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Environmental Management Plan

Molloy Island, Western Australia

13 June 2025

Prepared for:

Shire of Augusta-Margaret River

Attention: Merryn Delaney



Cover Photos L-R: *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo) (Ecosystem Solutions), *Caladenia* sp. (Ecosystem Solutions), *Pseudocheirus occidentalis* (Western Ringtail Possums) (Ecosystem Solutions).

Limitations Statement

This report has been prepared in accordance with the Agreement between Ecosystem Solutions Pty Ltd and Shire of Augusta Margaret River (“**Client**”). This Environmental Management Plan has been solely prepared for Molloy Island, Western Australia, within the Shire of Augusta-Margaret River (“**Site**”).

Information

In undertaking this work the authors have made every effort to ensure the accuracy of the information used. Unless otherwise stated in the report, Ecosystem Solutions Pty Ltd has not independently verified such information and cannot guarantee its accuracy or completeness.

Conclusions

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Document Control

Shire of Augusta-Margaret River

Molloy Island, Western Australia

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Executive Summary

The Shire of Augusta-Margaret River contracted Ecosystem Solutions to prepare an Environmental Management Plan (EMP) for Molloy Island, Western Australia. The EMP aims to combine all existing information known about the Molloy Island Shire reserves and Shire freehold land (commonage) into one comprehensive document, with additional surveys undertaken by Ecosystem Solutions to document other conservation values.

Over 210 native flora species have been recorded, compiled from existing data, as well as the surveys completed by Ecosystem Solutions in 2024. There are three Priority species recorded on the Island, with specimens submitted to the Western Australian Herbarium confirming identification, these are:

- *Hemiandra* sp. Windy Harbour (Priority 3),
- *Netrostylis* sp. Blackwood River (Priority 3), and
- Eucalyptus rudis subsp. cratyantha (Priority 4).

Six vegetation communities have been mapped across the Islands reserves. Of these, one is a Threatened Ecological Community - Subtropical and Temperate Coastal Saltmarsh (Priority 3 / Vulnerable). The Kingia Wetland vegetation community has been identified as being significant to the Island, being the only local occurrence of this vegetation type.

Over 100 native fauna species have been recorded from the Island and adjacent Blackwood River (Goorbiliyup), compiled from existing data as well as the surveys conducted by Ecosystem Solutions. There were four Threatened, three Priority and one Migratory species observed on the Island:

- *Zanda* spp. (White-tailed Black Cockatoos – *Z. baudinii* (Baudin's Cockatoo), Threatened/Endangered), and/or *Z. latirostris* (Carnaby's Cockatoo, Threatened/Endangered)),
- *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoos, Threatened/Vulnerable),
- *Pseudocheirus occidentalis* (Western Ringtail Possums, Threatened/Critically Endangered),
- *Tyto novaehollandiae novaehollandiae* (Masked Owl (southwest), Priority 3),
- *Hydromys chrysogaster* (Rakali, Priority 4),
- *Isoodon fusciventer* (Quenda, Priority 4), and
- *Pandion haliaetus* (Eastern Osprey, Marine and Migratory).

1 Introduction

The Shire of Augusta-Margaret River contracted Ecosystem Solutions to develop an Environmental Management Plan (EMP) for a series of Shire reserves and Shire freehold land located on Molloy Island, which are vested with the Shire of Augusta Margaret River. The location of Molloy Island is shown in Figure 1 with the respective land tenure provided in Figure 2.

Molloy Island represents an important natural area for locals, especially the residents of the Island. It is highly regarded for its ecological values with locals able to immerse themselves in the retained bushland that has an array of flora, fauna, and ecological communities. There are three active groups on the Island, the Friends of Molloy Island Reserves, who help conserve and protect the natural environment of the Molloy Island Shire Reserves, Molloy Island Home Owners Association (MIHOA) and Molloy Island Volunteer Bushfire Brigade. Previous groups included the Molloy Island Environmental (Protection) Group and the Molloy Island Phytophthora Action Group/Dieback Working Group.

1.1 Scope of Work

This report combines all existing information known about the Molloy Island Shire reserves and Shire freehold land (here after referred to as the 'survey area') into one useful document to protect the biodiversity values of the Island and private lots. The aims of this EMP are:

Commented [MD1]: Reserves and comanage referred to as the survey area throughout document and in the recommendations

- To conserve, protect and enhance the biodiversity, ecology, and conservation values of the Molloy Island for present and future generations to enjoy.
- To encourage community involvement in the management of the reserves.
- To raise community awareness of nature conservation and the protection of native flora and fauna.
- To encourage sustainable recreational and educational use of the reserves, consistent with the reserve's conservation significance.

The EMP includes:

- A reconnaissance and targeted survey of the flora, fauna, and vegetation.
- Recommendations for the management of conservation significant species and communities.
- Mapping of habitat trees, concentrating on specific areas of the survey area.

- Compiling existing data, including from previous reports, from Birdlife Australia data, collected by Christine Wilder (Cape to Cape Bird Group - CCBG) since 2004, Land for Wildlife (2012) and other data collected by volunteer groups and residents.
- Provide recommendations to increase community awareness of the impact of weeds on the conservation values of Molloy Island.
- Mapping of priority weed species and recommendations for appropriate control methods.
- Identify any issues with the management of access, and requirements for rehabilitation or restoration of native vegetation.
- A visual assessment of dieback and management recommendations.
- Management advice for the control of introduced fauna, including rabbits, foxes, feral cats, and management of domestic animals.
- Identification of appropriate bushfire risk reduction techniques that minimise harm to the ecological values of the Island, including advice in relation to managing *Kingia* and *Xanthorrhoea* species across the survey area and within private properties.
- Mapping of the existing firebreaks and fire access ways, as well as the fire history across the survey area.
- Recommendations for educational opportunities for the Island to allow landholders to engage and gain a better understanding of environmental values on the Island, and how they can be protected.
- Community engagement – Following the completion of this EMP, Ecosystem Solutions will present the plan to the community at a public forum. The purpose of the forum is to brief the community on the scope and recommendations of the plan, provide an opportunity for questions and feedback, to build relationships and raise awareness of environmental values on the Island.

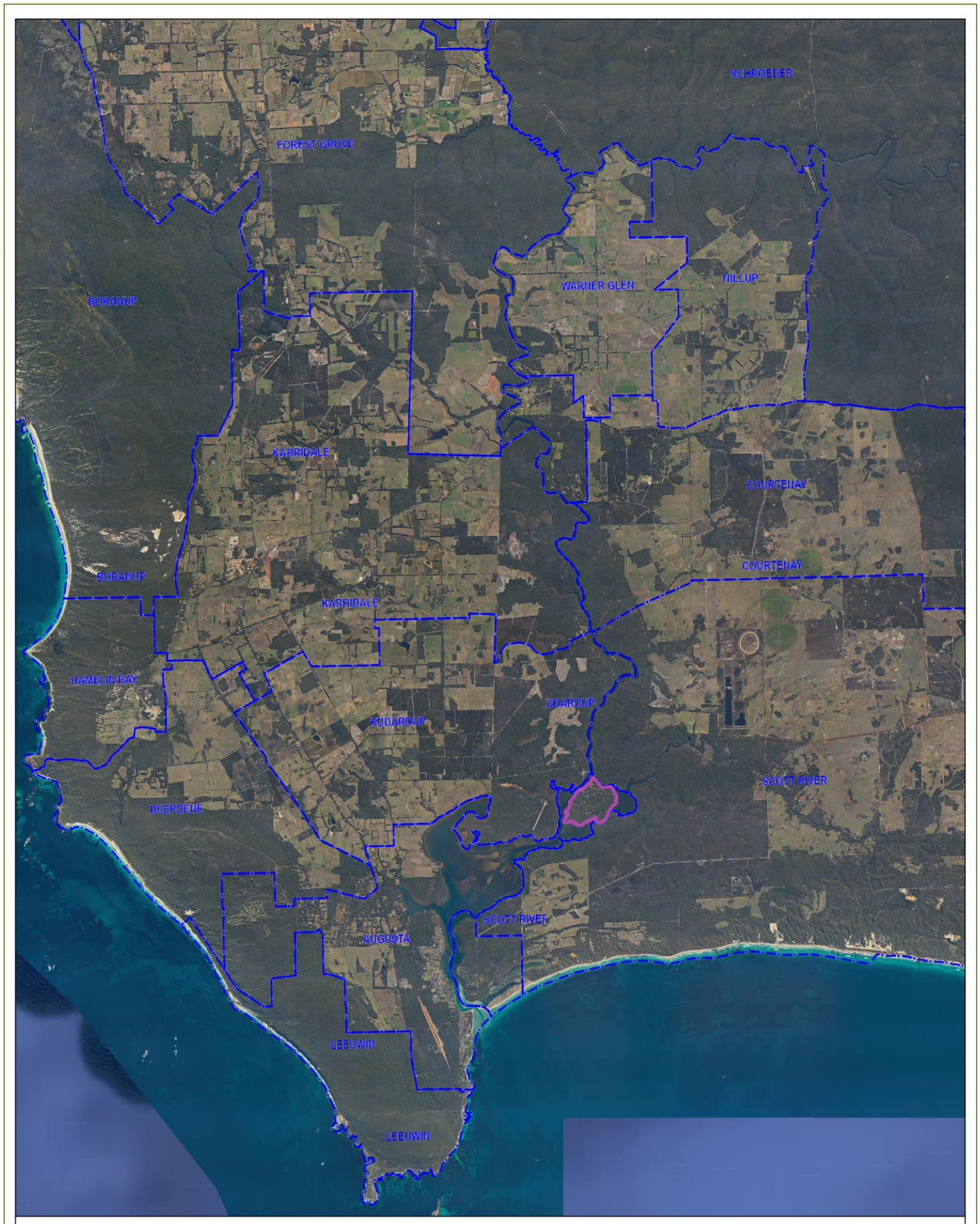


Figure 1 Site Location Map of Molloy Island, Western Australia

2 Site Details

Molloy Island is situated within the Blackwood River and is considered both a locally and regionally significant area The Island is separated from the mainland by the Blackwood River (Goorbilyup) and the Scott River basin areas and is accessible by ferry from the mainland at Molloy Island Road. The Island is adjacent to Kudardup locality to the northwest, Scott River to the southeast and Augusta further to the southwest. The Scott National Park lies to the northeast and south of the Island. Molloy Island is 167 ha in area and sits at an elevation of approximately 5-10 m Australian Height Datum (AHD), sloping gently down towards the river (Figure 2).

The Blackwood River (Goorbilyup) is an Aboriginal Cultural Heritage (ACH) Register Place (20434) under the *Aboriginal Heritage Act 1972* (WA). The entire waterway has mythological importance, it is a place that is connected to the spirit ancestors, in their various manifestations, of the 'Dreamtime' which continues to be important and of special significance to persons of Aboriginal descent.

Historically, Molloy Island was first granted to John and Georgiana Molloy in 1932 to graze stock. In 1917 there was an attempt to establish a farm to breed brushtail possums. It was then purchased for development and subdivision in 1974 by the Clements family. They envisioned a residential subdivision that protected the native vegetation and allowed people to live on the Island and enjoy the natural environment. The barge commenced operation in 1977 (Shire of Augusta Margaret River, 2012). Now the Island consists of a number of Shire reserves, zoned as 'Parks and Recreation,' that under the Shire of Augusta-Margaret River Local Planning Scheme1 'shall only be used for passive recreation except for low-key, unobtrusive recreation and community facilities approved by the local government' There are 275 privately owned residential lots, which to date include 98 permanent houses, 114 holiday homes, 14 long term rentals, 44 vacant blocks and five buildings under construction. The Island is also designated as a 'Special Control Area'(SCA2) under the Local Planning Scheme. A SCA signifies an area to preserve the character of discrete areas within the Shire, and for Molloy Island the objective of the SCA is to protect the existing natural qualities and amenity by strict control of all development.

Commented [MD2]: The zoning will most change to Environmental Conservation under LPS2 we are just waiting final endorsement - DOUG meaning of Environmental conservation.

Molloy Island is a part of the Land for Wildlife (LFW) program, a voluntary property registration scheme which aims to encourage and assist private landholders in Western Australia with bushland habitat on their property. From the Island's registration, two reports were developed, and the associated data has been incorporated into this report:

- Molloy Island Home Owners Association (2012). Land For Wildlife Property Assessment Report LFW Reg No. 2298. Unpublished report 19 September 2012 (Appendix A).

- Molloy Island Home Owners Association (2012). Land For Wildlife Monitoring Report LFW Reg No. 2298. Unpublished report Nov/Dec 2012 (Appendix B).

The survey area for this EMP consists of two reserves (R36542 and R35788) vested and managed by the Shire of Augusta-Margaret River and Lots 4766, 4683, 4761, 4758, 4706, 338, 258 and 231 which are designated as Shire freehold land owned by the Shire but managed by the Molloy Island Homeowners Association under a lease agreement with the Shire and associated management conditions (Figure 2).



Figure 2 Site Details Map of Molloy Island, Western Australia

3 Desktop Study

3.1 Landscape, Soils and Vegetation

Soil-landscape systems are areas with recurring patterns of landforms, soils and vegetation and are used by the Department of Primary Industries and Regional Development (DPIRD) (formally the Department of Agriculture) to maintain a consistent approach to land resource surveys. The DPIRD Natural Resource Information (WA) database was used to identify the soil and vegetation mapping within Molloy Island.

Molloy Island is located within the Scott Coastal Zone (215) which is between Augusta and Beedelup (DPIRD-017). This zone is defined as Pleistocene to recent coastal barrier dunes and backplain, non-calcareous sands dominate with podsolized soils with low-lying wet areas (DPIRD, 2024).

This zone is further classified into soil systems. The Island is solely situated on the Scott River Plain System (215Sr) (DPIRD-064), which is described as poorly drained coastal plain, in the southern Donnybrook Sunkland, with non-saline wet soil and pale deep sand. It is associated with heaths, sedgelands and jarrah-marri-paperbark woodland (DPIRD, 2024).

These systems are further classified into soil subsystems. Molloy Island is within three soil subsystems (DPIRD-027), and they are and described as (Figure 3):

- Blackwood River estuarine flats phase (215SrBLwy) - Estuarine flats fringing the Blackwood River near its mouth.
- Blackwood River flats phase (215SrBL1) – Flats with a variety of deep (mainly sandy) soils.
- Scott River Blackwood wet, inlet phase (215SrW_INLET) – Inlet.

The majority of Molloy Island and the survey area is within the Blackwood River flats phase. The Blackwood River estuarine flats phase is on the edge of the Island, adjacent to the flats phase. The Scott River Blackwood wet, inlet phase is where the Islands boundary sits within the inlet and only encompasses a small portion of Molloy Island and the survey area (Figure 3).



Figure 3 Soil Landscape Map of Molloy Island

Molloy Island is on the Blackwood Plateau and Plain subregion of the South-West Forests. The vegetation mapping of Havel and Mattiske (2000) identifies two complexes within the Island (Figure 4). These vegetation complexes are described as (Government of Western Australia, 2019):

- Blackwood Uplands (B) – Woodland to open forest of *Eucalyptus marginata* subsp. *marginata-Corymbia calophylla-Xylomelum occidentale-Agonis flexuosa* on raised river terrace in the perhumid zone.

- Blackwood Estuaries (Bwy) – Woodland of *Melaleuca cuticularis* and sedgelands of Cyperaceae-Restionaceae spp. on estuarine flats in the perhumid zone.

The majority of Molloy Island and the survey area is within the Blackwood Uplands complex and the edges of the Island are within the Blackwood Estuaries complex (Figure 4). The soil landscape mapping is consistent with vegetation complex mapping, with the Blackwood River flats phase and Blackwood Uplands boundaries being similar, as are the Blackwood River estuarine flats phase and the Blackwood Estuaries complex boundaries.

The 2018 South West Vegetation Complex Statistics (Government of Western Australia, 2019) for these vegetation associations are shown in Table 1. The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) aims to retain and protect those vegetation communities with below 30% remaining. The extent of the two-vegetation complex on Molloy Island are only within the Shire of Augusta-Margaret River (Table 1). Both complexes have over 30% of their pre-European extent remaining, with the Blackwood Uplands with just over 70% remaining and Blackwood Estuaries with over 87% remaining (Table 1). Just over 20% of each of the complex's extents are protected for conservation (Table 1).

Table 1 Vegetation Complex Statistics (Government of Western Australia, 2019)

Vegetation Complex	Pre-European Extent Remaining	Vegetation Complex extent within Shire AMR	Vegetation Complex extent within lands secure of conservation (IUCN I-IV)
Blackwood Uplands (B)	70.77%, 3,244.49 ha	100.00 %	22.35%, 1,024.72 ha
Blackwood Estuaries (Bwy)	87.39%, 56.81 ha	100.00 %	20.33 %, 13.22 ha

The Local Government Biodiversity Planning Guidelines Addendum for the South West Biodiversity Project Area by Molloy *et al*. (2007) provides additional ecological data and planning principles specific to the South West and aims to facilitate South West Local Governments in conserving biodiversity. Upon review of the Molloy *et al*. (2007) document, both complexes meet the regional representation & rarity local significance criteria. The Blackwood Uplands complex meets two of the criteria for assessing the biodiversity conservation value of natural areas and is a Locally Significant Natural Area (LSNA). These criteria state that the complex is an ecological community that has less

than 1500 ha protected in formal reserves (Molloy *et al*., 2007). The Blackwood Estuaries meets all four criteria for assessing the biodiversity conservation value of natural areas and is also considered a LSNA. Under the criteria it is an ecological community with less than 1500 ha of its pre-European extent remaining in and protected in formal plus informal reserves in the Southwest Forest Region portion of the Jarrah Forest and Warren IBRA Bioregions (Molloy *et al*., 2007). These complexes are locally significant in that they are of greatest value for biodiversity conservation and are likely to provide many environmental benefits and social importance (Molloy *et a*l., 2007).



Figure 4 Vegetation Complex Map of Molloy Island

3.2 Native Flora

A list of native vascular flora has been compiled from the historical flora data in the Land for Wildlife Property Assessment and Monitoring reports (2012), with 72 species recorded, and the historical records from the WA Herbarium database (Appendix C). A report and list of fungi has been prepared by Janean Robinson (resident) and the Friends of Molloy Island Reserves (Appendix D). The conservation significant flora records have been described further below.

3.2.1 Conservation Significant Flora

A desktop survey of the following databases has been conducted, to determine if records of any conservation listed flora species are known within Molloy Island or the surrounding 10 km (buffer):

- NatureMap interim data search showing listed species under the *Biodiversity Conservation (BC) Act 2016* managed by Department of Biodiversity, Conservation and Attractions (DBCA) (Appendix E).
- Protected Matters Search Tool (PMST) showing species listed under the Commonwealth *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Appendix F).
- Department Biodiversity, Conservation and Attractions Threatened and Priority Flora database search providing to ascertain if there are any records of threatened or priority flora within a locality (DBCA, 2024). This specific locality information for threatened flora is regarded as confidential and has therefore has not been provided in this report.

Flora species are protected based on their conservation status. DBCA recognises threats of extinction and consequently applies regulations towards population and species protection. Protected species are gazetted under the *Biodiversity Conservation Act (2016),* and it is an offence to "take" or damage rare flora without Ministerial approval. The act defines "to take" as "… to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means" (Government of Western Australia, 2010). Appendix G presents the definitions for conservation status under the *BC Act* 2016 (which was previously the *Wildlife Conservation Act 1950*, and *EPBC Act 1999*).

The interim NatureMap database identified a total of 11 Threatened (T) species and 51 Priority (P) species have been identified within a 10 km radius of the Survey Area (Appendix E). The PMST search identified 17 Threatened (T) species, within a 10 km radius of the Site. Three of which are Critically Endangered (CR), 10 Endangered (E) and four Vulnerable (V) species (Appendix F). The likelihood of the species occurring within the survey area has been determined based on known distribution, last known records and the habitat expected within the Survey Area (Appendix H).

The Land for Wildlife Property Assessment Report (2012) report did not identify any conservation significant flora on the Island, however, did have a list of possible species (Appendix A). It was noted

that a small shrub *Hypocalymma cordifolium* population on the Island that required formal identification as a known location of *Hypocalymma cordifolium* subsp. *minus* (Priority listed at the time) existed on private property within 5 km of the Island. *Hypocalymma cordifolium* subsp. *minus* is now known as *Hypocalymma minus* and is no longer priority listed. In the report there is also a photo of a potential *Acacia semitrullata* (P4) plant, which was noted to require formal identification at the time. There is a record of *Calothamnus lateralis* var. *crassus* (P3) within the commonage area of bushland (DBCA, 2024), however the notes of this record confirm that it is from within Scott River National Park and the location is not accurate. Overall, there are no confirmed existing records of Threatened or Priority flora species on the Island.

3.3 Threatened and Priority Ecological Communities

An ecological community is a naturally occurring biological assemblage that occurs in a particular type of habitat. A Threatened Ecological Community (TEC) is one which is found to fit into one of the following categories: Presumed Totally Destroyed; Critically Endangered; Endangered, or Vulnerable. Possible TECs that do not meet survey criteria are added to the Department of Parks and Wildlife's Priority Ecological Community (PEC) Lists, under Priority 1, 2 and 3. These are ranked in order of priority for survey and/or definition of the community type and evaluation of its conservation status.

The Protected Matters Search Tool (PMST, Appendix F) and DBCA Ecological Communities database were obtained to determine occurrences of Threatened and Priority Ecological Communities that occur within the 10 km of the Site. The PMST identified three Threatened Ecological Communities (TECs) and the DBCA database search identified five TECs and three PECs (Table 2). The DBCA Ecological Communities database (2024) indicated that the Subtropical and Temperate Coastal Saltmarsh occurs on Molloy Island and within the Survey Area.

The Land for Wildlife (2012a) report noted that the *Kingia* heathland with Semaphore Sedge understory on orange clay/loam soils on the Island required further investigation, as it was a possible Priority Ecological Community (Appendix A).

Table 2 Threatened and Priority Ecological Communities within 10 km of the Site.

Ecological Community Name	WA Status (BC Act)	Commonwealth Status (EPBC Act)	Source
Aquatic Root Mat Community 1 in Caves of the Leeuwin Naturaliste Ridge	Critically Endangered	Endangered	PMST, DBCA Data
Reedia spathacea - Empodisma gracillimum - Sporadanthus rivularis dominated floodplains and paluslopes of the Blackwood River catchment.	Priority 1	Endangered	DBCA Data
Rimstone pools and cave structures formed by microbial activity on marine shorelines (Augusta microbialites)	Endangered		DBCA Data
Scott River Ironstone Association	Critically Endangered	Endangered	PMST, DBCA Data
Subtropical and Temperate Coastal Saltmarsh	Priority 3	Vulnerable	PMST, DBCA Data

Ecological Community Name	WA Status (BC Act)	Commonwealth Status (EPBC Act)	Source
Tall closed sedgeland on shallow soils derived from granite gneiss on the Leeuwin Naturaliste Ridge ('Sedgelands of the Cape Leeuwin Spring')	Priority 1		DBCA Data

3.4 Native Fauna

A species list has been compiled from the historical flora data provided in the Land for Wildlife Property Assessment and Monitoring reports (2012), and Birdlife Australia data collected by the Cape to Cape Bird Group (CCBG) since 2004 and supplied by convenor Christine Wilder (Appendix I). The Land for Wildlife reported 13 fauna species in total, of which three are Threatened species and one Priority species (Appendix A & B). The Birdlife Australia data for the Island included 93 species recorded, with four of these being Threatened species, two Priority species and 19 Marine (EPBC Act listing status) listed species. The Friends of Molloy Island Reserves have recently observed Rakali/Water-Rat (*Hydromys chrysogaster*, Priority 4) on the Island. The Conservation Significant Fauna records have been discussed further below and in section 5.4.1.

3.4.1 Conservation Significant Fauna

Extracts from the following databases have been obtained, using a 10 km buffer, to determine if records of any conservation listed fauna species or fauna assemblages are known within Molloy Island or in the surrounding area:

- NatureMap interim data search showing listed species under the *Biodiversity Conservation (BC) Act 2016* managed by Department of Biodiversity, Conservation and Attractions (DBCA), (Appendix E).
- Protected Matters Search Tool (PMST) showing species listed under the commonwealth *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Appendix F).
- Department Biodiversity, Conservation and Attractions Threatened and Priority Fauna database search providing to ascertain if there are any records of threatened or priority fauna within a locality (DBCA, 2024). This specific locality information for threatened fauna is regarded as confidential therefore has not been provided in this report.

The conservation status of fauna within WA is determined by two acts of legislation, the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and the State Western Australian Biodiversity Conservation Act 2016 (WA) (BC Act). The conservation codes for fauna under the BC Act are presented in Appendix G. These categories are consistent with the International Union for Conservation of Nature (IUCN) classifications and link into a global ranking system for taxa at risk of extinction. Appendix G presents the definitions for conservation status under the *BC Act* 2016, which was previously the *Wildlife Conservation Act 1950*, and *EPBC Act 1999*.

