



# Fitzroy Biodiversity & Agriculture Natural Capital Emergency Preparedness and Response Plan

June 2024





FBA works for our central Queensland community to grow a sustainable, productive and profitable Fitzroy region.

FBA acknowledges the First Nations of the lands and waters within the Fitzroy region where we learn and live, and pay our respects to them, their culture and Elders past and present.

#### Version Control

Version	Date	Author	Changes
I	24 June 2024	FBA	Creation of finalised Emergency preparedness plan for DCCEEW

#### Acknowledgement

This project is funded by the Australian Government Natural Heritage Trust and delivered by Fitzroy Basin Association, a member of the Commonwealth Regional Delivery Partners panel

#### Disclosure Statement

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This document has been prepared with due care and diligence using the best available information at the time of publication. FBA holds no responsibility for any errors or omissions and decisions made by other parties based on this publication.



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## Background

Queensland is a global biodiversity hotspot – home to more than half of Australia’s native species. Some of these species are found nowhere else in the world. Yet, some of these precious plants and animals are at risk of extinction and natural events such as cyclones, floods, drought and fire contribute to their decline. We know now that these threats are being exacerbated by climate change. At the same time, Queensland’s agricultural output is expanding and intensifying. More than 88% of Queensland’s land is used for primary production and this means how we manage agriculture is intertwined with how we manage our environment.

Across mainland Queensland there are 11 regional NRM organisations working with partners, on the ground through its 334 highly qualified staff operating out of 27 rural and regional offices, to help communities become more resilient to the effects of climate change and to farm more sustainably. Using the best possible science, regional NRM organisations are ensuring our species and ecosystems – which provide essential environmental services for all of society – can withstand the threats which would otherwise impact their survival. By supporting communities to be prepared for disasters we will reduce the impact of these catastrophic events on species, ecosystems, agricultural natural capital assets and local economies. Strategically the Queensland regional NRM sector works collegiately with each other and across all levels of Government and regional stakeholders to align efforts, planning and resources to maximise the efficiency and effectiveness of emergency preparedness, response and recovery.

The Fitzroy Management Unit (MU 48) is one of the 11 regional NRM areas within Queensland, and is over 156,000 km<sup>2</sup> in size, adjacent to the World Heritage Listed Great Barrier Reef marine park. Taking in most of the region known as central Queensland, the Fitzroy Basin encompasses six major river systems with more than 20,000 km of waterways and is the largest river basin to flow into the Great Barrier Reef lagoon. The catchment stretches from the Carnarvon Ranges in the west to the river mouth in Keppel Bay, near Rockhampton.

Around 235,000 people live and work in the region. Agriculture is the major land use, up to 85 per cent of the landscape is used to produce food and fibre. Local grazing and farming enterprises are worth \$1.2 billion annually to Queensland’s economy. More than 3,700 agricultural businesses operate in our region, comprising almost 20 percent of Queensland’s 12 million head of cattle. The region includes 40 of Queensland’s 55 coal mines – a multi-billion-dollar industry. The region also features extensive natural assets, from mountain ranges, native grasslands, Brigalow forests and internationally significant wetlands all teeming with wildlife, some only found in this part of the world.

There is a growing need to enhance our preparedness for natural disasters and their impact on biodiversity and agricultural natural capital assets. Ensuring the survival of species and places helps to preserve key ecosystems services such as clean air, water, and climate regulation, all of which profoundly affect human well-being. Disaster preparedness bolsters the resilience of ecosystems, enabling them to recover and flourish following catastrophic events. Better preparation and response also contribute to stronger regional economies through sectors such as tourism and agriculture. For example, by investing in disaster preparedness, long-term costs for recovery and restoration post-disaster are reduced. This Plan considers the most likely disaster scenarios for the Fitzroy, which include bushfire, floods, cyclones, disease and pest outbreaks.

The Plan was built on the lessons learned during the 2019-20 Black Summer bushfires, other recent



environmental disasters, Fitzroy Basin Association's (FBA) current regional planning documents and consultation with various stakeholders of the region. This plan will enable a collaborative approach to ensure the long-term persistence of the region's biodiversity and agricultural assets. Working in synergy with the following pre-existing strategies and plans at the local, state and federal levels:

- The Fitzroy and Capricornia Regional Resilience Strategy 2022
- Central Queensland Sustainability Strategy 2030
- Queensland Strategy for Disaster Resilience 2022–2027
- Reef 2050 Long-Term Sustainability Plan
- Reef 2050 Wetlands Strategy
- National Strategy for Disaster Resilience
- Australia's Biodiversity Conservation Strategy 2010-2030
- The Threatened Species Action Plan

The Plan contributes, in part, to actions under Target 17 of the Threatened Species Action Plan 2022-321 and Outcomes 1, 2 and 3 of the Natural Heritage Trust (NHT), by addressing vulnerability from extreme weather events relevant to biodiversity<sup>2</sup> and agricultural natural capital assets<sup>3</sup> identified in the management unit and improving emergency response and planning within jurisdictions. The Plan also contributes to Outcomes 1 and 3 of the Climate-Smart Agriculture Program by supporting the agriculture sector to build resilience to climate change and conserve natural capital and biodiversity on-farm.

### **Bushfire:**

Fire and grassfire are endemic to the landscapes of large areas of the region, often ignited by lightning strike or accidental causes. In November and December 2018, the Central Queensland Bushfires devastated 35 communities across eight LGAs, including most within the Fitzroy and Capricornia region, burning 1.4 million hectares of land and impacting primary producers, agriculture and the environment. On 19 September 2023 the Bureau of Meteorology (BOM) declared an El Niño weather event and is forecasting an increased risk of drier and hotter conditions over coming months for most of Australia. This follows a period of below average rainfall, higher temperatures and the warmest recorded winter in 2023. Already the Fitzroy region has seen an increase in the quantity and severity of fire damage across the region and annual fire season is also starting earlier and lasting longer, adding an estimated 30 days onto the annual season over the past 70 years. Catastrophic fire conditions (exceeding FFDI 100) were observed during the 2018 Central Queensland Bushfires.

### **Floods:**

Due to its immense size and fan-like shape, the Fitzroy River catchment is capable of producing severe flooding following heavy rainfall events. The Fitzroy has a long and well documented history of flooding with flood records dating back to 1859. Over the last six years Rockhampton has exceeded the major flood level three times (2011, 2013, 2017). This period also provided the towns of Emerald, Rolleston and Theodore with their largest floods on record.

## Cyclones:

The Fitzroy and Capricornia region routinely feels the impact of tropical cyclones, including inland areas. Notable recent tropical cyclones and their category upon landfall in the region over recent times include:

- 2009 – Tropical Cyclone Hamish (Category 5)
- 2013 – Ex-Tropical Cyclone Oswald (Category 1)
- 2015 – Tropical Cyclone Marcia (Category 5)
- 2017 – Tropical Cyclone Debbie (Category 5)

During the early formation of cyclone Jasper (2023) The entire coast of the Fitzroy region was on high alert for possible impacts, highlighting the risk cyclones pose to the future of Biodiversity and agricultural assets.

## Disease and pest outbreaks:

Currently information on the number of diseases, their extent and impact on biodiversity and agricultural assets in the Fitzroy is limited. Eight Weeds of National Significance and 33 declared pest species are present within the Fitzroy. Weed species pose a risk to biodiversity and agricultural assets as they can permanently alter vegetation communities through a change in structure, but more significantly, through facilitating an increase in flammability and fuel load as well as outcompete native plants crops and grass. Pest animal species can damage soils, introduce weeds, predate on native species, transmit disease and compete for resources with native fauna. Whilst action is underway to control established weeds and pests, new outbreaks pose a significant risk for the Fitzroy. Actions for this plan will focus on preventing future outbreaks of new pest species and diseases rather than management of established pests, weeds and diseases.

Given the looming threat of the severe weather season (November through to March), along with the critical role of Regional Delivery Partners in supporting NRM preparedness and response, FBA was invited to deliver a 'Biodiversity and Agricultural Natural Capital Emergency Preparedness & Response Plan' (the Plan) in advance of the 2023/24 severe weather season.

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<sup>2</sup> Biodiversity assets refer to assets identified by jurisdictions, environment management agencies or environmental law as important to preserve during emergencies or natural disasters e.g., species, ecological communities, habitat features.

<sup>3</sup> Agricultural natural capital assets refer to on-farm natural resources that we rely on for food and fibre production, including soil, air, water, riparian areas, remnant native vegetation, agroforestry and environmental plantings and animals.



## Objectives of this plan

The objectives of this plan are to improve preparedness for, and response to, emergency events where they occur through better integration of biodiversity and agricultural natural capital assets in emergency planning and response. This includes efforts to enhance the resilience of biodiversity and agricultural assets by recognising the risks and threats posed by natural disasters and undertaking planning to improve outcomes through actions and management before, during (to the extent possible) and after to support recovery.

Working in synergy with pre-existing strategies at local, state and federal levels, this plan will build the capacity of our region to implement measures that ensure the long-term persistence the landscapes we value, are connected to and rely on.

Key objectives of this plan include:

- Working collaboratively across the region to prepare for emergency responses to disasters
- Improved data intelligence, monitoring and reporting for Biodiversity and agricultural assets
- Sharing information across sectors to support enhanced evidence-based decision making and situational awareness
- Upskilling of the community to enable effective and timely action for the long-term protection of biodiversity and agricultural assets

## Scope

The Fitzroy Biodiversity and Agricultural Natural Capital Emergency Preparedness and Response Plan (June 2024) concentrates on natural disaster preparedness and response in Central Queensland. The plan focuses on biodiversity and agricultural natural capital assets and the disasters of extreme fire, floods, cyclones and pest and diseases outbreaks. It identifies opportunities to build resilience through disaster management based on FBA's existing knowledge and experience – both within the organisation and through our strong relationships with stakeholders and community partners.

This plan aims to bring together information around the basin to better inform stakeholders of where natural and agricultural assets are located, their level of risk to disaster events, key actions recommended to increase their resilience, and currently what is being implemented across the basin for emergency preparedness. This document serves as a guide for informing future policies, strategies, collaboration, and the implementation of management practices and actions aimed at readying for, reinforcing resilience to, and ultimately reducing the effects of natural disasters on biodiversity and the natural assets of agriculture.



This plan identifies:

- Assets that are priorities for biodiversity and agriculture
- Location of these assets and their current condition
- Threats, their risk level and likely impact of disaster events on assets
- Synergies of Biodiversity and agricultural assets with NRM plan (CQSS2030) goals and targets
- Strategies already in place to aid in community emergency preparedness
- Gaps in knowledge, data and the stakeholders likely to be able to address these gaps
- Actions that can be implemented to mitigate/ reduce the risk per asset that are based on best practice and knowledge
- How this plan will be communicated to stakeholders and the broader community

## Role of NRM in emergency preparedness and response

FBA is dedicated to ensuring natural resources are managed to meet the needs of the present generation, without compromising the needs of future generations, FBA is the primary organisation for NRM in central Queensland and is uniquely placed geographically, strategically and operationally to deliver priority environmental and agricultural outcomes. FBA is proud to service one of the most productive and diverse regions in Australia through providing input into local plans/ strategies and developing and delivering effective and efficient programs that work with local community, stakeholders and investors to protect natural assets. At the regional and local level FBA works with land managers, and the broader community to enact best practice land management, to protect or enhance ecological services and inspires and empowers communities to value biodiversity assets and participate in citizen science, stewardship, and natural resource management. FBA's role within the broader emergency management framework is illustrated below (Figure 1).

