

Threatened Species and Communities Risk Assessment

Interim Protections and Management Actions - April
2021

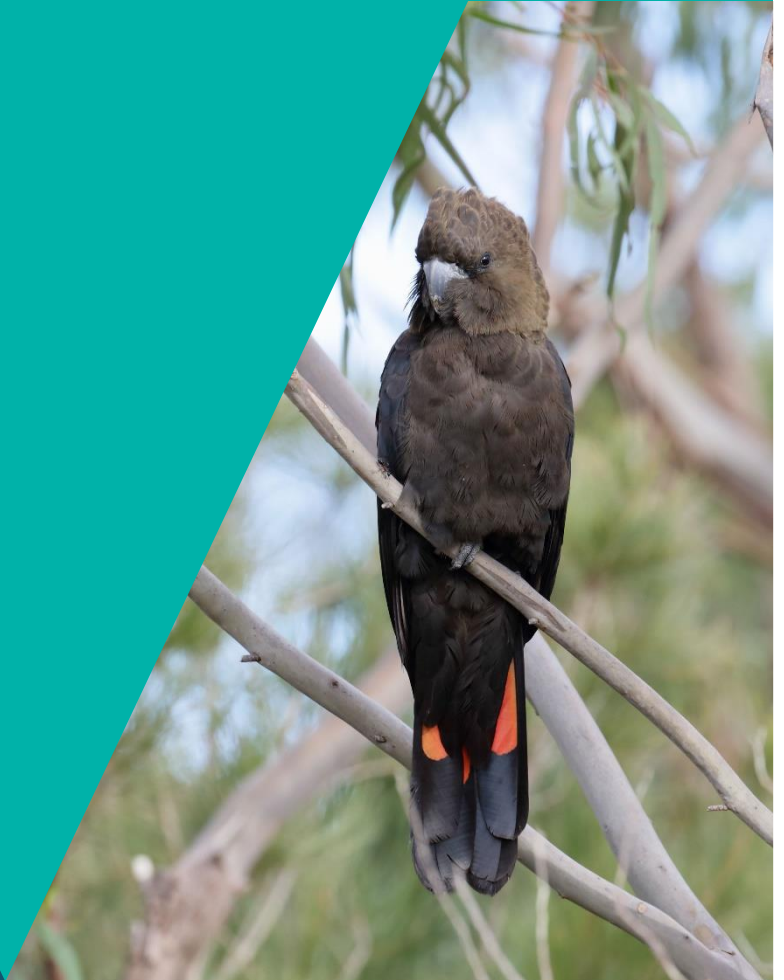


Photo credit: Glossy Black Cockatoo, DELWP.

Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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1. Introduction

The Threatened Species and Communities Risk Assessment (TSCRA) was completed in October 2020, as specified within each of Victoria's renewed Regional Forest Agreements (RFAs). As prescribed in the RFAs, this risk assessment applies to those species or communities that are listed under Part 13 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) or Part 3 of the *Flora and Fauna Guarantee Act 1988* (Victoria), and are, or have the potential to be, impacted by forestry operations. A total of 79 species and communities were assessed, comprising 70 species and nine communities. The relevant RFA clauses set out a timeline for conducting the risk assessment by 1 October 2020, with a requirements to also, where necessary, identify and make reasonable endeavours to implement interim protections. The RFAs include subsequent requirements to use reasonable endeavours to implement, where necessary, permanent protections or changes to the Forest Management System.

The TSCRA report published in December 2020, illustrates that DELWP has implemented many control measures since 1 April 2020, in addition to the range of existing control measures that mitigate and manage risks to threatened species and communities. These measures include the:

- Bushfire Biodiversity Recovery and Response program, which has been further tailored as part of the interim protections process
- Improved management of listed species and communities in emergencies
- Forest Restoration and Reseeding
- Ongoing delivery of Weeds and Pests on Public Land program
- Flora and Fauna Guarantee Act reform
- The Conservation Status Assessment project
- Refining decision support tools
- Victorian Deer Control Strategy implementation
- Curiosity® feral cat bait.

The Conservation Regulator has also ensured the application of the *Code of Practice for Timber Production 2014* in the post-bushfire environment.

However, further improvements and additional interim measures are required for those threatened species and communities at risk of short term harm, particularly as the impacts on biodiversity from the 2019-20 bushfires are better understood.

This report identifies and outlines interim protections to be in place up to April 2022, which has been to focus on identifying which species and communities are at the greatest risk of serious and irreversible environmental damage in the short term, such as those with narrow distribution and at elevated risk due to the 2019-20 bushfire impacts. This includes assessing risk to species or community relative to each RFA region, whereby a species or community may face higher risk in any one particular region over another.

The Action Plan that forms part of this report sets out a suite of interim risk mitigation measures for this priority list species or communities. These measures will remain in place until April 2022, when the species and communities assessed in the 2020 Risk Assessment are evaluated for permanent protections, and consideration is given to the cumulative impacts of multiple hazards in the context of past disturbance, recent events such as the 2019-20 bushfires and likely future disturbance.

Objectives

This risk assessment and delivery of interim protections acquits a central part of Victoria's commitments to threatened species and communities under the modernised RFAs. The National Forest Policy Statement is a foundation of the RFAs and includes the objective of maintaining viable populations of Listed Species and Communities, and the extent and condition forest ecosystems throughout their range. The RFAs sets out that Victoria's Forest Management System provides for the conservation and recovery of Listed Species and Communities (*Clause 25G Central Highlands RFA*).

The initial listing or upgrading of an existing listing of threatened species and communities is a formal signal of elevated conservation concern and the need for action. In the case of this assessment, many of the FFG and EPBC listed items had not been the subject of a recent detailed risk assessment and corresponding review of existing protection measures or management actions. This report and Action Plan identifies and manages immediate risks to Listed Species and Communities in certain RFA regions. Future risk assessments, interim protections, and further assessment of cumulative impacts of hazards will be required for species and communities listed after 1 April 2020.

2. RFA Commitments to Threatened Species and Communities

The modernised RFAs bolster protections for Victoria's unique forest biodiversity and threatened species and communities, including –

- providing for more timely interventions to protect threatened species and communities including plans for their care and protection; and
- identifying and reviewing priorities for research to fill critical knowledge gaps including the effectiveness of protections and management actions and to improve understanding of new and emerging threats to vulnerable species and communities.

For relevant Listed Species and Communities, the RFA commits to –

- undertaking a risk assessment to determine necessary additional interim or permanent protections and management actions within six months of a species or community being listed or signing of an RFA;
- where necessary, use reasonable endeavours to implement interim enforceable protections and priority management actions within six months of a species or community being listed or signing of an RFA;
- where necessary, use reasonable endeavours to implement permanent protections within 24 months of a species or community being listed or signing of an RFA;
- use reasonable endeavours to include any protections or management actions implemented in any new or updated Victorian Statutory Conservation Planning Documents
- undertake a review of legislation and subordinate instruments to identify any measures or improvements the Victoria's Forest Management System to strengthen protections by December 2022.

RFA requirement for interim protections

Following the completion of a risk assessment for listed species and communities, the modernised Victorian RFAs require reasonable endeavours are made to where necessary implement interim enforceable protections and priority management actions for listed species and communities present in an RFA region. To acquit the RFA obligation, any necessary interim protections or management actions will be implemented by April 2021 (deferred from 1 October 2020 and approved by Minister for Environment, Energy and Climate Change).

The Threatened Species & Communities Risk Assessment RFA clause (25K.)¹

Where:

- i. a Listed Species or Community is present in the Central Highlands RFA Region; or*
- ii. there is a change in the conservation status of a Listed Species or Community present in the Central Highlands RFA Region,*

Victoria will, having regard to relevant Commonwealth Statutory Conservation Planning Documents:

- (a) undertake a risk assessment within six months from each Relevant Date and determine whether additional interim or permanent protections and management actions are necessary;*
- (b) where necessary, use reasonable endeavours to implement interim enforceable protections and priority management actions for the Listed Species or Community within six months from each Relevant Date;*

1. Example of relevant clause taken from the Central Highlands RFA.

(c) *where necessary, use reasonable endeavours to implement permanent protections and any other changes to the Forest Management System required for the Listed Species or Community within 24 months from each Relevant Date; and*

(d) *use reasonable endeavours to include any protections or management actions implemented pursuant to sub-paragraphs (b) or (c) in any new or updated Victorian Statutory Conservation Planning Documents.*

*In this clause, **Relevant Date** means each of the following:*

- i. 1 April 2020;*
- ii. the date of listing, where that date postdates 1 April 2020; and*
- iii. the date of any change in the conservation status where that date postdates 1 April 2020.*

3. Threatened Species and Communities Risk Assessment

The risk assessment was completed in October 2020 and is now publicly available on the DELWP website at <https://www.environment.vic.gov.au/conserving-threatened-species/threatened-species-and-communities-risk-assessment>. The assessment covers species and communities listed at the point at which the RFAs were signed on 31 March 2020. Ongoing risk assessment will be required to consider actions for newly listed species or communities. This will occur over the course of 2021 and when necessary in the future as part of a broader program of works. Further work is also needed to consider the cumulative impact of identified hazards and will be considered as part of the next steps for threatened risk assessment.

