ecosystem response to forest disturbance over time (Suitor et al., 2016). The VFMP provides baseline data for long-term trend detection and prediction of type and severity of future changes, so that management options can be developed and evaluated in time to be effective.

*Australian and international standards*

VicForests is certified to the Responsible Wood Standard, which is endorsed by the Program for the Endorsement of Forest Certification. Operations conforming to this Standard are in line with best-practice sustainable forest management and meet environmental, economic, social and cultural requirements that support sustainable management. VicForests is also a member of the FSC and is working towards achieving the FSC Controlled Wood Standard through its FSC 2020: VicForests Controlled Wood Roadmap.

Certification allows wood users to know that the timber they are buying has been grown and harvested legally from a sustainable source, and that the company producing the timber is a sustainable and efficient forest manager.

*Policy development*

There are a number of policies being implemented by the Victorian Government to enhance ESFM. These include:

* *Protecting Victoria’s environment – biodiversity 2037*, which sets out a 20-year vision and goals for biodiversity conservation in Victoria;
* review of the FFG Act to more effectively protect biodiversity in the face of existing and emerging threats; and
* amendments to the regulation of native vegetation to provide better consideration of biodiversity elements in decision-making.

In 2017, the Victorian Government accepted VEAC recommendations that the following be undertaken within five years:

* State forests be administered under one Act;
* the *National Parks Act 1975* be expanded to include revised categories of national parks, conservation parks, nature reserves, marine protected areas and other categories and overlays classified as protected areas, to become the ‘National Parks and Conservation Reserves Act’; and
* a new public land Act be developed to replace the current *Land Act 1958*, *Crown Land (Reserves) Act 1978* and *Forests Act 1958*.

**Indicator 7.1e: Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services**

This indicator reports on the scientific understanding of Australian forest ecosystem characteristics and functions needed to underpin sustainable forest management. Research, inventory and the development of assessment methodologies provide the basis for sustainable forest management.

For this indicator, forestry research and development (R&D) covers research in relation to commercial management and protection of forests, including environmental and ecological considerations. It also includes forest products R&D such as production runs in mills, but not work on final product development (e.g. furniture production). This indicator is closely aligned to 6.2b, which monitors the investment in, and the adoption of, new or improved technologies in forest management and in forest-based industries.

*National capacity for Australian forestry R&D*

While research is fundamental to supporting development and improvement in all aspects of forest management, production and sustainability, several recent publications have highlighted the significant decline in national forestry R&D capacity and capability (Kile et al. 2014; Turner & Lambert 2015). Reasons for the reduction in funding for R&D associated with commercial forestry include the declining relative contribution of the forest industry to the national economy, reduced government involvement in the forestry industry, corporate restructuring and increased international ownership.

Resource allocation for research priorities in nature conservation reserves is generally funded by state-based agencies or through universities that have received project grants, with specific and targeted interests focused on biodiversity and conservation issues. State conservation agencies are frequently being restructured and forced to have a greater reliance on securing competitive external funding.

Forest products research is broadly considered in terms of utilisation of products from forests (i.e. primary processing, pulp and paper, engineered wood products, bioenergy). National R&D capacity in this area has also declined, notably with the demise of the contribution of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to wood products research. While there has been a decline in forestry R&D by government agencies, a small number of new university-based forestry and/or forest products research centres have recently been established, for example, the Forest Industries Research Centre at the University of the Sunshine Coast and the National Centre for Future Forest Industries at the University of Tasmania established under the National Institute for Forest Products Innovation.

Nationally, the number of staff (scientists, technicians, support staff and graduate students) involved in forestry and products research was about 276 in 2013 compared with 794 in the mid-1980s (Turner & Lambert 2015).

*Victorian capacity for forestry R&D associated with State forests*

DELWP has designed its current research program to develop improved capacity and evidence base to manage impacts of fire (natural and managed), climate variability and forest management regimes on water quantity and quality, biodiversity values, carbon assets and other social and economic values. It will also investigate the vulnerability and resilience of Victoria’s public forests. It will do this through:

* applying an integrated understanding of multiple forest values for adaptive forest management
* investigating the effects of fire, climate and management on the vulnerability and resilience of Victorian forests
* understanding and managing Victoria’s forest carbon
* assessing water security from Victoria’s forested catchments in the face of climate variability/climate change and fire
* understanding interactions between fire, landscape pattern and biodiversity; and
* assessing social, economic and community safety values of forests in fire-prone landscapes.