A review of all publicly available fauna data relevant to the study area has been completed. The combined database search (Appendix J) identified 12 Threatened (T) species, which are rare or are likely to become extinct, of these three are Critically Endangered (CR), three are Endangered (EN)

and six are Vulnerable (VU). Eight Priority (P), one Conservation Dependent (CD), one other specifically protected (OS) and 55 Marine/Migratory (MI) listed species were also identified as occurring within a 10 km radius of Molloy Island. The available data includes 97 observations of conservation significant fauna on the Island (DBCA, 2023). There are two known Black Cockatoo roosting sites, to the west, within 15 km of Molloy Island. The likelihood of the species occurring within the survey area is determined based on known distribution, last known records and the habitat expected within the survey area (Appendix J).

The Land for Wildlife Property Assessment Report (2012) stated that Western Ringtail Possums (*Pseudocheirus occidentalis*, T/CR) and Southern Brown Bandicoots/Quenda (*Isoodon fusciventer*, P4) have been observed on the Island and with species recorded in the subsequent Land for Wildlife Monitoring Report (Appendix A & B). The Land for Wildlife Monitoring Report also included observations of White tail Black Cockatoos (*Zanda* spp., T/EN), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*, T/VU) and a potential freshwater crayfish species (*Engaewa sp.*, potentially T/CR) (Appendix B).

The Birdlife Australia data, from the Cape to Cape Bird Group (CCBG) provided by Christine Wilder, has identified 19 Marine (EPBC Act Listing Status) bird species, two of which are designated as Migratory (MI), and four Threatened (T) and two Priority (P) listed species on Molloy Island. This data includes conservation listed bird and mammal species such as the Western Ringtail Possum (*Pseudocheirus occidentalis*, T/CR), White-tailed Black Cockatoo (*Zanda* spp., T/EN), Baudin's Cockatoo (*Zanda baudinii*, T/EN), Forest Red-tailed Black Cockatoo (T/VU), Southern Brown Bandicoot/Quenda (*Isoodon fusciventer*, P4), and Masked Owl (Southwest) (*Tyto novaehollandiae novaehollandiae*, P3). One of the marine and migratory listed birds, the Eastern Osprey (*Pandion haliaetus*), has had monitoring undertaken by the CCBG since 2018, with volunteers conducting surveys and documenting opportunistic observations of the species on the Island, specifically at the nest on top of the Telstra communication tower along Warrior Way.

Members of the Friends of Molloy Island Reserves have recently observed Rakali/Water-rat (*Hydromys chrysogaster*), on two separate occasions (P4).

4 Survey

The Site was surveyed in Autumn, Winter, and Spring from multiple dates in March, June, and October 2024 by team members from Ecosystem Solutions (Appendix K). The survey limitations are summarised in Appendix L.

A flora reconnaissance survey was conducted, consistent with the Technical Guidance for Flora and Vegetation Surveys (EPA, 2016). The Survey Area was walked in a systematic way utilising existing paths and firebreaks, to avoid unnecessary impact to the vegetation. The survey included observations of any significant flora and ecological communities, based on the likely species and communities identified in the desktop study (section 3). The vegetation has been mapped at the association level, with each including two or more plant communities, due to the scale of the survey area. Notes on the boundaries between vegetation types were recorded, with some inspection into the bushland areas to confirm the location of these transitions. Zones with consistent vegetation structure and composition were noted and the main species in each of the strata were identified and recorded. Opportunistic observations of flora, vegetation of significance and introduced flora sightings were recorded. In October 2024, a targeted spring survey, including 11 floristic sampling relevés (Appendix M), was completed to document and understand the floristics, vegetation types and condition of the survey area. Vegetation condition has been assessed using the Keighery (1994) scale (Table 3). Lists were compiled of flora, fauna and weed species. All recordings were marked by using a Garmin GPSMAP64 handheld devices (GPS), with mapping completed using QGIS.

A Level 1 fauna survey was conducted, consistent with the EPA's Technical Guidance: Terrestrial Fauna Surveys (2020). This method specifies a minimum requirement of a desktop study (section 3) to gather information on the subject site and a reconnaissance survey to verify the accuracy of the background study and delineate fauna and faunal assemblages. This survey has minimal impact on the fauna within the survey area and provides sufficient data on the presence and relative abundance and distribution of taxa. During the field surveys, the habitat within the survey area was assessed to determine its potential suitability to host any of the anticipated threatened or rare species. With the species identified in the desktop study in mind (Appendix J), the survey method included the following:

- Direct observations of fauna and signs of fauna were recorded using Garmin GPSMAP64 handheld devices (GPS). Field observations were analysed and mapped with QGIS. During the surveys, the existing paths and firebreaks were utilised to avoid unnecessary impact to the vegetation.
- **Roosting survey:** Dawn and dusk surveys were completed, to record observations of any Black Cockatoo roost sites. The survey area was attended at least one hour prior to sunset and sunrise and monitored for a minimum of two hours. The total time allocated for this targeted search is

a minimum of 10 hours over five days, which aligns with the recommended survey effort for Black Cockatoos (Department of the Environment, Water, Heritage, and the Arts, 2017). This survey ensures optimal opportunity to observe flocks leaving or returning to roost. The survey area was monitored for birds and their calls using audio and visual observations. Potential roosting trees were inspected via a physical inspection for hollows or signs of Black Cockatoo usage. A flock count was conducted of any observed roost sites.

- **Nocturnal survey:** Spotlight surveys were conducted while walking along the existing tracks and firebreaks of the survey area, to detect nocturnal species. This occurred over four nights, two consecutive nights conducted in June 2024 and another two consecutive nights conducted in October 2024, adding non-consecutive days to the entirety of the EMP with different parts of the Island targeted each night. Surveys took place after last light, with a total survey time of approximately 37 hours. The canopy of trees was rigorously observed for eye shine to detect fauna with white light handheld and head torches. The presence of Western Ringtail Possums or any other conservation listed species was recorded. Observations were recorded using GPS along with noting any other valuable information. Non-consecutive nocturnal surveys are conducted to better understand the extent of the Western Ringtail Possum home range, as an individual may stay within a small area for a few nights if particularly good foraging habitat is present. The nocturnal surveys conducted in June had a WRP focus to confirm presence and determine abundance. The nocturnal surveys conducted in October targeted other conservation significance fauna not yet recorded during the previous surveys.
- **Nesting tree survey**: This involves the recording of all suitable hollow bearing trees, deemed as those greater than 300 mm DBH, recorded with a GPS, noting the tree species, height and presence or likelihood of hollows. Only trees along firebreaks and other access tracks were recorded, as these are the most likely to be impacted during maintenance activities. All hollows were inspected for any signs of use by Black Cockatoos. These include wear around the hollow, chewing, scarring and scratch marks on the trunks or branches. A broad assessment of tree health including signs of plant disease has also been made. Old or recent evidence of cockatoo's feeding or roosting sites (feathers, droppings etc.) were also searched for with an assessment of potential hollows recorded. Not all hollows recorded will be suitable for use by Black Cockatoos. The entrance to a hollow must be a minimum diameter of at least 100 mm to be suitable for Black Cockatoo species (Saunders, 1982). The height from ground level to the entrance of the hollow has been recorded to be as low as 2 metres, to in excess of 10 metres, with an average between 5-7m. Other characteristics including aspect can also impact whether a hollow is suitable for Black Cockatoos (Saunders, 1979).

  Tree hollows can also be used as rest sites by Western Ringtail Possums and other species, and smaller hollows and their potential use was also noted. Tree hollows are important across the range of the species and hollow abundance has been positively correlated with possum

abundance (Department of Parks and Wildlife, 2017). In Jarrah Forests, tree hollows can comprise more than 70% of the rest sites.

- **Habitat assessment**: During the daytime surveys, completed across multiple dates, the presence of flora known to be foraging species for Western Ringtail Possums and Black Cockatoos, with an assessment of area and quality of vegetation, was recorded. Actual foraging evidence observed or any other secondary signs of fauna (e.g., scats, diggings, dreys, nests, burrows, feeding signs) were noted.
- The survey's protocol is also consistent with the requirements outlined in the Development Planning Guidelines for Western Ringtail Possums (CALM 2003, now DBCA).
- The referral guidelines for the three WA threatened black cockatoo species (Department of Agriculture, Water and The Environment, 2022) outline requirements for appropriate level of surveys for these species. This survey's intensity and design comply with these guidelines.
- Two camera traps were placed in two locations over two nights during the June 2024 surveys to target conservation significant, feral or other native fauna, specifically nocturnal species. The two camera traps were set up again during the October 2024 surveys in four locations over two nights.

5 Results and Discussion

5.1 Native Flora

The native flora species list (Appendix C) compiled from historical data has been updated to include native flora identified during the surveys conducted for this EMP. In total there has been 218 native flora species identified on the Island. Conservation Significant Flora identified within the survey area are discussed further below.

Any good quality specimens collected by Ecosystem Solutions will be sent to the Western Australian Herbarium as it was indicted that any high research quality specimens from Molloy Island would be useful for incorporation into the Herbarium's collection.

5.1.1 Conservation Significant Flora

There was no Threatened flora observed on Molloy Island; however, this should not be taken directly as an indication that there is no Threatened flora on the Island or in the survey area. There are some areas of the Island that were not surveyed as a part of this EMP to reduce unnecessary impact to vegetation.

Three Priority species were recorded during the surveys of the Island (Figure 12) and Threatened Priority Flora (TPFR) forms have been submitted to DBCA for these new populations. These species are further discussed below:

- *Hemiandra* sp. Windy Harbour (Priority 3),
- *Netrostylis* sp. Blackwood River (Priority 3), and
- *Eucalyptus rudis* subsp. *cratyantha* (Priority 4).

There was one species, *Hyalosperma demissum* (A.Gray) Paul G.Wilson, identified to be a significant range extension. A collection of each of these species was identified by the Western Australian Herbarium, with the specimens to be processed into the Herbarium's collection in due course.

The Priority listing is not a listing category under the BC Act, instead priority species are added to the DBCA Priority Flora List. Priority species are ranked from 1 to 4 based on prioritization for survey and evaluation of survey status so that consideration can be given to potentially listing a species as threatened (Appendix G). Although these species are not listed on the BC Act it should be noted that in WA all native flora is protected under Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure.

The recommended management of the Priority flora species on Molloy Island includes:

- Ensure the locations of known populations of Priority species are not disturbed and if any new locations are found have Threatened Priority Flora Report (TPFR) forms submitted to DBCA for incorporation into the Department's records.
- Be aware of the habitat for the known Priority species on the Island and to limit disturbance to these areas when works are required or being suggested.
- Add the new Priority flora data to the Shire's GIS system. This can also apply if any more Priority species are recorded or if any threatened flora species are observed on the Island.
- If prescribed burns are planned in any areas of Priority flora, ensure Shire environment officers liaise with Shire CESM and consultation with DBCA.

5.1.1.1 *Hemiandra* sp. Windy Harbour (P3)

Hemiandra sp. Windy Harbour (B.J. Conn & J.A. Scott BJC 3344) is a poorly known small shrub species that grows in the Jarrah Forest and Warren regions, east and southeast of Bunbury, east of Augusta and west of Walpole. It is known to occur in shallow soil of granite outcrops. The species is listed as Priority 3 on the DBCA Priority Flora List.

There were several plants observed on Molloy Island at Relevé 5 (MI05) in the eastern portion of Lot 4706, north of Dalton Way and west of Flora Grove (Figure 5, 6 & 12). The plants were growing in a seasonal wetland with dark grey sand.



Figure 5 *Hemiandra sp. Windy Harbour* (Priority 3) – scan of specimen collected from Molloy Island



Figure 6 *Hemiandra* sp. Windy Harbour on Molloy Island

5.1.1.2 *Netrostylis* sp. Blackwood River (P3)

Netrostylis sp. Blackwood River is a tufted perennial herb (sedge), that can grow up to 1.7m in height. It is predominately found growing along creek lines or within seasonally wet areas in loamy soil. It is listed as Priority 3 on the DBCA Priority Flora List. It is known to occur from Dwellingup in the north, Dunsborough to Forest Grove in the west, and to Manypeaks in the east.

The population recorded within the survey area is confined to a small patch within Lot 258, on the north-western boundary of this reserve (Figure 7 & 12) and at Relevé 6 (MI06) in Lot 4766, R36542 (Figure 12). It's likely that this species once had a wider distribution on the Island, however with the recession of the wetter areas, the habitat suitable for this species has reduced. There is potential that there are additional populations within other drainage lines of the Island, especially as this species can be difficult to detect within the thick sedge understory it prefers (Figure 8).



Figure 7 *Netrostylis* sp. Blackwood River (Priority 3) – scan of specimen collected from Molloy Island



Figure 8 *Netrostylis sp.* Blackwood River – Photo of the species growing near Dunsborough, Western Australia

5.1.1.3 *Eucalyptus rudis* subsp. *cratyantha* (P4)

Eucalyptus rudis subsp. *cratyantha* is a tree up to 20 m that grows on sand or loam in wetter areas, commonly along streams and in soaks and permanent swamps. It is listed as a Priority 4 species on the DBCA Priority Flora List. The two species of *E. rudis* are weakly defined, with the distribution of *E. rudis* subsp. *cratyantha* currently believed to be restricted to the Cape Naturaliste area (French & Nicolle, 2019).

The occurrence of *E. rudis* subsp. *cratyantha* on Molloy Island is a significant extension to the known range of this sub species. The species was observed to be confined to one population of eight trees, to the north of the barge (Figure 9, 10 & 12). The recorded points of the population are outside of the survey area except for one tree. Scattered trees were observed at a distance within thicker vegetation to the north of the population within the survey area however were not recorded to limit disturbance to the vegetation.

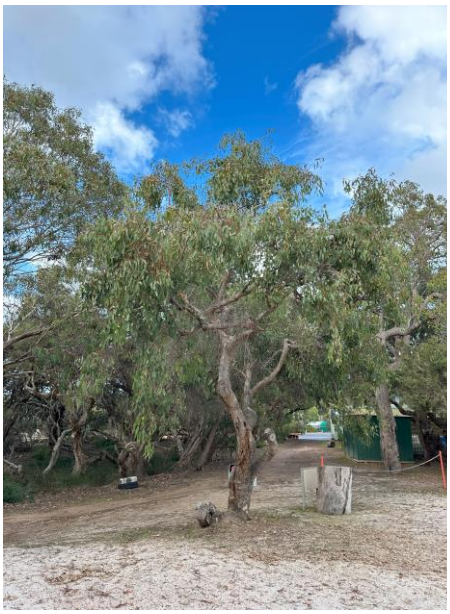


Figure 9 *Eucalyptus rudis* subsp. *cratyantha* *on Molloy Island*



Figure 10 *Eucalyptus rudis subsp. cratyantha - flowers, fruit and leaves*

5.1.1.4 *Hyalosperma demissum*

Hyalosperma demissum is a small, annual herb known to occur from Kalbarri in the north to as far as Dardanup, Boyup Brook and Mount Barker in the south; east of Condingup and further inland. It is commonly known as moss or dwarf sunray, and occurs in shallow soils over granite, lateritic and clay loam soils in winter-wet areas, granite slopes, and sandplains.

The occurrence of *Hyalosperma demissum* on Molloy Island is a significant southerly range extension to the known range of this species, confirmed by the Western Australian Herbarium. The specimen collected was taken in Lot 4706 (Figure11 & 12). It was observed in orange/brown loam adjacent to a waterway.



Figure 11 *Hyalosperma demissum – Scan of specimen collected from Molloy Island*

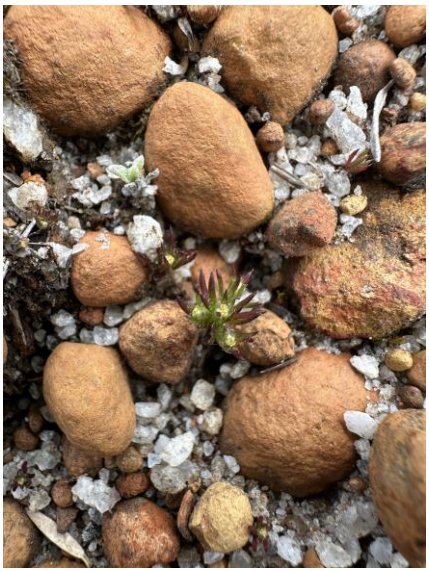


Figure 12 *Hyalosperma demissum* – Photo of the species growing near in Mount Frankland National Park, North Walpole



Figure 12 Conservation Significant Flora on Molloy Island

5.2 Vegetation

Structural vegetation mapping has been completed, using structure and dominant species characteristics to describe the different vegetation units (Figure 25). There were six vegetation communities recorded within the survey area, and they are defined broadly below.

Coastal Saltmarsh - *Melaleuca spp.* of varying composition and density over *Hakea* spp., *Gahnia trifida, Juncus kraussii, Suaeda australis,* samphire and other mixed herbs (Figure 13 & 14). Relevés 9 (MI09) and 11 (MI11) were conducted in this vegetation community (Appendix M). This vegetation unit is representative of the Subtropical and Temperate Coastal Saltmarsh ecological community (commonly referred to as Coastal Saltmarsh), which is listed as Vulnerable under the EPBC Act. This threatened ecological community has been discussed further in section 5.2.1 below.



Figure 13 Coastal Saltmarsh



Figure 14 Coastal Saltmarsh

Jarrah Marri Kingia Forest – *Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* open forest (Figure 15 & 16). Relevés 3 (MI03) and 4 (MI04) were conducted in this vegetation community (Appendix M). Although the Island is relatively flat, there are slightly higher and drier areas of that are characterised by *Kingia australis*, *Xanthorrhoea preissii, Macrozamia riedlei, and Banksia grandis.*



Figure 15 Jarrah Marri Kingia Forest



Figure 16 Jarrah Marri Kingia Forest

Jarrah Marri Peppermint Forest – *Corymbia calophylla, Eucalyptus marginata subsp. marginata* and *Agonis flexuosa* open forest (Figure 17 & 18). Relevés 2 (MI02), 7 (MI07) and 8 (MI08) were conducted in this vegetation community (Appendix M). *Agonis flexuosa, Hovea elliptica* and *Pteridium esculentum* are the dominant understory species in the lower and wetter areas, with pockets of loam soil that become inundated during the winter months (Myrtaceous Scrub vegetation community described below).





Figure 17 Jarrah Marri Peppermint Forest

Figure 18 Jarrah Marri Peppermint Forest

Kingia Wetland – *Kingia australis* and *Xanthorrhoea preissiana* shrubland (Figure 19 & 20). Relevé 5 (MI05) was conducted in this vegetation community (Appendix M). This vegetation has been identified as significant to the Island, being the only area of this vegetation type locally (A. Webb, Regional Botanist - DBCA South West Region, pers comm., February 2024), and warrants a higher priority of protection. The hydrology for the community varies becoming inundated based on season and tides.



Figure 19 Kingia wetland



Figure 20 Kingia wetland

Melaleuca Scrub – *Melaleuca* species of varying composition and density. It includes low closed heaths of *Melaleuca incana* over sedges, up to low closed forests of *Melaleuca preissiana* and/or *Melaleuca rhaphiophylla,* with *Taxandria juniperina, Taxandria linearifolia* and *Hakea spp.* over sedges and herbs (Figure 21 & 22). Relevés 6 (MI06) and 10 (MI10) were conducted in this vegetation community (Appendix M).



Figure 21 Melaleuca Scrub / Forest



Figure 22 Melaleuca Scrub / Forest

Myrtaceous Scrub - *Astartea (scoparia), Melaleuca* species and *Taxandria* species over *Cyathochaeta avenacea*, *Mesomelaena tetragona* and mixed sedges and herbs, confined to pockets of seasonally inundated, loamy soil within the Jarrah Marri communities (Figure 23 & 24). Relevé 1 (MI01) was conducted in this vegetation community (Appendix M).



Figure 23 Myrtaceous Scrub



Figure 24 Myrtaceous Scrub - disturbed area intersected by a track

5.2.1 Threatened and Priority Ecological Community - Subtropical and Temperate Coastal Saltmarsh

The Subtropical and Temperate Coastal Saltmarsh is known to occur on Molloy Island and is documented in the DBCA Ecological Communities database (section 3.3). It is a Threatened Ecological Community listed as Vulnerable under the EPBC Act and Priority 3 under the Department of Parks and Wildlife's Priority Ecological Community (PEC) Lists. As much of this ecological community's boundary, of what was able to be assessed during the surveys, was compared to available mapping and remapped where appropriate to reflect any observed changes (Figure 25).

The Coastal Saltmarsh community exists around the perimeter of Molloy Island, which is generally a damp and inundated area of the Island that is somewhat difficult to access. The firebreaks on the Island were widened at pinch points in 2024 which included those bordering this community. They were widened to accommodate for the Island fire truck but also with the intention to negate the need to burn the outer riverine portion of the Island and as it is not the intention of the authorities to burn this area.

The Coastal Saltmarsh occurs across Australia within a relatively narrow margin of the coastline within the subtropical and temperate climatic zones. In Western Australia it occurs in and south of Shark Bay, with the northern limit approximately before 26° latitude. It mainly consists of salt-tolerant vegetation under regular or intermittent tidal influence. The Coastal Saltmarsh forms one component of coastal and estuarine communities. The area that the community covers plus an appropriate buffer zone into adjacent vegetation are considered critical to the survival of the ecological community (Department of Sustainability, Environment, Water, Population and Communities, 2013).

These ecosystems are of immense ecological value and are recognised nationally and globally. They provide extensive ecosystem services such as filtering surface water prior to it entering the sea; carbon sequestration; coastal productivity; nursery habitat to a range of fisheries species; provision of food and nutrients for a wide range of adjacent marine and estuarine communities; and stabilising the coastline and providing a buffer from waves and storms (DSEWPC, 2013).

Coastal Saltmarshes are increasingly under threat and the threats are well known. Key threats to the ecological community that are relevant to Molloy Island include: clearing and fragmentation; 'Land-claim' or infilling; altered hydrology/tidal restriction; invasive species; climate change; recreation; pollution/litter; eutrophication; and inappropriate fire regimes (DSEWPC, 2013).

It is important to protect the values of this ecological community by limiting any disturbance to the area it covers. Recommended management actions for the Subtropical and Temperate Coastal Saltmarsh include (DSEWPC, 2013):

- Aim to ensure that any planned burns in areas surrounding or near the TEC do not spread into the Coastal Saltmarsh community.
- Avoid clearing native vegetation within the Coastal Saltmarsh and its surrounds.
- Undertake community engagement and education to promote the value of the Threatened Ecological Community including interpretive signage and highlight the importance of mitigating disturbance in these areas.
- Where the Coastal Saltmarsh is present on and adjacent to private property ensure that planning decisions consider its protection, where possible. For example, avoid infilling/raising the soil profile in saltmarshes for development.
- Where possible, avoid constructing drains that direct stormwater discharge into or near Coastal Saltmarsh.
- Continue to undertake weed control of major or emerging weed infestations.
- Where practical and appropriate, restrict or prevent vehicle access to the Coastal Saltmarsh.
- Where appropriate, implement restoration activities to mitigate the impacts of disturbance.



Figure 25 Vegetation Communities of Molloy Island

5.3 Vegetation Condition

Using the scale of condition developed by Keighery (1994), the survey area was ranked from excellent to completely degraded condition (Table 3, Figure 26). The vegetation condition has been done on a broad scale due to the size of the survey area, with an average condition applied to areas to account for a range of disturbances. The vegetation across the reserves generally ranges from excellent to very good. Some specific areas have been mapped and ranked separately as very good, good or degraded, due to disturbances discussed more below.

The majority of the vegetation across the survey area is in excellent to very good condition, and accounts for approximately 56.92% (40.43 ha) of the survey area. The vegetation structure is mostly intact with some changes evident due to disturbances that vary in impact and type. Disturbances observed in the vegetation included minor weeds, potential presence of rabbits, historical fire, quenda diggings, affects from an artificially dug drainage channel in Lot 231, potential changes to hydrology, herbivore grazing, and edge effects from nearby tracks and adjacent residential lots. Edge effects are the changes to vegetation that occur at the boundary in response to altered environmental conditions. Areas where houses back onto reserves have been considered to be in very good condition due to the impact of weeds spreading from private properties into the reserves and potential management into reserves by property owners. The part of Lot 4706 that is separated by a channel and only accessible by boat or canoe was not able to be accessed for this EMP but has been ranked as excellent/very good condition. The condition has been assumed and determined from observations made from the opposite side of the channel and based on the assumption that there would be minimal disturbance occurring to the area due to limited access and that no development has occurred there.

The Coastal Saltmarsh and Kingia Wetland were assessed to be in very good condition, approximately 34.80% of the survey area (24.72 ha). The Coastal Saltmarsh TEC is being impacted by weeds and potential hydrological changes with changes to the vegetation structure observed. For the Kingia wetland some dead *Kingia australis* were observed which could be potentially due to changing hydrology or dieback. It is recommended that the Kingia Wetland is monitored, and photo point monitoring (Appendix N) is set up in this vegetation community to document if further deaths occur and if management intervention is required.

There are small areas that have been ranked as good condition, approximately 0.28% of the survey area (0.2 ha). The vegetation structure has been altered by disturbances include edge effect from tracks and residential lots, minor weeds, and grazing by herbivores. These areas are located in riparian vegetation in Lot 4706, Lot 258 adjacent to the fire station and road, and Lot 4766.

Vegetation ranked to be in degraded condition also account for small areas in the survey area, approximately 0.24% (0.17 ha). The basic vegetation structure has been severely impacted by disturbance, such as minor weeds and historical clearing with the areas identified being adjacent to

residential lots where potential management by private landowners has occurred outside of the lots into the reserves.