Risk assessment outcomes

The risk assessment identified 79 listed species and communities that are, or have the potential to be, impacted by forestry operations, and included the evaluation of risk posed to each species or community from a range of hazards with a long-term lens (~20 years). Pest plants and animals and inappropriate fire regimes posed high or significant risk to the greatest number of species and communities (60 and 55 respectively). “Forestry operations” were assessed to pose a significant or high risk for 23 species and communities based on an assessment of the effectiveness of existing control measures for these species and communities with respect to forestry operations. This rating of significant or high risk does not translate to “serious or irreversible” harm in the short term, instead described as an overall rating of existing risk control effectiveness or residual risk having considered existing controls for each specific hazard.

In multiple cases, non-forestry hazards posed more significant or higher risks to a greater number of species and communities than forestry operations. The full list of hazards includes:

- Inappropriate fire regimes
- Bushfire management
- Forestry operations
- Pests plants and animals
- Roding and strategic fuel breaks
- Climate change
- Other hazards (e.g. adjacent land use, dams, disease, mining, recreation and infrastructure)

Implementation pathways proposed in the 2020 Risk Assessment

Implementation pathways proposed in the risk assessment report		
Proposed implementation pathways	Reasoning	Examples/recommended options
Adaptive management responses	Adaptive management responses can be applied directly or more generally to improve control effectiveness, reduce or moderate expected harm or decrease the likelihood of harm. Necessarily, they remain adaptive and flexible in the way they can be deployed and responsive to changing information.	application of the Precautionary Principle with respect to timber harvesting operations; development of Biodiversity Response Plans and active management programs; integrated forest and fire management planning and decision-making; data and modelling improvements

Implementation pathways proposed in the risk assessment report		
Proposed implementation pathways	Reasoning	Examples/recommended options
		tailoring forest survey programs to identify extent of critical populations
Targeted responses	Targeted responses are characterised by having a more definitive action, such as the protection of identified habitat areas or specific features through regulatory mechanisms, rather than guiding management approaches.	Minor Amendments to the Forest Management Zoning Scheme under s22 <i>Forests Act 1958</i> ; Critical Habitat Determination under s20 <i>Flora and Fauna Guarantee Act 1988</i>
Ongoing or existing actions	A range ongoing actions will continue to be implemented in the short-to medium term. In the time available it may be possible to tailor some of these more directly based on new information provided from the risk assessment and prioritisation process.	Examples include: Targeted pest plants and animals control programs Science (e.g. Expert elicitation to refine decision support tools, genetic risk assessment, scientific needs assessments) Other active management (e.g. nest boxes, tree hollows, seed collection)

4. Prioritisation Process and Rationale

Approach to prioritising species and communities for interim protection

Following the 2020 Risk Assessment, further prioritisation of the significant or high risk-rated species and communities was completed through spatial analysis, literature review, interviews with scientific experts and updates from scientists conducting field reconnaissance following the 2019-20 bushfires. This additional research identified 32 species and communities, of the 79, at the greatest risk of serious or irreversible environmental damage in the short term. This priority list is the focus of the identified interim enforceable protections and priority management actions. As stipulated in the RFAs, it only includes species and communities that are both listed and have the potential to be impacted by forestry operations. Species and communities at high or significant risk from forestry operations were identified for measures to address risks from forestry operations.

Prioritisation process

There are two key themes in assessing the need to prioritise a species or community: an assessment of the 'situation risk' followed by an assessment of the hazard as it relates to the species or community (see **Figure 1. Diagram of species and communities prioritisation process**). As indicated above, the complex issue of cumulative impacts will be considered as a next step.

Situation risk

Situation risk considers the distribution of the species or community, the extent to which it was impacted by the 2019-20 fires, and expert advice where quantifiable data is lacking or there is a specific ecological attribute of the species or community which makes it particularly vulnerable. A species or community can be ranked of concern here where it is range restricted and ecological traits and location of distribution make it at risk in the short term; alternatively, it could be a widely distributed species but have had a significant proportion of habitat in a specific region burned in the 2019-20 bushfires, which may compromise the persistence and recovery of that species in that specific region. Where these data are not available, expert advice can supplement this information. Where species or communities are identified in this stage of being of risk, then they proceed to the 'hazard assessment' stage.

Hazard assessment

In this process, a species or community is then considered for whether there is an actual risk being posed by the hazard. Firstly, there must be scientific and credible evidence that the hazard directly or indirectly impacts the species or community. This may be represented by scientific evidence indicating the hazard has a negative impact on the species or community. There is then an evaluation of the extent of hazard impact on the species or community via spatial analysis. For species and communities at high or significant risk from forestry operations, exposure to forestry operations is considered in terms of the extent of the species' or community's likely habitat (based on a habitat distribution model) that intersects with the area of State Forest where timber harvesting is likely to occur; this information is supplemented where available with information on the extent of important populations exposed to the net harvest area. Where data is lacking, expert advice can be used to assess the current controls – e.g. prescriptions – for their effectiveness and thus the risk of the hazard.

Where both the species situation risk and the hazard assessment indicates the species is at risk, then the species is prioritised for further consideration of interim protections. The prioritised species and communities, and associated hazards are outlined in Section 6 – Action Plan, noting that there are 16 species across all RFAs which are identified at high or significant risk from the forestry operation hazard. A full list of data and knowledge used in the prioritisation process is at Appendix A – Knowledge and Data.

Prioritisation Process – assessing risk of serious or irreversible harm from hazards within a RFA region

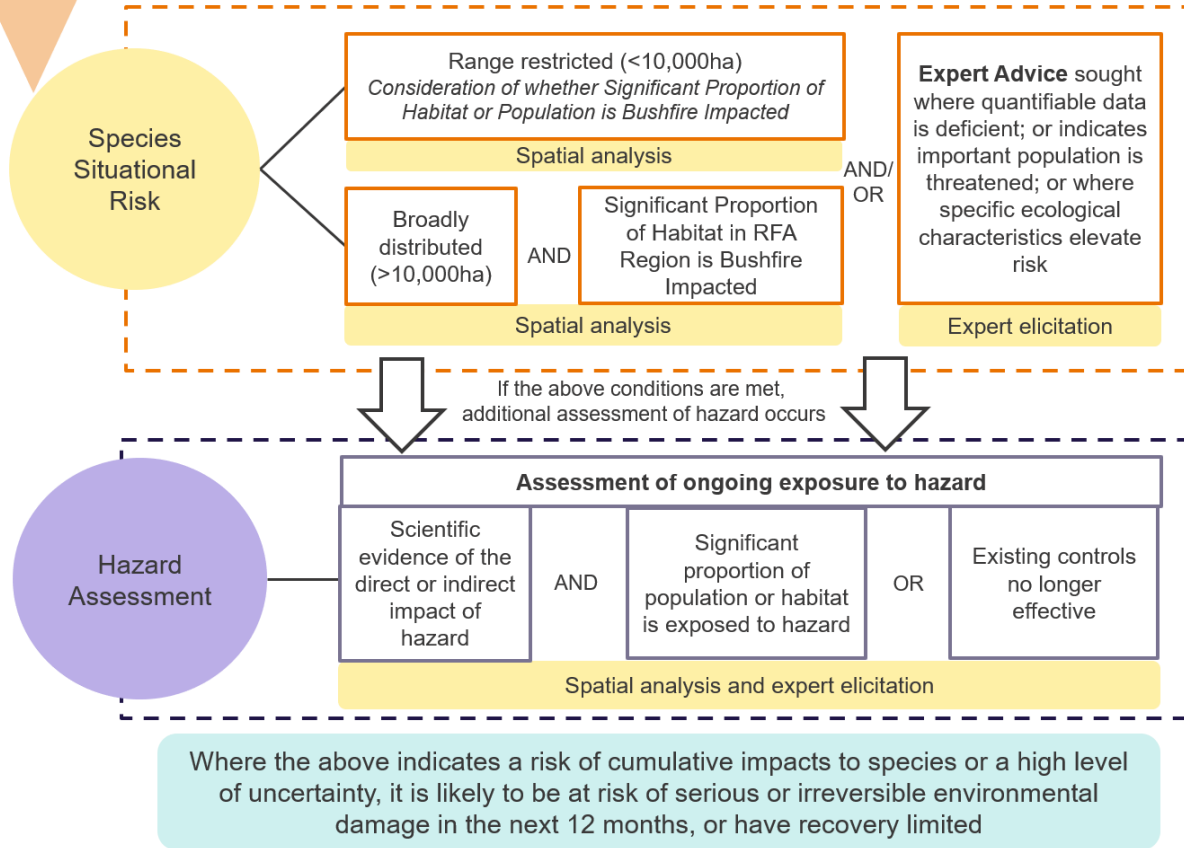


Figure 1. Diagram of species and communities prioritisation process

5. Interim protections and priority management actions

Determining what interim protections and actions are required

The relevant RFA clause includes elements that guide the determination of the program of interim protections and priority management actions to fulfil the RFA requirements. These must be:

- necessary;
- interim enforceable protections or priority management actions; and
- able to be achieved by reasonable endeavours.