Between 2006–7 and 2011–12, the Victorian Government invested approximately $29 million in forest-related research, development and education (an average of $4.8 million per year) (DEPI 2014d). The number of forest researchers employed by the Victorian Government fell from 21.9 FTE in 2011–12 to 17.9 in 2015–16. Research in Victoria is focused on native forests, with an emphasis on fire ecology, fauna ecology and sustainable forest management. Staff conducting research are employed by DELWP, ARI and VicForests (Commissioner for Environmental Sustainability Victoria 2019).

ARI is an applied ecological research centre with an emphasis on plants, animals and biodiversity issues. ARI is the Victorian Government’s ecological research institute and is a branch within the Biodiversity Division and Energy, Environment and Climate Change Group of DELWP.

*Victorian capacity for forestry R&D associated with national parks and reserves*

Parks Victoria manages national parks and reserves on behalf of the Victorian Government. It has established a collaborative research program known as the Parks Victoria Research Partners Program (RPP). The RPP includes a formal panel of 10 university and other research organisations, plus other informal research associations that bring together park managers and scientists to undertake applied research that addresses park management problems and improves understanding of environmental and social park management issues.

Since 2010 the RPP has completed or commenced around 140 partnership projects. These include being a partner/collaborator on 13 Australian Research Council Linkage projects. Each one dollar of Parks Victoria’s research funding has leveraged more than six dollars of additional funding. Many of these research projects involve land management and policy partners from both government and non-government organisations.

The RRP has undertaken a number of actions to address environmental issues, including:

* monitoring the existing and potential distribution and management of weeds, introduced predators and introduced herbivores
* identifying key habitats for threatened flora and fauna
* improving understanding of fire ecology requirements (in partnership with DELWP)
* better understanding the diet and impacts of native and introduced herbivores
* better understanding coastal and catchment processes
* mitigating impacts of pathogens
* managing the impacts of overabundant native fauna
* improving habitats for native flora and fauna (such as ecological thinning)
* marine habitat mapping
* collating inventory of flora, fauna and habitat to guide management planning.

It has also tackled social science questions such as testing of new spatial technology for community involvement in park planning and developing tools to measure visitor and community benefits of parks and assessment of visitor impacts.

*Forestry R&D within Victorian universities*

Research relating to forests and forestry which is funded by the Victorian Government is carried out by, and in collaboration with, a number of research agencies, universities and CRCs. These include: ARI, the CSIRO, the University of Melbourne, the Australian National University, La Trobe University, the University of Ballarat and various CRCs including the eWater CRC, Bushfire and Natural Hazards CRC and the CRC for Forestry.

Research has continued on all themes and priorities listed in the Victorian RFAs. The importance of ESFM and the development of appropriate mechanisms to monitor and continually improve management practices have remained central to the research carried out in Victoria. In addition to the themes listed in the RFAs, research has also continued on issues relating to climate change and carbon sequestration.

DELWP’s investment in R&D has a positive contribution to employment, with 26.3 FTE academics working in forest research and development in Victoria. The Integrated Forest and Ecosystem Research program at the University of Melbourne and the Bushfire and Natural Hazards CRC are examples of such research initiatives which focus on forest hydrology, fire behaviour, fire ecology, sustainable forest management and forest health (Commissioner for Environmental Sustainability Victoria 2019).

Wherever possible, reports are made publicly available and articles may also be published in peer-reviewed journals.

**Indicator 3.1a: Scale and impact of agents and processes affecting forest health and vitality**

This indicator identifies the scale and impact of forest health on a variety of processes and agents, both natural and human-induced. Through the regular collection of this information, significant changes to the health and vitality of forest ecosystems can be monitored and measured.

Operational aspects of this indicator involve maintaining Victoria’s forest ecosystem health and vitality through pest and weed monitoring and control, including insect pests, invertebrate pests and fungal diseases. Such practice follows the principles of ESFM, which requires that forests are managed in an environmentally appropriate, socially beneficial, and economically viable manner, and meet the needs of the present without compromising the needs of future generations (Holvert & Muys 2004, Washburn & Miller 2003).

*Tree canopy condition*

Forest health and vitality are related to a number of natural disturbances, including fire, invasion of non-native species, floods, disease outbreak and climatic events such as windstorms, extreme temperatures and droughts. These disturbances are an important natural process; however, there have been recent shifts in the frequency, scale and intensity of the agents that cause disruption in forest health and vitality (Commissioner for Environmental Sustainability Victoria 2019). Forest health and vitality was not reported in Victoria until the VSOFR 2013.