This approach allows for greater collaboration and coordination of resilience efforts across our region, guided by the principles of:

- local leadership
- flexibility and adaptation
- shared responsibility and collaboration
- prioritisation



## FBA's position within the Broader Emergency management framework

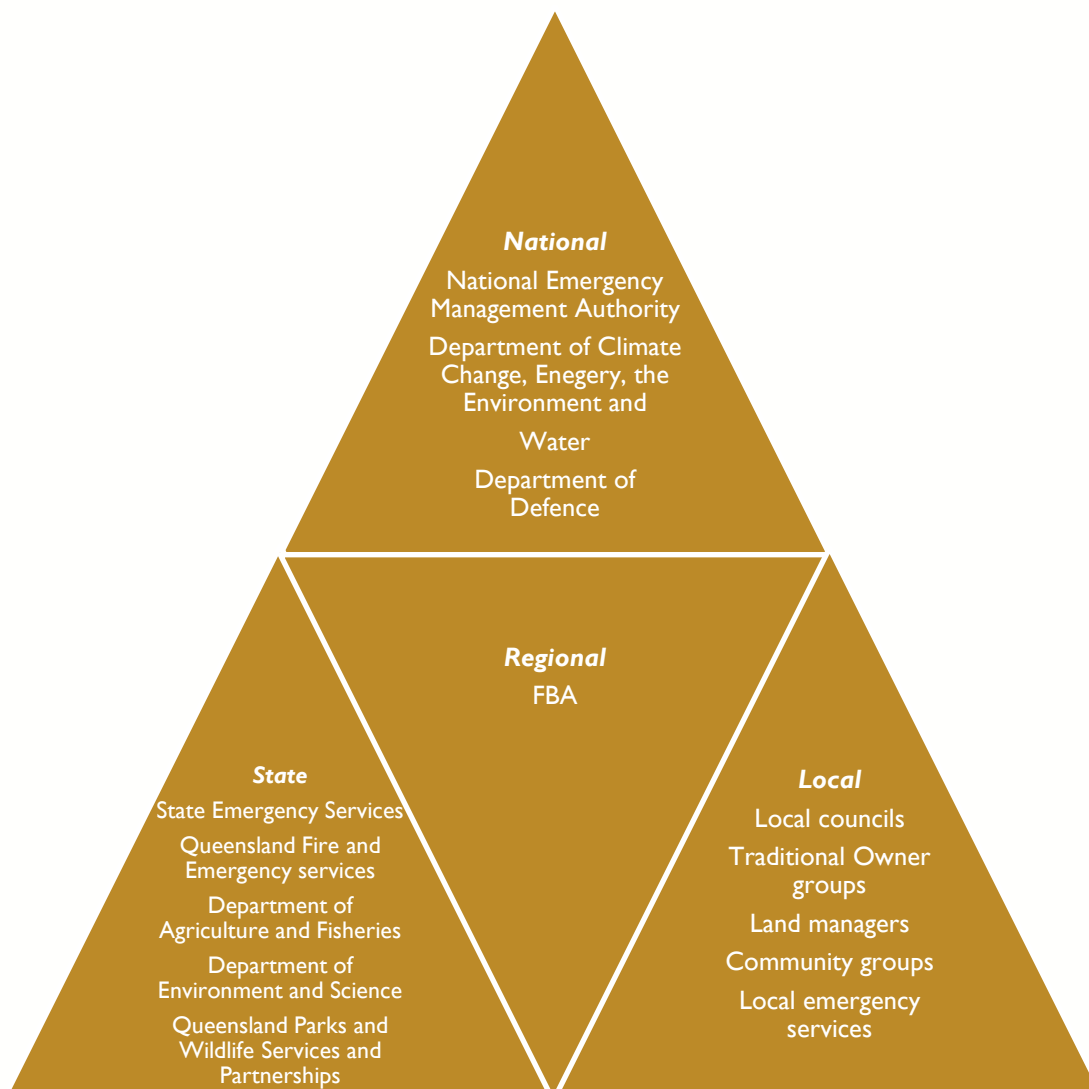


Figure 1. A visual diagram displaying how FBA fits within the broader emergency management framework/system for the Fitzroy Management Unit.



## Identification of management unit assets and susceptibility

The Fitzroy region features extensive biodiversity and agricultural assets (CQSS2030) including but not limited to

- 5178 native species of which 224 are rare or threatened
- 119 marine species
- 14 whales and other cetaceans
- Six fish habitat areas
- 77 migratory species
- 12 Threatened Ecological Communities
- Three bioregions
- 8,532 wetlands, of which 20 are listed as Directory of Important Wetland Areas
- One Ramsar site (Shoalwater and Corio Bays area)
- One World heritage area (Great Barrier Reef)
- Two Commonwealth Heritage places
- One National Heritage property
- 79% of land managed under agricultural production with roughly 3.2 million head of cattle (MLA, 2018)

FBA has done an extensive literature and database search to best map the above assets and their likelihood of threats to fire, cyclones, floods, disease and pest outbreaks (an interactive version of this map can be found on FBA's local drive L:\ACTIVITY AGREEMENTS\DCCEEW\_RDP\RDPEmergency preparedness\8.Mapping. This map will be accessible on the CQSS2030 website Postdelivery of milestone 3 (July 30, 2024) to incorporate DCCEEWW feedback. This map will be an interactive online map supported through the ESRI Arc GIS online platform. This will enable stakeholders to drill down to the individual asset e.g. Koala species modelled habitat in any location across the region to see not only where that individual asset polygon is located but how at risk that location is to each emergency disaster threat. Currently this map sits at 934,405 different polygons. Each polygon, representing an asset occurrence are broken down into broad asset type and then individual asset name (i.e. Threatened Species, Koala) see Figure 7 and Figure 8.

Also stored in this map within the attribute tables is the multi- jurisdictional inventory for biodiversity and agricultural assets. This table includes asset type, level of risk. With plans to incorporate key actions currently being implemented and stakeholder responsible to be incorporated as increased feedback as FBA continues to receive stakeholder feedback . Key gaps within the data availability and quality have been identified and listed below. It is expected that as FBA continues developing and improving this plan these gaps will be addressed and integrated.



FBA is currently creating a data disclaimer to accompany this map on the FBA website and will be similar to the below

#### *“Use Limitations*

The Emergency Preparedness Datasets are an amalgamation of spatial data representing some of the diverse geospatial features and datasets of Queensland. This data incorporates inputs from a variety of sources, levels of precision, methodologies of data acquisition, and time periods. The primary objective of these datasets is to provide a broad understanding and estimate of asset location and risk to natural disasters and should be interpreted and utilised correctly. Users of the information offered in the Emergency Preparedness Datasets accept all responsibility and risk associated with the use of the Information. Users are responsible for verifying the data's appropriateness for their intended applications and for any conclusions or actions derived from its use and should seek independent professional advice in relation to dealings with the Emergency Preparedness Datasets.

#### *Disclaimer*

This disclaimer underlines the commitment of Fitzroy Basin Association (FBA) to transparency and data integrity while also emphasizing the importance of prudent and well-informed usage of the Emergency Preparedness Datasets. Despite FBA's best efforts, FBA, its employees and the FBA Board makes no representations or warranties in relation to the information, and, to the extent permitted by law, exclude or limit all warranties relating to correctness, accuracy, reliability, completeness or currency and all liability for any direct, indirect and consequential costs, losses, damages and expenses incurred in any way (including but not limited to that arising from negligence) in connection with any use of, or reliance on, the Emergency Preparedness Datasets. These datasets are for general information purposes only. ”

Key gaps within the current data set include:

- Air quality mapping across the Fitzroy Basin
- Cultural heritage mapping availability (due to cultural sensitivities)
- Nesting sites and rookeries

Current maps detailing areas of highest risk for disaster occurrence have been provided below (Figure 2-5). To determine these areas a Multi Criteria Analysis was performed using asset presence and mapped disaster risks with the Multi Criteria Analysis Shell software (MCAS). This involved a composite analysis to determine areas where multiple occurrences of different assets occurred.

These were then intersected with disaster likelihood areas for each disaster risk (bushfire, cyclone, flood and pest and disease outbreaks).

Given limited resources for increasing the resilience of assets, areas considered to be a highest priority for action would be areas containing the greatest number of assets at risk from multiple events. To determine this a final composite analysis was completed to convey areas containing multiple assets and considered to be at risk from multiple disasters (Figure 6). These maps have been adjusted with stakeholder consultation, ground truthing and will continue to be adjusted as better datasets become available.

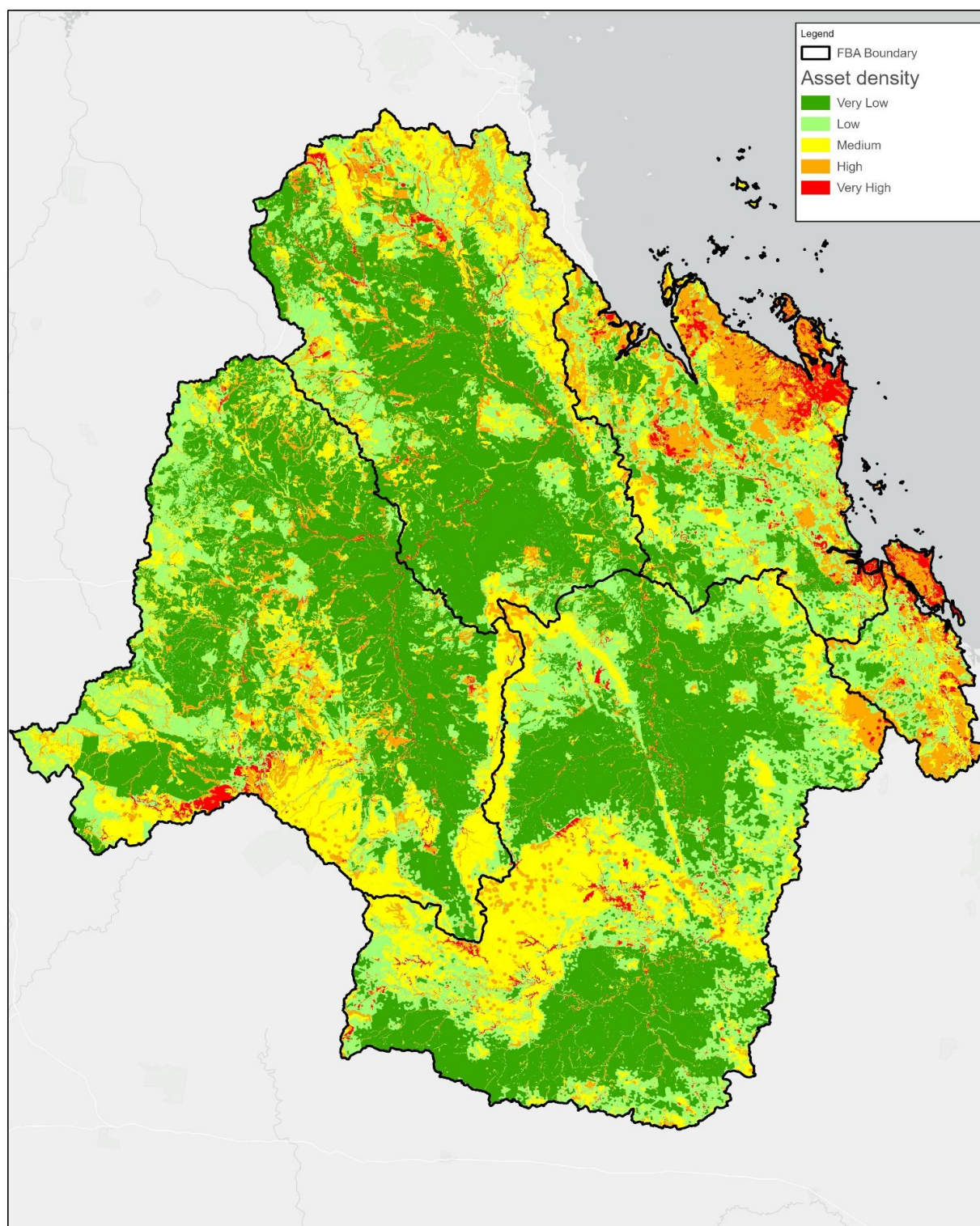


Figure 1: Areas where high number of environmental and agriculture assets are present



Scale 1:1,990,500  
(at original A3 size)

Spatial Reference: GCS GDA 1994



Imagery: Department of Resources, Dept. of Environment and Science, Esri, TomTom, Garmin, FAO, NOAA, USGS  
DCCB Data: CC BY 4.0. © State of Queensland (Department of Resources) 2022.  
Map: © Fitzroy Basin Association 2022.