Necessary

To be necessary the proposed interim protection or management action must:

- Apply to a listed species or community identified by the 2020 Risk Assessment as at potential risk from forestry operations and prioritised through subsequent analysis as being at risk of serious or irreversible harm in the short term if action is not taken to address one or more threats;
- Be relevant to the most serious identified hazard(s) or threat(s) for that species or community over the short term and have the potential to prevent serious or irreversible harm from occurring;
- Be backed by scientific literature and spatial analysis as part of the risk assessment and prioritisation process to quantify both the extent of the threat and the area relevant to the proposed mitigations.
- Be feasible to implement and have proven benefit as an effective control over the short term; have low or no risk of disbenefits to the environment (e.g. no maladaptation).

The prioritised list of species and communities identified interim enforceable protections or priority management actions that are necessary in the short term to prevent serious or irreversible harm.

Interim enforceable protections

Interim enforceable protections are:

- Tools such as regulatory or legislative measures that can be legally enforced on forestry operations but do not have the same enforceable application on other hazards, e.g. conduct of fuel reduction burning.
- Not from the outset permanent and are generally implemented as an action with minimal procedural requirements to address urgent and critical needs.
- Interventions that prevent immediate serious or irreversible harm to prioritised species and communities from identified hazards.

The 2020 Risk Assessment considered the following approaches for interim enforceable protections:

- application of the Precautionary Principle with respect to timber harvesting operations
- targeted zoning actions, including Minor Amendments to the Forest Management Zoning Scheme under s22 *Forests Act 1958* (e.g. creation of a Special Management Zone with management conditions), or amendments to fire management zoning under the Code of Practice for Bushfire Management on Public Land 2012;
- Critical Habitat Determination under s20 *Flora and Fauna Guarantee Act 1988* – Secretary determines area of critical habitat (s 20A-20F and s 26-42). Enforcement of protection of critical habitat is provided by Habitat Conservation Orders, which is an additional process.

Use of Critical Habitat Determination was assessed as not feasible due to the process and timelines involved but will be considered for future use where appropriate.

Priority management actions

A priority management action is an urgent, no regrets undertaking that can address critical risks or prevent serious or irreversible harm (e.g. targeted pest control programs). The risk assessment and additional analysis may recommend that a management action is a priority for a certain area or timeframe. Alternatively, there may be existing management actions in place that already mitigate the risks identified to threatened species and communities that it are necessary to augment and tailor to be more effective.

Priority management actions include:

- Actions that are not intended to be enforceable
- Active management of hazards and the collation of research and traditional ecological knowledge (e.g. pest plant and animal control, translocation, gene mixing, improved value mapping).
- Interventions designed to prevent serious or irreversible harm to a species or community from a hazard identified by the risk assessment and prioritisation.
- Tailoring of “ongoing” mitigation measures where results are assessed over the longer term. They are likely to need to remain in place until the hazard subsides and often resource intensive and field based.
- Active management actions that aim to achieve a net improvement in the outlook for native species or communities through an improvement in suitable habitat and the active management of threats.

The RFAs recognise the vital role that active management of threats to listed species and communities plays in achieving the objectives of the RFAs. The Victorian Government has committed to active management of state forests, including through proactive measures such as pest and weed control; use of silviculture practices to improve forest structure and condition; revegetation of priority areas.

Management actions (including priority management actions) can be embedded in adaptive management response options proposed in the risk assessment. Potential mechanisms for embedding these include improvements to the values checking process (to identify values and apply appropriate mitigations), changes to standard operating procedures, development of guidelines etc.

Summary table of the protection or management actions recommended as part of this report

		RFA Region				
		East Gippsland	Gippsland	Central Highlands	North East	West Victoria
Protection or Management Actions	Active management (e.g. pest control)	19	8	1	2	1
	Research (incl. important population mapping and feasibility studies)	17	8	1	1	1
	Tailored adaptive responses (part of VicForests’ precautionary principle approach – see note below)	7	1	-	-	-
	Targeted zoning amendments	6	4	-	-	-
	Procedures and guidelines (incl. values checking)	6	3	-	-	-
	Pre-harvest surveys	3	1	-	-	-

Note: these refer to measures undertaken by VicForests as part of their current approach to the acquittal of responsibilities under the Precautionary Principle. The assessment undertaken by Biodiversity Division determined that the actions proposed are appropriate and proportionate management actions to mitigate the risk of serious or irreversible damage from timber harvesting over the next 12 months.

6. Action Plan

Generally, the actions described in this section are *interim* from implementation until April 2022.

East Gippsland RFA

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Amphibians					
Giant Burrowing Frog	Forestry Operations	Special Management Zoning for important populations: In specific sub-catchments where existing breeding locations are known or in proximity, Special Management Zones will be utilised to mitigate risk from timber harvesting; the management actions associated with these zones will be in effect until April 2022.	Zoning Amendment	Merremingga State Forest, Bruthen Cluster	<ul style="list-style-type: none"> Important populations (Bushfire Biodiversity Response and Recovery Program) and catchment mapping (Biodiversity Division)
	Inappropriate Fire Regimes*	Important population and catchment mapping	Bushfire Biodiversity Response and Recovery Program	Sub-catchment Important population	<ul style="list-style-type: none"> <i>Ex situ</i> population –collection and husbandry of GBF tadpoles (Zoos Victoria)
	Pest Plants and Animals	Deer, fox, cat and pig control	Southern Ark program, (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program) Zoos Victoria Fighting Extinction GBF project	Known breeding locations as at March 2021	<ul style="list-style-type: none"> Fox Control – Southern Ark (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program²) Large herbivore control (Bushfire Biodiversity Response and Recovery Program) GBF not a target species however expected benefits, conduct further analysis and feasibility assessments to target control in known important populations (additional funding may be required)

² The Bushfire Biodiversity Response and Recovery Program is funded by a range of sources, including: Biodiversity Bushfire Relief and Early Response (Victorian Government), Bushfire Recovery Victoria (Victorian Government), Bushfire Recovery for Wildlife and Habitat (Australian Government)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Large Brown Tree Frog	Forestry Operations	Pre-harvest surveys; Apply a 20m buffer to waterbodies away from streams that may be potential breeding sites; Protect buffers from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high quality habitat or catchment buffer polygon; East Gippsland RFA	
	Inappropriate Fire Regimes*	<i>In situ</i> artificial breeding sites Genetic Analysis and action prioritisation, scoping options for translocation	Bushfire Biodiversity Response and Recovery Program		<ul style="list-style-type: none"> Genetic Analysis and action prioritisation (Bushfire Biodiversity Response and Recovery Program) <i>In situ</i> artificial breeding sites (Bushfire Biodiversity Response and Recovery Program)
	Roading and Strategic Fuel Breaks	Update values checking processes for road planning and construction; improve important populations mapping	Values Checking Program, Forest and Fire Management Planning Unit		<ul style="list-style-type: none"> Values Checking Program (DELWP)
Aquatics					
East Gippsland Galaxias	Forestry operations	Special Management Zones will be used to mitigate risk from timber harvesting in specific catchments, with the management actions associated with these zones being in effect until April 2022.	Zoning Amendment	Mapped priority catchments for the specific species	
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the specific species	

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Climate Change	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program)
	Inappropriate Fire Regimes*	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)
	Pest Plants and Animals	Trout management and large herbivore control (incl. aerial shooting)	Bushfire Response and Recovery funding	Mapped priority catchments for the specific species	<ul style="list-style-type: none"> Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program) Conduct further analysis for coverage for increased targeting of Roundsnout galaxias catchments (additional funding may be required)
Mallacoota Burrowing Crayfish	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the specific species	
	Climate Change	Crayfish taxonomy study	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Saving the Spynys: urgent actions to conserve the Euastacus freshwater crayfish (Australian Government Wildlife and Habitat Bushfire Recovery Grant Program)
	Inappropriate Fire Regimes*	Crayfish taxonomy study	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		
	Pest Plants and Animals	Trout management and large herbivore control (incl. aerial shooting)	Bushfire Response and Recovery funding	Mapped priority catchments for the specific species	<ul style="list-style-type: none"> Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
					<ul style="list-style-type: none"> Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program)
McDowall's Galaxias	Inappropriate Fire Regimes*	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)
	Climate Change	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program)
	Pest Plants and Animals	Trout management and large herbivore control (incl. aerial shooting)	Bushfire Response and Recovery funding	Mapped priority catchments for the specific species	<ul style="list-style-type: none"> Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program)
Orbost Spiny Crayfish	Forestry operations	Special Management Zones will be used to mitigate risk from timber harvesting in specific catchments, with the management actions associated with these zones being in effect until April 2022.	Zoning Amendment	Mapped priority catchments for the specific species	
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the specific species	
	Climate Change	Crayfish taxonomy study	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Saving the Spiny's: urgent actions to conserve the Euastacus freshwater crayfish (Australian Government Wildlife and Habitat Bushfire Recovery Grant Program)
	Inappropriate Fire Regimes*	Crayfish taxonomy study	Bushfire Biodiversity Response and Recovery Program ,		