Forest canopy condition is used globally as an indicator of forest health. In the VSOFR reports, canopy condition is presented by three measures: mortality, crown dieback and defoliation (Table ).

Table 118: Canopy condition of Victorian forests

|  |  |  |
| --- | --- | --- |
| Canopy condition | 2013 (per cent) | 2018 (per cent) |
| Tree mortality | 19.5 | 14.3 |
| Crown dieback | 23.7 | 20.3 |
| Defoliation | 18.2 | 23.3 |

It is difficult to identify significant differences between bioregions and between parks, reserves and State forests, except for the Victorian Volcanic Plains, where a higher mortality rate was identified in State forests in 2018 (Commissioner for Environmental Sustainability Victoria 2019). Mortality was particularly high in the VSOFR 2013 in the Australian Alps and South Eastern Highlands bioregions, which were recovering from significant bushfires (DEPI 2014d).

**Area of bushfires**

Since the RFAs were signed 20 years ago, Victoria has experienced a number of large-scale bushfire events. Lightning has been responsible for the largest area burned despite being a small percentage of the total number of fire ignitions (DEPI 2014d). Unattended campfires account for a large proportion of the fires reported on public land. The total area affected by bushfire between 2000 and 2017 is shown Figure 63 and Figure 64.



Figure 63: Major bushfires in Victoria 2000–2017



Figure 64: Total area affected by bushfires, 2000–2017

*Climate*

Australia is predicted to experience warmer temperatures, altered rainfall patterns, more-severe droughts, more-intense rain events and more heatwaves over the course of the 21st century (CSIRO 2018; Montréal Process Implementation Group for Australia and NFI Steering Committee 2018)

Forest health and vitality are related to climatic patterns and events, and are affected by rainfall deficit and extreme temperatures which impact mortality, defoliation and withering in trees and understorey vegetation. High temperatures and drought can also augment fire activity, and forests in drought stress are more susceptible to infection and insect invasion.

The Victorian climate has been warming since the 1950s with every year since 2013 among the top-ten warmest on record in Victoria. Both daytime and overnight temperatures have increased in this time.



Figure 65: Victorian mean temperature anomaly, 1910–2017

*Human-induced disturbance*

*Invasive species*

Vertebrate pests include both introduced species that have become introduced and established as wild populations and native species that can be damaging in some situations. Many introduced pest species have colonised large tracts of Australia and Victoria and their impacts have become significant. The adverse effects in forests include preying on or competing with native fauna, providing vectors for pathogens, contributing to soil erosion or spread of weeds and direct damage to plants by browsing, trampling or rubbing.

More than 2,800 exotic plant species are recorded as pests in Australia (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018). Few of these are the subject of widespread control or eradication measures. Data on weed species and control methods in Victoria is limited.

*Insects and pathogens*

Giant pine scale (*Marchaline hellenica*) is a sap-sucking pest that attacks trees in the Pinaceae family, including *Pinus. radiata*. It was first detected in early 2015 in Adelaide and Melbourne. While the Adelaide infestation was successfully eradicated, the Melbourne infestation was larger and unable to eradicate. While it has not been found in any other part of Australia, it poses a risk to Australia and Victoria’s softwood plantation industry.

Psyllids were the most damaging insect pests affecting native forests in 2011–16, particularly causing large-scale defoliation in river red gum (*Eucalyptus camaldulensis*) forests in Victoria. Large outbreaks of cup-moth (*Doratifera* spp.) in Victoria that commenced in 2006–11 abated and forests have recovered well (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018)

The introduced pathogens *Phytophthora cinnamomi* (phytophthora root-rot) and *Austropuccinia psidii* (myrtle rust) are the most damaging diseases in native forests because of the broad suite of highly susceptible species that they affect. Myrtle rust is the most significant pathogen threat to native forests and is now found in much of its predicted climatically optimal range. There are 380 native species known to be hosts of this pathogen (Montréal Process Implementation Group for Australia and NFI Steering Committee 2018). Basic mapping of phytophthora is carried out in Victoria and consists of testing and field surveillance and a risk assessment model developed to help determine the recommended hygiene conditions.