The firebreaks, tracks, recreation and infrastructure areas of the reserves have been ranked as completely degraded, approximately encompassing 7.76% (5.51 ha) of the survey area. These areas are completely clear of native vegetation.

From observations made by the Friends of Molloy Island Reserves group and from the EMP surveys there are no notable areas that require revegetation.

Table 3 Keighery (1994) Condition Scale

Category	Description
Pristine	Pristine or nearly so, no obvious signs of destruction.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, No obvious signs of disturbance.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate to it.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration, but not to a state approaching good condition without intensive management.
Completely Degraded	The structure of the vegetation in no longer intact and the area is completely or almost completely without native species.



Figure 26 Vegetation Condition of Molloy Island

5.4 Native Fauna

The native fauna species list (Appendix I) also includes fauna identified during the surveys conducted for this EMP. There are 108 native fauna species that have been recorded from the Island and adjacent Blackwood River from past surveys and this EMP's surveys. This includes 97 birds, five mammals, one insect, three amphibians and two reptiles. Conservation significant fauna observations have been discussed further below.

Camera traps that were installed during the June and October 2024 surveys to obtain additional fauna observations, specifically of nocturnal species (Figure 32). During the June surveys one camera trap was in Lot 258 and captured one *Isoodon fusciventer* (Quenda, P4) and the other camera was placed in Lot 4706 on the edge of the waterway and only captured *Anas superciliosa* (Pacific Black Duck). During the October surveys only one camera that was in Lot 258 recorded a kangaroo drinking from a waterbody the other cameras did not capture any fauna.

Observations have been made about the possible impact that the kangaroo population is having on the flora and vegetation of the Island. Information provided by Dr. Peter Mawson (CALM, 2002, Appendix O) to residents Janet James and Steven Cunnold in 2002 detailed concerns about overgrazing. A recommendation of at maximum 10 kangaroos on the Island was provided, based on population densities recorded at other nature reserves across the south-west. Consideration should be given to conducting further monitoring of kangaroo numbers and if potential control of the population would be of benefit.

From past visits to the Island by DBCA officers Cherie Kemp and Andrew Webb have not identified signs of overgrazing occurring on the Island or that it was an issue (Cherie Kemp, Off Reserve Conservation Officer, Landuse Planning Officer - DBCA, pers comm. with Merryn Delaney. Shire of the Augusta Margaret River, Oct 2024). To assess whether overgrazing is an issue a photo point monitoring program could be set up to monitor the number of kangaroos grazing on the Island and monitor the grazing effects occurring over time (Appendix N). Cherie Kemp also mentioned that the kangaroos can and will swim and are able to move from the Island. This photo monitoring program can be implemented along with additional kangaroo surveys undertaken by consultants, the Shire or the MIHOA. If overgrazing by kangaroos is determined to be occurring, then fencing of some areas of vegetation is suggested to ascertain the level of overgrazing occurring. It would also have to be in conjunction with rabbit control to ensure any overgrazing was in fact kangaroos rather than rabbit populations.

5.4.1 Conservation Significant Fauna

The results of the dawn, dusk and nocturnal fauna surveys are provided in Appendix P. In addition to these focussed fauna surveys, opportunistic fauna observations were recorded throughout the day surveys and were included in the final data but not in the table in Appendix P.

There have been four threatened, three priority and one migratory fauna species observed within Molloy Island from past surveys and this EMP's surveys. These species are listed and discussed further below:

- *Zanda* spp. (White-tailed Black Cockatoos – *Z. latirostris* (Carnaby's Cockatoo) and/or *Z. baudinii* (Baudin's Cockatoo), Threatened/Endangered),
- *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoos, Threatened/Vulnerable),
- *Pseudocheirus occidentalis* (Western Ringtail Possums, Threatened/Critically Endangered),
- *Tyto novaehollandiae novaehollandiae* (Masked Owl (southwest), Priority 3),
- *Isoodon fusciventer* (Quenda, Priority 4),
- *Hydromys chrysogaster* (Rakali, Priority 4), and
- *Pandion haliaetus* (Eastern Osprey, Marine and Migratory).

There is potential that there could be more conservation significant fauna species that utilise the Island and the lack of observation of the other species listed Appendix J should not be taken directly as an indication that they are not present or don't utilise the Island to some capacity. There are areas of the Island that were not surveyed as a part of this EMP, such as part of Lot 4706, and some areas not adjacent to tracks were not surveyed to reduce unnecessary impact to vegetation. There was also no trapping or seasonal sampling conducted as this was outside the scope of this EMP.

5.4.1.1 Three Black Cockatoo Species

The three Black Cockatoo species in Western Australia are Threatened species under the BC Act (WA). The Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) is Vulnerable under the EPBC Act, and the Carnaby's Cockatoo (*Zanda latirostris*) and Baudin's Cockatoo (*Z. baudinii*) are both listed as Endangered under the EPBC Act. Molloy Island is located within the South Coast, Region 4, as defined by the Referral Guidelines for the three Black Cockatoo Species (DAWE, 2022). This region supports foraging habitat for all three species with critical breeding habitat for Carnaby's Cockatoo and Baudin's Cockatoo. Black Cockatoos rely on this region to provide a range of foraging resources, such as Jarrah-Marri Forest, Karri and areas of low heath including *Banksia* spp. and *Hakea* spp., and those associated with breeding habitat (DAWE, 2022).

During the first dusk survey there were approximately 23 White-tailed Black Cockatoos, and four Forest Red-tailed Black Cockatoos observed foraging. Eight of the White-tailed Black Cockatoos were observed foraging on the comer of Hale Avenue and Sabina Drive, outside of the survey area. The other 15 White-tailed Black Cockatoos and the four Forest Red-tailed Black Cockatoos were observed foraging in Lot 231. The first dawn survey had three Forest Red-tailed Black Cockatoos observed foraging in Lot 4766 along Fairlawn Place. During the second dusk survey there were 30 Forest Red-tailed Black Cockatoos observed. Most of the Forest Red-tails were observed in flight, while 11 were observed foraging in private property, one foraging in Lot 231, two landed in a tree and one drinking from a puddle within Lot 4766, and two observed roosting in a tree in private property adjacent to Lot 4761. Four Forest Red-tailed Black Cockatoos were observed during the second dawn survey foraging on and around the roosting tree from the dusk survey the night before. One Forest Red-tailed Black Cockatoo was observed foraging in private property along Fairlawn Place. The fourth dusk survey had five Forest Red-tailed Black Cockatoos recorded, with three observed foraging on the edge of Lot 4761 and calling to others in distance and another two were observed foraging in private property. The fourth and final dawn survey recorded two Black Cockatoos flying over survey area and six Forest Red-tailed Black Cockatoos foraging in a Marri in Lot 231. During all the dawn, dusk and day surveys Black Cockatoos calls were heard. Overall, a total of 23 White-tailed Black Cockatoos and 50 Forest Red-tailed Black Cockatoos were observed on the Island and one roosting tree in private property (Figure 27, 28 & 33).

Nesting trees are a critical habitat component for the survival and recovery of Black Cockatoos, as they are used during the breeding season. Nesting occurs in hollows of live or dead trees of many eucalypt species (DAWE, 2022), with some tree species being preferred by each of the three Black Cockatoo species. It is believed it can take up to or over 200 years for trees to develop suitable nest hollows for black cockatoos (DAWE, 2022), therefore when nesting tree surveys are conducted even trees with no hollows are considered important as they have the potential to form hollows and become nesting trees in the future. A total of 747 trees with DBH greater than 30 cm were recorded

along the existing tracks and firebreaks of the survey area (Figure 34), the data has been provided in Appendix Q and is summarised in Table 4. Of those trees with DBH greater than 30 cm:

- 66 trees had hollow/s (8.84%), of which one showed signs of use, 143 trees had potential hollow/s (19.14%), 19 trees had unsuitable hollow/s for Black Cockatoos (2.54%) (i.e., the observed hollows are too small for Black Cockatoos to utilise) and 521 trees had no hollows observed (69.75%). Two trees had unsuitable hollows and potential hollows, and these trees have been added to both categories. Habitat tree hollow observations are depicted in Figure 34.
- 454 trees are *Eucalyptus marginata* (Jarrah, 60.78%), 267 are *Corymbia calophylla* (Marri, 35.74%), two were *Eucalyptus diversicolor* (Karri, 0.27%) and 24 trees unidentifiable due to them being dead (3.21%).
- The DBH of the trees ranged from approximately 30 cm to 170 cm.
- The height of the trees ranged from approximately 6 m to 27 m (Appendix Q).
- The majority of the trees within the survey area appeared to be in good health. There were some trees showing signs of stress and/or disease, with senescing branches observed, and 77 trees recorded were dead (10.31%).

Table 4 Tree species and hollow observations of the nesting trees (>30cm DBH) within the survey area, along the existing tracks and firebreaks

Tree Species	Hollow Observations				Total (DBH >30cm)
	No hollow/s	Unsuitable hollow/s	Potential hollow/s	Hollow/s	
Eucalyptus marginata (Jarrah)	297	17*	99*	43	**454***
Corymbia calophylla (Marri)	210	1	38	18	**267**
Eucalyptus diversicolor (Karri)	2	0	0	0	**2**
Unidentifiable (Dead)	12	1	6	5	**24**
Total	**521**	**19***	**143***	**66**	**747***

***** = Two trees had both unsuitable hollows and potential hollows and have been added to both categories.

The three Black Cockatoo species forage on a range of species, including native and non-native, and each Black Cockatoo species have common food items they prefer. Molloy Island contains large range of foraging species favoured by all three Black Cockatoo species. The common foraging species

identified within the survey area and their suitability for foraging potential for each species is provided in Table 5.

Table 5 Black Cockatoo foraging species present within the Survey Area

Species	Black Cockatoo Species		
	Baudin's	Carnaby's	Forest Red-tailed
Anigozanthos flavidus	X		
Banksia grandis	X	X	
Banksia littoralis	X	X	
Conospermum capitatum subsp. *glabratum*	X		
Corymbia calophylla	X	X	X
Eucalyptus diversicolor			X
Eucalyptus marginata	X		X
Hakea linearis	X	X	X
Hakea oleifolia	X	X	X
Hakea ruscifolia	X	X	X
Hakea sulcata	X	X	X
Hakea trifurcata	X	X	X
Hakea varia	X	X	X
Persoonia longifolia			X

The three Black Cockatoo populations are declining in WA and primarily due to loss and fragmentation of habitat due to clearing of native vegetation. Loss of habitat includes the loss of nesting trees, foraging habitat including native and non-native vegetation, and fragmentation of breeding habitat from foraging resources. The recommended management strategies for protecting Black Cockatoos on Molloy Island are:

- The protection and maintenance of existing habitat in the reserves for roosting, nesting and foraging is important. It is recommended that if further firebreak and track widening or upgrades are required that trees with DBH greater than 30 cm are avoided and worked around, where possible, especially trees with hollows. It is important to remember, as mentioned above, even trees with no hollows are important as they have the potential to form hollows and become nesting trees in the future.

- Raise community awareness about the three Black Cockatoo species including their ecology, conservation status under the Biodiversity Conservation Act 2016.
- Encourage and support landholders to preserve and restore remnant vegetation on their properties, particularly large trees with hollows.
- Explore if there is a need for artificial nesting hollows and permanent safe drinking areas to provide supplementary habitat for cockatoos.
- In partnership with the Shire and Birdlife Australia, volunteers can collect Black Cockatoo nesting, roosting and foraging activity data for the Island. Encourage data collected to be sent to DBCA via the Threatened and Priority Fauna Report (TPFR) form.
- Seek advice from Birdlife WA on potential ways to support cockatoo habitat on the Island.
- Work with local fire brigades and manage prescribed burns carefully to minimise canopy scorch and loss of hollows. This may include raking around trees identified to have hollows, where possible.
- Support volunteer participation in the Birdlife WA's annual Great Cocky Count.

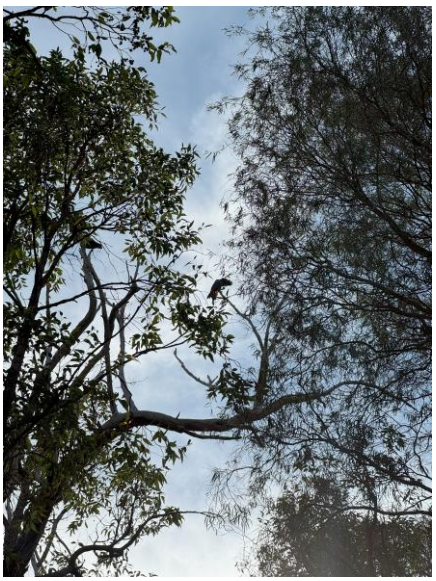


Figure 27 Forest Red-tailed Black Cockatoo foraging in a Marri



Figure 28 Black Cockatoos foraging in a Jarrah

5.4.1.2 Pseudocheirus occidentalis - Western Ringtail Possum

Western Ringtail Possums (*Pseudocheirus occidentalis*, WRP) are a Threatened species under the BC Act (WA) and Threatened (Critically Endangered) under the EPBC Act. Molloy Island is within the Swan Coastal Plain Management Zone, which is one of the three key management zones for WRP (Department of Parks and Wildlife, 2017). Molloy Island has previously been an undocumented location for WRP; however, a study from across the species remnant range has recently been conducted that has ascertained the genetic diversity (White *et al.*, 2021).The WRP population on Molloy Island has considerable genetic variability compared with other populations, such as compared to the Albany and Busselton populations and is very similar to the East Augusta populations (Emeritus Professor S.D. Bradshaw, Senior Honorary Research Fellow - The University of Western Australia, pers comm., July 2024). Molloy Island was found to have one of the highest values for genetic diversity along with Pemberton and Two Peoples Bay, and the unique diversity could offer adaptive potential to cope with changing environments (Weiser *et al*. 2013 and White *et al.*, 2021). The Islands population potentially has high conservation and genetic value (White *et al*., 2021).

The nocturnal surveys involved two teams of two covering different parts of the survey area to cover as much area as possible each night (Figure 35). There were 192 WRP observed during the June nocturnal surveys in Lots 4706, 4761, 231, 258, and 4766. The first nocturnal survey was conducted in Lots 4761, 231 and 258, with 103 WRP observed. For the second nocturnal survey the two teams recorded in Lots 4766 and 4706, with 89 WRP observed. On 27 occasions WRP were observed in pairs either in close proximity or in the same tree and 1 occasion three WRP were together in one tree. The October nocturnal surveys did not target WRP with the focus on other conservation significant fauna however whenever WRP were observed with the spotlight they were recorded. The third nocturnal survey had 26 WRP and the fourth and final nocturnal survey had 16, and there were four occasions in total where the WRP were observed in close proximity. It is evident that there is a significant population of WRP on the Island. The population is likely to be sustainable over time and will be able to manage itself. There is sufficient grazing material on the Island, with abundant foraging species observed, to sustain the population (Cherie Kemp, Off Reserve Conservation Officer, Landuse Planning Officer - DBCA, pers comm. with Merryn Delaney. Shire of the Augusta Margaret River, Oct 2024).

The preferred habitat of the species is vegetation that provide high nutrient foliage and has canopy continuity for evading predation and dispersal (de Tores, 2008). WRP predominately forage on the leaves of myrtaceous plants, being Peppermint, Marri, Jarrah, Karri and a range of shrub species (Department of Parks and Wildlife, 2017). Molloy Island has an extensive range of foraging habitat for the species. During the nocturnal surveys the WRP were observed in a range of tree species including *Agonis flexuosa* (Peppermint), *Banksia grandis, Callistachys lanceolata, Corymbia calophylla* (Marri), *Eucalyptus marginata* (Jarrah), *Eutaxia sp.*, *Hakea* spp., *Melaleuca* spp., *Nuytsia*

floribunda (Moodja), *Persoonia longifolia* (Snottygobble), and *Taxandria* spp., and some of the tree species were dead.

Scats are a secondary sign indicating if WRP are present within vegetation, and they were observed across the survey area with notable observations recorded (Figure 35). Western Ringtail Possums construct dreys, that range from rough platforms to more elaborate roughly spherical arboreal nests constructed from vegetation in trees, that they utilise as rests sites during the day. There were five dreys (secondary sign) observed during the surveys. The species also reside in tree hollows, particularly within mature Peppermint trees. From the nesting tree survey (Section 6.4.1.1), the trees containing hollows and potential hollows could be being utilised by WRP. Dreys are typically built where hollows are absent (Department of Parks and Wildlife, 2017).



Figure 29 Western Ringatil Possum observed during the first nocturnal survey



Figure 30 Western Ringtail Possum scats within survey area

There are many threatening processes impacting on WRP, with the main processes being habitat loss, degradation and fragmentation, predation from foxes and cats, climate change, timber harvesting, fire, competition for tree hollows, habitat tree decline, un-regulated relocation, and disease. There is however a very healthy population of WRP existing on the Island which indicates that they are surviving well under the current conditions. Recommended actions to support and protect the population include:

- Introduce an education program to increase knowledge about the Critically Endangered WRP, including their ecology and conservation status under the BC Act 2016 (legislation that protects them). The program should include information regarding the penalties that can apply to taking or disturbing threatened fauna without authorisation, and requirements under the legislation if removing vegetation from private properties that may contain possums.
- Provide information to landowners about responsible pet ownership in relation to the protection of native fauna.
- Continue to monitor cat and fox activity on the Island and undertake control when required to limit/prevent predation.
- Shire Environment Officers to continue to work with the fire control officers to ensure everyone is aware of the environmental values of the Island and controls are put in place to limit the disturbance to these values.
- Undertake carefully planned fire management and controlled burns to maintain suitable habitat and prevent severe fires. Where practical this may include working with volunteers to rake around trees with dreys and hollows before burns to limit habitat disturbance.
- Limit clearing and degradation of native vegetation on the Island to protect existing habitat and maintain connectivity.
- Establish a data collection program for any WRP observed on the Island. This can be established via the iNaturalist app for the Island (see section 8.5 for more details). The Friends of Molloy Island Reserves group could record and collect data on the species. Encourage data collected to also be sent to DBCA via the Threatened and Priority Fauna Report (TPFR) form (see section 8.5).

Additionally, Landowners can help protect the possum by:

- Provide water by hanging water bowls in safe elevated places.
- Plant native species of the Island in their gardens to provide habitat and food for WRP.
- Control domestic pets and driving with care at night to prevent injury and death of the WRP.
- Report all sightings of WRP (dead or alive) by submitting a DBCA Threatened and Priority Fauna Report (TPFR) form (see section 8.5).
- Keep the lid on your barbecue shut to prevent WRP from getting their feet burned and dispose of rubbish responsibly.

- If using baits or traps for rodents, place them where WRP can't access them. If you believe you have a WRP in your roof it is important you check first if you have possums or rodents in your roof.
- Never catch or handle possums – to "take or disturb" threatened fauna, which includes to chase, capture, injure or kill, is illegal and penalties apply under the BC Act. If any WRP require care, please contact a registered wildlife rehabilitator so they can take appropriate action.
- Participating in the annual Ringtail Tally established by GeoCatch in partnership with DBCA (see section 8.5 for more information about the Tally).

5.4.1.3 *Tyto novaehollandiae novaehollandiae* - Masked Owl (southwest)

Tyto novaehollandiae novaehollandiae is the southern subspecies of *Tyto novaehollandiae* (Australian Masked Owl) and is a Priority 3 listed species. The subspecies is a medium-sized raptor and the largest forest owl in south-western Australia (Fulton, 2017, Johnstone and Storr, 1998). They inhabit forests, woodlands and timbered waterways by open areas for foraging, adjacent to the coast, which have tall trees with suitable hollows for nesting and roosting (Western Australian Museum, 2024a). They have large territories that are up to 1200 ha (Fulton, 2017, Kavanagh and Murray 1996).

Christine Wilder from Bird Life Australia - Cape to Cape Bird Group (CCBG) and a resident of the Island has confirmed that Masked Owls have been recorded on the Island. During the surveys for this EMP, an unelicited call consistent with Masked Owls (A deep, rasping screech (Western Australian Museum, 2024)) was heard during the first nocturnal survey in June 2024 in Lot 258 just to the west of the volunteer fire station.

Threats to the species includes habitat loss and degradation from land-clearing, bushfires and inappropriate fire regimes, and secondary poisoning from rat baits. Management and protection measures for the species include:

- Landowners are encouraged to choose wildlife-safe rodent control such as using methods other than baits to control rats and mice. Masked Owls feed mainly on small mammals, such as rodents, and can consume poisoned pests or native animals which can directly or indirectly kill owls. More information can be found on the Owl Friendly Margaet River Region website - https://owlfriendly.org.au/.
- Report owl deaths to Owl Friendly Margaret River. If the observer is willing and able to wrap the body in paper towel, seal in a plastic bag and freeze as soon as possible and contact Owl Friendly Margaret River to lodge reports and offer specimens. Key information needed is cause of death, date, location and POC. More information can be found on the Owl Friendly Margaet River Region website - https://owlfriendly.org.au/.
- Protect and maintain existing habitat in the reserves. It is recommended that if further firebreak and track widening or upgraded are required that trees with DBH greater than 30 cm are avoided and worked around, where possible, especially trees with hollows.
- Raise awareness about the ecology and conservation status of the Masked Owl.
- Encourage and support landholders to preserve and restore remnant vegetation on their properties.

- Work with landholders to consider the installation of artificial nesting boxes to reduce potential competition and increase habitat availability.
- Manage prescribed burns carefully to minimise canopy scorch and loss of hollows where possible.
- Use the iNaturalist app to record and collect data on the Masked Owl on the Island and reporting all sightings to DBCA via the Threatened and Priority Fauna Report (TPFR) form (see section 8.5). Encourage the Friends of Molloy Island Reserves group and residents to use the DBCA TPFR form to collect data on the Masked Owl activity.
- Residents should use caution while driving at night, to reduce vehicle strikes.

5.4.1.4 *Isoodon fusciventer* - Quenda

Quenda (*Isoodon fusciventer*) is a Priority 4 listed species. Their habitat preference includes forest, woodland, shrub, and heath, usually in sandy soils with dense healthy vegetation in lower stratum (Department of Biodiversity, Conservation and Attractions, 2017). The species is also associated with watercourses in forests. Quendas dig into the soil with their strong foreclaws to produce a characteristic conical hole when foraging for food.

Quenda diggings (secondary sign) were observed throughout the survey area, indicating a strong species presence and distribution across the Island. Not all quenda digging observations were record via GPS as it became abundantly clear during the surveys that the diggings were across the whole survey area and the points on Figure 36 should be taken as an underestimate and a confirmation of presence. Direct observations of Quendas included one crossing Warrior Way outside of Lot 231 and another just outside of Lot 4761 along Sabina Drive. One of the camera traps set up during the June 2024 surveys also recorded a Quenda within Lot 258 (Figures 31). Quenda observations across the survey area are shown in Figure 36.

The species is threatened by predation by feral cats, dogs and foxes, vegetation clearing resulting in the loss of suitable habitat and habitat fragmentation, competition for food resources with other animals such as rabbits, and death from vehicle strike. Management approaches to protect Quenda on the Island include:

- Minimise clearing in reserves and limit clearing on private properties.
- Manage prescribed burning to create a mosaic of suitable habitats for the species.
- Restrict the access domestic animals have to potential habitat where Quendas might nest or forage.
- Continue monitoring for foxes and cats and respond if they are observed on the Island.

- Choose humane pest control methods to reduce harm to Quendas who may accidental get caught in traps or eat baits.
- Caution while driving, particularly at night, to reduce vehicle strikes.
- Raise community awareness about the ecology and conservation status of the species.



Figure 31 Quenda observation from camera trap located within Lot 258 on the 25/06/2024

5.4.1.5 *Hydromys chrysogaster* – Rakali/Water-rat

Rakali, also known as Water-Rat (*Hydromys chrysogaster*), is found across the country and is one of Australia's largest rodents (Western Australian Museum, 2024b) and is a Priority 4 species. The species is typically found near permanent bodies of fresh or brackish water, living in round burrows hidden by vegetation on the banks of river, lakes, wetlands, estuaries and occasionally the coast (Western Australian Museum, 2024b & Department of Water and Environmental Regulation, 2024). A key factor of these habitats for the species survival is bank stability and intact riparian vegetation (Department of Water and Environmental Regulation 2024). They are territorial, largely solitary and have a home range of around 1–4 km of a waterbody (Department of Water and Environmental Regulation, 2024). The Rakali feed on a wide range of prey that they forage for by swimming underwater and usually consume their prey at a regular feeding site (Western Australian Museum, 2024b).

They can be commonly mistaken for other rodents; however, they are a native Australian species and can be distinguished from other rodents. They vary in colour and are large in size, have a long, thick tail with a white tip, flattened head, long blunt nose, abundant whiskers, small eyes and ears, thick, soft waterproof fur, and webbed hind-feet (Western Australian Museum, 2024b).

Threats to this species include habitat alteration, loss, and degradation, such as flood mitigation, swamp drainage, introduced animal predation, salinisation and drying largely due to climate change (Western Australian Museum, 2024b & Department of Water and Environmental Regulation 2024). Management strategies to protect the species can include:

- Waterbody and associated vegetation restoration, specifically around the channels and lagoons where residents have private jetties, to improve vegetation structure and corridors and protect or restore instream habitat and water quality.
- Care is required by recreational fishers who use submerged traps, as Rakali are known to accidentally or intentionally enter traps when foraging and will perish if they can't get access to air (Department of Water and Environmental Regulation, 2024).
- Raise awareness about the species particularly highlighting their ecology and conservation status.