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
			Commonwealth Government Funding		
	Pest Plants and Animals	Trout management and large herbivore control (incl. aerial shooting)	Bushfire Response and Recovery funding	Mapped priority catchments for the specific species	<ul style="list-style-type: none"> Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program)
Roundsnout Galaxias	Inappropriate Fire Regimes*	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)
	Climate Change	Galaxiid Genetic analysis and action prioritisation, Galaxiid risk management and population management assessments	Bushfire Biodiversity Response and Recovery Program , Commonwealth Government Funding		<ul style="list-style-type: none"> Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program)
	Pest Plants and Animals	Trout management and large herbivore control (incl. aerial shooting)	Bushfire Response and Recovery funding	Mapped priority catchments for the specific species	<ul style="list-style-type: none"> Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program) Conduct further analysis for coverage for increased targeting of Roundsnout galaxias catchments (additional funding may be required)
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the specific species	

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Birds					
Glossy Black-Cockatoo	Forestry operations	Tailored Adaptive Protections: Pre-harvest surveys; Protect mature stands of Black She-oak from harvesting and regeneration activities. Retain undisturbed habitat patches containing hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high quality habitat or catchment buffer polygon	
	Bushfire Management	Update values checking processes for burn planning to limit crown scorch on Black she-oak	Values Checking Program, Forest and Fire Management Planning Unit	Modelled high-quality habitat	<ul style="list-style-type: none"> • Values Checking Program (DELWP)
Masked Owl	Forestry Operations	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high-quality habitat or catchment buffer polygon	
	Inappropriate Fire Regimes*	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)		

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Bushfire Management	Review mitigations and values checking processes	Values Checking Program, Forest and Fire Management Planning Unit	Mapped high-quality habitat	<ul style="list-style-type: none"> Values Checking Program (DELWP)
	Pest Plants and Animals	Deer control	Bushfire Biodiversity Response and Recovery Program	Non-target species but coverage across parts of EG range	<ul style="list-style-type: none"> Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program) Masked Owl non-target species with expected benefits, conduct further analysis to target herbivore control in known important populations (additional funding may be required)
Powerful Owl	Forestry Operations	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high-quality habitat or catchment buffer polygon	
	Inappropriate Fire Regimes*	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)		
	Bushfire Management	Review mitigations and values checking processes	Values Checking Program, Forest and Fire Management Planning Unit	Mapped high-quality habitat	<ul style="list-style-type: none"> Values Checking Program (DELWP)
Sooty Owl	Forestry Operations	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high-quality habitat or catchment buffer polygon	

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Inappropriate Fire Regimes*	Tailored Adaptive Protections: Retain undisturbed habitat patches containing dense understorey and hollow-bearing trees within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)		
	Pest Plants and Animals	Deer control	Bushfire Biodiversity Response and Recovery Program	Non-target species but coverage across parts of EG range ³	<ul style="list-style-type: none"> Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program) Sooty Owl non-target species with expected benefits, conduct further analysis to target herbivore control in known important populations (additional funding may be required)
Mammals					
Long-footed Potoroo	Forestry Operations	<p>Survey all unburned or low severity burned coupes in top 20% of habitat.</p> <p>Tailored Adaptive Protections: Buffer mapped and unmapped riparian areas containing dense understorey with a 40m buffer; Retain undisturbed habitat patches containing dense understorey within the harvestable area; Protect patches and buffers from harvesting and regeneration activities</p>	<p>Pre harvest survey programs</p> <p>Tailored adaptive responses (part of VicForests' precautionary principle approach)</p>	Where coupe intercepts with modelled high-quality habitat or catchment buffer polygon	

³ As above

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Inappropriate Fire Regimes	Improve understanding of genetic risk to Critical Weight Range Mammals and identify management priorities	Bushfire Biodiversity Response and Recovery Program	State-wide	<ul style="list-style-type: none"> Improve understanding of genetic risk to Critical Weight Range Mammals (Bushfire Biodiversity Response and Recovery Program)
Long-nosed Potoroo	Inappropriate Fire Regimes*	Improve understanding of genetic risk to Critical Weight Range Mammals and identify management priorities	Bushfire Biodiversity Response and Recovery Program		<ul style="list-style-type: none"> Improve understanding of genetic risk to Critical Weight Range Mammals (Bushfire Biodiversity Response and Recovery Program)
	Pest Plants and Animals	Expansion of Southern Ark program – Continued operational infill and expansion over additional 100,000 ha	Southern Ark program, (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program)	East Gippsland Southern Ark Extent and State-wide for genetics program	<ul style="list-style-type: none"> Expansion of Southern Ark program (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program)
Southern Greater Glider	Forestry Operations	Targeted Special Management Zoning will be undertaken for important populations to mitigate the risks from timber harvesting operations. The management actions associated with these zones will be in effect until April 2022.	Zoning Amendment	Modelled high value blocks in East Gippsland RFA.	<ul style="list-style-type: none"> Mapping of most important unburnt habitat areas in East Gippsland (Biodiversity Division)
		Ensure survey of all unburned and low severity burned coupes in top 20% of habitat	Pre-harvest survey programs		

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
		Outside of above target protections - Tailored Adaptive Protections: Apply 40% retention of coupe basal area; Retain undisturbed habitat patches containing hollow-bearing trees and a variety of feed tree species within the harvestable area; Protect patches from harvesting and regeneration activities	Tailored adaptive responses (part of VicForests' precautionary principle approach)	Where coupe intercepts with modelled high-quality habitat or catchment buffer polygon	
	Inappropriate Fire Regimes*	Mapping of most important unburnt habitat areas in East Gippsland	Research		<ul style="list-style-type: none"> • Mapping of most important unburnt habitat areas in East Gippsland (Biodiversity Division)
Spot-tailed Quoll	Pest Plants and Animals	<p>Fox Control program</p> <p>Translocation feasibility study</p>	<p>Bushfire Biodiversity Response and Recovery Program (Upper Snowy Fox Control focusing on fox control specific colonies - existing)</p> <p>Biodiversity Response Planning project: Improve habitat for threatened mammals in Upper Snowy</p> <p>Regional Land Partnerships (Cmwlth) Funding: Fox control in Spot-tailed Quoll known habitat areas</p>	Upper Snowy - Black Mountain, Suggan Buggan, Ingeegoodbee Creek Catchment	<ul style="list-style-type: none"> • Genetic risk assessment and planning for translocation to improve population resilience (Bushfire Biodiversity Response and Recovery Program) • Fox control in Upper Snowy (Regional Land Partnerships Australian Government) • Expand footprint and duration of fox control in Upper Snowy area
Broad-toothed Rat	Pest Plants and Animals	<p>Large herbivore control (deer, pigs, goats); feral horse management.</p> <p>Predator control feasibility study</p>	<p>Bushfire Biodiversity Response and Recovery Program</p> <p>Predator control feasibility study</p>	Eastern alps	<ul style="list-style-type: none"> • Large herbivore control in Eastern Alps (Bushfire Biodiversity Response and Recovery Program) • Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) • Predator control in Eastern Alps