*Planned burns*

Managing forest fuels helps to reduce the amount of fuel available to a bushfire, which can decrease its intensity and rate of spread. In 2010 the Victorian Government committed to expand the area covered by planned burns each year, as a result of the report by the 2009 Victorian Bushfires Royal Commission. In 2016 this approach changed from a hectare-based approach to a risk-based approach for bushfire management. Planned burns aim to fulfil the ecological requirements of flora and fauna and limit the effects of large-scale bushfires.

**Indicator 5.1a: Contribution of forest ecosystems and forest industries to the global greenhouse gas balance**

Forest ecosystems and forest industries contribute in a number of positive ways to the global greenhouse balance. When forests are managed sustainably, they generate harvested wood products (HWPs) which also play a significant role in the global greenhouse balance, primarily via carbon storage in long-lived products and in landfills, and also by displacing the use of more greenhouse-intensive materials.

However, these interactions between forest ecosystems and/or forest industries and the global greenhouse balance were not as apparent 20 years ago when the RFA was signed, and it has been only since the 2007 United Nations Climate Change Conference in Bali (UNFCCC COP 13) that international negotiations have focused on the role of natural forests in storing carbon (Mackey et al. 2008). The original RFA documents highlighted a number of areas of research to be targeted to improve knowledge. Since then a number of studies have addressed many of the gaps originally identified, including a strong focus on the life cycle of carbon in HWPs. The majority of the forest-based studies have been conducted in production forests (both native and plantations).

Natural forests are more resilient to climate change and disturbances than plantation forests because of their genetic, taxonomic and functional biodiversity (Mackey et al. 2008). The estimation of forest biomass and carbon has improved with the development of species-specific and generic allometric relationships for a number of important tree species (e.g. Keith et al. 2000; Paul et al. 2013, 2014 and 2016; Montagu et al. 2005; Ximenes et al. 2005a, 2005b, 2008, 2018). There is a better understanding also of the longevity of biomass in root systems following tree harvest (Ximenes et al. 2008). Carbon dynamics in forest ecosystems are affected by the impacts of climate change. These may include more-frequent and more severe bushfires, increased incidence of pests and diseases and also changes in growth dynamics due to increased CO2 levels in the atmosphere. The impact of natural disturbances such as bushfires on the greenhouse balance of forest ecosystems in Victoria may lead to large emission pulses for a particular year. However, these emissions are typically offset over time by the carbon sequestered when the burnt forests regrow.

When forests are managed for production, a large proportion of the biomass is left in the forests as residues. The carbon dynamics of HWPs has been the focus of a number of studies that have significantly improved knowledge of the role wood products play in climate change mitigation efforts, including carbon flows in sawmills, product substitution impacts and the fate of carbon in HWPs in landfill (Ximenes et al. 2015, 2016, 2017). These studies have highlighted the importance of understanding the carbon implications of the use of HWPs – addressing one of the key gaps identified in the original RFAs. For example, it is widely accepted now that HWPs in landfills represent a carbon reservoir, with minimal likely loss of carbon. This understanding has been reflected in the progressive change in the decay factor adopted in the national greenhouse gas inventory, from 50 per cent in 2006 to 10 per cent in 2016 (DOEE 2017).

Given the complex nature of the carbon dynamics in forests and HWPs, it is important to adopt a life-cycle-assessment approach in their assessment, taking into account what the atmosphere actually sees (i.e. actual flows and uptakes of greenhouse gases). This approach is typified by a life-cycle assessment conducted for typical houses built in Sydney (Ximenes and Grant 2013), which analysed the greenhouse gas implications of an increase in the use of HWPs in the residential sector. It has also been adopted in studies of the greenhouse balance of native forest management (Ximenes et al. 2016). Ximenes et al. (2016) quantified the greenhouse gas impact of a range of different alternative scenarios related to the management of native forests in New South Wales and Victoria, with greenhouse gas benefits associated with most of the scenarios analysed.

There is insufficient, systematic data available that can be used to estimate the total contribution of forest ecosystems and forest industries in the RFA regions and Victoria as a whole to the global greenhouse balance consistently since 1999. However, Victoria models biomass in the native forests in parks, reserves and State forests. The VSOFR 2018 estimates the average carbon per hectares across forest lands ranging between 33 to 334 tonnes per hectare.