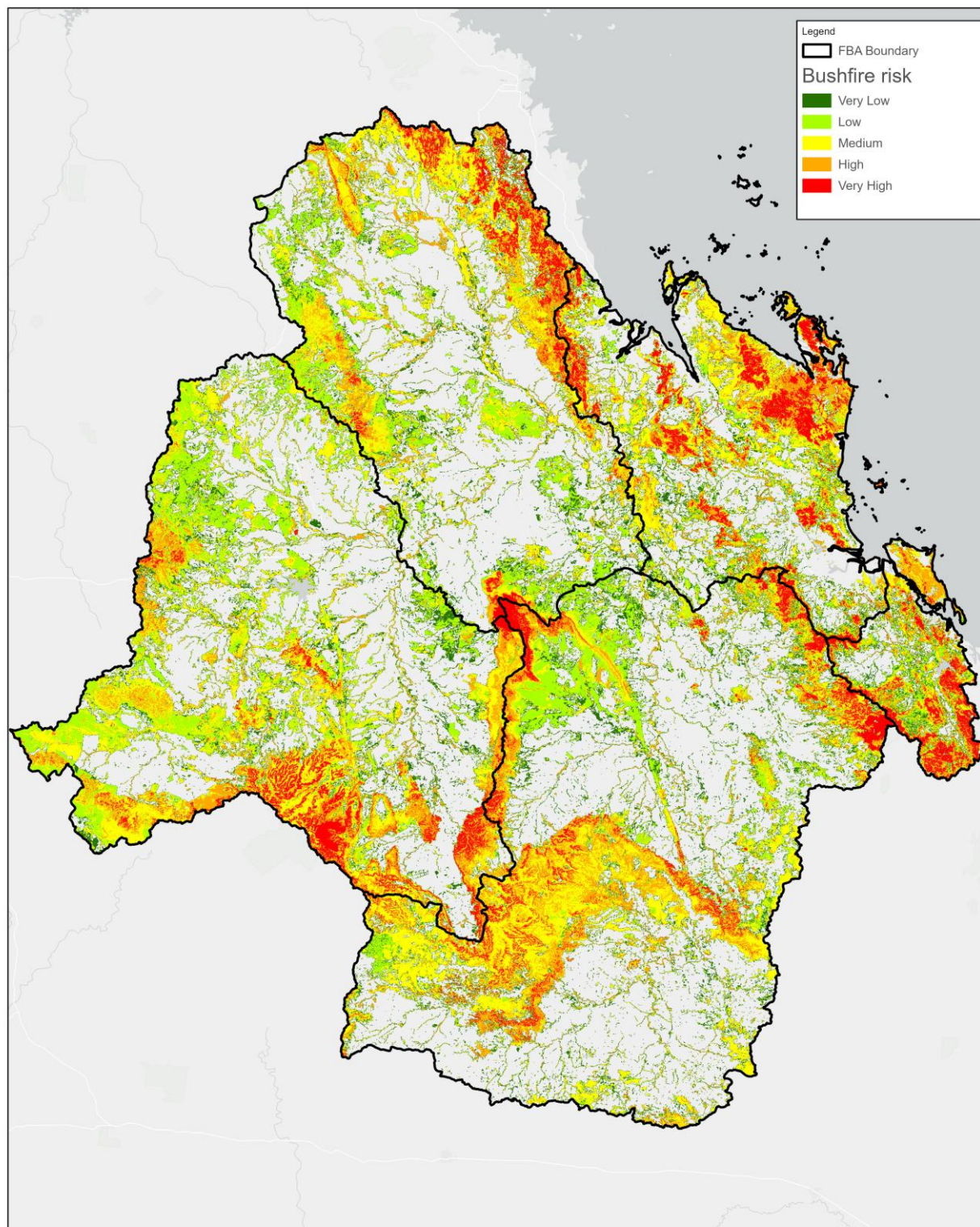


Figure 2: Areas where environmental and agriculture assets are at high risk from extreme bushfire events.



Scale 1:1,990,500  
(at original A3 size)  
Spatial Reference: GCS GDA 1994



Imagery: Department of Resources, Dept of Environment and Science, Esri, TomTom, Garmin, FAO, NOAA, USGS  
DCDB Data: CC BY 4.0 © State of Queensland (Department of Resources) 2022.  
Map: © Fitzroy Basin Association 2022.



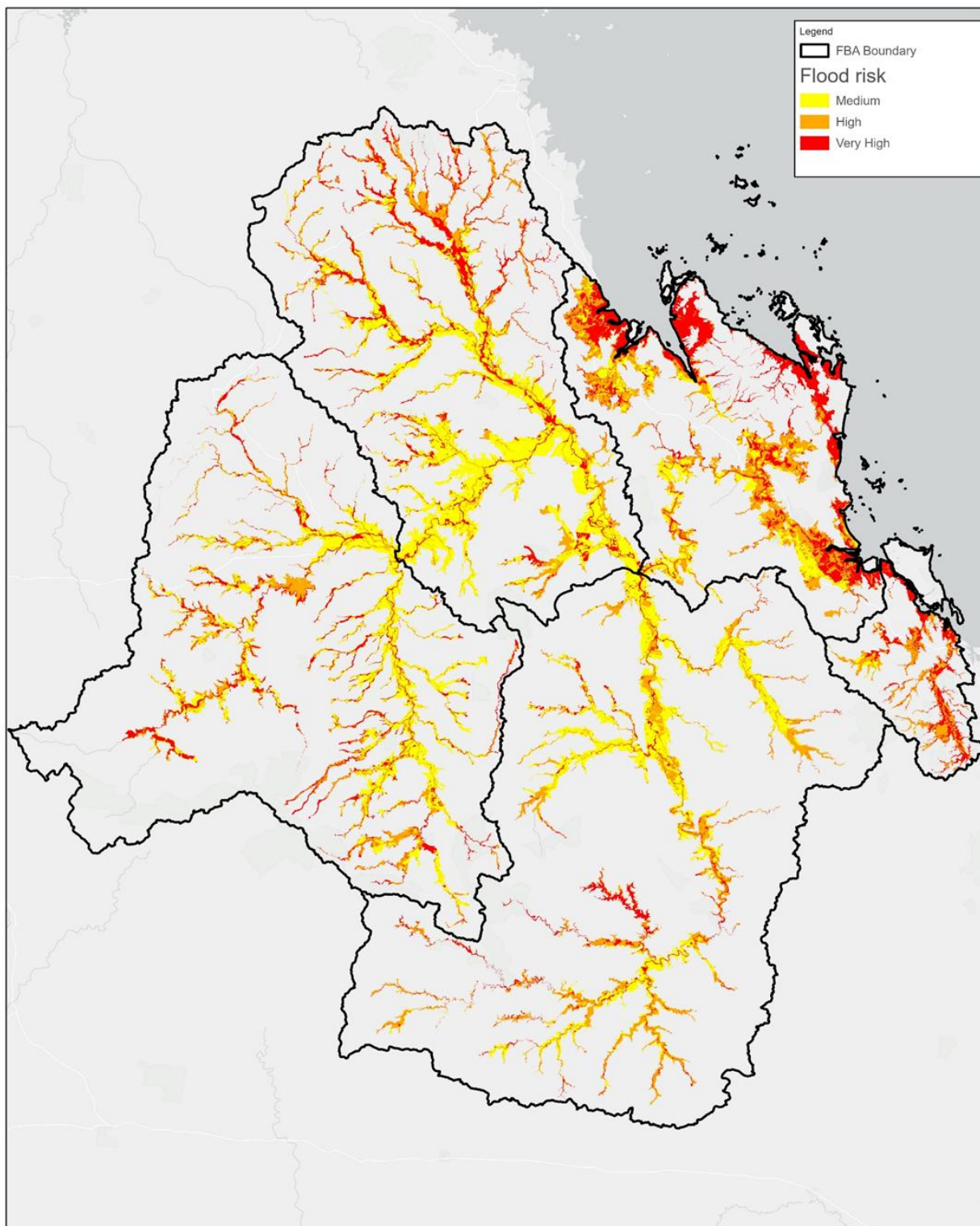


Figure 3: Areas where environmental and agriculture assets are at high risk from flood events.



Scale 1:1,990,500  
(at original A3 size)

Spatial Reference: GCS GDA 1994



Imagery: Department of Resources, Dept of Environment and Science, Esri, TomTom, Garmin, FAO, NOAA, USGS  
DCO Data: CC BY 4.0, © State of Queensland (Department of Resources) 2022  
Map: © Fitzroy Basin Association 2022

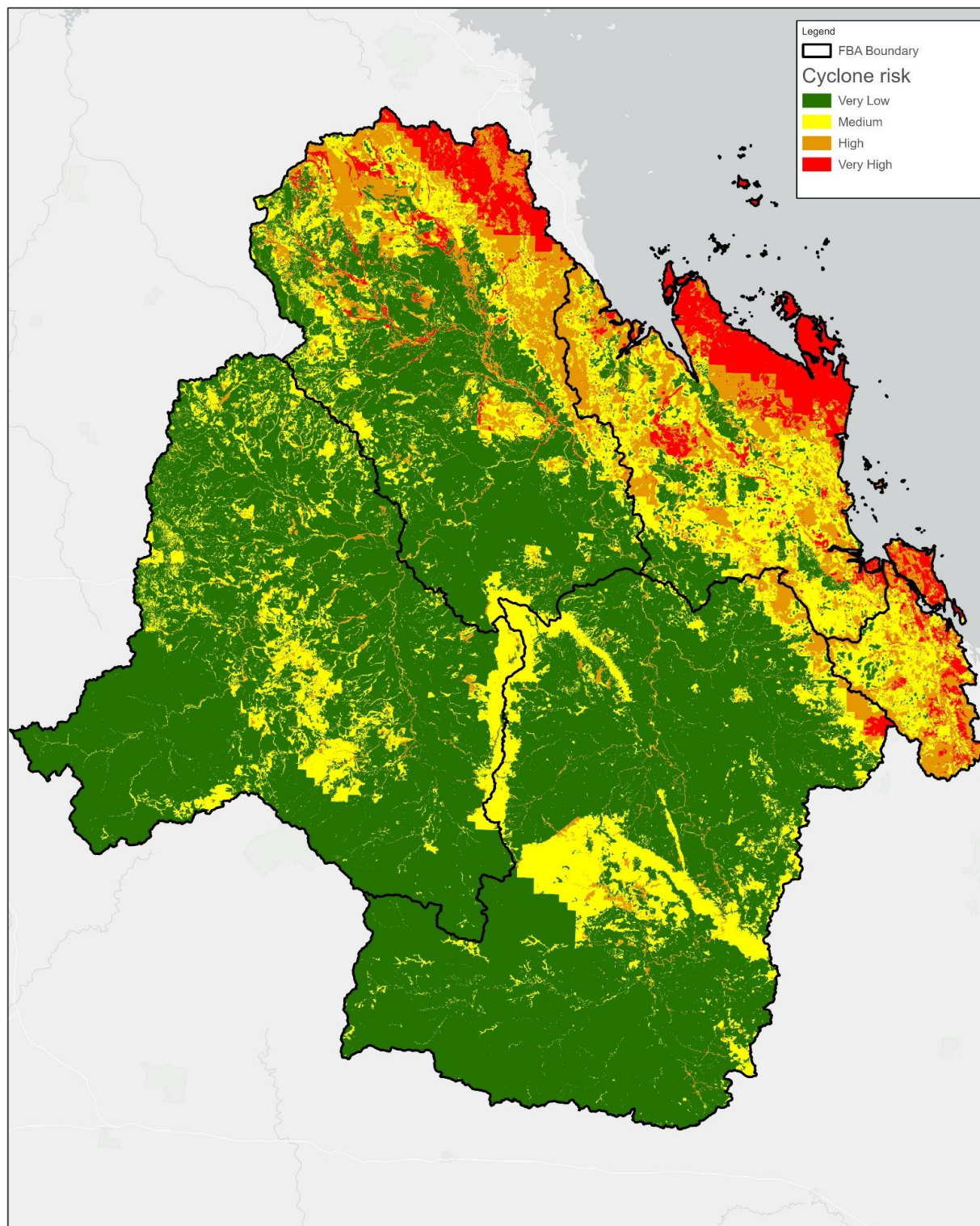


Figure 4: Areas where environmental and agriculture assets are at high risk from cyclone events.



Scale 1:1,990,500  
(at original A3 size)

Spatial Reference: GCS GDA 1994



Imagery: Department of Resources, Dept of Environment and Science, Esri, TomTom, Garmin, FAO, NOAA, USGS  
DCDB Data: CC BY 4.0, © State of Queensland (Department of Resources) 2022.  
Map: © Fitzroy Basin Association 2022.