The October 2024 nocturnal surveys specifically targeted other conservation significant fauna not yet recorded. Residents kindly shared their observations and locations of where Rakali had been previously observed on the Island, which pinpointed specific locations to target to try and capture the species in this EMP. One Rakali was observed at Molloy Island during the first nocturnal survey of the October 2024 visit (Figure 37). It was observed swimming and diving towards the shore adjacent to Lot 4758, east of Sabina Drive.

5.4.1.6 *Pandion haliaetus* - Eastern Osprey

The Eastern Osprey (*Pandion haliaetus*), a medium-sized raptor, is listed under the EPBC Act as Marine and Migratory (MI). In Australia, breeding occurs in solitary pairs which is what has been observed by the CCBG over the years and during the EMP surveys. There are to two Ospreys residing in a nest on top of the Telstra Communication Tower located along Warrior Way, adjacent to the tennis court (Figure 38). During the day survey on the 25 June 2024, one of the Ospreys was flying and calling over Lot 258 near the tower before landing on the tower where the other Osprey was also located. On another occasion on the same day one of the Ospreys was opportunistically observed flying over the lagoon in Lot 4706.

Threats to the Eastern Osprey include loss, degradation, or alteration of habitat for development, ingestion of prey items containing pollutants such as pesticides, heavy metals or fishing tackle; competition for food with commercial and recreational fisheries and reduced water quality at foraging grounds caused by discharge of effluent or runoff. Management actions to protect the current nest, pair of Ospreys and any future individuals include:

- Support the Birdlife Australia Cape to Cape group and continue observing the Osprey nest especially between May to January (breeding season) taking note of nest activity, observed feeding areas and take photos.
- Work with local Birdlife Australia to increase community awareness of the Osprey, highlighting their ecology, conservation status, and the EPBC Act legislation that protects them. This could include issues such as the threat of discarding fish with fishing tackle, and habitat requirements.



Figure 32 Camera Trap Locations on Molloy Island, Western Australia



Figure 33 Black Cockatoo Observations on Molloy Island, Western Australia



Figure 34 Habitat Tree Hollow Observations on Molloy Island, Western Australia



Figure 35 Western Ringtail Possum Observations on Molloy Island, Western Australia



Figure 36 Quenda (Isoodon fusciventer) Observations on Molloy Island, Western Australia



Figure 37 Rakali Observation on Molloy Island, Western Australia



Figure 38 Eastern Osprey Nest Observation on Molloy Island, Western Australia

6 Threats

6.1 Introduced Flora

A weed is a plant that requires some form of action to reduce its negative effects on the economy, the environment and human health or amenity (Invasive Plants and Animals Committee, 2016). In Australia, most weedy plants are exotic, however there are some that are native to Australia and have been introduced outside of their native range, for example the Sydney Golden Wattle (*Acacia longifolia*) is native to southeastern Australia and has been introduced into WA (Invasive Plants and Animals Committee, 2016).

Weed species can have a significant ecological impact on bushland, as they are able to affect the structure and function of ecosystems and impact negatively on native fauna and flora (Invasive Plants and Animals Committee, 2016). When weeds invade an ecosystem without management, they modify vegetation structure and composition which can displace native plant species, alter the resources available for fauna, and increase the biomass of ecosystems leading to more intense bushfires (Invasive Plants and Animals Committee, 2016). Weeds can also threaten nationally recognised significant sites such as cultural heritage sites and conservation significant species and communities.

Under the Shire Local Planning Scheme No. 1 under Section 6.4.2.2 (b), "Vegetation which is not indigenous to Molloy Island shall not be introduced, with the exception that domestic gardens within the immediate curtilage of a dwelling and as approved by the local government, may contain non-invasive non-indigenous species….". The Restrictive Covenant signed by all property owners requires the preservation of the natural bush on the Island and forbids bringing non-native plants on to the Island. However, even with these two prohibitions in place, continued education to ensure non-indigenous plants are not unknowingly or knowingly planted is essential. Weed encroachment from private lots into the reserves and shire freehold land is an issue that needs to be continuously monitored, as many private lots have boundaries that are directly adjacent to the survey area and historic plantings of species that are not native to the Island.

An introduced flora species list has been compiled from the historical flora data, including the Land for Wildlife Property Assessment (Appendix A), Woody Weed Removal Program 2012, Friends of Molloy Island Reserves and Nature Conservation Margaret River Region's (NCMRR) Fieldbook app data, along with the observations made by Ecosystem Solutions (Table 6, Figure 40). The Land for Wildlife Property Assessment had five weed species identified on the Island and the Woody Weed Removal Program 2012 had eight species. NCMRR recently launched an app called Fieldbook to collect data by volunteers about weeds in the Margaret River Region, the data we received from its launch included seven weed species observed on the Island included one declared pest. From the surveys conducted

for this EMP there have been 24 weed species observed within the survey area. Not all weeds were recorded with GPS during the surveys, only some species were recorded when opportunistically observed and have been mapped in Figure 40. There have been no Weeds of National Significance observed (WoNS) within the survey area.

Weed management has been undertaken on the Island by the Shire and the Friends of Molloy Island Reserves group, over many years. In 2014 the Shire worked with the Friends group and private landholders to access a grant from the South West Catchments Council to remove a large number of weedy wattles growing on the Island (Figure 39). Sydney Golden Watte, Flinders Range Wattle, Pittosporum and Victorian Tea Tree where the main targets and large volumes of these trees were removed via this project. This work has continued via the Friends of group who annually target these weeds which has led to significant reduction of weeds in the reserves. Weed removal activities were also undertaken in the second half of 2023 focusing on woody weeds in the reserves by the Friends of Group (Appendix R) with management continuing today.

- June 2023 - Volunteers removed a total of 200 Sydney Golden Wattles (including hand pulled, digging out, cutting down and use of Vigilant herbicide and capsule injection).
- July 2023 - Volunteers removed a total of 145 Sydney Golden Wattles and 50 Sweet Pittosporum saplings.
- August 2023 - Volunteers removed a total of 65 Sweet Pittosporum saplings.
- November 2023 – A woody weed workshop took place with the Friends Group, supported by the Shire and Nature Conservation Margaret River (NCMR), on the identification and control methods of some of the most invasive woody weeds threatening the Island. 40 Sweet Pittosporum saplings and 20 Polygala saplings were removed.
- Augusta 2024 – The Friends Group had further training with NCMR and learnt how to use the Fieldbook app that is used to help map weed infestation.



Figure 39 Friends of Molloy Island volunteer removing Sydney Golden wattle from Island in 2025

Photo supplied Janean Robinson

Recommended management actions for weeds includes:

- Continue to undertake weed management and monitoring on the Island to mitigate existing weeds.
- Continue to map weed infestations using the Fieldbrook app currently being used by volunteers.
- Educate, promote and lead collective action on Molloy Island of mitigation, management, and monitoring of weeds by all residents.
- Continue to raise awareness about current and potential weed issues on the Island including control methods and garden escapees via the newsletter, implementing signage or information booklets available for residents.

- Update the Molloy Island welcome kit to include more information about native species suitable for planting on the Island and identification and control methods of known weedy species and garden escapees.
- Implement access protocols to prevent the introduction and spread of weeds. Contractors entering the Island to undertake public works should aim to ensure their vehicles are weed free on entry to prevent the spread of weeds.
- Continue to remind residents that under the restrictive covenant they signed and the Local Planning Scheme 1 (Molloy Island Area - section 6.4.2.2) that it is forbidden to bring and/or plant non-native/non-indigenous plants on the Island. Only native species may be planted, and a list is available from the office.

Table 6 Molloy Island introduced flora species list, including status, ecological impact and invasiveness (DBCA, 2014).

Species Name	Common Name	Land for Wildlife Reports 2012	Woody Weed Removal Program 2012	Friends of Molloy Island Reserves	Nature Conservation Margaret River Fieldbook App 2024	Ecosystem Solutions 2024	Status[1]	Ecological Impact[2]	Invasiveness[2]
Acacia baileyana	Cootamundra Wattle		X					Low	Slow
Acacia dealbata	Silver Wattle		X					High	Moderate
Acacia elata	Mountain Cedar Wattle		X		X	X		Low	Slow
Acacia floribunda	White Swallow Wattle				X	X		Unknown	Unknown
Acacia iteaphylla	Flinders Range Wattle	X	X			X		Unknown	Rapid
Acacia longifolia	Sydney Golden Wattle	X	X	X	X	X		Unknown	Moderate
Acacia mearnsii	Black Wattle	X	X					Unknown	Unknown
Acacia melanoxylon	Blackwood	X				X		Medium	Slow
Acacia podalyriifolia	Queensland Silver Wattle		X					Low	Slow
Aira (caryophyllea)	Silvery Hairgrass					X		Unknown	Rapid
Atriplex prostrata	Hastate Orache					X		Unknown	Rapid

[1] Western Australian Organism List (WAOL) for declared pests in WA as per Department of Primary Industries and Regional Development and Biosecurity and Agriculture Management Act 2007.

[2] Ecological Impact and invasiveness ratings as per Department of Parks and Wildlife Southwest Region Species Prioritisation Process (DBCA 2014).

Species Name	Common Name	Land for Wildlife Reports 2012	Woody Weed Removal Program 2012	Friends of Molloy Island Reserves	Nature Conservation Margaret River Fieldbook App 2024	Ecosystem Solutions 2024	Status[1]	Ecological Impact[2]	Invasiveness[2]
Briza maxima	Blowfly Grass					X		Unknown	Rapid
Callitriche stagnalis	Common Starwort					X		Unknown	Rapid
Cicendia filiformis	Slender Cicendia					X		Low	Rapid
Coleonema pulchellum	Confetti Bush					X		Unknown	Unknown
Cotula turbinata	Funnel Weed					X		Unknown	Rapid
Crassula natans var. *minor*	Stonecrop					X		Low	Rapid
Mentha pulegium	Pennyroyal					X		Medium	Moderate
Pandorea pandorana	Wonga Vine					X		Unknown	Unknown
Pittosporum undulatum	Sweet Pittosporum	X	X	X	X	X		High	Rapid
Polygala myrtifolia	Myrtle-leaf Milkwort			X	X	X		Medium	Moderate
(Samolus valerandi)	Water Pimpernel					X		Low	Rapid
Watsonia sp.	Bugle Lily				X			High	Moderate
Zantedeschia aethiopica	Arum Lily				X		Declared Pest	High	Moderate

() = Tentative ID



Figure 40 Weed Species identified on Molloy Island

6.2 Introduced Fauna

The presence of invasive species has consistently been identified as one of the most significant threats to WA's native species and ecosystems. The Australian Government has identified foxes and feral cats as a key cause of the extinction and decline of dozens of native animal species across Australia. In 2022, a study estimated that foxes and cats combined are killing more than 2.6 billion mammals, birds, and reptiles every year (Stobo-Wilson *et al.*, 2022).

There are currently no introduced fauna control activities being undertaken on Molloy Island, as there has been no recent fox, rabbit, and/or feral cat observations in the recent years. Historically there have been introduced fauna on the Island and were managed with the removal of the species such as the Rabbit Task Force. In the surrounding landscape there is Western Shield fox and feral cat baiting undertaken in the Scott National Park (flying program) to the east and south of Molloy Island (Government of Western Australia, 2024).

An integrated management approach of introduced fauna species alleviates pressure on local native fauna and flora and provides an enhanced success, cost-effective and long-term management of individual species. For example, enacting control measures for rabbits also enhances feral cat and fox management by removing rabbits as one of their food sources (DBCA, 2023).

6.2.1 *Vulpes vulpes* - European Red Fox

The European Red Fox is a declared pest in Western Australia under the *Biosecurity and Agriculture Management Act 2007* (BAM Act). They are widespread across the Australian mainland. They have a direct impact on a range of native animal and predation by the European Red Fox is listed as a key threatening process under the EPBC Act (DEWHA, 2008). Islands are often refuges for animals no longer found on the mainland. The prevention of the introduction of foxes to new areas, such as Islands, is a high priority.

Fox control methods include fertility control, exclusion fencing, toxicants such as baiting, shooting, den fumigation, trapping, and managing habitat, weeds, and waste (McLeod L, Harris C (ed), 2020). Attempting to control foxes on an individual property without the support of neighbours rarely succeeds. Working with groups of neighbours more effectively controls foxes over larger areas limits re-invasion and is more cost effective due to the sharing of labour and equipment. Most methods are expensive, labour intensive, long term and of limited effectiveness (DEWHA, 2008). The control of other pest species, such as rabbits, can have effects on foxes too, with some studies identifying fox numbers decreased after the release a biological control that reduced rabbit numbers (DEWHA, 2008).

There are currently no known foxes on Molloy Island. Continued monitoring should be a priority, with early detection and extermination the best way to ensure that Molloy Island remains fox free. Any observations of signs or direct sightings should be reported immediately to the Shire of Augusta-Margaret River.

6.2.2 *Felis catus* - Feral Cats

Feral cats are a declared pest in Western Australia under the Biosecurity and Agriculture Management Act 2007 (BAM Act). Feral cats are defined as cats that live and reproduce in the wild in self-sustaining populations in natural habitats of all types. They are not reliant on humans and survive exclusively by hunting and scavenging. They display different behaviour to domestic (owned pet cats) or stray (semi-feral) cats in that they are averse to being in the presence of humans (DBCA, 2023). Predation by feral cats is listed as a key threatening process under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and they are recognised as a threat and have contributed to the extinction of many native fauna species (DBCA, 2023).

Control methods include exclusion fencing, baiting, cage trapping, shooting, Felixer Grooming Traps and Indigenous hunting. Paruna Wildlife Sanctuary, in the Avon Valley east of Perth, manages feral cats through an intensive trapping program, where an array of lured cage traps are set throughout the accessible areas of the sanctuary. Cage traps are complemented by an array of camera traps positioned throughout the sanctuary. When undertaken at local scales, targeted control such as that undertaken at Paruna can remove problem feral cats that pose a threat to particular native species populations.

There are currently no known feral cats on Molloy Island. Continued monitoring should be a priority, with early detection and extermination the best way to ensure that Molloy Island remains feral cat free. Any observations of signs or direct sightings should be reported to the Shire of Augusta-Margaret River, so immediate action can be taken.

6.2.3 *Oryctolagus cuniculus* - European Rabbits

Rabbits are a declared pest in Western Australia under the Biosecurity and Agriculture Management Act 2007 (BAM Act). They are one of the most widely distributed and abundant mammals in Australia, however their exact abundance is unknown (Commonwealth of Australia, 2016a). Rabbits impact on the environment in multiple ways both directly and indirectly affecting native flora and fauna, vegetation communities and sensitive sites (Commonwealth of Australia, 2016a). For example, they compete with native fauna for food and shelter, graze and damage native flora and prevent regeneration of seedlings (Commonwealth of Australia, 2016a).

Broad scale eradication of rabbits is not deemed possible, however there is the potential on some Islands and exclusion areas (Commonwealth of Australia, 2016b). Therefore, management measures aim for long-term suppression of rabbit populations (Commonwealth of Australia, 2016b). Rabbit control is most important in areas of high conservation concern, particularly those that support populations of threatened species. Control options include baiting, warren fumigation, warren ripping, harbourage destruction, exclusion fencing, biological control, shooting and trapping. Monitoring rabbits, including their abundance, is critical in determining whether a management program has been successful or not and if population outbreaks have occurred and follow up control (Commonwealth of Australia, 2016b). For control measures to be more successful, long-term, and cost-effective, integrated approaches are best with the implementation of more than one technique and coordinated with the control of other pest species (Commonwealth of Australia, 2016b). It should be also considered that rabbit control activities can directly and indirectly impact other species and she be considered when planning control programs.

There were signs of rabbits in the survey area, with scats and digging both observed. There were no direct sightings made by Ecosystem Solutions during the surveys; however, one resident informed us they have seen rabbits on the Island recently. Rabbits were also noted by Christine Wilder (CCBG) as being a food source for the Island's Ospreys in 2022. Continued monitoring should be a priority, with early detection and extermination the best way to ensure that the population does not become out of control. Rabbit control was undertaken by the Shire of Augusta-Margaret River in March 2025 with the release of Calici virus. Any observations of signs or direct sightings should be reported to the Shire of Augusta-Margaret River.

6.2.4 Domestic Animals

Responsible pet ownership is essential and enables owners to enjoy companionship of their pets while minimising harm to native animals, especially threatened species. Poor pet management can severely impact on native animal welfare and the surrounding environment. For example, in many cases feral animals were once domestic and have gone wild. Domestic dogs and cats can attack a wide variety of native animals, not only killing them, but potentially leaving them injured, making them more vulnerable to attack from other predators. Their natural hunting instincts is a significant threat to native fauna. Even if a pet's requirements for food and shelter are met, instinctive hunting and chasing behaviour will continue (DCCEEW, 2021). There is also a potential that native animals may develop a sense of familiarity with domestic pets, which increases their vulnerability. Even the sight, sounds and smells of domestic animals cause native animals great stress, with the potential for native animals to leave the current area they are inhabiting or leave their young unprotected.

With the increasing residential population on the Island, there has also been an increase in the number of pets on the Island. It is suggested that an education program is developed to help landowners understand their responsibilities and the legislative requirements of managing pets. Cats

and dogs have the potential to "take" – chase, capture, injure, kill wildlife (including threatened and priority listed fauna known to occur on the Island, such as WRP, Black Cockatoos and Quenda). A landowner would be in breach of the BC Act if their pet(s) were found to be preying upon threatened fauna. The Dog Act also specifies that it is unlawful for dogs to chase, harass, injure etc. any animal. It is understood that ensuring compliance on the Island is and will be difficult and we recommend that residents report any breaches they observe to the Shire so further action can be taken. The encouragement of responsible of pet ownership can improve the welfare of all animals (DCCEEW, 2021), and it is important that pets are managed appropriately and this includes:

- Owners should be aware they must know where their pet is at all times.
- Ensure pets are kept in a yard or secured area private properties, not just at night. If cats are allowed on the Island they are to be kept inside or in a catio or katzone compound at all times (Cat Act). All dogs are to be kept inside or within fenced building envelopes during the day, and it is recommended they are kept inside at night.
- Choose pets that are appropriate for residents' property.
- Create 'pet free' areas on properties.
- Never release unwanted pets into the wild.
- When walking pets ensure they are always on a lead. Owners should stick to the existing tracks and avoid taking them into the bush.
- Always clean up after pets and dispose of their faeces appropriately, especially if walking them in the reserves and Shire freehold land.

6.2.4.1 Domestic Pet Cats

Cats are by nature are instinctive hunters (DCCEEW, 2021) and those in homes near bushland roam the furthest and hunt the most frequently (Invasive Species Council, 2023). Pet cats are a major threat to native wildlife, with 546 million animals killed per year by roaming pet cats in Australia (Invasive Species Council, 2023). In 2023, data showed that 71% of all pet cats in Australia are able to roam and 78% of these cats' hunt (Invasive Species Council, 2023). On average, each roaming and hunting pet cat kills more than three animals every week and 186 animals (110 native animals) each year (Invasive Species Council, 2023). Many owners are unaware or believe their pet cat does not roam, kill or contribution to the statistics and their cat won't make a difference, however it has been found that individual pet cats have driven the decline and complete loss of populations of some native animal species in their area (Invasive Species Council, 2023). Keeping pet cats contained at all times, 24 hours a day, either indoors or in a secure outdoor cat run, is the only way to prevent them from killing wildlife (Invasive Species Council, 2023). The killing of native animals is not the only impact, other issues can include the disruption to breeding and feeding as animals may have to spend more time hiding or escaping (Invasive Species Council, 2023) as well as the transmission of toxoplasmosis, with the risk of pet cats spreading the disease and impacting native animals (Land for Wildlife Queensland, 2011).

The Shire of Augusta Margaret River have Cat Prohibited Areas under the Cat Local Law 2023. Molloy Islands Shire reserves and Shire freehold land are designated Cat Prohibited Areas under this law. The neighbouring Scott National Park to the northeast and south of the Island is also an important biodiversity area and it is important that it remain cat free. It has been noted that when the Molloy Island development was established, it was with the intention that the Island would remain free of cats. The sign at the ferry entry/exit point of the Island states that "no person may bring a cat onto the Island." (Figure 41). The Molloy Island Home Owners Association have stated that cats are forbidden on the Island. It is recommended that the MIHOA amend their Constitution to clarify that there are no cats to be kept on the Island, as well as the development of a pet management plan for the Island. Following this change to the MIHOA Constitution, it is also recommended that the Shire amends the Cat Local Law 2023 to include the whole of Molloy Island as a cat prohibited area.

6.2.4.2 Domestic Pet Dogs

In the Shire of Augusta Margaret River dogs are required to be on a lead at all times in public spaces. The Shire reserves and Shire freehold land are all considered public spaces and there are no designated dog exercise areas on Molloy Island. The Molloy Island Home Owners Association sign at the ferry entry/exit point of the Island states that "only registered homeowners may bring a dog onto the Island." (Figure 41). Visitors and renters are not permitted to bring dogs onto the Island. The Molloy Island Constitution states that "dogs must be kept on a lead at all times, no dog designated exercise areas and must be in a fenced area that aligns with the Islands fencing rules.".

It is known that unconfined dogs can harass and kill native animals in search of food and shelter (DCCEEW, 2021), and to protect their territories (Land for Wildlife Queensland, 2011). Some dogs may even join roaming packs with other local dogs and hunt wildlife. Research indicates that the scent of dogs may deter some fauna from utilising habitats that dogs visit and alter their natural behaviours as a result (Land for Wildlife Queensland, 2011), for example dog faeces not picked up and disposed of appropriately signals to fauna that predators are about, and they should stay away. Not picking up and disposing of pet faeces also has other effects on the environment and puts human health at risk. Pet faeces contain excessive nutrients due to the high protein diet pets have, which when not picked up adds an imbalance to naturally low nutrient soils when in excess and lead to biodiversity loss. Faeces can also get washed into waterways causing harm to aquatic life. There is also harmful bacteria and parasites in pet faeces that harm native fauna.

It is recommended that additional signage is installed, reminding residents to keep their dogs on leads at all times, to stick to existing tracks and that there no designated off-leash exercise areas on the Island. Additionally, dog waste stations with pet waste bag dispensers have been implemented and will be managed by the MIHOA to encourage dog owners to clean up after their dogs.



Figure 41 Information sign on the mainland side of the barge to Molloy Island, with information regarding cats and dogs

6.3 Plant Pathogens

Plant pathogens are viruses, bacteria and fungi that cause disease when they infect flora and adversely affect the environment and biodiversity. As pathogens are microscopic, they present special problems for detection and management, however Molloy Island is in a unique situation where restrictions can be applied to stop the introduction of plant pests and pathogens. The pathogens that pose a threat to the flora in the south-west of Western Australia and are important to be aware of on Molloy Island are Dieback, Myrtle/Eucalyptus Rust, and Marri Canker.

Dieback is caused by a fungus from the genus *Phytophthora*, and is the plant pathogen that was focused on for this EMP. Over 60 species of *Phytophthora* have been detected in Western Australia, with almost 40 of them detected in native ecosystems. These root-rot diseases can affect up to 40% of the south-west flora with 14% (800 species) being highly susceptible to Dieback (Shearer *et al.*, 2004). Threatened flora are at even greater risk with around 56% being considered susceptible (Shearer *et al.*, 2004). *Phytophthora cinnamomi* is the species with the greatest impact on biodiversity and is known as the "botanical bulldozer".

Dieback can significantly alter the vegetation community composition, leading to impacts on local fauna. The disease is spread naturally via underground water flow movements and animal movement. It can be anthropogenically spread when infested soil is disturbed and moved, such as vehicles, footwear, equipment, and materials. The disease impact is greatest in wet sites (Dieback Working Group, 2015).

It is unknown whether *Phytophthora cinnamomi* (dieback) or other *Phytophthora* species are present on Molloy Island. There has been no dieback interpretation or mapping undertaken on the Island and it is recommended that mapping is completed to accurately determine the presence of *Phytophthora cinnamomi* or other *Phytophthora* species. An assessment should be conducted by registered *Phytophthora* Dieback Interpreter. There are also no dieback protocols for Molloy Island and is recommended that dieback protocols are established to prevent introduction of the pathogen or prevent further spread on the Island if it is found to be present.

From the surveys connected by Ecosystem Solutions, it was noted that at relevé 5 (MR05) there was *Kingia australis* deaths that could potentially be due to dieback, however this could also be due to other factors such as hydrology changes. There were also signs of stress with tree deaths observed at relevés 1, 3, and 6, again this could be due to dieback or other causes. It should be noted that no soil or tissue samples were taken as Ecosystem Solutions is not a qualified Phytophthora Dieback Interpreter.