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Inappropriate Fire Regimes*	Improve understanding of genetic risk to Critical Weight Range Mammals and identify management priorities	Bushfire Biodiversity Response and Recovery Program		<ul style="list-style-type: none"> Genetic Risk Assessments. Determining whether translocation is appropriate (Bushfire Biodiversity Response and Recovery Program)
Southern Brown Bandicoot	Inappropriate Fire Regimes*	Improve understanding of genetic risk to Critical Weight Range Mammals and identify management priorities			<ul style="list-style-type: none"> Design and implementation of genetic rescue strategy (Bushfire Biodiversity Response and Recovery Program, Melbourne Strategic Assessment)
	Pest Plants and Animals	East Gippsland Expansion of Southern Ark program – Continued operational infill and expansion over additional 100,000 ha	Bushfire Biodiversity Response and Recovery Program	East Gippsland Southern Ark extent	<ul style="list-style-type: none"> Expansion of Southern Ark program (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program)
White-Footed Dunnart	Inappropriate Fire Regimes*	Gene-mixing project	Bushfire Biodiversity Response and Recovery Program	East Gippsland Southern Ark extent, Mt Stradbroke	<ul style="list-style-type: none"> Proposed genetic rescue project (Bushfire Biodiversity Response and Recovery Program)
	Pest Plants and Animals	Expansion of Southern Ark program – Continued operational infill and expansion over additional 100,000 ha (note: not a target species for this program but benefits expected in the absence of landscape scale cat control) Fox control Mt Stradbroke	Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program Parks Victoria		<ul style="list-style-type: none"> Expansion of Southern Ark program (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program) Fox control Mt Stradbroke (Parks Victoria)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Plants					
Colquhoun Grevillea	Forestry Operations	Survey all unburned or low severity burned proposed coupes where in the top 20% of HDM in Colquhoun State Forest. Tailored Adaptive Protections - Retain undisturbed patches containing suitable understorey habitat within the harvestable area; Protect patches from harvesting and regeneration activities	Pre-harvest survey programs; Tailored adaptive responses (part of VicForests' precautionary principle approach)	Colquhoun State Forest	<ul style="list-style-type: none"> • Mapping on-ground and signage review
	Inappropriate Fire Regimes*	Update values checking processes for weed spraying and burn planning. Survey and mapping of populations to improve species extent and enhance signage	Values Checking Program, Forest and Fire Management Planning Unit; mapping and signage work required	Colquhoun State Forest	<ul style="list-style-type: none"> • Values Checking Program (DELWP) • Threatened plant propagation project (Bushfire Biodiversity Response and Recovery Program) • Mapping on-ground and signage review
	Bushfire management	Update values checking processes for weed spraying and burn planning. Survey and mapping of populations to improve species extent and enhance signage	Values Checking Program, Forest and Fire Management Planning Unit; mapping and signage work required	Colquhoun State Forest	<ul style="list-style-type: none"> • Values Checking Program (DELWP) • Mapping on-ground and signage review
Rufous Pomaderris	Inappropriate Fire Regimes*	Deer control; species survey and bushfire recovery monitoring	Bushfire Biodiversity Response and Recovery Program; additional funding required for survey	Snowy River National Park	<ul style="list-style-type: none"> • Large herbivore control (Bushfire Biodiversity Response and Recovery Program) • Threatened plant propagation project ((Bushfire Biodiversity Response and Recovery Program) • Species survey and monitoring in response to bushfire management and recovery effort
Blue tongued Greenhood	Pest Plants and Animals	Large herbivore control (deer, pigs, goats); feral horse management, species survey and bushfire recovery monitoring	Bushfire Biodiversity Response and Recovery Program , Parks Victoria Feral Horse Strategic	Eastern alps	<ul style="list-style-type: none"> • Large herbivore control (Bushfire Biodiversity Response and Recovery Program) • Feral Horse Management (Bushfire Biodiversity Response and Recovery Program)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
			Action Plan , additional funding required for survey		<ul style="list-style-type: none"> • • Species survey and monitoring in response to bushfire management and recovery effort
Reptiles					
Diamond Python	Inappropriate Fire Regimes*	Update values checking processes for burn planning.	Values Checking Program, Forest and Fire Management Planning Unit		<ul style="list-style-type: none"> • Values Checking Program (DELWP)
	Pest Plants and Animals	Predator control	Southern Ark program Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program	Areas of 'important populations' in East Gippsland population	<ul style="list-style-type: none"> • Expansion of Southern Ark program (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program)
	Bushfire management	Update values checking processes for burn planning.	Values Checking Program, Forest and Fire Management Planning Unit	Areas of 'important populations' in East Gippsland population	<ul style="list-style-type: none"> • Values Checking Program (DELWP)
Eastern She-oak skink	Inappropriate Fire Regimes*		Bushfire Biodiversity Response and Recovery Program	East Gippsland population (no HDM, VBA records)	
	Pest Plants and Animals	Predator Control and deer control (non-target species but expected benefit)	Southern Ark program Bushfire Biodiversity Response and Recovery Program	East Gippsland population (no HDM, VBA records)	<ul style="list-style-type: none"> • Expansion of Southern Ark program (Weeds and Pests on Public Land, Bushfire Biodiversity Response and Recovery Program) • Large Herbivore control – East Gippsland (Bushfire Biodiversity Response and Recovery Program) Eastern-She Oak Skink non-target species with expected benefits, conduct further analysis to target herbivore control in known important populations (additional funding may be required)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Communities					
Alpine Sphagnum Bogs and Associated Fens	Pest Plants and Animals	Large herbivore control; feral horse management; fencing to reduce grazing pressure; removal of high threat weeds	Bushfire Biodiversity Response and Recovery Program	Alpine National Park, Alpine areas and alpine bogs	<ul style="list-style-type: none"> • Aerial and/or ground herbivore control (Bushfire Biodiversity Response and Recovery Program) • Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) • Fencing local populations (Bushfire Biodiversity Response and Recovery Program) • Removal of high threat weeds (Bushfire Biodiversity Response and Recovery Program)
	Inappropriate Fire Regimes	Large herbivore control; feral horse management; fencing to reduce grazing pressure.	Bushfire Biodiversity Response and Recovery Program	Alpine National Park, Alpine areas and alpine bogs	
Warm Temperate Rainforest (East Gippsland Alluvial Terraces) and Warm Temperate Rainforest (Far East Gippsland)	Inappropriate Fire Regimes	Application of Special Management Zone buffers to where the two sub-communities of rainforest have been severely burned by the 2019-20 bushfires. This buffering will be in place until April 2022.	Zoning Amendment in Forest Management Zoning Scheme	Mapped area of WTR rainforest communities in East Gippsland RFA	
	Pest Plants and Animals	Deer control	Bushfire Biodiversity Response and Recovery Program	Mapped area of WTR rainforest communities in East Gippsland RFA	<ul style="list-style-type: none"> • Deer control in Rainforest 'Sites of significance' (Bushfire Biodiversity Response and Recovery Program) • Removal of high threat weeds (Bushfire Biodiversity Response and Recovery Program)
	Sclerophyll invasion	Development of causal model, to understand the benefits and disbenefits of intervention actions (such as removing eucalypt incursion)	Bushfire Biodiversity Response and Recovery Program	Mapped area of WTR rainforest communities in East Gippsland RFA	<ul style="list-style-type: none"> • Removal of high threat weeds (Bushfire Biodiversity Response and Recovery Program) • Development of causal model, to understand the benefits and disbenefits of intervention actions (such as removing eucalypt incursion) (Bushfire Biodiversity Response and Recovery Program)

* Note that the hazard of 'Inappropriate Fire Regimes' is often mitigated through other measures and does not always require its own mitigation. For example, reducing grazing pressure, or buffers around sensitive vegetation, may reduce the risk associated with inappropriate fire regimes

Gippsland RFA

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Amphibians					
Giant Burrowing Frog	Forestry Operations	Special Management Zoning for important populations: In specific sub-catchments where existing breeding locations are known or in proximity, Special Management Zones will be utilised to mitigate risk from timber harvesting; the management actions associated with these zones will be in effect until April 2022.	Zoning Amendment	Mt Alfred State Forest	
		Important population and catchment mapping			
	Inappropriate Fire Regimes*	Important population and catchment mapping	Biodiversity Division (DELWP)		
	Pest Plants and Animals	Feasibility assessment and delivery of deer, fox, cat and pig control in Mt Alfred	Bushfire Biodiversity Response and Recovery	Sub-catchment Important population	<ul style="list-style-type: none"> Feasibility assessment and delivery large herbivore and predator control within Mt Alfred State Forest and potential for cross-tenure programs
Aquatics					
Dargo Galaxias	Forestry operations	Special Management Zones will be used to mitigate risk from timber harvesting in specific catchments, with these zones being in place until April 2022.	Zoning Amendment	Mapped priority catchments for the species	