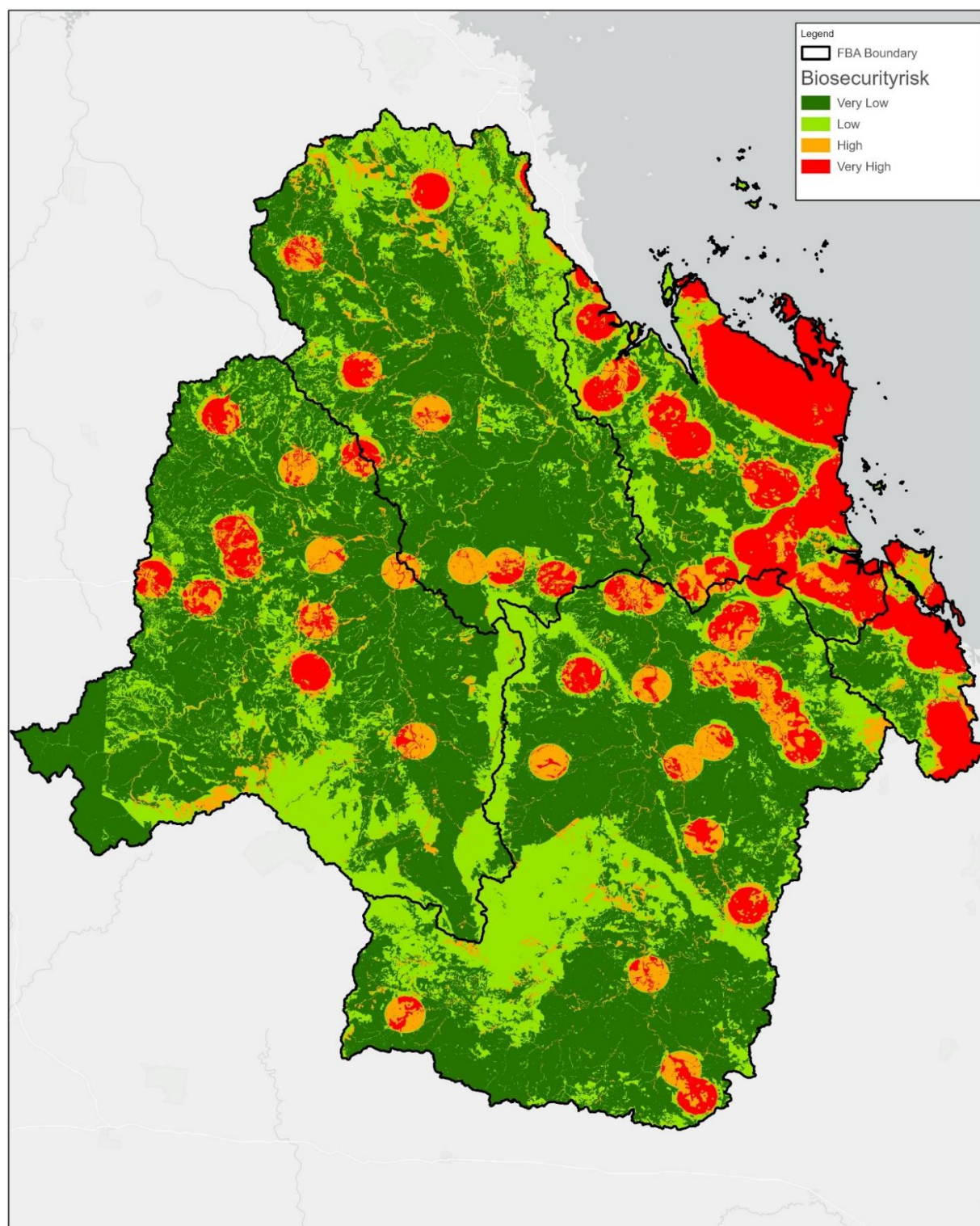


Figure 5: Areas where environmental and agriculture assets are at high risk from pest and disease outbreaks.



Scale 1:1,990,500  
(at original A3 size)  
Spatial Reference: GCS GDA 1994





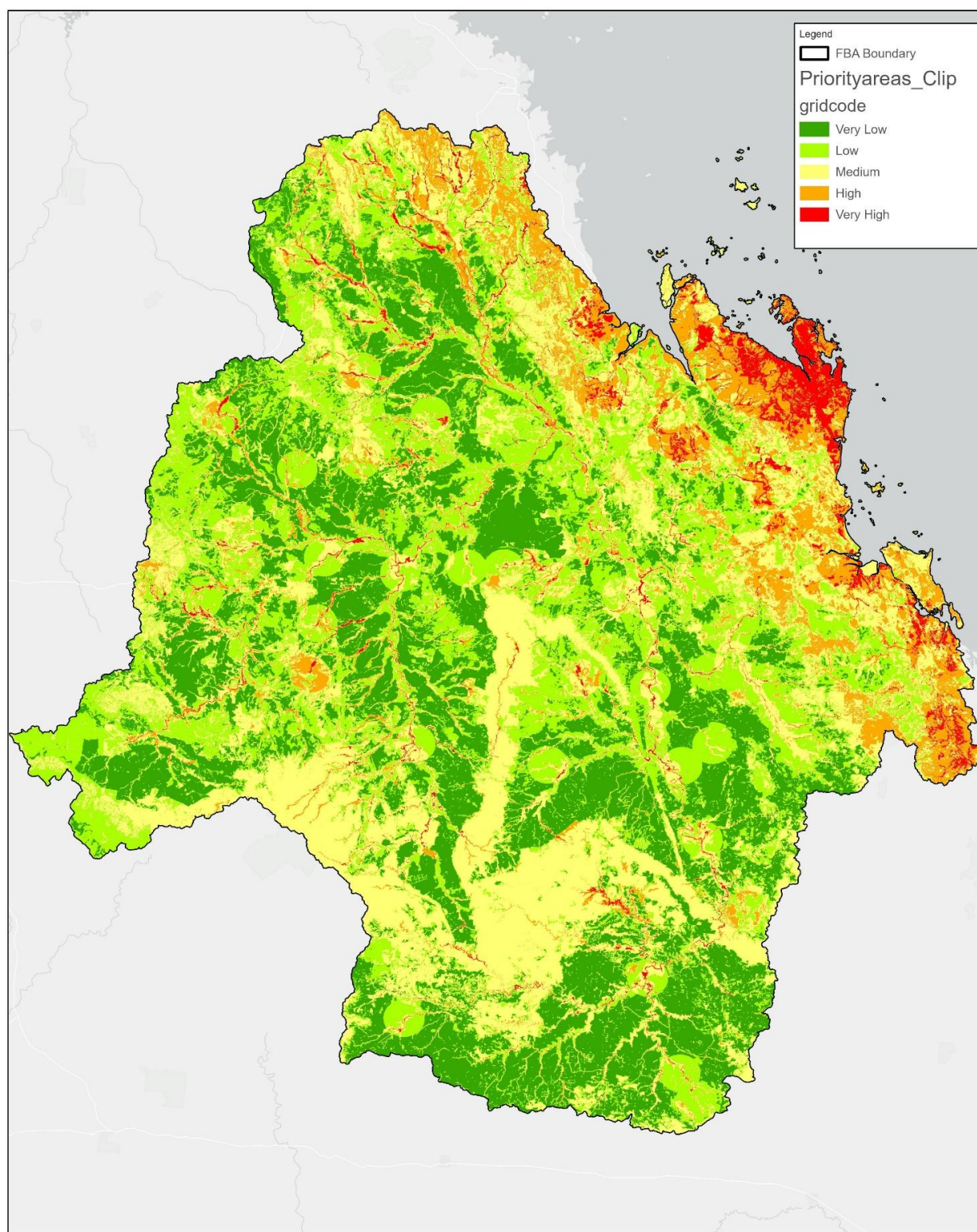
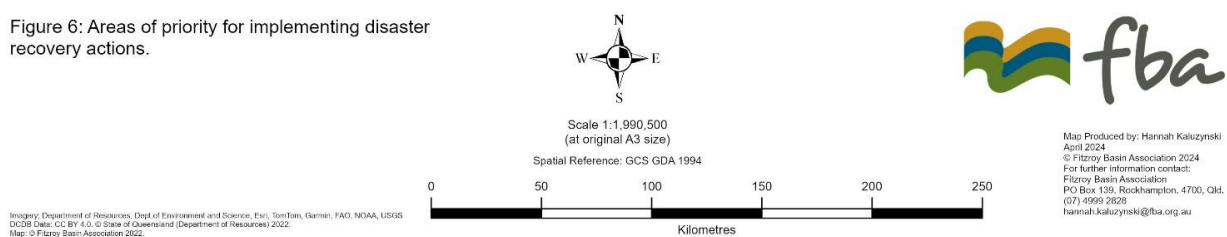


Figure 6: Areas of priority for implementing disaster recovery actions.



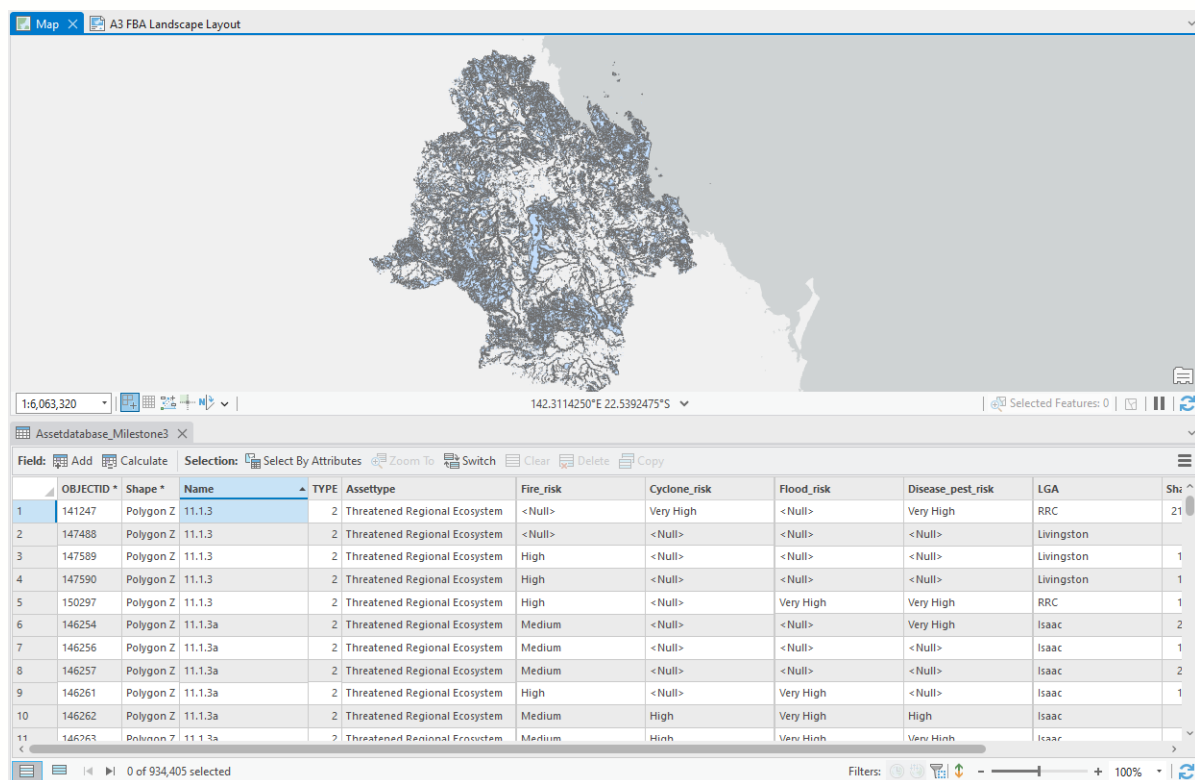


Figure 7: Example of mapping information to be published online pending DCCEE approval