There was a Molloy Island Phytophthora Action Group/Molloy Island Dieback Working Group formed in January 2005, that undertook measures to prevent potential dieback spread/introduction on the

Island, mostly focusing on injecting trees for dieback control. Typical Dieback treatments include injecting Phosphite© via the stem for affected trees and spraying for affected shrubs, including a 5m buffer area, which can improve the plant's ability to respond to stress. This is the recommended method if Dieback is known to occur within an area. The Group injected 377 trees with Phosphite© on 9 private properties: Lots 252, 106, 180, 98, 241, 31, 240, 172, and 5, from January to March 2005, for the prevention of dieback on the Island. A range of tree species were injected including *Eucalyptus* spp. (such as *E. marginata*), *Corymbia* spp. (such as *C. calophylla, C. ficifolia*), *Persoonia* sp. (Snottygobble), *Banksia* spp., *Xanthorrhoea preissii*, *Grevillea* spp., *Thryptomene* sp., *Kingia autralis*, *Melaleuca* sp., *Callistemon* sp.. They also received guidance and assistance with their efforts from Chris Dunne, the Shire of Kalamunda Dieback Project Officer (Dieback Working Group) at the time. He took two samples from the Island to test for dieback; both resulted in a negative result. However, Chris indicated that the time of sampling was not ideal and that it is vital that more samples around the Island be taken to get a more definitive result. He said that without a definite positive result to show the presence of the pathogen on the Island, the benefit of Phosphite© treatment would be unclear. Chris also presented a couple of awareness raising sessions in early 2005 to distribute information. He showed a range of equipment used in Dieback treatment practices, suggested actions towards a management plan, provided advice and demonstrated tree injections to the Group and any other interested residents.

Good hygiene can protect uninfested areas from dieback infection. Hygiene refers to the cleaning of 'carriers' before entering natural areas. A 'carrier' is anything that may pick up soil and plant material such as machines, vehicles, footwear, or equipment. Hygiene practices should be implemented for all types of carriers to prevent the introduction/spread of the disease. A precautionary approach of cleaning before entering an area prevents introducing dieback to potentially uninfested areas, and cleaning on exit, prevents bringing infested soil out of potentially infested areas. This method also prevents residents from taking it home where it can infect their property. Dieback management recommendations have been provided below (DWG, 2015). These recommendations are mainly based on the basis that it is currently unknown if Dieback is present on Molloy Island.

- Engage a registered Phytophthora Dieback Interpreter to complete dieback mapping on the Island and determine if *Phytophothora* is present.
- Develop and implement a Dieback management plan for the Island. There are a range of resources available from the Dieback Working Group to develop a plan that could be used as a reference. The plan should apply to everyone that enters and exits the Island, and all areas of the Island. It should include hygiene protocols to ensure that contractors entering the Island ensure their equipment and machinery is clean. This should apply to all vehicles, tools, equipment, footwear, and machinery being free of all mud and soil.

- Ensure all residents and visitors are aware and informed of the dieback status of the Island and hygiene practices, once determined and implemented, before or upon their arrival.
- Monitor for dieback around Kingia wetland community and consider the need for limestone tracks around this area.
- All maintenance activities should be planned to reduce the risk of introduction and spread of Dieback.
    - Controlled burns should be conducted with hygiene practices in place.
    - Prevent or minimise activities undertaken during high-risk times of the year. Schedule activities involving soil disturbance during low rainfall months (November to March) when the soil is dry.
    - During fire break maintenance soil disturbance should be limited, where possible.
    - If moving soil is necessary only push the material down slope and never push soil upslope.
- Limit the number of tracks in the reserves and Shire freehold land (commonage) and ensure existing tracks are well drained. If new tracks need to be constructed avoid creating them on the upper slopes of the bushland or require them to be topped with limestone to limit the spread of dieback.
- If unauthorised vehicle access to the reserves and Shire freehold land becomes an issue that cannot be addressed by the MIHOA it is recommended that bollards or gates are installed allowing only authorised personnel entry to the tracks.
- Dieback increases the stress placed on affected plants, and controlled burns can add additional stress. If dieback mapping occurs and dieback affected areas are found, these areas could benefit with a decreased fire frequency, to allow species to recover from the fire.
- Avoid bringing soil, gravel, or sand into the reserves and Shire freehold land. If material must be introduced ensure any material used is *Phytophthora* free. Infested materials such as gravel can often introduce Dieback, and earthworks can move the disease through the bush.
- Revegetation has a high risk of introducing dieback. To prevent the introduction of the disease, consider direct seeding rather than planting seedlings. If seedlings or plants are purchased ensure they are from nurseries with Nursery Industry accreditation. Planting should be conducted when soil is moist, but not wet.

- When moving from one area of the bush to another, ensure that all equipment and shoes are free of mud and soil and move from high points moving to low areas of bush. Minimise walking in the bushland when the soil is wet and muddy and stick to tracks as much as possible.
- If weeds are being removed, they should be placed immediately in a container to ensure that plant material or soil is not dropped in other parts of the reserves and Shire freehold land.
- Install signs, such as “arrive clean, leave clean” and “dieback protection area” signs, at reserve and Shire freehold land entrances to highlight the disease situation in the area once known. Include recommendations on the sign such as avoiding access when the soil is wet and sticking to tracks.
- Shoe cleaning stations can also be implemented at entry and exit points of reserves and Shire freehold land to encourage people to clean their footwear when they enter and exit these areas. If bikes are commonly ridden in the reserves and Shire freehold land, there are also bike grids that are designed to shake soil from tyres. Bikes also apply to requiring to be free of all mud and soil before and after leaving these areas and sticking to existing tracks.
- Consider reestablishing the Molloy Island Phytophthora Action Group/Molloy Island Dieback Working Group. The method implemented by the group is an option to get re-established and applied to vegetation in the reserves and Shire freehold land, if determined to be required.
- Educate residents and raise awareness that plants should not be removed from Shire land and not to dump rubbish or green waste into the reserves and Shire freehold land.
- Encourage all properties to have their own at home cleaning toolkits. The simplest kit consists of 70% methylated spirits and 30% water in a spray bottle and a scrubbing brush to reduce the introduction/spread of dieback.
- Consider up-grading tracks to a hard well drained surface that does not allow for the easy movement of soil out of the reserves and Shire freehold land, such as resurfacing the tracks with limesand or limestone.
- When residents walk their dogs in the reserves and Shire freehold land they need to stick to hard and well drained tracks. If walking dogs enter the bush, ensure that paws are free of mud and soil when entering and exiting an area.
- Look out for people undertaking activities in or near the reserves and Shire freehold land that could introduce the pathogen. If the activities are not operating under hygienic conditions, contact the MIHOA and the Shire.

6.4 Other Anthropogenic Threats

One issue on the Island raised by residents to Ecosystem Solutions is the **clearing of native vegetation** both on private property and potentially illegally in the Shire reserves. In Western Australia, a permit is required to clear native vegetation, unless either an exemption or it has been determined that a permit is not needed during the clearing referral process. Any clearing that takes place in the reserves by residents is illegal. The reserves are under the care, control and management of the Shire of Augusta Margaret River and therefore Shire permission is required before any clearing, development or re-vegetation work is undertaken. The Shire of Augusta Margaret River Local Planning Scheme 1 section 6.4.2.2 (a) states "the removal of any indigenous tree or clearing of indigenous undergrowth is prohibited". Unlawful clearing of native vegetation can be reported to the WA Government.

The remaining undeveloped lots on the Island are being cleared to comply with State Planning Policy 3.7 – Planning in Bushfire Prone Areas, and the Planning for Bushfire Guidelines (as amended) (Western Australian Planning Commission, 2024). Clearing of these private lots is the legal obligations of the owners to comply with the Standards, along with their right to develop and construct a dwelling on their land. In the Local Planning Scheme 1 it states that 'Molloy Island's environment is an example of a location which has experienced increasing pressure following the introduction of the State Planning Policy 3.7 – Planning in Bushfire Prone Areas, which has prevented new development from maintaining the natural wilderness feel, with considerable areas of vegetation required to be removed to facilitate compliant development.' and that 'some review of the requirements applicable to Molloy Island may be warranted to achieve more balanced outcomes in respect to planning for Bushfire Protection.'. Not much can be done in respect of this clearing if the owners have received proper approvals through their development application and that the clearing is only occurring within their lot and not encroaching into the reserves.

Littering in Western Australia is an offence under the *Litter Act 1979* and **illegal dumping** is an offence under the Environmental Protection Act 1986 (EP Act). Littering is defined as the failure to appropriately dispose of any waste products on land or water, either by mistake or on purpose. Fines are defined in the Litter Regulations 1981 and issued under the *Litter Act 1979* by local government, police and authorised officers. Litterers can be held accountable and reported to the Shire of Augusta Margaret River or online to the WA Government. Illegal dumping is an offence to abandon any waste in a publicly accessible area without the consent of the person who controls and manages the area under s.49A of the EP Act. The Department of Water and Environmental Regulation (DWER) investigates and prosecutes illegal dumping, and reports can be submitted to the online Pollution Watch form or hotline and Crime Stoppers WA. On Molloy Island this includes dumping of garden waste in the reserves, not only is this illegal but can have significant environmental impacts such as spreading weeds and increasing fire risk.

The **feeding of native fauna** is an offence without lawful authority under the Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulations 2018. Feeding native animals disrupts their natural behaviour, exposes them to health risks, can cause human-wildlife conflict, high population numbers, increased aggression and predators, and increased risk of animal to human disease. It is also not just only feeding that it is the issue it also human interaction that can be harmful too. There are other ways to enjoy native animals in gardens or properties without causing them harm, such as providing and maintaining natural habitats that naturally provide sources of food and shelter.

Firewood collection is a regulated practice in Western Australia by the Department of Biodiversity, Conservation and Attractions (DBCA). This management ensures that vegetation and wildlife are protected, and that supply is ecologically sustainable. Taking firewood from public land including national parks, nature reserves and conservation parks is illegal, and this includes gathering of firewood from Molloy Island's reserves. Unlawful taking of firewood is an enforceable action by DBCA with penalties applicable. Firewood can only be collected to use at home from nominated areas of State Forest managed by DBCA, with designated areas in the Southwest, otherwise firewood can be purchased from an authorised person or business. Any suspicious firewood activity can be reported to the Wildcare Helpline on 9474 9055. It is recommended for residents that collect firewood from their own private properties to only take wood already on the ground as felling or removing live or dead trees or tree branches can cause significant environmental damage and removes important habitat for native fauna especially conservation significant species.

Molloy Island has extensive tracks that are all mostly firebreaks that only authorised personnel can drive vehicles on, and residents are able to use for walking (These tracks have now been sign posted by the Shire). The existing tracks provide a way for people to enjoy the natural environment, whilst simultaneously minimizing the amount of human-induced impact on the adjacent vegetation. It is highly encouraged that all residents and visitors stick to walking on the existing track to avoid creating unnecessary damage to the reserves and never taking any natural materials from the reserves (including flowers, seeds, whole plants, and firewood), unless authorised to take under a flora licence.

7 Fire Management

During Extreme and Catastrophic fire rating danger days (i.e. Forest Fire Danger Index- FFDI above 50), fire conditions become unpredictable, and control of a fire is unlikely. Reducing fuel loads is one management action to protect nearby assets and reduce fire intensity, however it should be recognised that there is no guarantee that it will always be successful especially on elevated fire danger days. Note that it is the fine fuels that provide the bulk of the fire height and rate of spread, however logs and thicker branches that can increase intensity and burning time. When conditions become extreme and catastrophic, it is the wind and soil moisture that become the predominate influence on fire behaviour, with little control ability for Fire brigades and land managers.

The Island has undergone fuel reduction actions in the past under a burn management plan by the Shire of Augusta Margaret River, resulting in vegetation with a range of time since fire (Figure 42). In 2012 prescribed burns were conducted east of Clements Crescent and south of Dalton Way within Lot 4766, R36542. The exact location of the 2012 burns is not known and as a result have not been included in Figure 42. Three prescribed burns occurred in 2016/2017: a portion of Lot 4706 behind houses on Dalton Way; a part of Lot 231 behind houses along Hale Avenue; and part of Lot 169 (7 Clements Crescent). In approximately 2018 a prescribed burn was conducted in the western half on Lot 231. A prescribed burn is proposed for the centre of Lot 4761 in the future, if conditions permit. Residents also undertake their own small-scale burns on their properties to protects infrastructure including the areas around the barge, caretakers' residence, and fire station.

The firebreaks and access tracks have been mapped by the Shire of Augusta Margaret River and is provided in Appendix S. The firebreaks and access tracks were widened at necessary pinch points in January 2024 to allow access for the Island fire truck and signposted at the end of 2024. The tracks are only allowed to be used authorised vehicles and must be kept clear at all times. Residents and visitors of the Island are not allowed to use vehicles on these tracks however they are suitable for walking.

7.1 Fire Management Advice

- The Shire should continue to advise and work with residents and the Friends of Molloy Island Reserves group regarding fire mitigation activities on the Island.
- Avoid burning the Kingia wetland community to protect it from an inappropriate fire management practice that could impact on the *Kingia australis* and fragility of the community. As it is the only vegetation type locally it warrants extra protection.

- Ecological diversity benefits from bushland areas having a diversity of habitat areas, which can be obtained by planned fuel reduction burns. The burns should be in small, manageable areas over a suitable length of time to allow plants to mature and set seeds before the next round of prescribed burns. This style of burning will also provide benefits for the native fauna present. Therefore, for a diverse landscape it is recommended to burn in different cells, with each cell having a different fire frequency and to be burnt in different years, to allow a variety of age of flora species and variety in the seed banks.

- Consultation is recommended with cultural custodians to help inform contemporary ecological fire practices conducted on the Island.

- Continued weed removal to limit the contribution of weeds as available fuel.

- Dieback can be spread during controlled burns, therefore hygiene practices should be implemented for all vehicles, equipment and footwear to prevent the introduction and/or spread of the disease.

- Implement pre-burn actions such as:

    - The fire control officer is required to apply for permits to take/disturb flora from Department of Biodiversity Conservation and Attraction pre-burn. These permits are assessed by DBCA and where required conditions are applied.

    - In some areas where burns are proposed volunteers can rake around habitat trees, especially those observed to have hollows and be utilised by Black Cockatoos and other conservation significant species; logs; priority flora; *Kingia australis* and tall *Xanthorrhoea* sp. to try and protect these values during a burn. The raking can be conducted by volunteers such as those from the Friends of Group or the volunteer fire brigade.

    - Continue to notify landholders of when fuel reduction actions are going to take place. Details of the Shires hazard reduction burns program are available on the Shire website. Additionally adjacent landholders are advised pre-burn through a mail out and then a door knock immediately prior to any burn.

- A post-fire monitoring program undertaken by the Friends of group could be set up to monitor the recovery of the bushland post-burn, note any observations and ensure that the ecosystem is responding well. Information on post fire monitoring has been provided in Appendix T.

Most grass trees, *Xanthorrhoea* sp., are adapted to, and some species are stimulated by, fire. They have a structural adaptation, where the skirt acts as insultation to protect the stem from flames and heat and the living growth-point is underground. *Kingia australis* also responds to fire, in that a fire

can stimulate the production of flower clusters. However, it should be noted that too frequent fire can threaten the survival of both species, any burns should be planned and where fire is not required trim and/or rake around individual plants. Management advice for the *Xanthorrhoea* spp. and *Kingia australis* includes:

- It is recommended that the *Kingia australis* are not burnt and are avoided, where possible. The *Kingia australis* are fragile especially the old and tall ones if the base is compromised. This is evident from the taller trees being observed as lacking stability.
- Where appropriate, such as on private property, grass trees can be trimmed, with power tools or hand saws, of the dry grass to reduce the amount, and it is an alternative method to burning.
- Where appropriate to exclude grass trees, rake around individual plants prior to a burn to exclude them from getting burnt in a planned burn.
- Best burning practice for grass trees:
    - Before burning check for the presence or signs, such as nests and hollows, of any fauna in the thatch. Also check for fauna under smaller grasstrees by poking under the skirt to allow fauna to flee.
    - Burn one tree at a time to help prevent the fire from blocking escape routes of fauna.
    - Light from the top down, using a single ignition point and on the downwind side of the grasstree. This method allows fauna to evacuate the grass tree and results in a less intense fire that spreads more slowly.
    - Avoid water and let the grass tree burn out on its own.
    - DFES have developed an information sheet called Burning Grass Trees (March, 2022) that can assist landholders understand how best to manage grass trees on their property - https://cdn.prod.website-files.com/61de5d84c5a92d75c52a9ca6/644f4f6aafe8ee0402050e1f_DFES-Burning-Grass-Trees-Information-Sheet.pdf

One of the key threats to the Subtropical and Temperate Coastal Saltmarsh TEC is inappropriate fire regimes (DSEWPC, 2013). The ecological community is not well fire-adapted, and fire is lethal to many of the species, with recovery of areas known to be is relatively slow and the long-term impacts of burning are uncertain (DSEWPC, 2013). The Coastal Saltmarsh is in the outer riverine portion of the Island with firebreaks around the edges. Recommendations specifically for this ecological community include (DSEWPC, 2013):

- Avoid conducting prescribed burns in the ecological community. The Shire currently no has no intention to burn areas of the TEC.
- Where possible, ensure planned burns in areas surrounding the Coastal Saltmarsh are not allowed to spread into the ecological community.
- Develop recovery actions for post-fire management to ensure that the required parties are prepared if a fire event impacts on the ecological community.

7.2 Community Fire Education and Action

Many of the residential lots are adjacent to the reserves. All landowners need to be aware of the risk of bushfire and manage the risk of fire within their own lot and be prepared to evacuate immediately if a bushfire event should occur. Residents should be familiar with the Emergency Evacuation Plan for the Island and ensure that appropriate arrangements are always in place in case of an emergency. All residents should annually review the evacuation plan to re-familiarise themselves with the plan and be aware of any updates that are made to the plan. We recommend installing the Emergency Evacuation Diagram on the inside face of all external doors. The Evacuation Map for the Island (Map 10) is available on the Shire of Augusta Margaret River website under Local Emergency Management. Also, residents should be engaged with and aware of the Molloy Island Community Fire Ready program.

Residents in these areas must manage the vegetation within their lot to a low fuel state, particularly removing the fine fuels around their dwellings and comply with the Shire of Augusta Margaret River Firebreak Notice and Bushfire Information. Landowners with dwellings constructed prior to 2015 need to be aware that their dwellings are unlikely to have been built to BAL standards, as Australian Standard 3959 (2018) was not enforceable till that year, however, it is still important that all landowners maintain an Asset Protection Zone (APZ) within 20 metres (DFES, 2020), or to the lot boundary, whichever is closer from the external walls, of any habitable building. Properties subject to an approved BMP must comply with the requirements of their BMP in addition to the requirements of the Shires Firebreak Notice. Owners need to be aware they are only allowed to manage the vegetation within their own lot and should not be conducting any clearing within the reserves or Shire freehold land.

Establishment of an Asset Protection Zone does not mean the removal of all vegetation within this area. Trees can be retained if the trunks at maturity are 6 metres from all elevations of the building, branches at maturity do not touch or overhang the building, lower branches are removed to a height of 2 metres above the ground or surface vegetation and canopy cover is less than 15%, with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy. Shrubs and ground covers can also be retained if they are managed to Asset Protection Zone requirements. Maintenance of the APZ is imperative and seasonal preparations can be conducted to ensure landowners properties is prepared for the fire season.

Another important aspect is the maintenance of landowner's private driveways. Landowners must ensure that the driveway complies with the Guideline requirements, with a 4m wide trafficable surface, 4.5m vertical clearance and 6 m wide horizontal clearance, and should refer to the Shire of AMR bushfire notice.



Figure 42 Molloy Island Prescribed Burns Map

8 Additional Community Education and Information

Tables have been provided in appendix U that included planning and environmental acts, standard and guidelines for Molloy Island residents to be aware of. In appendix V tables have been provided with the Shire of Augusta-Margaret River and state government departments contact details to assist Molloy Island residents with who to contact for environmental queries and reporting issues.

8.1 Educational Opportunities

Encourage residents to join the Friends of Molloy Island Reserves, to help conserve the Molloy Island Shire Reserves. An increase in the number of volunteers would enable more programs and works to be undertaken on the Island. The group could develop resources about the Islands natural environment, continue organising events with guest speakers, with the opportunity to hold presentations to keep other residents up to date on the activities of the Friends group, including things they have observed and achieved. Also, promote the Friends of Molloy Island Reserves Facebook page which can contain information and updates about the work of the group and the important environmental values of the Island. The Friends of group's information files also require updating with current knowledge, legislation and guidelines.

Additional information regarding the environmental issues could be added to The Molloy Messenger newsletter, such as a permanent environmental section in the newsletter, to promote engagement with more residents. Extra environmental information could be put on the existing notice board.

As mentioned throughout the EMP different forms of signage could be installed on the Island to educate and inform residents, contractors and any other visitors of the environmental values present on the Island. For example, signage could be installed the entry/exit of the tracks or along the tracks of species on the Island to engage and educate residents, especially about the Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community and other items of conservation significant. These signs could include both the common and scientific names, a photo, and information about the species/communities. Additional signage could be installed at the ferry crossover to educate on environmental values present on the Island, as this is one of the first things someone sees upon entry to the Island.

Update information provided to residents in the Molloy Island Welcome Kit, especially the species planting list. Include fact sheets with information about the flora and fauna found on the Island, conservation significant species and their conservation status and legislation that protects them.

Engage with the Wildflowers Society of Western Australia, specifically the South West Capes Branch. The Wildflower Society promote the value of natural bushland and have extensive knowledge about Western Australian Wildflowers. They regularly organise walks and workshops in the Leeuwin-Naturaliste Cape to Cape region and beyond to engage members and locals in the area.

Engage with the Undalup Association to run a Wadandi Cultural Walk and talk that enables those who attend to learn about different bush plants and cultural values of the area and involve Wadandi rangers in conservation works where appropriate.

Engage with Birdlife WA to run a bird identification walk around the Island for residents. Additionally, with the abundant bird life on the Island the Merlin Bird ID app is a useful tool to help identify birds and their songs and calls. The app enables the user to explore lists of birds near them, and with downloading the 'Australia: West' bird pack the list is tailored to Western Australian birds and those that frequent the State.

8.2 Monitoring Opportunities

Photographs can rapidly document vegetation changes of a location and give an overall impression of the success or otherwise of a project's activities. They are a simple and effective means of recording a project's progress. Photo point monitoring requires that photographs be taken from the same location at set intervals over time using a standardised method. Guiding principles and a template field sheet have been provided in Appendix N. The Friends of group, with support of the Shire, could set up photo monitoring points at key locations, such as in each vegetation community, and capture changes on the Island in both written and photo form over time. A physical and/or electronic file could be kept creating a database of this information so it can be refereed back to in the future. The template can be edited and updated according to what the type of information the Friends of group would like to record.

As mentioned through the EMP other monitoring opportunities include post fire monitoring (Appendix T) and monitoring threatened and priority flora and fauna species. A physical and/or electronic file could also be developed and kept for these monitoring programs creating a database of this information so it can be refereed back to in the future.

8.3 Citizen Science Opportunities

iNaturalist (inaturalist.ala.org.au) is a citizen science app and website where anyone can submit their observations of flora and fauna and connect with experts to identify organisms. It's a resource that provides opportunities to build individuals knowledge, assist with identification of species, learn about your little pocket of bush, contribute to data, and help scientists. A 'project' (a catalogue of all observations made in an area) for Molloy Island could be created to start gathering data and gets all residents involved. This could

create awareness of what species are on the Island, create a catalogue of all the data, and a way for people to learn species from each other's observations.

FrogID (www.frogid.net.au) is an Australian Museum initiative and app that records frog calls for scientists to listen and identify and help provide valuable nation-wide data for the protection and conservation of Australian frogs. The project is helping to monitor frog distributions over time, help understand how frogs, and their ecosystems, are responding to a changing planet. It solely relies on frog calls to identify species, as many frog species are indistinguishable by appearance, and minimises disturbance to frogs and their habitat.

As mentioned previously in the EMP, another way to contribute to data collection is by filing out DBCA's threatened and priority fauna and flora report forms if you have observed a threatened and priority species, other specially protected animals, and migratory birds protected under international agreement.

- DBCA threatened and priority fauna report form - www.dbca.wa.gov.au/management/threatened-species-and-communities/resources/threatened-and-priority-fauna-resources
- DBCA Threatened and priority flora report form - www.dbca.wa.gov.au/management/threatened-species-and-communities/resources/threatened-and-priority-flora-resources

There are also free online tools for documenting sightings of introduced fauna and flora. For feral cats, foxes, and rabbits there is the FeralCatScan, FoxScan and RabbitScan websites, all combined of the FeralScan Pest Mapping app. It is a resource for recording introduced fauna sightings, impacts and control activities. It can also be used to submit other introduced fauna sightings other than the three listed above. There is also the MyPestGuide Reporter app, along with the website, which submits observations to experts at the Department of Agriculture and Food, Western Australia (DAFWA) who identify the pest, and reply with identification and advice to protect the natural environment from exotic pests. There is also the WeedScan app by the Centre of Invasive Species Solutions that provides identification and management information for priority weed species. Nature Conservation Margaret River Region launched their own app in 2024 called Fieldbook to boost nature and biodiversity in the region. The app enables people to record target invasive weed species they see in any area of bushland, national park, road verge or reserve in the region and then the information is collated and shared with community groups and government departments to help map infestations and identify priority areas.