Total carbon stored in forests and harvested wood products in Victoria from 2001 to 2016 is shown in Table . With the exception of Flinders, total carbon per hectare is 40 per cent higher on average in State forests than in parks and reserves, due to larger total plant biomass on State forests. The higher prevalence of old-growth trees restricted for harvest in State forests relative to younger stands may contribute to better carbon storage (Commissioner for Environmental Sustainability Victoria 2019). The following factors also play a role:

* Parks and reserves often contain non-forest areas (e.g. the Australian Alps bioregion includes areas above the tree line).
* State forests are managed to achieve higher stocking rates.
* Carbon from large dead trees in the Australian Alps reserves is higher comparative to the rest of the bioregions because of fires in 2003, 2007 and 2009 producing at least two times more carbon from large dead trees than in other bioregions.

Table 119: Total carbon stored in forests and harvested wood products in Victoria, 2016

|  |  |
| --- | --- |
| Forest category | 2016 (Mt) |
| Native forests |  |
| Non-production native forests | 1,661 |
| Production native forests | 279 |
| *Total native forests* | *1940* |
| Other forests |  |
| Post 1990 environmental plantings | 2 |
| *Total other forests* | *2* |
| Plantations |  |
| Softwood plantations | 33 |
| Hardwood plantations | 33 |
| *Total plantations* | *66* |
| **Forests total** | **2008** |
| Harvested wood products |  |
| Wood products in use | 23 |
| Wood products in landfill | 11 |
| *Harvested wood products total* | *34* |
| **Total forests and harvested wood products** | **2042** |

Source: ASOFR 2018

In 2017 the Victorian Government’s *Climate Change Act 2017* established a target of net-zero greenhouse gas emissions by 2050. The Act also requires five-yearly interim emissions reduction targets to meet the long-term target. The forest sector is a net sink of carbon emissions, except in years of major bushfire (Figure 66) (e.g. 2003, 2007 and 2009). Carbon is primarily sequestered by afforestation and reforestation (including post-harvest regrowth), and sequestration from forest management has increased since 2011 due to vegetation projects funded by the ERF. In 2016, about 10 per cent of total carbon emissions were sequestered by forest-related activities (afforestation, reforestation, forest management and revegetation). Many of the forest management options proposed internationally are already being implemented in public forests in Victoria. Where actions are not being implemented it is due to technical, economic, social or scientific challenges (Keenan & Nitschke 2016).



Figure 66: GHG inventory (carbon dioxide) trend by sector in Victoria, 1990–2016

Data source: Australian Government, Australian Greenhouse Emissions Information System

In the future, it is likely that, due to increased temperatures and extended droughts, the number of high fire danger days will increase, thus increasing the frequency and/or intensity of bushfires. This will depend on fuel loads, future wind patterns and topography. The number of days of high or extreme fire danger ratings are likely to increase by 4–25 per cent by 2020 and 15–70 per cent by 2050, with higher fire danger in spring, summer and autumn that will shift any periods suitable for fuel reduction burning into winter (Keenan & Nitschke 2016).

*Current research*

Through the Integrated Forest and Ecosystem Research Agreement with the University of Melbourne, Victoria is investing in research for ‘Understanding and managing Victoria’s forest carbon’. Temperate forests like those in Victoria are an important component of the global forest carbon sink and Australia has made international commitments to report anthropogenic changes in that sink in line with efforts to mitigate climate change. Therefore, it is important that we understand the size of our forest carbon assets (i.e. how much carbon is stored), how resilient those assets are to emerging fire and climate regimes and how risks to carbon assets can best be identified and managed. This project aims to address key knowledge gaps relevant to the estimation of the largest carbon assets (live trees and soil) and the resilience of those assets to changing climate and fire regimes. These data and relationships will be integrated into a carbon-modelling framework, which will be used to identify risks and opportunities in forest carbon management.

Through the RFA assessment process Victoria is undertaking an economic assessment of the current benefits of Victoria’s forests, which will include valuation of the benefits of climate change mitigation through carbon sequestration and storage. The project will use an environmental-economic accounting framework to identify and describe ecosystem services produced by Victorian forests, and value the benefits they provide to people. This will include determining the quantity of carbon stored in Victorian forests and how this has changed over time. Researchers will model and map this across Victoria by RFA region and apply economic valuation techniques to calculate the monetary value of the benefits carbon storage provides people in Victoria and globally.

*Emissions Reduction Fund: plantations*

Plantations can also contribute significantly to the global net greenhouse emissions via additional carbon sequestration, especially if planted in lands that have been previously cleared for another use.