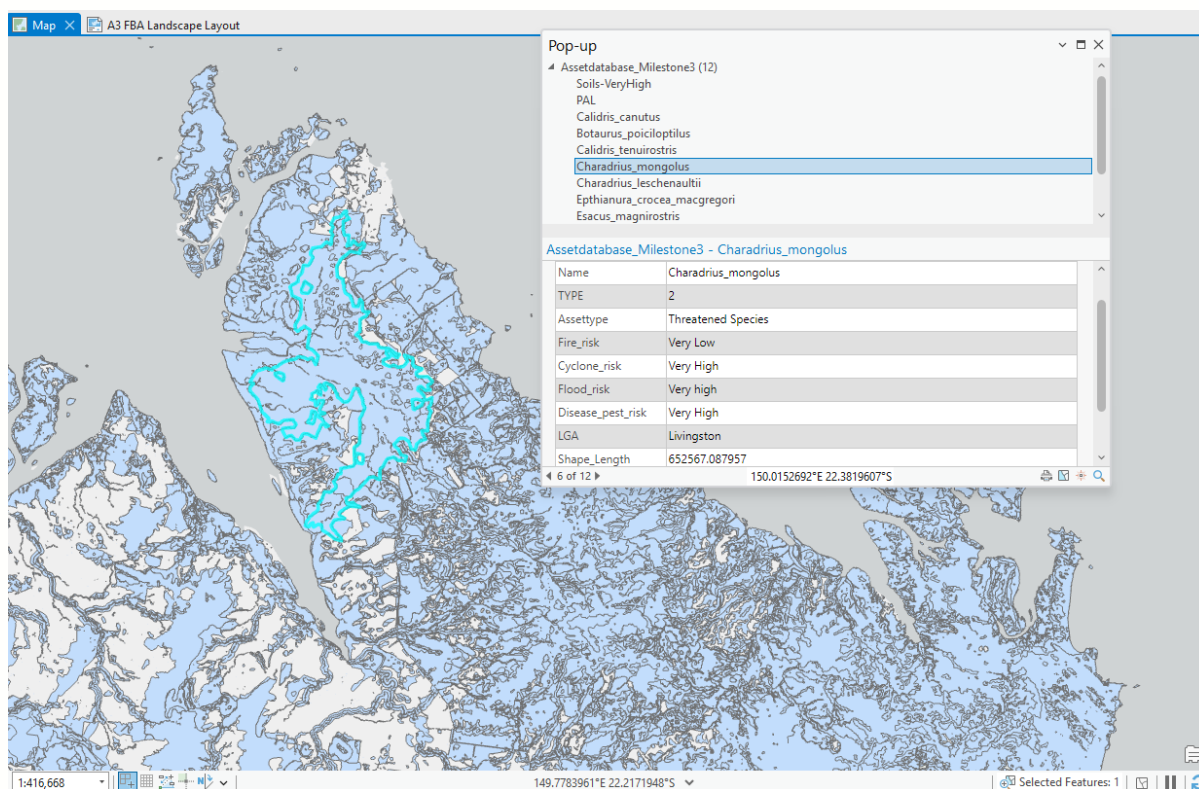


Figure 8: Example of how stakeholders will be able to view individual assets and risk level at particular locations of interest across the Fitzroy Basin on the publicly accessible map.



Table 1: Important biodiversity and agricultural assets, the impacts and susceptibility to natural disaster events in the Fitzroy

Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<b>Extreme Fire events</b>			
<p>Threatened Ecological communities:</p> <p><i>Brigalow</i></p> <p><i>Broadleaf Tea Tree Woodlands</i></p> <p><i>Coastal Swamp Oak Forest</i></p> <p><i>Littoral Rainforest and Coastal Vine Thickets</i></p> <p><i>Semi-evergreen Vine Thicket</i></p> <p><i>Coastal saltmarsh</i></p> <p><i>White Box-yellow Box Woodland</i></p> <p>Threatened regional Ecosystems (94)</p> <p>Directory of Important Wetland areas</p> <p>Ramsar</p> <p>Agricultural assets:</p> <p><i>Riparian vegetation</i></p>	<p>Damage and destruction to vegetation structure</p> <p>Reduced recruitment survival</p> <p>Increased risk to invasion from weeds and invasive species</p> <p>Increased risk of erosion</p> <p>Overall loss of biodiversity</p> <p>Release of carbon stores</p> <p>Habitat loss due to regrowth thickening</p> <p>Reduced soil health and increased risk of erosion</p>	High	<p>Proximity to area with high likelihood to experience extreme fire</p> <p>Local knowledge and history of catastrophic fire events provided from experts during consultation</p> <p>Fire has been listed as a key threatening process in either Conservation advice, recovery plans of threat abatement processes</p>
<p>Threatened amphibian, reptile, and insect species:</p> <p><i>Acanthophis antarcticus</i></p> <p><i>Adclarkia cameroni</i></p> <p><i>Adclarkia dawsonensis</i></p> <p><i>Furina dunmalli</i></p> <p><i>Egernia rugosa</i></p> <p><i>Litoria kroombitensis</i></p> <p>Threatened bird species:</p> <p><i>Epthianura crocea macgregori</i></p> <p><i>Turnix melanogaster</i></p> <p><i>Erythroriorchis radiatus</i></p> <p>Threatened mammal species:</p> <p><i>Nyctophilus corbeni</i></p> <p><i>Potorous tridactylus tridactylus</i></p> <p><i>Antechinus argentus</i></p>	<p>Habitat loss through removal of wood debris and microhabitat features.</p> <p>Habitat loss due to regrowth thickening</p> <p>Habitat degradation due to risk of invasion from weeds</p> <p>Destruction of breeding habitat</p> <p>Loss of food resources</p> <p>Increases risk of predation post fire</p> <p>Direct mortalities reducing population size and genetic diversity</p>	High	<p>Proximity to area with high likelihood to experience extreme fire</p> <p>Local knowledge and history of catastrophic fire events provided from experts during consultation</p> <p>Fire has been listed as a key threatening process in either Conservation advice, recovery plans of threat abatement processes</p>

Assets impacted		Impacts	Susceptibility	Susceptibility reasoning
<i>Dasyurus hallucatus</i> <i>Dasyurus maculatus maculatus</i> <i>Petaurus australis australis</i>				
Threatened plant species: <i>Acacia calanthe</i> <i>Acacia eremophiloides</i> <i>Acacia grandifolia</i> <i>Acacia hockingsii</i> <i>Acacia pedleyi</i> <i>Acacia spania</i> <i>Acacia storyi</i> <i>Acacia wardellii</i> <i>Apatophyllum olseni</i> <i>Arthraxon hispidus</i> <i>Atalaya collina</i> <i>Bertya opposens</i> <i>Bertya pedicellata</i> <i>Bertya sharpeana</i> <i>Bosistoa transversa</i> <i>Bulbophyllum globuliforme</i> <i>Cadellia pentastylis</i> <i>Callicarpa thozetii</i> <i>Calytrix gurlumundensis</i> <i>Comesperma oblongatum</i> <i>Cycas megacarpa</i> <i>Dansiea elliptica</i> <i>Daviesia discolor</i> <i>Daviesia quoquoversus</i> <i>Dichanthium setosum</i> <i>Digitaria porrecta</i> <i>Eucalyptus curtisii</i> <i>Eucalyptus decolor</i> <i>Eucalyptus raveretiana</i> <i>Eucalyptus virens</i> <i>Fontainea venosa</i> <i>Graptophyllum excelsum</i>		Direct mortalities reducing population size and genetic diversity Limited recruitment Increased competition with weed species	High	Proximity to area with high likelihood to experience extreme fire Local knowledge and history of catastrophic fire events provided from experts during consultation Fire has been listed as a key threatening process Ecosystem has been deemed fire sensitive or to not be burned as a management practice

Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<i>Zieria actites</i>			
Agricultural asset air	Reduced air quality resulting in increased risk of illness for livestock and people	Medium	Likely to only impact local and surrounding areas affected during fire events
Agricultural asset soil	Reduced soil health through loss of microbiology and macroinvertebrates, nutrients and organic matter Altering of soil physical properties Increased risk of erosion due to exposure and destruction of plant roots	Medium	Likely to only impact local and surrounding areas affected during fire events Knowledge about the severity of impacts is a current gap
<b>Floods</b>			
Threatened Ecological communities: <i>Coastal Swamp Oak Forest</i> <i>Coastal saltmarsh</i> <i>Coolibah Black Box Woodlands</i>  Threatened regional Ecosystems (215, current gap to be refined) Directory of Important Wetland Areas(DIWA) Ramsar Site World Heritage area (GBR)  Agricultural assets: <i>Riparian areas</i> <i>Water</i> <i>Remnant native vegetation</i> <i>Soil</i>	Continued loss of patches of the ecological community or crops Reduced water quality Sedimentation from increased surface run off Changed hydrologic regime Rot and decomposition of plant species (including marine plants) Habitat loss for fauna species Increased risk of acid sulphate soils Impact on local microclimates Increased risk of erosion Overall loss of biodiversity	Medium	Proximity to area with high likelihood to experience extreme flood events  Local knowledge and history of Flood events provided from experts during consultation  Flood has been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes  Ecosystem has been deemed fire sensitive or to not be burned as a management practice
Threatened plant species:  <i>Acacia hockingsii</i> <i>Acacia sp. (Castletower N.Gibson TOI345)</i> <i>Acacia storyi</i> <i>Actephila bella</i> <i>Apatophyllum flavovirens</i> <i>Baeckea trapeza</i> <i>Bertya opposens</i> <i>Dansiea elliptica</i> <i>Decaspermum struckoiligum</i>  <i>Fontainea venosa</i> <i>Graptophyllum ilicifolium</i> <i>Livistona fulva</i> <i>Omphalea celata</i> <i>Phlegmariurus tetrastichoides</i> <i>Solanum dissectum</i> <i>Solanum elachophyllum</i> <i>Trioncinia patens</i> <i>Zieria actites</i>	Direct mortalities reducing population size and genetic diversity Rot and decomposition of plant species Limited recruitment Increased risk to invasion from weeds and invasive species	Low	Proximity to area with high likelihood to experience extreme flood events  Local knowledge and history of Flood events provided from experts during consultation  Flood has been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes
Threatened mammal species: <i>Sousa sahalensis</i> <i>Chalinolobus dwyeri</i>	Habitat loss through removal of microhabitat features Habitat loss due to sedimentation Destruction of breeding habitat	Low	Proximity to area with high likelihood to experience extreme flood events

Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<i>Petauroides volans</i>  Threatened amphibian, reptile, and insect species: <i>Elseya albagula</i> <i>Taudactylus pleione</i> <i>Adclarkia dawsonensis</i>	Loss of food resources Direct mortalities reducing population size and genetic diversity Impact on local microclimates Reduced drinking water quality		Local knowledge and history of Flood events provided from experts during consultation  Flood has been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes
<b>Cyclones</b>			
Threatened Ecological communities: (Current gap to be refined) <i>Brigalow</i> <i>Broadleaf Tea Tree Woodlands</i> <i>Coastal Swamp Oak Forest</i> <i>Coolibah Black Box Woodland</i> <i>Coastal saltmarsh</i> <i>Semi-evergreen Vine Thicket</i>  Threatened regional Ecosystems (184) Directory of Important Wetland areas (DIWA) Ramsar Site World heritage area (GBR)  Agricultural assets: <i>Riparian areas</i> <i>Remnant native vegetation</i> <i>Soil</i> <i>Water</i>	Continued loss of patches of the ecological community Biodiversity loss through plant and animal mortality Reduced recruitment survival Alteration of community structure reducing ecosystem function Reduction/ removal of canopy layer leading to an increase fire risk due to increase in fuel load Increased risk of erosion due to exposed soils Sedimentation from increased surface run off Changed hydrologic regime Rot and decomposition of plant species (including marine plants) Release of carbon stores	High	Proximity to area with high likelihood to experience cyclone events Local knowledge and history of cyclone events provided from experts during consultation  Cyclones have been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes
Threatened mammal species: <i>Chalinolobus dwyeri</i> <i>Petauroides volans</i>  Threatened amphibian and reptile species <i>Elseya albagula</i> <i>Taudactylus Pleione</i>	Direct mortalities reducing population size and genetic diversity Loss of breeding habitat Increased risk to invasion from weeds and invasive species Increased risk of predation Increased risk of waterborne, fungus and insect spread diseases	High	Proximity to area with high likelihood to experience cyclone events Local knowledge and history of cyclone events provided from experts during consultation  Cyclones have been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes
Threatened plant species:	Direct mortalities reducing population size and genetic diversity	High	

Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<i>Acacia hockingsii</i> <i>Acacia</i> sp. (Castletower N.Gibson TOI345) <i>Acacia storyi</i> <i>Actephila bella</i> <i>Apatophyllum flavovirens</i> <i>Baeckea trapeza</i> <i>Bertya opposens</i> <i>Dansiea elliptica</i> <i>Decaspermum struckoileum</i>	<i>Fontainea venosa</i> <i>Graptophyllum ilicifolium</i> <i>Livistona fulva</i> <i>Omphalea celata</i> <i>Phlegmariurus tetrastichoides</i> <i>Solanum dissectum</i> <i>Solanum elachophyllum</i> <i>Trioncinia patens</i> <i>Zieria actites</i>	Limited recruitment Increased risk to invasion from weeds and invasive species Increased risk of predation Increased risk of waterborne, fungus and insect spread diseases	Proximity to area with high likelihood to experience cyclone events Local knowledge and history of cyclone events provided from experts during consultation  Cyclones have been listed as a key threatening process in either Conservation advice, recovery plans or threat abatement processes
Disease outbreaks			
Threatened Ecological Communities: <i>Littoral Rainforest and Coastal Vine Thickets</i> <i>Poplar Box Woodlands</i> <i>White Box-yellow Box Woodland</i>  Agricultural assets Soil	Continued loss of remaining patches of the ecological community Biodiversity loss through plant and animal mortality Reduced recruitment survival	Medium- High	Current gap in knowledge aimed to be further refined through continued consultation  There is very little information available for the susceptibility of assets to disease, further research is required outbreaksDAF and Biosecurity Queensland will be key stakeholders to continue to aid in addressing key data gaps
Threatened mammal species <i>Orcaella heinsohni</i> <i>Potorous tridactylus tridactylus</i> <i>Lasiornis krefftii</i> <i>Phascogalea cinerea</i> <i>Dasyurus hallucatus</i>  Threatened Birds: <i>Lophochroa leadbeateri</i> <i>Calidris canutus</i> <i>Limosa lapponica baueri</i> <i>Thalassarche cauta</i>  Threatened amphibian, reptile and fish species: <i>Natator depressus</i> <i>Litoria kroombitensis</i> <i>Taudactylus eungellensis</i> <i>Adelotus brevis</i> <i>Bidyanus bidyanus</i>	Direct mortalities reducing population size and genetic diversity Increased animal suffering/ prolonged pain Increased risk to predation Increased risk of zoonotic transfer to other species	Medium- high	Current gap in knowledge aimed to be further refined through continued consultation  There is very little information available for the susceptibility of assets to disease, further research is required outbreaks  DAF and Biosecurity Queensland will be key stakeholders to continue to aid in addressing key data gaps



Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<b>Pest outbreaks</b>			
<p>Threatened Ecological communities:</p> <p><i>Brigalow</i></p> <p><i>Coastal Swamp Oak Forest</i></p> <p><i>Littoral Rainforest and Coastal Vine Thickets</i></p> <p><i>Lowland and Subtropical Rainforest</i></p> <p><i>Natural Grasslands</i></p> <p><i>Poplar Box Woodland</i></p> <p><i>Semi-evergreen Vine Thicket</i></p> <p><i>Coastal saltmarsh</i></p> <p><i>White Box-yellow Box Woodland</i></p> <p>Threatened regional Ecosystems (471, current gap to be refined)</p> <p>Directory of Important Wetland areas</p> <p>Ramsar Site</p> <p>Agricultural assets:</p> <p><i>Riparian areas</i></p> <p><i>Remnant native vegetation</i></p> <p><i>Soil</i></p>	<p>Damage and destruction to vegetation structure</p> <p>Reduced soil health</p> <p>Reduced recruitment survival</p> <p>Competition with weeds</p> <p>Increased risk of erosion</p> <p>Overall loss of biodiversity</p> <p>Increased risk of fire due to transformer weeds</p>	Medium-High	<p>Current gap in knowledge aimed to be further refined through continued consultation</p> <p>Whilst some small areas of the basin have mapped data available for most of the Fitzroy region is lacking detailed information</p> <p>Local knowledge and history of key areas for potential outbreaks to begin provided from experts during consultation</p> <p>DAF and Biosecurity Queensland will be key stakeholders to continue to aid in addressing key data gaps</p>
<p>Threatened mammal species:</p> <p><i>Xeromys myoides</i></p> <p><i>Chalinolobus dwyeri</i></p> <p><i>Nyctophilus corbeni</i></p> <p><i>Hipposideros semoni</i></p> <p><i>Macroderma gigas</i></p> <p><i>Onychogalea fraenata</i></p> <p><i>Potorous tridactylus tridactylus</i></p> <p><i>Lasiorhinus krefftii</i></p> <p><i>Antechinus argentus</i></p> <p><i>Dasyurus hallucatus</i></p> <p><i>Dasyurus maculatus maculatus</i></p> <p><i>Petaurus australis australis</i></p> <p>Threatened bird species:</p> <p><i>Epthianura crocea macgregori</i></p> <p><i>Turnix melanogaster</i></p> <p><i>Calidris canutus</i></p> <p><i>Calidris ferruginea</i></p> <p><i>Calidris tenuirostris</i></p> <p><i>Limosa lapponica baueri</i></p> <p><i>Esacus magnirostris</i></p> <p><i>Ardenna pacifica</i></p> <p><i>Diomedea exulans</i></p> <p><i>Podargus ocellatus plumiferus</i></p> <p><i>Geophaps scripta scripta</i></p> <p><i>Phaethon rubricauda</i></p>	<p>Direct mortalities reducing population size and genetic diversity</p> <p>Increased risk of zoonotic transfer to other species</p> <p>Competition for limited resources (food, habitat, water etc)</p>	Medium-High	<p>Current gap in knowledge aimed to be addressed in further development of this plan</p> <p>Whilst some small areas of the basin have mapped data available for most of the Fitzroy region is lacking detailed information</p> <p>Local knowledge and history of key areas for potential outbreaks to begin provided from experts during consultation</p> <p>DAF and Biosecurity Queensland will be key stakeholders to continue to aid in addressing key data gaps</p>

Assets impacted	Impacts	Susceptibility	Susceptibility reasoning
<p><i>Rostratula australis</i> <i>Charadrius leschenaultia</i></p> <p>Threatened amphibian, reptile, fish and insect species:</p> <p><i>Acanthopis antarcticus</i> <i>Denisonia maculata</i> <i>Furina dunmalli</i> <i>Egernia rugosa</i> <i>Delma torquata</i> <i>Strophurus taenicauda</i> <i>Elseya albagula</i> <i>Rheodytes leukops</i></p>	<p><i>Ardena grisea</i></p> <p><i>Caretta caretta</i> <i>Litoria kroombitensis</i> <i>Taudactylus pleione</i> <i>Adelotus brevis</i> <i>Bidyanus bidyanus</i> <i>Pseudomugil mellis</i> <i>Adclarkia cameroni</i> <i>Adclarkia dawsoneensis</i></p>		
<p>Threatened Plant species:</p> <p><i>Acacia curranii</i> <i>Acacia hockingsii</i> <i>Actephila bella</i> <i>Apatophyllum olsenii</i> <i>Arthraxon hispidus</i> <i>Arytera dictyoneura</i> <i>Atalaya collina</i> <i>Bertya opponens</i> <i>Bertya sharpeana</i> <i>Bosistoa transversa</i> <i>Bulbophyllum globuliforme</i> <i>Cossinia australiana</i> <i>Cryptandra ciliata</i> <i>Daviesia quoquoversus</i> <i>Decaspermum struckoileum</i> <i>Dichanthium queenslandicum</i> <i>Dichanthium setosum</i> <i>Digitaria porrecta</i> <i>Discaria pubescens</i> <i>Eriocaulon carsonii</i> <i>Eucalyptus raveretiana</i> <i>Eucalyptus virens</i> <i>Fontainea venosa</i></p>	<p><i>Homopholis belsonii</i> <i>Macadamia integrifolia</i> <i>Marsdenia brevifolia</i> <i>Medicosma elliptica</i> <i>Melaleuca irbyana</i> <i>Myriophyllum artesium</i> <i>Neisosperma kilneri</i> <i>Neoroepera buxifolia</i> <i>Omphalea celata</i> <i>Ozothamnus eriocephalus</i> <i>Parsonsia larcomensis</i> <i>Pomaderris coomingalensis</i> <i>Rhaponticum australe</i> <i>Rhodamnia angustifolia</i> <i>Rutidosis glandulosa</i> <i>Samadera bidwillii</i> <i>Solanum dissectum</i> <i>Solanum elachophyllum</i> <i>Solanum johnsonianum</i> <i>Tectaria devexa var. devexa</i> <i>Thelypteris confluens</i> <i>Thesium australe</i> <i>Trioncinia patens</i></p>	<p>Direct mortalities reducing population size and genetic diversity Increased risk of zoonotic transfer to other species Competition for limited resources (food, habitat, water etc)</p>	<p>Medium-High</p> <p>Current gap in knowledge aimed to be addressed in further development of this plan Whilst some small areas of the basin have mapped data available for most of the Fitzroy region is lacking detailed information</p> <p>Local knowledge and history of key areas for potential outbreaks to begin provided from experts during consultation</p> <p>DAF and Biosecurity Queensland will be key stakeholders to continue to aid in addressing key data gaps Current gap in knowledge aimed to be addressed in further development of this plan Whilst some small areas of the basin have mapped data available for most of the Fitzroy region is lacking detailed information</p>

Assets impacted	Impacts	Susceptibility *This will be further refined during the plan's development as higher quality data and knowledge becomes available	Susceptibility reasoning *This will be further refined during the plan's development as higher quality data and knowledge becomes available through stakeholder consultation
<i>Graptophyllum excelsum</i> <i>Graptophyllum ilicifolium</i> <i>Haloragis exalata subsp. velutina</i>	<i>Xerothamnella herbacea</i> <i>Zieria actites</i>		



## Asset preparedness and response

### **Actions for protecting Biodiversity and agricultural assets**

Actions implemented on-ground can benefit both biodiversity and agricultural assets working together to create a cohesive and resilient landscape to natural disasters. The below table indicates actions that can be taken to prepare assets for each extreme event, mitigate the effects of disasters as they are occurring and help the landscape recover from extreme event impacts.

This table has been informed from a desktop analysis, literature review and consultation with the community and key stakeholders to determine and refine appropriate actions considered best practice.

Table 2 Actions that can be implemented to protect and enhance biodiversity and agricultural assets for extreme events within the Fitzroy

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Actions appropriate for all disaster events															
Buffer establishment	X	X	X	X	X	X					X	X			Land managers QPWS Queensland Biosecurity Local Councils
Creating/updating disaster management plans	X	X	X	X	X	X	X	X	X	X	X	X		X	FBA (This plan) QPWS QFES Queensland Biosecurity Local Councils State and Federal Government
Encouraging behaviour change	X	X	X	X	X	X	X	X	X	X	X	X	X	X	FBA Local Councils QPWS QFES Queensland Biosecurity
Implementing on ground programs to support asset resilience and recovery	X	X	X	X	X	X	X	X	X	X	X	X		X	FBA Local Councils Queensland Biosecurity
Increasing awareness/ education	X	X	X	X	X	X	X	X	X	X	X	X	X	X	FBA Local Councils



Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Mapping of assets and disaster risks, locations and impacts	X	X	X	X	X	X	X	X	X	X	X	X		X	FBA Local Councils QPWS QFES Queensland Biosecurity
Monitoring of action effectiveness	X	X	X	X	X	X	X	X	X	X	X			X	FBA Land managers Local Councils QPWS QFES Queensland Biosecurity
Monitoring of disaster impacts	X	X	X	X	X	X	X	X	X	X	X		X	X	FBA Land managers Local Councils QPWS QFES Queensland Biosecurity
Rehabilitation of impacted areas	X	X	X	X	X	X	X	X	X	X	X			X	FBA Land managers Local Councils Community groups
Relocate animals from areas predicted to be affected	X			X									X		CURRENT GAP
Research	X	X	X	X	X	X	X	X	X	X	X	X	X	X	CQU UQ

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Respond during the disaster as required	X	X	X	X	X	X	X	X	X	X	X		X		QPWS QFES Department of Defence Local councils Queensland Police Queensland Health
Restrict public access to areas at risk	X	X	X	X	X	X	X	X	X	X	X		X		QPWS Local Council
Stakeholder meetings and collaboration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	All relevant stakeholders
Weed control	X	X	X	X	X	X	X	X		X	X	X		X	Land managers QPWS Queensland Biosecurity
Bushfire															
Build knowledge and awareness about end-of-dry season groundcover/biomass standards by land type	X	X	X	X	X	X		X		X	X	X		X	FBA QFES
Controlled grazing regime to maintain appropriate ground cover	X	X	X	X	X		X	X		X	X	X	X	X	Land managers
Creating/updating fire management plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Land managers QFES QPWS