- FeralScan - www.feralscan.org.au
- MyPestGuide Reporter - www.agric.wa.gov.au/apps/mypestguide-reporter
- WeedScan - weedscan.org.au
- Fieldbook - ncmrr.fieldbook.xyz/login and How to Guide https://natureconservation.org.au/naturecon/wp-content/uploads/2024/06/Fieldbook-How-to-Guide-V7.pdf

Participate in the annual Ringtail Tally (www.geocatch.asn.au/living-with-possums/possum-tally). It is a citizen science survey of Western Ringtail Possums established by GeoCatch to record sightings of possums in participants local area over a 4-week period during April to May. Since its origin, the Tally has expanded beyond the original Geographe Bay Catchment area, with Nature Conservation Margaret River and other organisations helping run the project in their local community's area. The information gained from the Tally builds data about Western Ringtail Possum locations and numbers that will improve our knowledge, assist in determining population trends, future planning decisions and conservation projects.

Other citizen science projects can be found on the Australian Citizen Science Association website (citizenscience.org.au), through the Australian Citizen Science Project Finder. There are hundreds of projects available that can be filtered by state and to an individual's interests, as well as other options.

9 Summary

The following summary is based on the Molloy Island Shire reserves and Shire freehold land survey results the:

- There have been 218 native flora species identified on the Island (Section 5.1, Appendix C), this list has been compiled from historical data and observations made from the EMP surveys. Of these, there were three Priority species recorded during the surveys of the Island:
  - *Hemiandra* sp. Windy Harbour (Priority 3),
  - *Netrostylis* sp. Blackwood River (Priority 3), and
  - *Eucalyptus rudis* subsp. *cratyantha* (Priority 4).

  There was one species, *Hyalosperma demissum*, identified to be a significant range extension.
- There were six vegetation communities recorded within the survey area. These communities were mapped and described using structure and dominant species characteristics (Section 5.2):
  - Coastal Saltmarsh – This is a Threatened and Priority Ecological Community 'Subtropical and Temperate Coastal Saltmarsh' (Section 5.2.1),
  - Jarrah Marri Kingia Forest,
  - Jarrah Marri Peppermint Forest,
  - Kingia Wetland,
  - Melaleuca Scrub, and
  - Myrtaceous Scrub.
- Using the scale of condition developed by Keighery (1994), the survey area was ranked from excellent to completely degraded condition (Section 5.3). The vegetation across the reserves ranges from excellent to very good with some areas ranked as good to degraded, due to disturbances such edge effects, minor weeds, grazing by herbivores and potential changes to hydrology. The majority of the survey area is in very good condition.
- There have been 108 native fauna species that have been recorded from the Island and adjacent Blackwood River compiled from historical data and the surveys conducted for this EMP (Section 5.4, Appendix I). This includes 97 birds, five mammals, one insect, three amphibians and two reptiles. Of these there have been four threatened, three priority and one migratory fauna species observed on Molloy Island:

- *Zanda* spp. (White-tailed Black Cockatoos – *Z. latirostris* (Carnaby's Cockatoo) and/or *Z. baudinii* (Baudin's Cockatoo), Threatened/Endangered),
- *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoos, Threatened/Vulnerable),
- *Pseudocheirus occidentalis* (Western Ringtail Possums, Threatened/Critically Endangered),
- *Tyto novaehollandiae novaehollandiae* (Masked Owl (southwest), Priority 3),
- *Isoodon fusciventer* (Quenda, Priority 4),
- *Hydromys chrysogaster* (Rakali, Priority 4), and
- *Pandion haliaetus* (Eastern Osprey, Marine and Migratory).

- An introduced flora species list has been compiled from the historical flora data, with 24 species observed on the Island, one of which is a declared pest (Section 6.1).

In this EMP, recommendations have been suggested to address issues and protect ecological values identified on the Island to guide implementation of the EMP. Many of the recommendations are general in nature to allow flexibility and choice in the way that they are implemented. Some specific information has been provided for implementing the recommendations and are detailed within the relevant sections of the EMP. Each recommendation has been assigned to at least one responsible group. Any responsibility allocated to the Friends of Molloy Island Reserves group and Molloy Island Home Owners Association (MIHOA) are intended to be a guide to the activities that the community can undertake collectively. Many recommendations require ongoing attention and should be continued for the life of the EMP or until a review says otherwise. A schedule of the recommended actions from this EMP could be developed by the Shire of Augusta Margaret River, MIHOA and any other interested groups that could commit and agree to implement the chosen actions. The recommendations mentioned in this EMP have been collated and listed in Table 7 below.

Table 7 Molloy Island EMP Recommendations

	Conservation Significant Flora (EMP section 5.1)	Timeframe	Responsibility
1.1	Ensure locations of known populations of Priority species of Molloy Island are not disturbed and if any new locations are found have Threatened Priority Flora Forms submitted to DBCA for incorporation into the Department's records.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
1.2	Be aware of the habitat for the known priority species on the Island and to limit disturbance to these areas when works are required or being suggested.	Ongoing	Shire of Augusta Margaret River
1.3	Add any new threatened or priority data information to the Shire's GIS system.	Ongoing	Shire of Augusta Margaret River
1.4	If prescribed burns are planned in any areas of Priority flora, ensure Shire environment officers liaise with Shire CESM and consultation with DBCA.	Ongoing	Shire of Augusta Margaret River
	Threatened and Priority Ecological Community - Subtropical and Temperate Coastal Saltmarsh (EMP section 5.2)	**Timeframe**	**Responsibility**
2.1	Limit disturbance to the coastal saltmarsh ecological community.	Ongoing	Shire of Augusta Margaret River
2.2	Aim to ensure that any planned burns in areas surrounding or near the TEC do not spread into the coastal saltmarsh community.	Ongoing	Shire of Augusta Margaret River
2.3	Avoid clearing native vegetation within the Coastal Saltmarsh and its surrounds.	Ongoing	Shire of Augusta Margaret River
2.4	Undertake community engagement and education to promote the value of the threatened ecological community including interpretive signage and highlight the importance of minimising disturbance in the coastal saltmarsh community.	1-5 years	Shire of Augusta Margaret River

2.5	Where the Coastal Saltmarsh is present on and adjacent to private property ensure that planning decisions consider its protection, where possible. For example, avoid infilling/raising the soil profile in saltmarshes for development.	Ongoing	Shire of Augusta Margaret River
2.6	Where possible, avoid constructing new drains that direct stormwater discharge into Coastal Saltmarsh.	Ongoing	Shire of Augusta Margaret River
2.7	Continue to undertake weed control of major or emerging weed infestations.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
2.8	Where practical and appropriate, restrict or prevent vehicle access to the Coastal Saltmarsh.	Ongoing	Shire of Augusta Margaret River and MIHOA
2.9	Where appropriate, implement restoration activities to mitigate the impacts of disturbance.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Vegetation Condition (EMP section 5.3)	**Timeframe**	**Responsibility**
3.1	Monitor the Kingia Wetland utilising photo point monitoring (Appendix N) to document if further deaths occur to *Kingia australis* and if management intervention is required.	1-3 years	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Native Fauna (EMP section 5.4)	**Timeframe**	**Responsibility**
4.1	Consider further monitoring of kangaroos via photo point monitoring to observe the number of kangaroos and the impacts of kangaroo grazing on native vegetation occurring over time.	1-3 years	Shire of Augusta Margaret River and Friends of Molloy Island Reserves

4.2	Consider undertaking additional kangaroo surveys to determine if the kangaroo population is a problem – to be completed externally.	1-3 years	Shire of Augusta Margaret River
4.3	Investigate potential control of the kangaroo population if determined to be required post monitoring.	1-5 years	Shire of Augusta Margaret River
	Black Cockatoos (EMP section 5.4.1.1)	**Timeframe**	**Responsibility**
5.1	If further firebreak and track widening or upgrades are required that trees with DBH greater than 30 cm are avoided and worked around, where possible, especially trees with hollows.	Ongoing	Shire of Augusta Margaret River
5.2	Raise community awareness about the three Black Cockatoo species including their ecology, conservation status under the Biodiversity Conservation Act 2016.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
5.3	Encourage and support landholders to preserve and restore remnant vegetation on their properties, particularly large trees with hollows.	Ongoing	Shire of Augusta Margaret River
5.4	Explore if there is a need for artificial nesting hollows and permanent safe drinking areas to provide supplementary habitat for cockatoos.	Ongoing	Shire of Augusta Margaret River
5.5	In partnership with the Shire and Birdlife Australia, volunteers can collect Black Cockatoo nesting, roosting and foraging activity data for the Island. Encourage data collected to be sent to DBCA via the Threatened and Priority Fauna Report (TPFR) form.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
5.6	Seek advice from Birdlife WA on potential ways to support cockatoo habitat on the Island.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves

5.7	Work with local fire brigades and manage prescribed burns carefully to minimise canopy scorch and loss of hollows. This may include raking around trees identified to have hollows, where possible.	Ongoing	Shire of Augusta Margaret River
5.8	Support volunteer participation in the Birdlife WA's annual Great Cocky Count.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Western Ringtail Possums (EMP section 5.4.1.2)	**Timeframe**	**Responsibility**
6.1	Introduce an education program to increase knowledge about the Critically Endangered WRP, including their ecology and conservation status under the BC Act 2016.	1-3 years	Shire of Augusta Margaret River
6.2	Provide information to landowners about responsible pet ownership in relation to the protection of native fauna.	1-3 years	Shire of Augusta Margaret River
6.3	Continue to monitor cat and fox activity on the Island and undertake control when required to limit/prevent predation.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
6.4	Shire Environment Officers to continue to work with the fire control officers to ensure everyone is aware of the environmental values of the Island and controls are put in place to limit the disturbance to these values.	Ongoing	Shire of Augusta Margaret River
6.5	Undertake carefully planned fire management and controlled burns to maintain suitable habitat and prevent severe fires.	Ongoing	Shire of Augusta Margaret River

6.6	Limit clearing and degradation of native vegetation within the survey area to protect existing habitat and maintain connectivity.	Ongoing	Shire of Augusta Margaret River
6.7	Establish a data collection program for any WRP observed on the Island and encourage submissions of the Threatened and Priority Fauna Report (TPFR) form to DBCA.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
6.8	Landowners can help protect the possum by: • Provide water by hanging water bowls in safe elevated places. • Plant native species of the Island in their gardens to provide habitat and food for WRP. • Control domestic pets and driving with care at night to prevent injury and death of the WRP. • Report all sightings of WRP (dead or alive) by submitting a DBCA Threatened and Priority Fauna Report (TPFR) form. • Keep the lid on your barbecue shut to prevent WRP from getting their feet burned and dispose of rubbish responsibly. • If using baits or traps for rodents, place them where WRP can't access them. • Never catch or handle possums –penalties apply under the BC Act. • If any WRP require care, please contact a registered wildlife rehabilitator so they can take appropriate action. • Participating in the annual GeoCatach Ringtail Tally.	Ongoing	Landowners

	Masked Owl (southwest) (EMP section 5.4.1.3)	Timeframe	Responsibility
7.1	Landowners are encouraged to choose wildlife-safe rodent control such as using methods other than baits to control rats and mice to prevent direct or indirect owl deaths.	Ongoing	Landowners and MIHOA
7.2	Report owl deaths to Owl Friendly Margaret River.	Ongoing	Friends of Molloy Island Reserves and Landowners
7.3	Protect and maintain existing habitat in the reserves, including trees with DBH greater than 30 cm are avoided and worked around, where possible, especially trees with hollows.	Ongoing	Shire of Augusta Margaret River
7.4	Raise awareness about the ecology and conservation status of the Masked Owl.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
7.5	Encourage and support landholders to preserve and restore remnant vegetation on their properties.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
7.7	Manage prescribed burns carefully to minimise canopy scorch and loss of hollows where possible.	Ongoing	Shire of Augusta Margaret River
7.8	Use the iNaturalist app to record and collect data on the Masked Owl on the Island and reporting all sightings to DBCA via the Threatened and Priority Fauna Report (TPFR) form.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
7.9	Residents should use caution while driving at night, to reduce vehicle strikes.	Ongoing	Landowners and MIHOA
	Quenda (EMP section 5.4.1.4)	**Timeframe**	**Responsibility**

8.1	Minimise clearing in reserves and limit clearing on private properties.	Ongoing	Shire of Augusta Margaret River
8.2	Manage prescribed burning to create a mosaic of suitable habitats for the species.	Ongoing	Shire of Augusta Margaret River
8.3	Restrict the access domestic animals have to potential habitat where Quendas might nest or forage.	Ongoing	Landowners and MIHOA
8.4	Continue monitoring for foxes and cats that prey on Quenda and respond if they are observed on the Island.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
8.5	Choose humane pest control methods to reduce harm to Quendas who may accidental get caught in traps or eat baits.	Ongoing	Landowners
8.6	Caution while driving, particularly at night, to reduce vehicle strikes.	Ongoing	Landowners
8.7	Raise community awareness about the ecology and conservation status of the species.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Rakali/Water-rat (EMP section 5.4.1.5)	**Timeframe**	**Responsibility**
9.1	Protect and restore waterbodies and associated vegetation, including instream habitat, to improve vegetation structure and corridors.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
9.2	Recreational fishers who use submerged traps to take extra consideration and care, as Rakali are known to accidentally or intentionally enter traps when foraging and will perish if they can't get access to air.	Ongoing	Landowners

9.3	Raise awareness about the species particularly highlighting their ecology and conservation status.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Eastern Osprey (EMP section 5.4.1.6)	**Timeframe**	**Responsibility**
10.1	Support the Birdlife Australia Cape to Cape group and continue observing the Osprey nest especially between May to January (breeding season) taking note of nest activity, observed feeding areas and take photos.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
10.2	Work with local Birdlife Australia to increase community awareness of the Osprey, highlighting their ecology, conservation status, and the EPBC Act legislation that protects them.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
	Introduced Flora (EMP section 6.1)	**Timeframe**	**Responsibility**
11.1	Continued education to ensure non-indigenous plants are not unknowingly or knowingly planted.	Ongoing	Shire of Augusta Margaret River, MIHOA, and Friends of Molloy Island Reserves
11.2	Continued monitoring and action on weed encroachment from private lots into the survey area.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
11.3	Continue to undertake weed management and monitoring on the Island to mitigate existing weeds.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
11.4	Continue to map weed infestations using the Fieldbook app currently being used by volunteers.	Ongoing	Friends of Molloy Island Reserves

11.5	Educate, promote and lead collective action on Molloy Island of mitigation, management, and monitoring of weeds by all residents.	Ongoing	Shire of Augusta Margaret River, MIHOA, and Friends of Molloy Island Reserves
11.6	Continue to raise awareness about current and potential weed issues on the Island including control methods and garden escapees via the newsletter, implementing signage or information booklets available for residents.	Ongoing	Shire of Augusta Margaret River, MIHOA, and Friends of Molloy Island Reserves
11.7	Update the Molloy Island welcome kit to include more information about native species suitable for planting on the Island and identification and control methods of known weedy species and garden escapees.	1-3 years	Shire of Augusta Margaret River, MIHOA, and Friends of Molloy Island Reserves
11.8		Ongoing	Shire of Augusta Margaret River
11.9	Continue to remind residents that under the restrictive covenant they signed and the Local Planning Scheme 1 (Molloy Island Area - section 6.4.2.2) that it is forbidden to bring and/or plant non-native/non-indigenous plants on the Island.	Ongoing	Shire of Augusta Margaret River and MIHOA

	Introduced Fauna - Foxes, Feral Cates & Rabbits (EMP section 6.2)	**Timeframe**	**Responsibility**

12.1	Continued monitoring should be a priority, with early detection and extermination the best way to ensure that Molloy Island remains fox, rabbit and feral cat free.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
12.2	Any observations of signs or direct sightings of foxes, feral cats or rabbits should be reported to the Shire of Augusta-Margaret River.	Ongoing	Landowners and Friends of Molloy Island Reserves
	Domestic Animals -Dogs (EMP section 6.2.4)	**Timeframe**	**Responsibility**
13.1	Develop an education program to help landowners understand their responsibilities and the legislative requirements of managing pets.	1-3 years	Shire of Augusta Margaret River and Friends of Molloy Island Reserves

13.2	Encouragement of responsible of pet ownership: • Owners should be aware they must know where their pet is at all times. • Ensure pets are kept in a yard or secured area private properties, not just at night. All dogs are to be kept inside or within fenced building envelopes during the day, and it is recommended they are kept inside at night. • Choose pets that are appropriate for residents' property. • Create 'pet free' areas on properties. • Never release unwanted pets into the wild. • When walking pets ensure they are always on a lead. Owners should stick to the existing tracks and avoid taking them into the bush. • Always clean up after pets and dispose of their faeces appropriately, especially if walking them in the reserves.	Ongoing	Landowners
13.3	Amend the MIHOA Constitution to clarify that there are no cats to be kept on the Island.	1-3 years	MIHOA
13.4	Develop a pet management plan for the Island.	1-3 years	Shire of Augusta Margaret River and MIHOA

13.5	Following the change to the MIHOA Constitution, it is recommended that the Shire amends the Cat Local Law 2023 to include the whole of Molloy Island as a cat prohibited area.	1-3 years	Shire of Augusta Margaret River
13.6	Installation of signage reminding residents to keep their dogs on leads at all times, to stick to existing tracks and that there no designated off-leash exercise areas on the Island.	Ongoing	Shire of Augusta Margaret River
	Plant Pathogens - Dieback/*Phytophthora* (EMP section 6.3)	**Timeframe**	**Responsibility**
14.1	Engage a registered Phytophthora Dieback Interpreter to complete dieback mapping on the Island and determine if *Phytophothora* is present.	1-3 years	Shire of Augusta Margaret River
14.2	Develop and implement a Dieback management plan for the Island, that includes hygiene protocols for all types of carriers to prevent the introduction/spread of the disease. The plan should apply to everyone that enters and exits the Island, and all areas of the Island.	1-5 years	Shire of Augusta Margaret River and MIHOA
14.3	Ensure all residents and visitors are aware and informed of the dieback status of the Island and hygiene practices, before or upon their arrival.	Ongoing	Shire of Augusta Margaret River, MIHOA and Friends of Molloy Island Reserves

14.4	Monitor for Dieback around Kingia wetland community and consider the need for limestone tracks around this area.	1-3 years	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
14.5	All maintenance activities should be planned to reduce the risk of introduction and spread of Dieback. • Controlled burns should be conducted with hygiene practices in place. • Prevent or minimise activities undertaken during high-risk times of the year. Schedule activities involving soil disturbance during low rainfall months (November to March) when the soil is dry. • During fire break maintenance soil disturbance should be limited to localised areas, as much as possible. • If moving soil is necessary only push the material down slope and never push soil upslope.	Ongoing	Shire of Augusta Margaret River

14.6	Limit the number of tracks in the survey area s and ensure existing tracks are well drained. If new tracks need to be constructed avoid creating them on the upper slopes of the bushland or require them to be topped with limestone to limit the spread of dieback.	Ongoing	Shire of Augusta Margaret River
14.7	If unauthorised vehicle access to the survey area becomes an issue that cannot be addressed by the MIHOA it is recommended that bollards or gates are installed allowing only authorised personnel entry to the tracks.	Ongoing	Shire of Augusta Margaret River
14.8	If dieback mapping occurs and dieback affected areas are found, these areas could benefit with a decreased fire frequency, to allow species to recover from the fire.	Ongoing	Shire of Augusta Margaret River
14.9	Avoid bringing soil, gravel, or sand into the survey area . If material must be introduced ensure any material used is *Phytophthora* free. Infested materials such as gravel can often introduce Dieback, and earthworks can move the disease through the bush.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves

14.10	Direct seeding rather than planting seedlings if revegetation accords. If seedlings or plants are purchased ensure they are from nurseries with Nursery Industry accreditation. Planting should be conducted when soil is moist, but not wet.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
14.11	When moving from one area of the bush to another, aim to ensure that all equipment and shoes are free of mud and soil and move from high points moving to low areas of bush. Minimise walking in the bushland when the soil is wet and muddy and stick to tracks as much as possible.	Ongoing	Shire of Augusta Margaret River, Landowners and Friends of Molloy Island Reserves
14.12	If weeds are being removed, they should be left in place or placed in a container to ensure that plant material or soil is not dropped in other parts of the reserves and freehold land.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
14.13	If the Dieback management plan recommends - Install signs, such as “arrive clean, leave clean” and “dieback protection area” signs, at reserve entrances to highlight the disease situation in the area once known. Include recommendations on the sign such as avoiding access when the soil is wet and sticking to tracks.	Ongoing	Shire of Augusta Margaret River

14.14.	If identified in the dieback management plan, shoe cleaning stations and bike grids could be implemented at entry and exit points of reserve to encourage people to clean their footwear and bike tyres when they enter and exit these areas.	1-5 years	Shire of Augusta Margaret River
14.15	Consider reestablishing the Molloy Island Phytophthora Action Group/Molloy Island Dieback Working Group.	ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
14.16	Educate residents and raise awareness that plants should not be removed from Shire land and not to dump rubbish or green waste into the survey area.	Ongoing	Shire of Augusta Margaret River, MIHOA and Friends of Molloy Island Reserves
14.17	Encourage all properties to have their own at home cleaning toolkits - 70% methylated spirits and 30% water in a spray bottle and a scrubbing brush to reduce the introduction/spread of dieback.	Ongoing	Shire of Augusta Margaret River, MIHOA and Friends of Molloy Island Reserves
14.18	Consider up-grading tracks to a hard well drained surface that does not allow for the easy movement of soil out of the survey area, such as resurfacing the tracks with limesand or limestone.	Ongoing	Shire of Augusta Margaret River

14.19	When residents walk their dogs in the survey area stick to hard and well drained tracks.	Ongoing	Landowners
14.20		Ongoing	Landowners and Friends of Molloy Island Reserves
	Fire Management (EMP section 7)	**Timeframe**	**Responsibility**
15.1	Continue to advise and work with residents and the Friends Group regarding fire mitigation activities on the Island.	Ongoing	Shire of Augusta Maragret River
15.2	Avoid burning the Kingia wetland community to protect it from an inappropriate fire management practice that could impact on the *Kingia australis* and fragility of the community.	Ongoing	Shire of Augusta Maragret River
15.3	Perform prescribed burns in small, manageable areas over a suitable length of time to allow a variety of age of flora species, plants to mature and set seeds before the next round of prescribed burns.	Ongoing	Shire of Augusta Maragret River
15.4	Consultation is recommended with cultural custodians to help inform contemporary ecological fire practices conducted on the Island.	Ongoing	Shire of Augusta Maragret River

15.5	Continued weed removal to limit the contribution of weeds as available fuel.	Ongoing	Shire of Augusta Margaret River and Friends of Molloy Island Reserves
15.6	Hygiene practices should be implemented for all vehicles, equipment and footwear to prevent the introduction and/or spread of Dieback.	Ongoing	Shire of Augusta Margaret River
15.7	Consider the Implemention of pre-burn actions such as raking around high ecological values where appropriate and as resources permit.	Ongoing	Shire of Augusta Margaret River, Molloy Island Fire Brigade volunteer TBC),
15.8	A post- firemonitoring program could be set up to monitor the recovery of the bushland post-burn. Such as photographic monitoring points to capture changes over time and completion of post fire monitoring reporting form found in appendix T .	Ongoing	Shire of Augusta Margaret River,

15.9	Management advice for the *Xanthorrhoea* spp. and *Kingia australis on private lots* includes: • It is recommended that the *Kingia australis* are not burnt and are avoided, where possible. • Where appropriate, such as on private property, grass trees can be trimmed, with power tools or hand saws, of the dry grass to reduce the amount, and it is an alternative method to burning. • Where appropriate to exclude grass trees, rake around individual plants prior to a burn to exclude them from getting burnt in a planned burn. • Best burning practice for grass trees: ○ Before burning check for the presence or signs, such as nests and hollows, of any fauna in the thatch. Also check for fauna under smaller grasstrees by poking under the skirt to allow any to flee. ○ Burn one tree at a time to help prevent the fire from blocking escape routes of fauna. ○ Light from the top down, using a single ignition point and on the downwind side of the grasstree. This method allows fauna to evacuate the grass tree and results in a less intense fire that spreads more slowly.	Ongoing	Landowners

	○ Avoid water and let the grass tree burn out on its own.		
15.10	Specific recommendations for the Subtropical and Temperate Coastal Saltmarsh ecological community include: • Avoid conducting prescribed burns in the ecological community. • Where possible, ensure planned burns in areas surrounding the Coastal Saltmarsh are not allowed to spread into the ecological community. • Develop recovery actions for post-fire management to ensure that the required parties are prepared if a fire event impacts on the ecological community.	Ongoing	Shire of Augusta Maragret River

	Additional Community Education and Information (EMP section 8)	Timeframe	Responsibility
16.1	Encourage residents to join the Friends of Molloy Island Reserves and promote the Facebook page.	Ongoing	Shire of Augusta Maragret River and Friends of Molloy Island Reserves
16.2	Friends of Molloy Island Reserves could develop resources about the Islands natural environment, continue organising events with guest speakers, with the opportunity to hold presentations.	Ongoing	Friends of Molloy Island Reserves

16.3	Additional information regarding the environmental issues could be added to The Molloy Messenger newsletter, such as a permanent environmental section in the newsletter, to promote engagement with more residents. Extra environmental information could be put on the existing notice board.	Ongoing	MIHOA and Friends of Molloy Island Reserves
16.4	Installation of signage to educate and inform residents, contractors and any other visitors of the environmental values present on the Island.	Ongoing	Shire of Augusta Maragret River
16.5	Update information provided to residents in the Molloy Island Welcome Kit, including the species planting list, and include fact sheets with information about the flora and fauna found on the Island, conservation significant species and their conservation status and legislation that protects them.	1-3 years	MIHOA and Friends of Molloy Island Reserves
16.6	Update the Friends of group's information files with current, legislation, guidelines and flora and fauna reporting forms.	Ongoing	Friends of Molloy Island Reserves
16.7	Engage with the Wildflowers Society of Western Australia, specifically the South West Capes Branch, Undalup Association and Birdlife WA.	Ongoing	Shire of Augusta Maragret River and Friends of Molloy Island Reserves
16.8	The Friends of group with support of the Shire could set up photo monitoring points at key locations, and capture changes on the Island in both written and photo form over time. A physical and/or electronic file could be kept creating a database of this information so it can be refereed back to in the future.	Ongoing	Shire of Augusta Maragret River and Friends of Molloy Island Reserves
16.9	Create a project for Molloy Island using the iNaturalist app/website to start gathering data and gets residents involved.	Ongoing	Friends of Molloy Island Reserves

16.10 Participate in citizen science opportunities such as: • Submit DBCA's threatened and priority fauna and flora report forms if you have observed a threatened and priority species, other specially protected animals, and migratory birds protected under international agreement. • Record frog calls using the FrogID app • Report introduced flora and fauna on the FeralScan, MyPestGuide Reporter, WeedScan and the Fieldbook apps.	Ongoing	Landowners and Friends of Molloy Island Reserves
16.11 Participate in the annual Geocatch Ringtail Tally over a 4-week period during April to May.	Ongoing	Landowners and Friends of Molloy Island Reserves

10 Acknowledgements

The data included in this report has been compiled from a number of sources, including many volunteers who have spent significant time recording the ecological values of the Island. We are grateful to everyone who has contributed to this Environmental Management Plan, by way of data, advice, and accommodation/hospitality to allow us to facilitate the various surveys.