The Emissions Reduction Fund (ERF) is one of the Australian Government’s key mechanisms to achieve its greenhouse gas emission abatement targets. The ERF rewards abatement in a number of industry sectors using specific methods, and in 2017 a new method was approved to reward carbon abatement in new plantation establishment (under certain conditions) and also in conversion from short to long-rotation plantations.

The plantation method presents an opportunity for plantations to obtain credits for carbon abatement. Projects in areas with greater than 600 mm average rainfall are ineligible, unless they fit within certain exemptions. This ‘water rule’ seeks to manage the impact that plantations have on water availability. Industry claims that challenges in meeting exemptions to the water rule constrain access to carbon credits for plantation projects. As part of its September 2018 National Forest Industries Plan, the Commonwealth Government committed to review the water rule.

**Summary of future management of the principles of ecologically sustainable forest management**

The Australian and Victorian governments (the Parties) had regard to CRAs and the principles of ESFM of forests in the development of the Victorian RFAs. In the five Victorian RFAs, the Parties have agreed that ESFM is an objective which requires a long-term commitment to continuous improvement and that the key elements for achieving it are: the establishment of a CAR reserve system; the development of internationally competitive forest products industries; and integrated, complementary and strategic forest management systems capable of responding to new information. These three elements have been delivered and are being maintained and enhanced where possible in the modernised Victorian RFAs. This chapter has provided a further assessment of the ecologically sustainable management of forests in the Victorian RFA regions.

Victoria’s forest management system is implemented by an institutional and regulatory system that is adaptable to changing circumstances. Victoria’s legal and institutional framework is complex, but Victoria has committed to streamlining and simplifying this framework. It established an Office of the Conservation Regulator, and details of this can be found online.[[7]](#footnote-7) Victoria is currently also undertaking a review of its forest management system that will ensure that it remains contemporary, fit for purpose and reflects modern management priorities.

The Victorian RFAs implement an extensive CAR reserve system for the conservation of forest and non-forest vegetation communities in perpetuity. They also ensure that ESFM on the public and private estate is practised, providing for wood and non-wood products for industry development, as well as ecosystem services and other societal benefits.

Research and development capacity in forestry has decreased over the last 20 years in Australia (Turner & Lambert 2015). The Australian Government continues to fund forestry research through contributions to Forest and Wood Products Australia and the National Institute for Forest Products Innovation. The Victorian Government funds forestry research internally through ARI, plus through partnerships with a number of Victorian universities and research organisations.

Research on climate change and carbon dynamics in forests has greatly improved our understanding of forests’ contribution to global carbon cycles since the signing of the Victorian RFAs. Forests in the Victorian RFA regions will continue to be impacted by climate change, which may include more frequent and severe droughts and bushfires, increased incidence of pests and diseases and changes to growth dynamics.

Plantations can also contribute significantly to the global greenhouse balance via additional carbon sequestration, especially if planted on lands that have been previously cleared for another land use or by converting existing short-rotation plantations to long rotations. There are also opportunities for ERF payments for these actions into the future.

ESFM is an objective which requires a long-term commitment to continuous improvement. The extended Victorian RFAs will continue to provide for ESFM in the Victorian RFA regions. The Victorian RFAs will continue to commit the Parties to the key elements of ESFM, including the maintenance of the CAR reserve system and an integrated, complementary and strategic forest management system capable of responding to new information.

1. Core values are what is important in people’s life, such as valuing the biosphere, social justice or tradition. These deeply held values help to explain why people value particular attributes of entities. [↑](#footnote-ref-1)
2. Valued entities are tangible landscape elements that can be mapped and managed. [↑](#footnote-ref-2)
3. Valued Attributes are qualities of entities that help explain why they are important to people. [↑](#footnote-ref-3)
4. See the Harvester Case and Higgins ruling; [https://en.wikipedia.org/wiki/Harvester\_case#](https://en.wikipedia.org/wiki/Harvester_case) [↑](#footnote-ref-4)
5. (<https://www2.delwp.vic.gov.au/futureforests/about/about>) [↑](#footnote-ref-5)
6. Prior to 2005 effects of the economic framework on sustainable forest management were reported under indicators which were then enumerated as 7.3a and 7.3b. [↑](#footnote-ref-6)
7. DELWP Office of the Conservation Regulator https://www2.delwp.vic.gov.au/our-department/regulator [↑](#footnote-ref-7)