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the species	
	Pest Plants and Animals	Trout management planning, Large herbivore control	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) • Large Herbivore control for West Gippsland and Tapered Galaxias
	Climate Change	Genetic analysis and translocation	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program) • Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)
Tapered Galaxias	Forestry operations	Special Management Zones will be used to mitigate risk from timber harvesting in specific catchments, with these zones being in place until April 2022.	Zoning Amendment	Mapped priority catchments for the species	
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the species	
	Pest Plants and Animals	Trout management planning, Large herbivore control	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) • Large Herbivore control for West Gippsland and Tapered Galaxias
	Climate Change	Genetic analysis and translocation	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program) • Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
West Gippsland Galaxias	Forestry operations	Special Management Zones will be used to mitigate risk from timber harvesting in specific catchments, with these zones being in place until April 2022.	Zoning Amendment	Mapped priority catchments for the species	
	Roading and Strategic Fuel Breaks	Mapping of important populations and guidance to mitigate when constructing fuel breaks	Strategic Fuel Breaks Standard and Mitigations program	Mapped priority catchments for the species	
	Pest Plants and Animals	Trout management planning, Large herbivore control	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Trout management planning, stakeholder engagement and implementation (Bushfire Biodiversity Response and Recovery Program) • Large Herbivore control for West Gippsland and Tapered Galaxias
	Climate Change	Genetic analysis and translocation	Bushfire Biodiversity Response and Recovery Program , Large herbivore control		<ul style="list-style-type: none"> • Galaxiid genetic analysis and action prioritisation, scoping options for translocation (Bushfire Biodiversity Response and Recovery Program) • Galaxiid risk management and population management assessments (Bushfire Biodiversity Response and Recovery Program)
Birds					
Sooty Owl	Inappropriate Fire Regimes*	Review mitigations and values checking processes	Values Checking Program, Forest and Fire Management Planning Unit		<ul style="list-style-type: none"> • Values Checking Program (DELWP)
	Pest Plants and Animals	Deer control– feasibility study into expansion of program	Bushfire Biodiversity Response and Recovery Program		<ul style="list-style-type: none"> • Large Herbivore control – conduct further analysis to target herbivore control in known important populations
Powerful Owl	Inappropriate Fire Regimes*	Review mitigations and values checking processes	Values Checking Program, Forest and Fire Management Planning Unit	Modelled high quality habitat	<ul style="list-style-type: none"> • Values Checking Program (DELWP)

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
	Bushfire Management	Review mitigations and values checking processes	Values Checking Program, Forest and Fire Management Planning Unit	Modelled high quality habitat	<ul style="list-style-type: none"> Values Checking Program (DELWP)
Plants					
Colquhoun Grevillea	Forestry Operations	Survey all unburned or low severity burned proposed coupes where in the top 20% of HDM in Colquhoun State Forest. Tailored Adaptive Protections - Retain undisturbed patches containing suitable understorey habitat within the harvestable area; Protect patches from harvesting and regeneration activities	Pre-harvest survey programs ; Tailored adaptive responses (part of VicForests' precautionary principle approach)	Colquhoun State Forest	
	Inappropriate Fire Regimes*	Update values checking processes for weed spraying and burn planning. Survey and mapping of populations to improve species extent and enhance signage	Values Checking Program, Forest and Fire Management Planning Unit, mapping and signage work required	Colquhoun State Forest	<ul style="list-style-type: none"> Threatened plant propagation project (Bushfire Biodiversity Response and Recovery Program) Mapping on-ground and signage review
	Bushfire management	Update values checking processes for weed spraying and burn planning. Survey and mapping of populations to improve species extent and enhance signage	Values Checking Program, Forest and Fire Management Planning Unit, mapping and signage work required	Colquhoun State Forest	<ul style="list-style-type: none"> Values Checking Program (DELWP) Mapping on-ground and signage review
Leafy Nematolepis	Pest Plants and Animals	Survey for post fire recovery; investigate need for deer management		Mount Elizabeth and Fainting Range area	<ul style="list-style-type: none"> Species survey and monitoring in response to bushfire management and recovery effort
	Inappropriate Fire Regimes*	Survey for post fire recovery; investigate need for deer management		Mount Elizabeth and Fainting Range area	<ul style="list-style-type: none"> Species survey and monitoring in response to bushfire management and recovery effort

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Blue tongued Greenhood	Pest Plants and Animals	Large herbivore control (deer, pigs, goats); feral horse management, species survey and bushfire recovery monitoring	Bushfire Biodiversity Response and Recovery Program , Parks Victoria Feral Horse Strategic Action Plan , additional funding required for survey	Nunniong, Tambo SF	<ul style="list-style-type: none"> • Aerial and/or ground herbivore control (Bushfire Biodiversity Response and Recovery Program) • Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) • Species survey and monitoring in response to bushfire management and recovery effort
Communities					
Alpine Sphagnum Bogs and Associated Fens	Pest Plants and Animals	Large herbivore control; feral horse management; fencing to reduce grazing pressure.	Biodiversity Bushfire Recovery funding	Alpine National Park, Alpine areas and alpine bogs	<ul style="list-style-type: none"> • Aerial and/or ground herbivore control (Bushfire Biodiversity Response and Recovery Program) • Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) • Fencing local populations (Bushfire Biodiversity Response and Recovery Program)
	Inappropriate Fire Regimes*				

* Note that the hazard of 'Inappropriate Fire Regimes' is often mitigated through other measures and does not always require its own mitigation. For example, reducing grazing pressure, or buffers around sensitive vegetation, may reduce the risk associated with inappropriate fire regimes

North East RFA

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Mammals					
Long-footed Potoroo	Pest Plants and Animals	Fox control feasibility study and delivery	Bushfire Biodiversity Response and Recovery Program	Great Dividing Range (Barry Mountains)	<ul style="list-style-type: none"> Feasibility study into fox control expansion Barry Mountains and delivery (Bushfire Biodiversity Response and Recovery Program)
Plants					
Blue tongued Greenhood	Pest Plants and Animals	Large herbivore control (deer, pigs, goats); feral horse management, species survey and bushfire recovery monitoring	Bushfire Biodiversity Response and Recovery Program , Parks Victoria Feral Horse Strategic Action Plan , additional funding required for survey	Eastern alps (Upper Murray)	<ul style="list-style-type: none"> Large herbivore control (Bushfire Biodiversity Response and Recovery Program) Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) Species survey and monitoring in response to bushfire management and recovery effort
Communities					
Alpine Sphagnum Bogs and Associated Fens	Pest Plants and Animals	Large herbivore control; feral horse management; fencing to reduce grazing pressure.	Biodiversity Bushfire Recovery funding	Alpine National Park, Alpine areas and alpine bogs	<ul style="list-style-type: none"> Aerial and/or ground herbivore control (Bushfire Biodiversity Response and Recovery Program) Feral Horse Management (Bushfire Biodiversity Response and Recovery Program) Fencing local populations (Bushfire Biodiversity Response and Recovery Program)
	Inappropriate Fire Regimes*				

* Note that the hazard of 'Inappropriate Fire Regimes' is often mitigated through other measures and does not always require its own mitigation. For example, reducing grazing pressure, or buffers around sensitive vegetation, may reduce the risk associated with inappropriate fire regimes

Central Highlands RFA

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Amphibians					
Baw Baw Frog	Pest Plants and Animals	Deer control	Implementation of Victorian Deer Management Strategy 2020	Mt Baw Baw	<ul style="list-style-type: none"> Implementation of Victorian Deer Management Strategy 2020
	Disease and Pathogens	Captive breeding	Zoos Victoria Conservation Master Plan	Mt Baw Baw	<ul style="list-style-type: none"> Zoo's Victoria Captive breeding program

West Victoria RFA

Species or Community	Hazard	Mitigation	Mechanism	Specific location	Active management or knowledge
Plants					
Gorae Leek-orchid	Roading and Strategic Fuel Breaks	Update values checking processes for burn planning, roading and strategic fuel breaks.	Values Checking Program, Forest and Fire Management Planning Unit , include species within risk register for non-DELWP activities , mapping and updates to important populations layer	Barwon South West region	
	Bushfire Management	Update values checking processes for burn planning, roading and strategic fuel breaks.	Values Checking Program, Forest and Fire Management Planning Unit , include species within risk register for non-DELWP activities , mapping and updates to important populations layer	Barwon South West region	
	Pest Plants and Animals	Biomass reduction (native and invasive) and weed control	Funding required for Barwon South-West	Barwon South West region	<ul style="list-style-type: none"> Biomass control (incl. private land populations within Trust for Nature Covenant)
	Fertiliser and herbicide	Education and engagement programs	Funding required for Barwon South-West	Barwon South West region	<ul style="list-style-type: none"> Education and engagement programs

7. Implementation

Implementing the measures

Measures for prioritised species and communities are being implemented through a range of planned or current programs, or existing legislative or regulatory arrangements. They include both interim enforceable protections and priority management actions, depending on the hazard and the most appropriate control available.

Interim enforceable protections

Forest Management Zones

The management and conservation strategies outlined in existing Forest Management Plans (FMPs) are expressed through the Forest Management Zoning (FMZ) Scheme, which classifies areas of State Forest for conservation, production, or multiple use. The Forest Management Zoning Scheme comprises:

- Special Protection Zone (SPZ), managed for conservation values;
- Special Management Zone (SMZ), managed to conserve specific features, while catering for timber harvesting operations under special conditions specified in SMZ plans; and
- General Management Zone (GMZ) where multiple use management and timber production is generally permitted.