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- Friends of Molloy Island Reserves (Flora, Fauna and Weed observations and data);
- Janean Robinson, Friends of Molloy Island Reserves (Fungi data, plus other flora & fauna sightings);
- Merryn Delaney, Shire of Augusta Margaret River (Flora, Fauna, Vegetation, and other historical data and contact information); and
- Nature Conservation Margaret River (Weed data from Fieldbook app).

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Appendix A Land For Wildlife Property Assessment Report 2012

Appendix B Land For Wildlife Monitoring Report 2012

Appendix C Native Flora Species List

Appendix D Fungi Report & Species List

Fungi of Molloy Island Reserves – Janean Robinson and the Friends of Molloy Island Reserves

Austroboletus occidentalis (Ridge-Stemmed Bolete) 3.07.22 near Baker's Landing



Ramaria capitata var. *ochraceosalmonicolor* (Salmon Coral Fungus) 22.07.24 Central Reserve



To the best of my knowledge, no specific survey or report has been conducted of the Fungi of Molloy Island. I have, together with the Friends of MI Reserves, been collecting anecdotal data (mainly photographs) that may provide a form of documentation/ baseline for the future. One of the resources used to help identify these species were reports done both in 2007 & 2008 of the '*Fungi of West Bay Bushland, Augusta', WA* written and produced by Neale L. Bougher, Roz Hart, Sarah de Bueger, Joe Froudist and Brett Glossop (Department of Environment and Conservation and the Perth Uban Bushland Fungi Project PUBF, whose website remains as www.fungiperth.org.au).

Below is the cover of one of these reports which I obtained from the Augusta library. Someone from our previous MI wonderful Environmental Group, must have attended the 2008 workshop, because a copy of PUBF Fungi Kit is in our records!



The latest version of Neale L. Bougher's *'Fungi of the Perth Region and Beyond: A Self-Managed Field Book'* (2009/2017) published by Western Australian Naturalists' Club (Inc.) Perth, Western Australia, has also been most helpful in trying to identify our specimens on Molloy Island. I want to declare that we are 'citizen scientists' in this quest to try to preserve the ecological and environmental values of Molloy Island as we compile this research on our Fungi and therefore do not claim to have it all correct! As Bougher et al., (2017) explain, "without fungi many plants and animals in the bushlands would struggle to thrive". That is because their "networks recycle and distribute precious nutrients" in our reserves and our native plants (including orchids) have symbiotic mycorrhizal partnerships with them. Fungi also provide food and sometimes habitat for many of our animals including quendas and important insects. We hope to continue to study them and appreciate more the interdependence between the Flora, Fauna and Fungi of Molloy Island Reserves to help manage and nurture them into the future.

Important information for this report was also gleaned from the work of ecologist Richard Robinson who was a senior research scientist with the then Department of Conservation and Land Management, based at the Manjimup Research Centre.

Fungi can also be weeds!

From Robinson's fact sheet 69 (2013), we have learnt that what we thought were helpful fungi, can in fact be a problem. *Armillaria luteobubalina*, or Australian Honey Fungus, pictured below by our group (first in 2023 and then again in July 2024), we now realise, is an endemic parasitic fungus. This then not only infects the trees (in this case large paperbarks near the lagoon) that have been weakened by other factors (lack of light, water, disturbance etc) but can eventually kill them.

Another invasive fungus which has arrived on our shores are the Orange Ping Pong Bats (*Favolaschia calocera)*, which are spreading rapidly and tend to fruit in colonies on dead wood. We will be monitoring this closely and track distributions so they can be submitted to the Fungimap website at http://fungimap.org.au/. When we walk in the area of the reserves that we know this invasive species exists, we will be very vigilant, because not only does it displace native fungi and produce chemicals that attack other fungi, but its spores can travel on everything including our hats! Source: Problem Fungi - Fungi4Land





2024

But not all is lost, because we still have 'good' fungi on the Island, for example those that provide us with a beautiful green luminescent glow at night! That is the ghost fungus (*Omphalotus nidiformis*) pictured (below left) found close to the public jetty in July 2024. We are also happy to witness the grandchildren of some of our members learn about the rainbow form of fungi (*Trametes versicolour*) as they get up close with their spiderman superhero investigations! Finally, we are pleased to share the first 'leather look' fungi we photographed in 2024, after the rains at last arrived after a very long hiatus of 7 months! This fungus was growing at the base of a jarrah tree and was purely glistening with pride on the last day of May in 2024. The is *Fistulina hepatica* (Beef steak fungi).





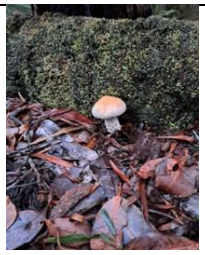


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Molloy Island Fungi Species List

Species	Notes	Photo
Armillaria luteobubalina	Australian Honey Fungus An endemic parasitic fungus. This species can infect trees, especially those that have been weakened by other factors, and eventually kill them.	
Austroboletus occidentalis	Ridge-Stemmed Bolete. 3/7/2022 near Baker's Landing.	
Cortinarius sp.	19/05/2021	
Favolaschia calocera	Orange Pore Fungus. An invasive fungus, which is spreading rapidly on the Island. Caution must be taken to not spread this species further into the bushland.	
Fistulina hepatica	Beefsteak Polypore. At the base of a Jarrah tree, 31 May 2024.	

Fomitopsis sp.	Species of bracket fungi in the family Fomitopsidaceae observed by Ecosystem Solutions. 10/10/2024	
Gymnopilus junonius	Spectacular Rustgill 25/05/2023	
Laetiporus portentosus	White Punk Fungus 16/06/2024 Growing on a large gum near the RU OK shed.	
Lichenomphalia sp.	Species of Hygrophoraceae fungi, a basidiolichen and an agaric genus, observed by Ecosystem Solutions. 9/10/2024	
Mycena sp.	Growing on dead Marri 14/07/2024	

Omphalotus nidiformis	Ghost Fungus Close to the public jetty, July 2024.	
Piptoporus australiensis	Curry Punk 27/02/2022	
Ramaria capitata var. *ochraceosalmonicolor*	Salmon Coral Fungus 22/07/2024 Central Reserve.	
Russula clelandii	19/05/2021	
Trametes versicolor	Turkey-tail	

Appendix E NatureMap Interim Data Search Extract

Naturemap Extract of Flora Recorded within 10km of the Site (DBCA, 2023)

Taxon	Cons. Status	WA Status
Acacia lateriticola var. Glabrous variant (B.R. Maslin 6765)	3	
Adenanthos detmoldii	4	
Adenanthos x pamela	4	
Amanita fibrillopes	3	
Andersonia ferricola	1	
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	3	
Aotus carinata	4	
Astartea onycis	4	
Banksia meisneri subsp. ascendens	4	
Banksia nivea subsp. uliginosa	T	EN
Blennospora doliiformis	3	
Boronia anceps	3	
Boronia exilis	T	EN
Caladenia abbreviata	3	
Caladenia excelsa	T	
Caladenia lodgeana	T	CR
Caladenia pholcoidea subsp. augustensis	1	
Calothamnus lateralis var. crassus	3	
Chordifex gracilior	3	
Chordifex jacksonii	3	
Conospermum quadripetalum	2	
Cyathochaeta stipoides	3	
Dampiera heteroptera	3	
Darwinia ferricola	T	EN
Darwinia terricola	1	
Diuris drummondii	T	VU
Diuris heberlei	2	
Drosera fimbriata	4	
Franklandia triaristata	4	
Gastrolobium formosum	3	
Gonocarpus pusillus	4	
Grevillea brachystylis subsp. australis	T	EN
Grevillea manglesioides subsp. ferricola	3	
Grevillea papillosa	3	
Hemiandra sp. Windy Harbour (B.J. Conn & J.A. Scott BJC 3344)	3	
Hemigenia obovata	1	

Taxon	Cons. Status	WA Status
Hemigenia sp. Nillup (R.D. Royce 98)	2	
Isopogon formosus subsp. dasylepis	3	
Kennedia lateritia	T	EN
Lambertia orbifolia subsp. Scott River Plains (L.W. Sage 684)	T	EN
Lambertia orbifolia subsp. vespera	T	
Leptomeria dielsiana	X	EX
Leptomeria furtiva	2	
Leucopogon wheelerae	3	
Loxocarya magna	3	
Melaleuca basicephala	4	
Pericalymma megaphyllum	1	
Philydrella pygmaea subsp. minima	1	
Pigea volubilis	2	
Pultenaea skinneri	4	
Schoenus indutus	1	
Schoenus loliaceus	2	
Schoenus sp. Grassy (E. Gude & J. Harvey 250)	2	
Stenanthemum sublineare	2	
Stylidium ireneae	4	
Stylidium leeuwinense	4	
Stylidium sp. Scott River Plain (N.G. Marchant 74/23)	1	
Stylidium trudgenii	3	
Styphelia intricata	2	
Synaphea nexosa	1	
Tripterococcus sp. Brachylobus (A.S. George 14234)	4	
Verticordia lehmannii	4	
Verticordia plumosa var. vassensis	T	EN

Naturemap Extract of Fauna Recorded within 10km of the Site (DBCA, 2023)

Taxon	Common Name	Class	WA Status	EPBC Status
Actitis hypoleucos	Common Sandpiper	Bird	MI	MI
Arctocephalus tropicalis	Subantarctic Fur-Seal	Mammal	VU	EN
Ardenna carneipes	Flesh-Footed Shearwater	Bird	VU	MI
Arenaria interpres	Ruddy Turnstone	Bird	MI	MI
Atrichornis clamosus	Noisy Scrub-Bird, Tjimiluk	Bird	EN	EN
Bettongia penicillata ogilbyi	Woylie, Brush-Tailed Bettong	Mammal	CR	EN
Cacatua pastinator pastinator	Muir's Corella	Bird	CD	
Calidris acuminata	Sharp-Tailed Sandpiper	Bird	MI	MI
Calidris alba	Sanderling	Bird	MI	MI
Calidris canutus	Red Knot	Bird	EN	EN
Calidris ferruginea	Curlew Sandpiper	Bird	CR	MI
Calidris ruficollis	Red-Necked Stint	Bird	MI	MI
Calidris subminuta	Long-Toed Stint	Bird	MI	MI
Calidris tenuirostris	Great Knot	Bird	CR	MI
Calyptorhynchus banksii naso	Forest Red-Tailed Black Cockatoo	Bird	VU	VU
Calyptorhynchus baudinii	Baudin's Cockatoo	Bird	EN	EN
Calyptorhynchus latirostris	Carnaby's Cockatoo	Bird	EN	EN
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-Tailed Black Cockatoo	Bird	EN	EN
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-Tailed Black Cockatoo	Bird	EN	
Caretta caretta	Loggerhead Turtle	Reptile	EN	EN & MI
Charadrius bicinctus	Double-Banded Plover	Bird	MI	MI
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Bird	VU	MI
Charadrius mongolus	Lesser Sand Plover	Bird	EN	MI
Dasyornis longirostris	Western Bristlebird	Bird	EN	EN
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal	VU	VU
Diomedea exulans	Wandering Albatross	Bird	VU	VU
Eubalaena australis	Southern Right Whale	Mammal	VU	EN
Eubalaena australis	Southern Right Whale	Mammal	VU	EN & MI
Falco peregrinus	Peregrine Falcon	Bird	OS	
Falsistrellus mackenziei	Western False Pipistrelle, Western Falsistrelle	Mammal	P4	
Galaxiella munda	Mud Minnow, Western Dwarf Galaxias	Fish	VU	
Galaxiella nigrostriata	Black-Stripe Minnow, Black-Striped Dwarf Galaxias	Fish	EN	EN
Geocrinia alba	White-Bellied Frog	Amphibian	CR	CR

Taxon	Common Name	Class	WA Status	EPBC Status
Geotria australis	Pouched Lamprey	Fish	P3	
Hydromys chrysogaster	Water-Rat, Rakali	Mammal	P4	
Hydroprogne caspia	Caspian Tern	Bird	MI	MI
Isoodon fusciventer	Quenda, Southwestern Brown Bandicoot	Mammal	P4	
Leipoa ocellata	Malleefowl	Bird	VU	VU
Lepidogalaxias salamandroides	Salamanderfish	Fish	EN	
Limicola falcinellus	Broad-Billed Sandpiper	Bird	MI	MI
Limosa lapponica	Bar-Tailed Godwit	Bird	MI	MI
Limosa limosa	Black-Tailed Godwit	Bird	MI	MI
Macronectes giganteus	Southern Giant Petrel	Bird	MI	EN
Megaptera novaeangliae	Humpback Whale	Mammal	CD & MI	VU
Megaptera novaeangliae	Humpback Whale	Mammal	CD & MI	MI
Notamacropus irma	Western Brush Wallaby	Mammal	P4	
Numenius phaeopus	Whimbrel	Bird	MI	MI
Onychoprion anaethetus	Bridled Tern	Bird	MI	MI
Oxyura australis	Blue-Billed Duck	Bird	P4	
Pandion haliaetus	Osprey	Bird	MI	MI
Pezoporus flaviventris	Western Ground Parrot	Bird	CR	CR
Phascogale tapoatafa wambenger	South-Western Brush-Tailed Phascogale, Wambenger	Mammal	CD	
Physeter macrocephalus	Sperm Whale	Mammal	VU	MI
Plegadis falcinellus	Glossy Ibis	Bird	MI	MI
Pluvialis fulva	Pacific Golden Plover	Bird	MI	MI
Pluvialis squatarola	Grey Plover	Bird	MI	MI
Potorous gilbertii	Gilbert's Potoroo	Mammal	CR	CR
Pseudocheirus occidentalis	Western Ringtail Possum, Ngwayir	Mammal	CR	CR
Pseudomys fieldi	Shark Bay Mouse, Djoongari	Mammal	VU	VU
Pseudomys shortridgei	Heath Mouse, Heath Rat, Dayang	Mammal	VU	EN
Setonix brachyurus	Quokka	Mammal	VU	VU
Stercorarius antarcticus lonnbergi	Brown Skua, Subantarctic Skua	Bird	P4	
Stercorarius parasiticus	Arctic Jaeger, Arctic Skua	Bird	MI	MI
Thalassarche carteri	Indian Yellow-Nosed Albatross	Bird	EN	VU & MI
Thalassarche cauta cauta	Shy Albatross	Bird	VU	MI
Thalassarche chlororhynchos	Atlantic Yellow-Nosed Albatross	Bird	VU	MI
Thalassarche melanophris	Black-Browed Albatross	Bird	EN	VU & MI
Thalassarche melanophris	Black-Browed Albatross	Bird	EN	MI

Taxon	Common Name	Class	WA Status	EPBC Status
Thalasseus bergii	Crested Tern	Bird	MI	MI
Thinornis rubricollis	Hooded Plover, Hooded Dotterel	Bird	P4	
Tringa brevipes	Grey-Tailed Tattler	Bird	MI & P4	MI
Tringa nebularia	Common Greenshank	Bird	MI	MI
Tringa stagnatilis	Marsh Sandpiper	Bird	MI	MI
Tyto novaehollandiae novaehollandiae	Masked Owl (Southwest)	Bird	P3	
Westralunio carteri	Carter's Freshwater Mussel	Invertebrate	VU	VU

Appendix F PMST Report

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 16-Aug-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	67
Listed Migratory Species:	49

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	73
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	6
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	10
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
EEZ and Territorial Sea	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Aquatic Root Mat Community 1 in Caves of the Leeuwin Naturaliste Ridge	Endangered	Community known to occur within area	In buffer area only
Scott River Ironstone Association	Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			
Engaewa pseudoreducta			
Margaret River Burrowing Crayfish [82674]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Engaewa reducta			
Dunsborough Burrowing Crayfish [82675]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
FISH			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat known to occur within area	In feature area
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Anstisia alba listed as Geocrinia alba			
White-bellied Frog, Creek Frog [92544]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Myrmecobius fasciatus			
Numbat [294]	Endangered	Species or species habitat may occur within area	In buffer area only
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Setonix brachyurus			
Quokka [229]	Vulnerable	Species or species habitat likely to occur within area	In feature area
OTHER			
Westralunio carteri			
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In feature area
PLANT			
Banksia mimica			
Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
Banksia nivea subsp. uliginosa			
Swamp Honeypot [82766]	Endangered	Species or species habitat known to occur within area	In feature area
Banksia squarrosa subsp. argillacea			
Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Boronia exilis Scott River Boronia [64844]	Endangered	Species or species habitat known to occur within area	In feature area
Caladenia hoffmanii Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area	In buffer area only
Caladenia lodgeana Lodge's Spider-orchid [68664]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Calectasia cyanea Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Darwinia ferricola Scott River Darwinia [56706]	Endangered	Species or species habitat known to occur within area	In buffer area only
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea brachystylis subsp. australis [55525]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Kennedia lateritia Augusta Kennedia [45985]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area	In buffer area only
Lambertia orbifolia Roundleaf Honeysuckle [15725]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leptomeria dielsiana			
Diels' Currant Bush [5146]	Vulnerable	Species or species habitat known to occur within area	In feature area
Reedia spathacea			
Reedia [2995]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Verticordia plumosa var. vassensis			
Vasse Featherflower [55804]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (west coast population)			
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Listed Migratory Species			[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea			
Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Diomedea amsterdamensis			
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena			
Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora			
Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans			
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi			
Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Hydroprogne caspia			
Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Macronectes giganteus			
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli			
Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Onychoprion anaethetus			
Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca			
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Congregation or aggregation known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat likely to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcinus orca			
Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba			
Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis			
Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Calidris tenuirostris			
Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica			
Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva			
Pacific Golden Plover [25545]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50386]	WA	In buffer area only
Commonwealth Land - [52112]	WA	In buffer area only
Commonwealth Land - [51483]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anous tenuirostris melanops			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba			
Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Halobaena caerulea			
Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hydroprogne caspia as Sterna caspia			
Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Larus pacificus			
Pacific Gull [811]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Limosa lapponica			
Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area
Macronectes giganteus			
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli			
Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus			
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Onychoprion anaethetus as Sterna anaethetus			
Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pachyptila turtur			
Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat likely to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area
Fish			
Acentronura australe			
Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei			
Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna			
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus			
Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps			
Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus subelongatus			
West Australian Seahorse [66722]		Species or species habitat may occur within area	In buffer area only
Histiogamphelus cristatus			
Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis			
Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus			
Prophet's Pipefish [66250]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In buffer area only
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vanacampus margaritifer			
Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Vanacampus phillipi			
Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
Vanacampus poecilolaemus			
Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area	In buffer area only
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Congregation or aggregation known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Australian Marine Parks [Resource Information]

Park Name	Zone & IUCN Categories	Buffer Status
South-west Corner	Special Purpose Zone (Mining Exclusion) (IUCN VI)	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Leeuwin-Naturaliste	National Park	WA	In buffer area only
Ngari Capes	Marine Park	WA	In buffer area only
Scott	National Park	WA	In feature area
Unnamed WA15185	Nature Reserve	WA	In buffer area only
Unnamed WA42377	Nature Reserve	WA	In buffer area only
Unnamed WA42942	Nature Reserve	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Blackwood River (Lower Reaches) and Tributaries System	WA	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Flat Rock boating facility	2008/4506	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Busselton to Flinders Bay Rails to Trails Project, WA	2013/6835	Not Controlled Action	Completed	In buffer area only
CTBT - Cape Leeuwin Hydroacoustic Station Proposal	2000/27	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Geo-science Investigations	2005/2069	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Residential-Rural Subdivision, Lot 1 Kudardup Rd, Kudardup, WA	2012/6471	Not Controlled Action	Completed	In buffer area only
Vegetation clearing for sand extraction, Lot 268 Leeuwin Road, Augusta	2013/6860	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna carneipes Flesh-footed Shearwater [82404]	Foraging (in high numbers)	Known to occur	In buffer area only
Eudyptula minor Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Sternula nereis			
Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias			
White Shark [64470]	Foraging	Known to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda			
Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north)	Known to occur	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix G Conservation Codes for Western Australian Fauna, Flora, and Ecological Communities

Western Australian Fauna and Flora

Conservation Code	Description
Threatened species (T)	Listed by order of the Minister as Threatened in the category of critically endangered, endangered, or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act). ***Threated fauna*** is the species of fauna that are listed as critically endangered, endangered, or vulnerable threatened species. ***Threatened flora*** is the species of flora that are listed as critically endangered, endangered, or vulnerable threatened species. The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline Number 1 and Ministerial Guideline Number 2 that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria and is based on the national distribution of the species.
Critically endangered species (CR)	Threatened species considered to be *"facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines"*. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
Endangered species (EN)	Threatened species considered to *be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines"*. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.
Vulnerable species (VU)	Threatened species considered to be *"facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines"*. Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct Species	Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.
Extinct species (EX)	Species where *"there is no reasonable doubt that the last member of the species has died"*, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Conservation Code	Description
Extinct in the wild species (EW)	Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form"*, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no fauna or flora species listed as extinct in the wild.
Specially protected species (SP)	Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as threatened species (critically endangered, endangered, or vulnerable) or extinct species under the BC Act cannot also be listed as specially protected species.
Migratory species (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Migratory species include birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA)4, China (CAMBA)5 or The Republic of Korea (ROKAMBA)6, and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention) 7, an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Species of special conservation interest (conservation dependent) (CD)	Species of special conservation need that are dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Currently only fauna are listed as species of special conservation interest
Species otherwise in need of special protection (other specially protected) (OS)	Species otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Currently only fauna are listed as species otherwise in need of special protection.

Conservation Code	Description
Priority species (P)	Priority is not a listing category under the BC Act. The Priority Flora and Fauna lists are maintained by the department and are published on the department's website. All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land). Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened. Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
Priority 1: Poorly known species - Known from few locations, none on conservation lands	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.
Priority 2: Poorly known species - Known from few locations, some on conservation lands	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

Conservation Code	Description
Priority 3: Poorly known species - Known from several locations	Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.
Priority 4: Rare, Near Threatened and other species in need of monitoring	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species. (c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy. (d) Other species in need of monitoring.

Western Australian Ecological Communities

Conservation Code	Description
Listed Ecological Communities	Assessment of the conservation status of ecological communities is carried out in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline Number 1 and Ministerial Guideline Number 4 that adopt the use of the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Categories and Criteria.
Collapsed ecological communities (CO)	An ecological community listed by order of the Minister as collapsed under section 31(1) of the BC Act. As determined by criteria set out in section 32 of the BC Act, an ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time — (a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or (b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover — (i) its species composition or structure; or (ii) (ii) its species composition and structure.

Conservation Code	Description
Critically endangered ecological communities (CR)	A threatened ecological community listed in the category of critically endangered under section 27(1)(a) of the BC Act, as determined by criteria set out in section 28 of the BC Act and the ministerial guidelines. A critically endangered ecological community faces an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines.
Endangered ecological communities (EN)	A threatened ecological community listed in the category of endangered ecological community under section 27(1)(b) of the BC Act, as determined by criteria set out in section 29 of the BC Act and the ministerial guidelines. A threatened ecological community faces a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines.
Vulnerable ecological communities (VU)	A threatened ecological community listed in the category of vulnerable ecological community under section 27(1)(c) of the BC Act, as determined by criteria set out in section 30 of the BC Act and the ministerial guidelines. A vulnerable ecological community faces a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines.
Priority Listed Ecological Communities	Priority is not a listing category under the BC Act. The Priority Ecological Communities list is maintained by the department and is published on the department's website. All fauna and flora that may be present in an ecological community are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when these species occur in an ecological community that is not listed as threatened, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land). Possible threatened ecological communities that do not meet survey criteria or are not adequately defined to enable listing are added to the department's Priority Ecological Communities for Western Australia list under priority 1, 2 or 3. Ecological communities that are adequately known and not threatened but rare, near threatened, or have recently been removed from the threatened list are placed in priority 4. Conservation dependent ecological communities are placed in priority 5.