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
															Local councils Department of Defence
Fire break installation and maintenance	X	X	X	X	X	X		X				X	X	X	Land managers QPWS Local councils
Fire training	X	X	X	X	X	X		X			X	X			QFES QPWS
Habitat features reintroduced (rocks, logs, nesting boxes etc)	X			X										X	CURRENT GAP
Hazard reduction burns	X	X	X	X				X	X		X	X			Land managers QFES QPWS
Identify and protect priority species/ecosystems and critical refugia	X	X	X	X	X	X						X	X	X	FBA Department of Environment and Science Department of Climate Change, Energy the Environment and water Local Councils QPWS
Implement appropriate fire regime	X	X	X	X	X	X		X	X	X	X	X			Land managers QPWS Local councils
Pest animal control	X	X		X	X	X		X		X	X	X		X	Land managers QPWS Local councils

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
															Biosecurity Queensland
Promote and support management practices that maintain air quality									X			X		X	CURRENT GAP
Provision of food sources				X										X	CURRENT GAP
Relocate moveable infrastructure	X	X	X	X				X		X	X		X		Land managers QPWS Local councils
Seed collection and storage	X	X	X	X							X	X			Native Plants Capricornia (Volunteer Group) Commercial operators Councils (GRC, LSC, RRC and BSC)
Water infrastructure installation				X						X	X	X		X	Land managers QPWS Local councils
Floods															
Build knowledge and awareness about end-of-dry season groundcover/biomass standards by land type	X	X	X	X	X	X		X		X	X	X		X	FBA QFES
Controlled grazing regime to maintain appropriate ground cover	X	X	X	X	X		X	X		X	X	X	X	X	Land managers

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Habitat features reintroduced (rocks, logs, nesting boxes etc)	X			X										X	CURRENT GAP
Install appropriate infrastructure	X	X			X	X	X			X		X		X	Local Councils
Install sediment capturing infrastructure					X	X	X	X		X	X	X			CURRENT GAP
Promote and support management practices that reduce demands on water resources manage salinity risk and avoid contamination of water sources					X	X				X	X	X	X	X	Local Councils FBA
Provision of food sources				X										X	CURRENT GAP
Relocate moveable infrastructure	X	X	X	X				X		X	X		X		Land managers QPWS Local councils
Seed/ mulch bare areas to gain groundcover	X	X	X	X	X		X	X		X	X	X		X	Land managers
Cyclones															
Controlled grazing regime to maintain appropriate ground cover	X	X	X	X	X		X	X		X	X	X	X	X	Land managers
Habitat features reintroduced (rocks, logs, nesting boxes etc)	X			X										X	CURRENT GAP

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Install appropriate infrastructure	X	X			X	X	X			X		X		X	Local councils
Pest animal control	X	X		X	X	X		X		X	X	X		X	Land managers QPWS Local councils
Protect and prioritise the coastal zone as a critical buffer	X	X	X	X	X	X	X					X		X	CURRENT GAP
Provision of food sources				X										X	CURRENT GAP
Relocate moveable infrastructure	X	X	X	X				X		X	X		X		Land managers QPWS Local councils
Seed collection and storage	X	X	X	X							X	X			Native Plants Capricornia (Volunteer Group) Commercial operators Councils (GRC, LSC, RRC and BSC)
Seed/ mulch bare areas to gain groundcover	X	X	X	X	X		X	X		X	X	X		X	Land managers
Store equipment appropriately	X	X	X	X	X	X	X	X		X	X		X		QPWS Local Councils
Understand and prepare for changes in sea level and tidal/storm surges	X	X	X	X	X	X	X	X			X	X	X	X	QPWS Local Councils Department of Defence
Disease Outbreaks															



Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
Creating/updating biosecurity plans	X	X	X	X	X	X	X	X	X	X	X	X		X	Land managers Queensland Biosecurity QPWS Local councils Department of Defence
Humanely destroy effected animals/ plants as necessary	X	X	X	X	X	X	X	X			X		X		Land managers QPWS Queensland Biosecurity
Identify and protect priority species/ecosystems and critical refugia	X	X	X	X	X	X						X	X	X	Queensland Biosecurity QPWS Local councils FBA
Implement appropriate hygiene protocols	X	X	X	X	X	X	X	X			X	X	X	X	Land managers Queensland Biosecurity QPWS Local councils Department of Defence FBA
Pest animal control	X	X		X	X	X		X		X	X	X	X	X	Land managers QPWS Local councils
Quarantine effected animals/plants	X	X	X	X								X	X	X	Land managers Queensland Biosecurity
Seed collection and storage	X	X	X	X							X	X			Native Plants Capricornia (Volunteer Group) Commercial operators

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
															Councils (GRC, LSC, RRC and BSC)
Store equipment appropriately	X	X	X	X	X	X	X	X		X	X	X	X	X	QPWS QFES Local Councils
Washdown any new equipment entering area	X	X	X	X	X	X	X	X		X	X	X	X	X	Queensland Biosecurity QPWS QFES Local councils FBA
Pest Outbreaks															
Creating/updating biosecurity plans	X	X	X	X	X	X	X	X	X	X	X	X		X	Land managers Queensland Biosecurity QPWS Local councils Department of Defence
Humanely destroy effected animals/ plants as necessary	X	X	X	X	X	X	X	X			X		X		Land managers QPWS Queensland Biosecurity
Identify and protect priority species/ecosystems and critical refugia	X	X	X	X	X	X						X	X	X	Queensland Biosecurity QPWS Local councils FBA
Pest animal control	X	X		X	X	X		X		X	X	X	X	X	Land managers

Actions to be implemented	Relevant asset											Timing of Action implementation			Agency currently Implementing action within Fitzroy
	Biodiversity							Agricultural							
	TEC	Threatened RE	Threatened plants	Threatened Animals	DIWA	Ramsar Site	GBR	Soil	Air	Water	Riparian vegetation	Pre	During	Post	
															QPWS Local councils
Seed collection and storage	X	X	X	X							X	X			Native Plants Capricornia (Volunteer Group) Commercial operators Councils (GRC, LSC, RRC and BSC)



## Legal framework

FBA is a Company Limited by Guarantee (registered under the Corporations Act 2001). FBA complies with all statutory legal and governance obligations demonstrated through a legally sound Constitution, FBA Corporate Governance Charter and an established and implemented suite of Policies and Procedures. FBA is dedicated to finding the best way to connect and motivate central Queensland people to adopt sustainable practices to ensure long term persistence of assets.

FBA takes its responsibility to the community and its members seriously and reports annually to stakeholders via an Annual General Meeting (AGM) and informally semi-regularly through our website, social media, newsletters, and events. FBA commits to meeting ethical procurement, human resource management, and environmental sustainability expectations and ensures accountability for the expenditure of public funds in delivery of any plan actions.

FBA has an organisation-wide Work Health and Safety Plan (WHS Plan). This Plan is supported by – a comprehensive suite of policies and procedures, FBA's Risk Management Statement, and fit-for- purpose risk management software (SkyTrust).

FBA's Work Health and Safety (WHS) risk assessment methodology ensures that appropriate mitigation strategies are implemented for identified risks and hazards to protect workers, contractors, visitors, and volunteers from risks to their health, safety, and welfare. FBA follows a 4-step process for the identification and treatment of WHS risks consistent with Safe Work Australia guidelines and the Work Health and Safety Act 2011 (Cth): (1) Identify hazards, (2) Assess risks, (3) Control Risks, and (4) Review measures. Identification of risks is supported by workplace and equipment inspections and the Job Safety Analysis procedures for identifying hazards and risks at external events and locations.

FBA's risk assessment tool assesses risk levels by likelihood and severity consistent with best practices, including Safe Work Australia and Safe Work Queensland guidelines.

Control measures are implemented following the hierarchy of control. In order of preference, these measures are:

- Elimination: removal of the risk, for example, refusing to undertake a risky activity
- Substitution: substitute the risk for something that is less hazardous
- Isolation: isolate the risk away from people or property
- Engineering: control the risk by guarding the hazard physically
- Administrative: provide training, policies, procedures, or signage and
- Personal Protective Equipment (PPE): equipment or clothing to reduce the risk

Review of procedures is supported by information collection through risk management software, performance indicators, internal and external audits, planning and implementation of improvements. SkyTrust is FBA's integrated Quality, Safety, Health and Environment (QHSE) platform. Using SkyTrust, health and safety data is collected in a central location, allowing management to identify potential hazards and implement effective risk management strategies. This system also provides notifications to ensure that all incidents and hazards are investigated promptly and streamlines the approval of activities where risk mitigation must be considered. SkyTrust documents FBA's risk assessment activities and provides a centralised Risk Register for FBA, its Services, and Projects.



This system is currently used to manage:

- FBA's approved Risk Register
- Environmental aspect and impact register
- Hazard identification and risk assessment
- Project service risk assessments
- Project WHS risk assessments
- Job safety analysis
- Generation of reports to the FBA Board
- Safety incidents and responses, and
- Safety inspections and audits

The WHS Plan provides systems for WHS training for staff, contractors or volunteers, consultation regarding health and safety matters, risk assessment and risk management, workplace inspection and monitoring arrangements, and reporting notifiable incidents and near misses. The WHS Plan is maintained by the Risk and Safety Officer responsible for ensuring compliance and continuous improvement of WHS at FBA.

## Risk management including mitigation strategies

Currently this Section has been informed from a desktop analysis, literature review, FBA's experience with on-ground project delivery risks, and stakeholder consultation. The below table (Table 6) will continue to be refined as the plan is developed and implementation actions are finalised. It is anticipated that as consultation with the community and key stakeholders occurs, mitigation actions will be further defined to include other stakeholder approaches to delivery.

Table 6: Outline of key overarching risks associated with the implementation of the asset preparedness/response actions and how they can be mitigated

Actions	Potential risks	Consequences	Possible controls	Risk
Behaviour change Build knowledge and awareness about end-of- dry season groundcover/biomass standards by land type Creating/ updating a fire management plan Identify and protect priority species/ecosystems and critical refugia Increasing awareness/ education Promote and support best management practices Understand and prepare for changes in sea level and tidal/storm surges	Environmental incidents caused by FBA projects Lack of effective communication leads to misunderstanding or misinformation Accusations of mismanagement of funds or resources Unintended consequences of FBA initiatives that lead to dissatisfaction within local communities Unfavourable reporting by media outlets regarding FBA activities or decisions	Unintended damage to biodiversity and/or agricultural assets Reduced trust and confidence in FBA's services or knowledge Reduction in financial support from governments and other stakeholders Damage to relationship with partners due to reputational concerns Negative reactions from local communities and other stakeholders Potential disruptions to ongoing projects and activities Reduced ability to recruit landholders for projects Heightened scrutiny from regulatory bodies	FBA investor relationships FBA service delivery FBA retained earnings available to support business development and new opportunity exploration if approved through the budget process Stakeholder Member engagement ongoing Staff trained and supported in relationship management and identifying potential issues early Staff are recruited for their strong communication skills and supported through training and professional development FBA Engagement plan guides efforts to maintain engagement and connection	Low
Buffer establishment Controlled grazing regime to maintain ground cover Fire break installation Habitat features reintroduced (rocks, logs, nesting boxes etc) Install appropriate infrastructure/ Water infrastructure Protect and prioritise the coastal zone as a critical buffer Provision of food sources Rehabilitation Relocate moveable infrastructure Seed collection Seed/ mulch bare areas to gain	Workplace accidents or incidents resulting in injury or death to staff or others Unintended environmental harm that adversely affects public health Risks of unsafe practices used by suppliers or contractors Misidentification of cultural heritage sites	Potential legal or regulatory action Damage to FBA's reputation and perception of trust Disruption to or cancellation of projects Financial liability for compensation, legal fees, and fines Erosion of stakeholder support	FBA policies and procedures are in place and regularly reviewed Good safe work procedures and staff training are in place Risk management processes are implemented and periodically reviewed as best practice evolves Developing a culture of proactive risk management The online risk management system, SkyTrust, is accurate and maintained Employsure provides HR advice Whistle-blower Policy	Low