The arrangement of these zones in the landscape, and the actions they give rise to, is the primary mechanism through which forest management objectives contained in these plans are met. The Secretary of DELWP puts the FMZ Scheme into operation under section 22 of the *Forests Act 1958* and is the custodian of the FMZ Scheme. The FMZ Scheme can be amended by the Secretary under this section, whereby existing General Management Zone, Special Management Zone or Special Protection Zone areas could be amended to create new Special Management Zone or Special Protection Zones to manage and protect specific forest values or localities in State Forests. As part of the TSCRA, Special Management Zones are proposed for six species in East Gippsland RFA and four species in Gippsland RFA.

Special Management Zones are managed to conserve specific features, while catering for timber production under certain conditions. Management arrangements for areas in the Special Management Zone are determined on a case-by-case basis according to the values present. Special Management plans are prepared which detail if and under what conditions timber harvesting may occur. Where there is less certainty regarding the specific location or extent of certain species or communities, Special Management Zones are useful management responses which allow for associated conditions aimed at mitigating environmental harm or the likelihood of the harm arising from the hazard.

Decisions to undertake minor zoning amendments must generally consider a range of guidelines and standards, such as ensuring that the principles and operational goals of the *Code of Practice for Timber Production 2014* can be met, and that there is minimisation of practical access problems for forestry operations and forest management. Compliance with the FMZ Scheme is a condition of the Allocation Order, which permits and authorises the conduct of timber harvesting operations and associated management activities in State forests.

Precautionary Principle: tailored adaptive responses

The precautionary principle is a mandatory action under the *Code of Practice for Timber Production 2014* (the Code). It “means when contemplating decisions that will affect the environment, careful evaluation of management options be undertaken to wherever practical avoid serious or irreversible damage to the environment; and to properly assess the risk-weighted consequences of various options. When dealing with threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.”

Clause 2.2.2.2 of the Code states that the precautionary principle “*must be applied to the conservation of biodiversity values.*” As part of its regulatory oversight of the Code, the Conservation Regulator provides advice to VicForests on requirements to meet its regulatory obligations, including the precautionary principle. The Conservation Regulator will consider whether VicForests’ proposed response to risks are proportionate and in accordance with the precautionary principle based on the best available science.

Application of the precautionary principle is relevant in light of the 2019-20 bushfires and the impact on forest-dependent species. The fires impacted on the populations of many forest dependent species changing both the threat of risk of forestry operations causing serious and irreversible harm to these species and also created significant scientific uncertainty regarding impacts on those species posed by timber harvesting operations. Biodiversity and scientific expert advice provided to the Conservation Regulator is that the condition precedents for the Precautionary Principle are met for a number of species of concern in East Gippsland and Gippsland. VicForests is currently implementing a series of tailored adaptive responses that apply to forestry operations designed to mitigate the risk of serious or irreversible damage to species and communities impacted by the 2019-20 bushfires based on current scientific advice and factoring in relevant scientific uncertainty as part of its acquittal of the precautionary principle. The tailored adaptive responses described in this report apply to specific species or communities in a specific area of an RFA region. For impacts from forestry operations, the assessment undertaken by Biodiversity Division determined that the tailored adaptive responses proposed are appropriate and proportionate management actions to mitigate the risk of serious or irreversible damage from timber harvesting over the next 12 months.

Further work needs to be done to consider cumulative impacts of timber harvesting on biodiversity in light of the 2019-20 bushfires. This will be undertaken as part of the assessment of listed species and communities that may require permanent protections. In the meantime, the Conservation Regulator is closely monitoring VicForests’ approach to cumulative impacts under the precautionary principle, particularly in East Gippsland.

Management actions

A priority management action is an urgent, no regrets undertaking that can address critical risks or prevent serious or irreversible harm (e.g. targeted pest control programs). The risk assessment and additional analysis may recommend that a management action is a priority for a certain area or timeframe. Alternatively, there may be existing management actions in place that, while they currently contribute to mitigating the risks identified to threatened species and communities, could be augmented and/or tailored to be more effective.

Through the risk assessment prioritisation process, some current programs will become more targeted for the specific species or communities listed in the action plan. A number of new programs will be established to address risks outside the current investment.

Bushfire Biodiversity Response and Recovery (BBRR) program

Seventy-two interim management actions (that benefits twenty-five TSCRA prioritised species and communities) are being implemented under the Bushfire Biodiversity Response and Recovery Program. The BBRR program includes actions funded by the Victorian Government, Australian Government and other sources including public donations. DELWP is working closely with partner agencies, Traditional Owners, and non-government organisations to coordinate and support all actions to help the protection and recovery of Victoria’s flora, fauna and habitats impacted by the 2019-20 fires.

The Victorian Government is providing \$64.3 million for the Bushfire Biodiversity Response and Recovery program to support Victoria’s bushfire impacted wildlife and biodiversity. This is supported by approximately \$12.8 million from the Australian Government’s Wildlife and habitat bushfire recovery package.

The BBRR program delivers actions across a range of themes and focus areas. Interim actions identified in this document are directly funded from this program and seek to address risks following the 2019-20 bushfires.

Given that the degree of bushfire impacts was a significant criterion in the prioritisation process, a suite of management actions that are being delivered out of this program meet the interim needs of these species and communities, with scope to target specific high-priority species or communities following feasibility assessments. Some species and communities that might not be a specific target might nevertheless benefit from the landscape-scale action, based on an assessment of the distribution and coverage of the proposals for the next 12-months.

Interim management actions implemented under this program include the control of large herbivores, predators, weed management, genetics and translocation studies. Actions will be delivered by a range of partner organisations across public and private land tenures. Interim management actions that reference feral horse management are aligned with the Parks Victoria *Protection of the Alpine National Park - Feral Horse Strategic Action Plan 2018-2021*.

DELWP will work with project leads on undertaking further analysis to target or expand the footprint of funded programs for specific species and communities over the following 12-months. Additional funding may be required to ensure sufficient extent, duration or intensity of control delivered required benefits for the priority species and communities.

Implementation of Victorian Deer Control Strategy 2020

One interim management action will be delivered by the Victorian Deer Control Strategy. The strategy has been prepared by DELWP and the Department of Jobs, Precincts and Regions to address the widespread and rapid increase in feral deer across Victoria. The Strategy outlines a process for a strategic and coordinated approach to deer control. It is Victoria's plan to reduce the impact that increasing deer numbers are having on the environment, agriculture, Aboriginal cultural heritage, and public safety.

To kickstart the strategy's rollout, the Victorian Government invested an initial \$1M to develop and implement the first regional deer control plan prepared under the strategy– the Peri-urban Melbourne Deer Control Plan. The Victorian Government has announced a further \$18.25 million and \$4.4 million per annum ongoing to implement the strategy. The Eastern (and Western) Regional Deer Control plans are due to be completed by March 2022. Public land managers, councils, community groups and Traditional Owners will be involved in the plan's development. Species identified in the prioritisation process requiring deer control outside of existing programs will be included in the prioritisation process for deer control under this program.

Values checking update program - standard mitigations

Ten interim actions (that benefit eight prioritised species) relate to the Values Checking Update Program (VCUP), a program of works to enhance the Department's values checking process for both forest and fire management activities, making it more accurate, efficient and effective. It responds to VAGO Recommendation 5 and may include enhancements to CFA's processes and integration with DELWP processes, as per VAGO Recommendation 8. Enhancements include updates to the processes, systems and data used in values checking.

Values checking is an informal term used throughout DELWP to describe a risk assessment process undertaken before land management action is taken. Values checking occurs in both fire and forest operational and tactical planning processes, for example, in the creation of Joint Fuel Management Program (JFMP), District Action Plans (DAP), burn plans and work orders. Typically, values checks are undertaken by DELWP subject matter experts for each individual burn or work order, identifying the values that may be impacted by the proposed works and the mitigation measure(s) that should be applied. There are a series of standard mitigation measures for many value types, however not all values have these and not for all threats. The subject matter expert determines if the standard mitigation (if available) is appropriate in a particular instance, or if any variation or additional mitigation measures are required. If no standard is available, the subject matter expert determines mitigation measures appropriate to the value and the proposed work.

Updating the standard mitigations for priority environmental values is one component of the Values Checking Update Program. Eight species identified through the Threatened Species and Communities Risk Assessment will be prioritised to have their standard mitigations updated through this program, to limit the risk of bushfire management on these species.

Strategic Fuel Breaks program

Eight species are a priority to have appropriate avoidance or mitigation measures put in place where a proposed Strategic Fuel Break intersects with these species' habitat. Strategic fuel breaks are critical to protecting communities, catchments, and the environment from devastation by bushfire, and they make it easier, faster and safer for firefighters to suppress fires. The Victorian Government has invested \$82 million in bushfire management following the bushfires of 2019-20. As part of this investment \$35 million has been allocated to deliver 1,447 km of strategic fuel breaks across Victoria in the next 18 months.

The strategic fuel breaks will help reduce the risk and impact of bushfires by creating a long-term protective fuel reduced ring around townships, assets and critical landscapes, allowing firefighters to more safely and effectively defend these areas and conduct planned burning operations.

The species highlighted in this report will be prioritised as part of the planning and approvals process of strategic fuel breaks. DELWP will also be undertaking a broader assessment of the environmental and cultural heritage values and assets that require protection. State and Commonwealth regulatory obligations apply and will require that DELWP avoids impacts wherever possible, applies mitigations where impacts are unavoidable, and counterbalances any losses to native vegetation or biodiversity.

Planning of the strategic fuel breaks will involve working closely with project partners to enable compliance with key biodiversity, cultural and heritage values and regulatory requirements, and to establish appropriate monitoring of key environmental indicators.

Survey programs and mapping

Eighteen actions (that benefit sixteen prioritised species and communities) have been prioritised for survey programs and/or updated mapping of known distribution. Survey programs provide useful on-ground information which can help with management decisions and targeted approaches relating to threatened species and communities and key habitat.

Four actions (benefitting three prioritised species) have been prioritised for pre-harvest surveys. The Forest Protection Survey Program (FPSP) currently surveys at least 80 per cent of coupes in State forests that are scheduled to be harvested each year, to assist in determining the appropriate protections measures, as set out in the Code. A prioritisation process identifies the highest-priority species and coupes to survey, with surveys adopting specific techniques to identify and detect the target species or their habitats.

For some species and communities, additional survey and mapping will be delivered outside the scope of this project to proactively verify occupancy for narrowly distributed species and communities and identify important habitat locations for a range of threatened species and communities. This will provide important adaptive management information for threatened species and communities management and protection. This will help inform a number of risk mitigation actions such as signage to avoid mechanical disturbance or spraying or for inclusion in 'risk registers' for use in bushfire management activities. This information can also assist in targeted delivery of on-ground.

Other on-ground management actions

For some prioritised species and communities, on-ground management actions are outside the scope of current investment. These programs will be delivered by the appropriate land managers as targeted risk management actions for the next 12-months. This includes actions to manage biomass accumulation for some threatened plants.

Additional or existing measures that offset the need for interim protections

In the period since the 2019-20 bushfires and the renewal of Regional Forest Agreements on 31 March 2020, the Victorian Government has proactively responded to biodiversity risks, including a range of programs and measures that either directly or indirectly respond to many of the risks identified in this risk assessment. These measures are diverse and wide-ranging and are covered in detail in the 2020 Risk Assessment. In the process to develop interim protections and priority management actions these existing measures have been considered in two respects. First, the extent to which hazards impacting threatened species and communities are already being mitigated by programs underway. Second, the extent to which relevant programs or management actions can be better targeted based on the 2020 Risk Assessment to meet the needs of threatened species and communities by mitigating the risk of serious or irreversible harm in the short term.

8. Next steps

Reporting on interim protections and management actions

The protections and management actions described in this report are by default interim. In determining, where necessary, permanent protections that are required for threatened species and communities by April 2022, DELWP will take into additional and improved data, as well as consideration of the effectiveness of the interim protections and management actions set out in the Action Plan in reducing the risk of serious or irreversible harm to a prioritised species or community. An assessment will be made as to whether or not interim protections need to be extended or altered at the point where permanent protections are scheduled to be implemented. The outcome of this process will be reported on in the rationale for permanent protections.

Assessing cumulative impacts

Further work is required to ascertain the cumulative risk to threatened species and communities at the landscape scale. This work will be undertaken with the intent to consider the cumulative data as part of the process to determine any additional necessary permanent protections that may be required by April 2022.

Other RFA commitments

Permanent protections

All 79 species and communities identified in the risk assessment will be assessed as part of the RFA obligation to introduce permanent protections, and these will be analysed for permanent protections by April 2022. Any species or community considered in the October 2020 Risk Assessment and not prioritised for interim protection will be considered as part of this process.

Risk assessment and interim protections for new listed species and communities

The 2020 Risk Assessment considered all species and communities that were already listed as of 1 April 2020, and that had the potential to be impacted by forestry operations. The species that qualified for a risk assessment were then analysed in relation to multiple hazards, including inappropriate fire regimes, forestry operations and pest animals and plants. Each time a new species or community is listed the TSCRA risk assessment process set out in the RFAs is re-triggered.

Since the 2020 Risk Assessment, the Platypus and Little Eagle have been listed. To streamline the risk assessment approach DELWP proposes to start a second Risk Assessment and interim protections process from mid-2021 with consideration of necessary permanent protections after that.

Appendix A – Knowledge and Data

The table below outlines the knowledge and data used to inform the species and communities prioritisation, hazard assessment and proposed mitigations outlined in this report.

Data Source	Description	Species and Community Assessments	Hazard Assessments	Mitigations
2019-20 fire extent and severity	The fire footprint following the 19-20 Black Summer Bushfires, as of 20 th April 2020 and severity classes derived from Sentinel 2 imagery. The final fire severity map used in this analysis can be accessed publicly at data.vic.gov.au	Y	Y	Y
Activity data	Current active management activity data delivered via a range of government investment programs, produced by both internal and external agencies. Including management activities conducted and managed by both DELWP and Parks Victoria.	N	Y	Y
Alpine Bog and associated fens community mapping	Current extent of alpine bogs and associated fens spatial data. Unpublished.	N	Y	Y
Area Available to timber harvesting	Estimate of the likely area available to harvesting (both forward and backward looking), excluding CAR reserve extent. As identified in VicForests' Net Harvest Area file which is the area within the allocation order with some modelled exclusions. Forest greater than and younger than 30 years have been included in the risk assessment.	N	Y	Y
Bushfire Threat management	Identifying locations that would benefit from threat management actions post-bushfire, as identified via the Bushfire Biodiversity Response and Recovery Program .	N	Y	Y
CAR Reserve System	Areas identified in the CAR reserve system include all formal reserves (Parks and reserves etc.), informal reserves (SPZs), values protected by prescription where these can be mapped (modelled exclusions, stream buffers,	N	Y	Y

	steep slopes etc) and private land covenants. “Other public land” and “private land” not under covenants are not considered part of the CAR reserve system. It is acknowledged that values protected by prescription are modelled only and subject to field verification.			
Expert Advice	Expert knowledge and validation of modelling outcomes to inform species and community specific assessments and appropriate mitigations. A list of expert assessors is published in the risk assessment report .	Y	Y	Y
Expert elicitation data	Data collected from species and taxonomic experts to inform the development of NatureKit version 3 and Identification of immediate and short term response actions following the 19-20 bushfires. Unpublished.	N	N	Y
Habitat Distribution Models	DELWP currently has Habitat Distribution Models (HDMs) for over 4000 taxa that predict the distribution and relative likelihood of suitable habitat for each species across Victoria. This covers all terrestrial vertebrate fauna and most vascular plants. HDMs are built using species occurrence records from the Victorian Biodiversity Atlas (VBA) and relating that data to environmental variables, such as soil, prevailing climate and topography to make predictions about the likely distribution of habitat for individual species across Victoria. For more information on how DELWP’s HDMs are built, read the fact sheet . For a subset of species that DELWP does not have continuous modelled distributions for, polygons of expert delineated habitat extent are used (e.g. Galaxiids, Crayfish).	Y	Y	Y
Important Populations data	Spatial data to determine where important species locations exist, and appropriate management actions to minimise the impacts to these populations during an emergency event. Unpublished.	Y	Y	Y
Outcomes of Bushfire Biodiversity Response and Recovery Reconnaissance projects (Theme 1)	Assessing the specific impacts of the fires on species or locations of concern enables more targeted actions. This theme assessed the status of key plants, animals and ecosystems following the fires to inform management actions. The focus is on species or ecosystems that have had all known populations/locations	Y	Y	Y

affected or where the level of impact is not fully known. A summary report is in preparation.

Rainfor100 (Rainforest mapping)	Current rainforest extent spatial data, used to identify listed Warm Temperate Rainforest Communities. Publicly available here.	N	Y	Y
Regional Forest Agreement area boundaries	The spatial boundaries that determine the extent of Victoria's five RFA boundaries.	Y	Y	Y
Strategic Management Prospects	Strategic Management Prospects (SMP) integrates and simultaneously compares information on biodiversity values, threats, effectiveness of management actions and indicative direct costs of management actions for biodiversity across Victoria using a spatially explicit approach to prioritise conservation actions state-wide. It is the key decision-support tool used by the Victorian government to guide investment in on-ground actions for biodiversity. For more information, read the fact sheet .	N	Y	Y
Victorian Biodiversity Atlas species observation data	The VBA species observations are a foundation dataset that feeds into some of the many biodiversity tools used in DELWP's everyday decision making - showing where wildlife is now and how this has changed over time. This makes it a core input to the majority of the governments processes and programs that impact native species. Accessible directly on the VBA here and via NatureKit .	Y	Y	Y