groundcover

Washdown any new equipment entering area

<p>Fire training</p> <p>Implement appropriate fire regime</p>	<p>Workplace accidents or incidents resulting in injury to staff or others</p> <p>Unintended environmental harm that adversely affects public health</p> <p>Risks of unsafe practices used by suppliers or contractors</p> <p>Misidentification of cultural heritage sites</p> <p>Environmental incidents caused by FBA projects</p> <p>Lack of effective communication leads to misunderstanding or misinformation</p> <p>Accusations of mismanagement of funds or resources</p> <p>Unintended consequences of FBA initiatives that lead to dissatisfaction within local communities</p> <p>Unfavourable reporting by media outlets regarding FBA activities or decisions</p>	<p>Potential legal or regulatory action.</p> <p>Damage to FBA's reputation and perception of trust</p> <p>Disruption to or cancellation of projects</p> <p>Financial liability for compensation, legal fees, and fines</p> <p>Erosion of stakeholder support</p> <p>Unintended damage to biodiversity and/or agricultural assets</p> <p>Reduced trust and confidence in FBA's services or knowledge</p> <p>Reduction in financial support from governments and other stakeholders</p> <p>Damage to relationship with partners due to reputational concerns</p> <p>Negative reactions from local communities and other stakeholders</p> <p>Potential disruptions to ongoing projects and activities</p> <p>Reduced ability to recruit landholders for projects</p> <p>Heightened scrutiny from regulatory bodies</p>	<p>FBA policies and procedures are in place and regularly reviewed</p> <p>Good safe work procedures and staff training are in place.</p> <p>Risk management processes are implemented and periodically reviewed as best practice evolves</p> <p>Developing a culture of proactive risk management</p> <p>The online risk management system, SkyTrust, is accurate and maintained</p> <p>Employsure provides HR advice</p> <p>Whistle-blower Policy</p> <p>FBA investor relationships</p> <p>FBA service delivery</p> <p>FBA retained earnings available to support business development and new opportunity exploration if approved through the budget process</p> <p>Stakeholder Member engagement ongoing</p> <p>Staff trained and supported in relationship management and identifying potential issues early</p> <p>Staff are recruited for their strong communication skills and supported through training and professional development</p> <p>FBA Engagement plan guides efforts to maintain engagement and connection</p>	<p>Low</p>
<p>Humanely destroy effected animals/ plants as necessary</p> <p>Quarantine effected animals/plants</p> <p>Relocate animals from areas predicted to be affected</p>	<p>Workplace accidents or incidents resulting in injury to staff or others</p> <p>Unintended environmental harm that adversely affects public health</p> <p>Risks of unsafe practices used by suppliers or contractors</p> <p>Financial liability</p> <p>Animals being treated inhumanely</p>	<p>Potential legal or regulatory action</p> <p>Damage to FBA's reputation and perception of trust</p> <p>Disruption to or cancellation of projects</p> <p>Financial liability for compensation, legal fees, and fines</p> <p>Erosion of stakeholder support</p>	<p>FBA policies and procedures are in place and regularly reviewed</p> <p>Good safe work procedures and staff training are in place.</p> <p>Risk management processes are implemented and periodically reviewed as best practice evolves</p> <p>Developing a culture of proactive risk management</p> <p>Follow Biosecurity QLD guidelines. Only officers employed by Biosecurity Queensland and local</p>	<p>Medium</p>

	<p>Risk to reputation. Non targeted animals affected</p> <p>Human poisoning when there is no antidote</p> <p>Financial penalties for noncompliance against the:</p> <p>a. Australian Model Code of Practice for the Welfare of Animals – Pigs” b. Model Code of Practice for the welfare of animals: feral livestock animals’, under the Animal Care and Protection Act (2001)</p> <p>No humane way to dispatch animals involved in car accidents</p> <p>Lack of nearby veterinary care</p>		<p>government who have undertaken practical and written examinations and received approval from Queensland Health are approved to prepare 1080 baits. All 1080 operators must be retrained every two years</p> <p>Copies of the following documents to be sought from the Marksman and placed on file: a. Relevant gun licence b. Public Liability Certificate of Currency c. Written confirmation of previous experience in aerial pig shooting, and they are appropriately training and competent to undertake such activities. d. Shooter to be accredited for mobile marksmanship. e. Written confirmation of compliance against the ‘Australian Model Code of Practice for the Welfare of Animals – Pigs”, ‘Model Code of Practice for the welfare of animals: feral livestock animals’, under the Animal Care and Protection Act 2001)</p>	
<p>Monitoring of action effectiveness</p> <p>Monitoring of impacts</p> <p>Research</p>	<p>Workplace accidents or incidents resulting in injury to staff or others</p> <p>Unintended environmental harm that adversely affects public health</p> <p>Risks of unsafe practices used by suppliers or contractors</p>	<p>Potential legal or regulatory action</p> <p>Damage to FBA's reputation and perception of trust</p> <p>Disruption to or cancellation of projects</p> <p>Financial liability for compensation, legal fees, and fines</p> <p>Erosion of stakeholder support</p>	<p>FBA policies and procedures are in place and regularly reviewed</p> <p>Good safe work procedures and staff training are in place</p> <p>Risk management processes are implemented and periodically reviewed as best practice evolves</p> <p>Developing a culture of proactive risk management</p> <p>The online risk management system, SkyTrust, is accurate and maintained</p> <p>Employsure provides HR advice</p> <p>Whistle-blower Policy</p>	Low
<p>Pest animal control</p>	<p>Workplace accidents or incidents resulting in injury to staff or others</p> <p>Unintended environmental harm that adversely affects public health</p> <p>Risks of unsafe practices used by suppliers or contractors</p> <p>Financial liability</p> <p>Animals being treated inhumanely</p> <p>Risk to reputation. Non targeted animals affected</p> <p>Human poisoning when there is no antidote</p>	<p>Potential legal or regulatory action</p> <p>Damage to FBA's reputation and perception of trust</p> <p>Disruption to or cancellation of projects</p> <p>Financial liability for compensation, legal fees, and fines</p> <p>Erosion of stakeholder support</p>	<p>FBA policies and procedures are in place and regularly reviewed</p> <p>Good safe work procedures and staff training are in place.</p> <p>Risk management processes are implemented and periodically reviewed as best practice evolves</p> <p>Developing a culture of proactive risk management</p> <p>Follow Biosecurity QLD guidelines. Only officers employed by Biosecurity Queensland and local government who have undertaken practical and written examinations and received approval from Queensland</p>	Medium

	<p>Financial penalties for noncompliance against the:</p> <p>a. Australian Model Code of Practice for the Welfare of Animals – Pigs” b. Model Code of Practice for the welfare of animals: feral livestock animals’, under the Animal Care and Protection Act (2001)</p> <p>No humane way to dispatch animals involved in car accidents</p> <p>Lack of nearby veterinary care</p>		<p>Health are approved to prepare 1080 baits. All 1080 operators must be retrained every two years</p> <p>Copies of the following documents to be sought from the Marksman and placed on file: a. Relevant gun licence b. Public Liability Certificate of Currency c. Written confirmation of previous experience in aerial pig shooting, and they are appropriately training and competent to undertake such activities. d. Shooter to be accredited for mobile marksmanship. e. Written confirmation of compliance against the ‘Australian Model Code of Practice for the Welfare of Animals – Pigs”, ‘Model Code of Practice for the welfare of animals: feral livestock animals’, under the Animal Care and Protection Act 2001)</p>	
Weed control	<p>Workplace accidents or incidents resulting in injury to staff or others</p> <p>Unintended environmental harm that adversely affects public health</p> <p>Risks of unsafe practices used by suppliers or contractors</p> <p>Health and wellbeing of users</p> <p>Long term health effects</p> <p>Poisoning of local fauna and flora Damage to FBA reputation</p>	<p>Potential legal or regulatory action</p> <p>Damage to FBA’s reputation and perception of trust</p> <p>Disruption to or cancellation of projects</p> <p>Financial liability for compensation, legal fees, and fines</p> <p>Erosion of stakeholder support</p>	<p>Correct PPE is to be worn during the use of chemicals. Only persons trained in the use of chemicals are to be involved in their application. Chemicals at workshops are to be supplied and used by facilitator only</p>	Low

## Monitoring and data

This Section will continue to be further developed as asset locations are confirmed through ongoing stakeholder consultations. It is expected that monitoring and data collected for this plan will be a combination of remote sensing and on-ground assessments. Table 8 will be completed and updated as information on the assets becomes available in the plan development. Existing monitoring programs conducted by other stakeholders will be determined and incorporated within the table as required. Discussions will occur with stakeholders to establish data sharing arrangements and agreements. Data will likely be stored within FBA's internal drive and on ARC platforms as enable large data files to be securely stored. Access to data for external stakeholders can be provided to ARC platforms and agreements will be established between all parties wishing to have access to the data.

Table 7: Current known monitoring processes for biodiversity and agricultural assets across the Fitzroy region

Asset	Monitoring type	Method employed	Agency/ Group/ Person responsible	Timing of monitoring
Threatened Ecological Communities	On- ground	BioCondition BioCondition lite VegCAT EMSA protocols	TBD Current Gap	Pre and post event
Threatened Regional Ecosystems	Remote	BioCondition modelling (In development)	Queensland Herbarium	Annually
	Existing monitoring programs	State Land and tree Study Weed distribution survey Weed spotter	DES DA F Queensland Herbarium	Annually Continuous
Threatened Plants	TBD Current Gap	TBD Current Gap	TBD Current Gap	TBD Current Gap
Threatened Animals	On- ground	Population density surveys – Bioacoustics, camera traps, physical trapping etc. EMSA protocols	TBD Current Gap	Pre and post event
	Existing monitoring programs	Koala tracker Kroombit Frog Search Bird surveys Bridled Nailtail Wallaby Recovery Capricorn Yellow Chat population trend Clarke Connors Range Koalas Pest surveys	Alexis Harris QLD Frog society Birdlife Capricornia BNW recovery group Birdlife Capricornia CQU DAF	Opportunistic Unknown Annually/opportunistic Unknown Annually/opportunistic Opportunistic Continuous
DIWA	Remote	Queensland wetland mapping	DES	Annually
	On- ground	WetCAT	TBD Current Gap	Pre and post event
Ramsar Site	Remote	Ramsar assessment tool	FBA	Unknown
Great Barrier Reef	On-ground	TBD Current Gap	TBD Current Gap	Pre and post event
	Existing monitoring programs	Coral watch Crowns of Thorns Mission Marine monitoring program Basin water quality report card	UQ Jolly Rogers fishing club GBRMP FPRH	Variable Opportunistic Variable Biannually
Soil	On- ground	LCAT	FBA TBD Current Gap	Pre and post event
	Remote	Paddock to Reef	DES	Annually



## Key contacts

The following individuals within the table below are the expected FBA key contacts to enable effective delivery of this emergency preparedness plan. Once Stakeholder engagement occurs key contacts from other relevant agencies will be added and incorporated.

Table 8: Key contacts responsible for delivery of this emergency preparedness plan

FBA position	Staff member responsible	Contact Information	Emergency Plan preparedness role
CEO	Elyse Riethmuller	Elyse.Riethmuller@fba.org.au 0420 934 621 07 4999 2818	Final approval of plan
Partnerships and Strategy Manager	Rebecca French	Rebecca.French@fba.org.au 0418 765 762 07 4999 2830	Approval of community/ stakeholder approach
Environment Team Leader	Shannon van Nunen	Shannon.vanNunen@fba.org.au 07 4999 2822 0427 167 515	Review of plan Community/ stakeholder engagement activities
Environmental Coordinator	Hannah Kaluzynski	Hannah.Kaluzynski@fba.org.au 0447 479 371 07 4999 2828	Coordination and plan development Project delivery Coordination of monitoring, data collection and collation of asset data Development and maintenance of multi-jurisdictional inventory Data analysis Community/ stakeholder engagement activities
Senior GIS Officer	Peter Smith	Peter.Smith@fba.org.au 07 4999 2810	Mapping Gap analysis Data analysis
Indigenous Engagement Coordinator	Gloria Malone	Gloria.Malone@fba.org.au 0419 016 306 07 4999 2837	Community/ stakeholder engagement activities First Nations Participation and Relations
Communications Officer	Tayla Hill  Rachel McGhee	Tayla.Hill@fba.org.au 07 4999 2843 0417 273 695 Rachel.McGhee@fba.org.au 07 4999 2808 0448 314 292	community/stakeholder engagement activities



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