Conservation Code	Description
Priority 1: Poorly known ecological communities - very few occurrences, very restricted distribution	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g., within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2: Poorly known ecological communities - few occurrences, restricted distribution	Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3: Poorly known ecological communities - inadequately surveyed or not well defined	Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them. This category includes three sub-categories: (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation. (ii) Communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years). (iii) Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change, etc.

Conservation Code	Description
Priority 4: Adequately known ecological communities - rare, near threatened, or recently removed from the threatened list	Ecological communities that are adequately known and either rare but not threatened, near threatened, or have recently been removed from the threatened list. These communities require regular monitoring. (i) Rare: ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near threatened: ecological communities that are considered to have been adequately surveyed and that do not qualify as conservation dependent, but that are close to qualifying for a higher threat category. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
Priority 5: Conservation dependent ecological communities	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix H Conservation significant flora species recorded within 10 km of Molloy Island

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Caladenia lodgeana	T/CR	Herb	Sandy-clay and clay soils in seasonally damp flats. Found between Augusta and Margaret River.	Possible. Some areas of suitable habitat are present within the Site. Closest record is just over 1 km north.	PMST, Naturemap, TPFL, WAHerb
Calectasia cyanea	T/CR	Herb	White, grey, or yellow sand, gravel.	Unlikely, known population is from Torndirrup National Park, south of Albany and Mt Barker.	PMST
Reedia spathacea	T/CR	Herb	Peaty sand. Swamps.	Unlikely. Preferred habitat is not present within the Site.	PMST
Banksia mimica	T/EN	Shrub	White or grey sand over laterite, sandy loam.	Unlikely. Preferred habitat is not present within the Site; closest population occurs in the Whicher Range.	PMST
Banksia nivea subsp. uliginosa	T/EN	Shrub	Sandy Clay, gravel. Occurs in two areas, near Busselton and Scott River Plain on clay over laterite in thick scrub, in winter wet southern ironstones.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, WAHerb
Boronia exilis	T/EN	Herb	Seasonally wet heath or sedgelands on grey silty sand, over ironstone.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, WAHerb
Caladenia excelsa	T/EN	Herb	Sandy soils in forests and woodlands. Found between Dunsborough and Karridale.	Unlikely. Preferred habitat does not occur within the Site. The Augusta record is historical, and location is inaccurate. Southern most extent of current known distribution is Karridale.	WAHerb
Caladenia hoffmanii	T/EN	Herb	Sandy -clay oil in rocky hills and breakaways. Found between Geraldton and Murchinson River.	Unlikely, this species is only known from north of Geraldton.	PMST
Darwinia ferricola	T/EN	Shrub	Red, sandy, shallow loams over ironstone, around winter wet areas near the coast. Occurs from east of Augusta to Walpole.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, WAHerb
Gastrolobium papilio	T/EN	Shrub	Sandy clay over ironstone and laterite. Flat plains.	Unlikely. Preferred habitat is not present within the Site.	PMST

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Kennedia lateritia	T/EN	Climber	Close to the coast in black humus-rich sand, often amongst granite outcrops. Typically, the vegetation is low coastal heath, but sometimes Peppermints or Karris are present. The mean annual rainfall is approximately 1000 mm.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, TPFL, WAHerb
Lambertia echinata subsp. occidentalis	T/EN	Shrub	White sandy soils over laterite, orange/brown-red clay over ironstone. Flats to foothills, winter-wet sites.	Unlikely. Preferred habitat is not present within the Site.	PMST
Lambertia orbifolia subsp. vespera (syn *Lambertia orbifolia* subsp. Scott River Plains)	T/EN	Shrub	Sand or sandy clay in association with ironstone, around seasonally wet areas near the coast or further inland on riverbanks or more upland plains.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, WAHerb
Verticordia plumosa var. vassensis	T/EN	Shrub	A variety of sands and swampy clay soils in mostly winter-wet flats and depressions.	Unlikely. Preferred habitat is not present within the Site.	PMST & Naturemap
Banksia squarrosa subsp. argillacea	T/VU	Shrub	White/grey sand, gravelly clay, or loam. Winter-wet flats, clay flats. Ironstone, occasionally lateritic gravel pits, however these populations may have been introduced.	Unlikely. Preferred habitat is not present within the Site.	PMST
Conospermum quadripetalum	T	Shrub	Sandy clay, grey sand. Flats behind coastal hills, swamps and clay flats.	Unlikely. Only small areas of marginal habitat within the Site.	Naturemap, TPFL, WAHerb
Diuris drummondii	T/VU	Herb	Sandy-clay and clay soils in seasonally wet flats, flowering best in season following a summer fire. Found mainly between Perth and Albany, rare, scattered populations as far north as Northampton.	Unlikely. Only small areas of marginal habitat within the Site.	Naturemap, TPFL
Drakaea micrantha	T/VU	Herb	Sandy soil in forests and woodlands. Found between Perth and Albany.	Possible. Closest records are 17 km to the north of the Site.	PMST
Grevillea brachystylis subsp. australis	T/VU	Shrub	Sand, sandy clay. Swampy situations, stream banks.	Unlikely. Preferred habitat is not present within the Site.	PMST, Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Leptomeria dielsiana	T/VU/X	Shrub	Locality & description unknown. Only known from one type collection and has not been relocated since the first collection in scrubby heath in the Scott River area. Presumed extinct.	Unlikely. Presumed extinct.	PMST, Naturemap, WAHerb
Andersonia ferricola	P1	Shrub	White sand or red-brown loam over ironstone, seasonally wet flats.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Caladenia pholcoidea subsp. augustensis	P1	Herb	Clay and sandy-clay soils in seasonally wet flats, flowers only in season following a summer fire. Found near Augusta.	Unlikely. Only small areas of marginal habitat within the Site.	Naturemap, WAHerb
Darwinia terricola	P1	Shrub	Shallow sandy clay over granite, in winter damp flats under a Mallee shrubland dominated by Eucalyptus marginata. Confined to the Black-wood Plateau.	Unlikely. Preferred habitat is not present within the Site.	Naturemap
Pericalymma megaphyllum	P1	Shrub	Red-brown lateritic clayey sand. Elevated washed areas.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Philydrella pygmaea subsp. minima	P1	Herb	Damp sites.	Unlikely. Some areas of the Site may have suitable habitat, but there is only one record of this species in proximity.	Naturemap, TPFL, WAHerb
Schoenus indutus	P1	Sedge	Gravelly sand, black sand over clay, swamp edges.	Unlikely. Some areas of the Site may have suitable habitat, but there is only one record of this species in proximity.	Naturemap, WAHerb
Stylidium sp. Scott River Plain (N.G. Marchant 74/23)	P1	Herb	No information available. Only known from one collection/location.	Unlikely. Some areas of the Site may have suitable habitat, but there is only one record of this species in proximity.	Naturemap, WAHerb
Synaphea nexosa	P1	Shrub	Clay-loam. Winter-wet flats.	Unlikely. Some areas of the Site may have suitable habitat, but there is only one record of this species in proximity.	Naturemap, TPFL, WAHerb
Diuris heberlei	P2	Herb	Sandy-clay and peaty soils in seasonally damp coastal flats. Found between Augusta and Two Peoples Bay.	Unlikely. Only small areas of marginal habitat within the Site.	Naturemap, TPFL
Hemigenia sp. Nillup (R.D. Royce 98)	P2	Shrub	Grey/brown sand/loam.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Leptomeria furtiva	P2	Shrub	Grey or black peaty sand. Winter-wet flats.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, TPFL, WAHerb
Pigea volubilis	P2	Herb	Clay or sandy clay. Riverbanks.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Schoenus loliaceus	P2	Sedge	Sandy soils. Winter-wet depressions.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, TPFL, WAHerb
Schoenus sp. Grassy (E. Gude & J. Harvey 250)	P2	Sedge	Black silt. Swamps.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Stenanthemum sublineare	P2	Shrub	Littered white sand. Coastal plain.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Styphelia intricata	P2	Shrub	Seasonal wetlands in open woodland or heath.	Possible. Some areas of the Site may provide suitable habitat for this species.	
Acacia lateriticola var. Glabrous variant (B.R. Maslin 6765)	P3	Shrub	Lateritic soils.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, WAHerb
Amanita fibrillopes	P3	Fungi	Sandy or gravelly soil in dry sclerophyll forest and Banksia woodland, or in humus rich soil in seasonally wet eucalypt and paperbark woodland, often associated with *Eucalyptus marginata, E. jacksonii, Allocasuarina fraseriana, Corymbia calophylla, Melaleuca preissiana* and *Agonis* sp..	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	P3	Shrub	Black sand in seasonally wet swamps in heath.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Blennospora doliiformis	P3	Herb	Grey or red clay soils over ironstone. Seasonally wet flats.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Boronia anceps	P3	Herb	Grey or brown sand or clay. Seasonally swampy heaths.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Caladenia abbreviata	P3	Herb	Deep sandy soils in coastal woodlands and shrublands. Abundant in disturbed areas along edges of graded racks and firebreaks. Found between Yallingup and William Bay.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Calothamnus lateralis var. crassus	P3	Shrub	Sand, clay or peat in swamps and winter-wet depressions.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, WAHerb
Chordifex gracilior	P3	Herb	Peaty sand. Swamps.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Chordifex jacksonii	P3	Herb	Sand, loamy sand. Seasonally inundated swamps.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, TPFL, WAHerb
Cyathochaeta stipoides	P3	Sedge	Grey or red-brown sand. Seasonally wet flats.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, TPFL, WAHerb
Dampiera heteroptera	P3	Herb or shrub	Sandy soils. Swampy areas.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Gastrolobium formosum	P3	Shrub	Clay loam. Along riverbanks or in swamps.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, TPFL, WAHerb
Grevillea manglesioides subsp. ferricola	P3	Shrub	Red sandy clay over ironstone. Winter wet flats.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Grevillea papillosa	P3	Shrub	Brown or peaty sand, sandy clay, loam. Seasonally wet areas, swamps.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, TPFL, WAHerb
Hemiandra sp. Windy Harbour (B.J. Conn & J.A. Scott BJC 3344)	P3	Shrub	Granite outcrops. Poorly known.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Isopogon formosus subsp. dasylepis	P3	Shrub	Sand, sandy clay, gravelly sandy soils over laterite. Often swampy areas.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Leucopogon wheelerae	P3	Shrub	Restricted to heath or woodland edge on seasonally wet flats. Occurs in the far south-west corner of Western Australia between the Hardy Inlet, near Augusta, and the Donnelly River.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Loxocarya magna	P3	Herb	Sand, loam, clay, ironstone. Seasonally inundated or damp habitats.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Stylidium trudgenii	P3	Herb	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Adenanthos detmoldii	P4	Shrub	Grey or black peaty sand, wet. Swamps, roadsides.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Adenanthos x pamela	P4	Shrub	Grey sand, laterite. Damp flats, roadsides.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Aotus carinata	P4	Shrub	Sandy soils. Seasonally wet flats.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, WAHerb
Astartea onycis	P4	Shrub	Seasonally inundated swamps, winter-wet, low-lying, or damp areas, woodlands, sedgelands. Sandy clay, loam, or peat.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Banksia meisneri subsp. ascendens	P4	Shrub	White or grey sand. Swampy flats.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Drosera fimbriata	P4	Herb	White sand, granite.	Unlikely. Preferred habitat is not present within the Site.	Naturemap, TPFL, WAHerb
Franklandia triaristata	P4	Shrub	White or grey sand.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Gonocarpus pusillus	P4	Herb	Grey sandy clay. Winter-wet swamps.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, TPFL, WAHerb
Melaleuca basicephala	P4	Shrub	Black peaty sand, clay. Winter-wet flats, swamps.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within Molloy Island	Data Source
Pultenaea skinneri	P4	Shrub	Sandy or clayey soils. Winter-wet depressions.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb
Stylidium ireneae	P4	Herb	Sandy loam. Valleys near creek lines, woodland, often with *Agonis*.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, WAHerb
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4	Herb	Grey sandy loam, Eucalypt woodland. Grey sand, plain, wetland with wet grey clay.	Possible. Some areas of the Site may provide suitable habitat for this species.	Naturemap, TPFL, WAHerb
Verticordia lehmannii	P4	Shrub	Sandy clay. Winter-wet flats.	Unlikely. Only small areas of the Site provide marginal habitat for this species.	Naturemap, WAHerb

* BC Act: T = Threatened, P = Priority / EPBC Act: CR = Critically Endangered, EN = Endangered, VU = Vulnerable

Appendix I Native Fauna Species List

Appendix J Conservation significant fauna species recorded within 10 km of Molloy Island

Species and Common Name	Conservation Status*	Habitat	Likelihood of occurrence within the Site	Data Source
Anstisia alba listed as *Geocrinia alba* White-bellied Frog	T/CR	Broad drainage lines with riparian vegetation.	Unlikely. Known distribution is restricted to an area nearly 10 km to the north of the Survey Area.	Naturemap, PMST & DBCA
Engaewa pseudoreducta Margaret River Burrowing Crayfish	T/CR	Narrow, creek tributaries of the Margaret River and Carbunup River. Heavy grey-yellow clays in areas of narrow, sloping depressions, with a dense shrub stratum, minimal tree strata, at 110-120 m above sea level. Flat with low dendritic channels in coarse white sand with open and low shrub strata, no tree strata, at 40 m above sea level.	Unlikely, marginal habitat available for this species within the Site.	PMST & DBCA
Engaewa reducta Dunsborough Burrowing Crayfish	T/CR	Wide range of habitats, though generally with sandy soils and an accessible watertable.	Unlikely. The Survey Area is not located within the known range of this species. The closest known records are nearly 10km to the north.	PMST & DBCA
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir	T/CR	Woodlands of peppermint (*Agonis flexuosa*), jarrah (*Eucalyptus marginata*), marri (*Corymbia calophylla*) as well as karri (*Eucalyptus diversicolor*) forests, Allocasuarina woodlands and Bullich (*Eucalyptus megacarpa*) dominated riparian zones.	Known to occur. There are multiple records of this species from within the Survey Area.	Naturemap, PMST & DBCA
Botaurus poiciloptilus Australasian Bittern	T/EN	Wetlands with tall, dense vegetation, favours permanent and seasonal freshwater habitats, dominated by sedges rushes and reeds, growing over a muggy or peaty substrate.	Possible, there is some suitable habitat within the Survey Area.	PMST & DBCA
Zanda baudinii listed as *Calyptorhynchus baudinii* Baudin's cockatoo	T/EN	Eucalypt forest, especially Jarrah, Karri and Marri forests, also woodlands, partly cleared farmland and urban areas. Species nest in tree hollows, with minimum entrance size of 100 mm.	Known to occur. There are multiple records of this species from within the Survey Area.	Naturemap, PMST & DBCA
Zanda latirostris listed as *Calyptorhynchus latirostris* Carnaby's cockatoo	T/EN	Eucalypt woodlands, and in shrubland or Kwongan heathland. Species nest in tree hollows, with minimum entrance size of 100 mm.	Likely. The Survey Area is located within the known range of this species, with multiple recent records within 10 km of the Site.	Naturemap, PMST & DBCA

Austroassiminea letha Cape Leeuwin Freshwater Snail	T/VU	Short range endemic. Wet and humid environments, seepage films and splash zones near small freshwater streams and springs. Requires perennially moist or highly humid conditions. May inhabit rocks, leaves, soil and litter.	Unlikely, habitat not present.	DBCA
Calyptorhynchus banksii naso Forest red-tailed black cockatoo	T/VU	Eucalypt forests. Species nest in tree hollows, with minimum entrance size of 100 mm.	Known to occur. There are records of this species from within the Survey Area.	Naturemap, PMST & DBCA
Dasyurus geoffroii Chuditch, Western Quoll	T/VU	Variety, most dense in riparian jarrah forests. Require large, unfragmented habitats.	Unlikely, Survey Area does not include habitat that is likely to support this species.	Naturemap, PMST & DBCA
Leipoa ocellata Malleefowl	T/VU	Semi-arid to arid shrublands and low woodlands dominated by mallee and/or acacia.	Unlikely, however there is a record of a bird taken into care from Molloy Island in 2023.	Naturemap & DBCA
Setonix brachyurus Quokka	T/VU	Mainly dense riparian vegetation, other areas with dense vegetated understory with close proximity to freshwater.	Unlikely, Survey Area does not include habitat that is likely to support this species.	Naturemap, PMST & DBCA
Westralunio carteri Carter's Freshwater Mussel	T/VU	Coastal freshwater rivers and lakes of the south-west region. Also occurs in water supply and farm dams. Prefers slower flowing waters where sediments stable. Species has low salinity tolerance.	Unlikely, habitat is not present within the Site.	Naturemap, PMST & DBCA
Elapognathus minor Short-nosed Snake	P2	Heath, swamps and wet sclerophyll forest.	Possible, there is some suitable habitat within the Survey Area.	DBCA
Tyto novaehollandiae novae-hollandiae Masked Owl (southwest)	P3	Tall forests, woodlands, timbered waterways and open country on the fringe of these areas.	Known to occur. There are records of this species from within the Survey Area.	Naturemap & DBCA
Falsistrellus mackenziei Western False Pipistrelle	P4	Wet sclerophyll forests of Karri, Jarrah and Tuart eucalypts. roost in hollows in old trees, branches and stumps.	Possible, there is some suitable habitat within the Survey Area.	Naturemap & DBCA
Hydromys chrysogaster Water-rat, Rakali	P4	Found Near permanent fresh or brackish waters, Areas of permanent fresh or brackish water, drainage swamps.	Known to occur. There are records of this species from within the Survey Area.	Naturemap & DBCA
Isoodon fusciventer Quenda, Southwestern Brown Bandicoot	P4	Forest, woodland, shrub and heath, usually in sandy soils with dense healthy vegetation in lower stratum.	Known to occur. There are multiple records of this species from within the Survey Area.	Naturemap & DBCA

Notamacropus Irma Western Brush Wallaby	P4	Favours open, seasonal damp areas with low grasses and open scrubby brush.	Unlikely, habitat is not present within the Site.	Naturemap & DBCA
Oxyura australis Blue-billed Duck	P4	Deep freshwater areas with dense vegetation.	Unlikely, habitat is not present within the Site.	Naturemap & DBCA
Platycercus icterotis xanthogenys Western Rosella (inland)	P4	Mainly eucalypt and casuarina woodlands and scrubs, especially of wandoo, flooded gum, salmon gum, tall mallees and *Allocasuarina huegeliana*. Attracted to seeding *E wandoo, A. huegeliana, Glischrocaryon flavescens* and *Olearia revoluta* and to flowering *Melaleuca acuminata* and *Eucalyptus eremophilrx*.	Unlikely, this species is restricted to the Wheatbelt region, with one possible sighting from 2007 within proximity to the Site.	DBCA
Cacatua pastinator pastinator Muir's corella	CD	Large live or dead eucalypts, particularly *Corymbia calophylla* and *Eucalyptus marginata, rudis, Eucalyptus cornuta* and *Melaleuca preissiana* in forested areas or as lone trees in paddocks and along roadsides.	Unlikely, Survey Area is not within the current known distribution of this species. The most recent record in proximity is from 1978.	Naturemap & DBCA
Phascogale tapoatafa wambenger South-western brush-tailed phascogale, wambenger	CD	Highly arboreal, prefers open forest with sparse groundcover.	Likely. The Survey Area provides substantial areas of suitable habitat.	Naturemap & DBCA
Falco peregrinus Peregrine falcon	OS	Wide variety. Prefers coastal and inland cliffs or open woodlands near water.	Known to occur. There are records of this species from within the Survey Area. Multiple records within 10 km.	Naturemap & DBCA

* BC Act: T = Threatened, P = Priority / EPBC Act: CR = Critically Endangered, EN = Endangered, VU = Vulnerable, CD = Conservation Dependent, OS = Other Specifically Protected

Appendix K Project Team and Licencing

Team Member	Role	Qualifications	Flora Licence Number
Kelly Paterson (KP)	Field surveys (manager / team leader), plant identifications	B.Sc. Hons. Nat Rs Mgmt.	FB62000182 TFL 54-2021
Danae Plowman (DP)	Field surveys (manager / team leader), plant identifications	B.Sc. P.G Dip. Engy & Env	FB62000342 TFL 2223-0162
Hayley Drake (HD)	Field surveys (team member)	B.Sc. Cons & Wildlife Bio and Molecular Bio	FB62000348
Dani Cuthbert (DC)	Field surveys (team member)	Dip Bus & Dip TM	
Barb Black (BB)	Field surveys (team member)	B.Sc.	

Appendix L Survey Limitations

Limitation	Level of Constraint	Comment
Competency & experience of the survey team	Negligible	The flora and fauna field surveys were completed and lead by two Ecologists with over 10 years' experience surveying for flora and fauna in southwest Western Australia. The report has been endorsed by an Ecologist who has more than 20 years' experience in Western Australia.
Survey type, effort, and extent	Low	The Survey Area was traversed in a systematic way, focusing on vegetation adjacent to existing paths and firebreaks, to avoid unnecessary impact to the vegetation. There were 11 relevés conducted and is considered appropriate given the scope of this report. As there is no proposed impact to the remnant vegetation within the Survey Area, it was not deemed of benefit to traverse deeper into vegetation as this would cause trampling.
Survey timing and season	Low	The surveys were conducted across 2024 in Autumn, Winter and Spring (March, June, October), with the targeted survey and floristic relevés completed in Spring. Spring is the optimal time for flowering and therefore the timing is appropriate. September is the optimum time for bird and mammal surveys in the southwest. Weather conditions did not impact surveys
Availability of contextual information at regional and local scale	Minor	This report is resourced with data from SLIP Data WA, Interim Naturemap, Florabase, DBCA Threatened and Priority Flora and Fauna databases (2024) and data provided by the Shire of Augusta Margaret River. Previous reports and data of the Molloy Island have also been taken into consideration and incorporated (Including BirdLife Australia specifically the Cape to Cape Bird Group data, Land for Wildlife reports and additional data provided by residents and Friends of Molloy Island Reserves).
Access restrictions within the Site	Low	The survey effort has been concentrated along existing tracks and firebreaks, to avoid unnecessary impact to the remnant vegetation. Some areas of vegetation were surveyed off the tracks; however, areas of particularly dense vegetation were not surveyed to avoided unnecessary trampling or other damage, particularly to the Coastal Saltmarsh.
Disturbances (e.g. fire, flood or clearing) that may have affected the results of the survey.	Minor	The Survey Area is moderately disturbed as it is bound by roads and residential houses, with tracks and firebreaks intersecting the Survey Area. Some clearing has recently occurred for fire maintenance activities.

Limitation	Level of Constraint	Comment
Proportion of flora recorded and/or collected, any identification issues	Minor	A focus was placed on identifying any potential conservation significant flora species observed during the time of survey, with these collections all identified to species level. Specimens that were not potentially conservation significant species have been identified to genus level, or species where this can be easily ascertained. To ensure accurate identification some specimens were sent to the Western Australian Herbarium for formal identification.
Proportion of fauna identified, recorded, or collected	Minor	Any potential conservation significant fauna species observed during the surveys have been identified.
Inconsistent flowering habit of some species	Moderate	Some species do not flower every season and may require environmental triggers to promote flowering such as rainfall, fire, presence of suitable pollinators etc.
Scope of the survey, e.g., where faunal groups were excluded from the survey	Minor	This survey focussed on birds, mammals, and other vertebrate species. Aquatic species and Invertebrates were not included in the scope of this survey.
Timing Western Ringtail Possums (WRP) may arise from rest sites & likelihood of rest sites being located outside the Site	Moderate	As WRP use up to 2-7 rest sites at any one time and up to 20 throughout the year there is potential that they are not observed on Site at the time of survey, even though they are utilising the Site. The time WRP arise from a rest Site is also variable and may prevent WRP being observed during survey.
Determination of hollow suitability from the ground	Nil	Factors including entrance size, hollow depth, floor, and orientation of the hollow are important factors to nesting hollow suitability and which are difficult to assess from the ground. Therefore, there is potential for the number of hollows recorded to be an over estimation of those suitable as nesting hollows.

Appendix M Relevé Field Sheets and Photos

Appendix N Vegetation Photo Point Monitoring

Establishing a Permanent Photo Point

Photographs can rapidly document vegetation changes at a site and give an overall impression of the success or otherwise of a project's activities. They are a simple and effective means of recording a project's progress. Photo point monitoring requires that photographs be taken from the same location at set intervals over time using a standardised method.

To follow are guiding principles for establishing a permanent photo point for vegetation monitoring.

1. Photo points should be located where they can easily be found in future years.

2. Photo point sites should be marked with a painted metal star pickets (which should not be destroyed in a planned burn), and a compass bearing used to give the direction of the shot. The location of the photo point should be noted with a GPS reading and recorded along with an identifying number on a metal tag on the picket. Consider putting two-star pickets in the ground as a reference for the angle of the photograph so that successive photographs will be along the same line each time.

3. Ideally, photos should be taken during the same season, at the same time of day, from the same place with the same view and camera settings. Take care with placing photo points that face east to west. You may have difficulty photographing these in the morning or afternoon.

4. Try to take photos that contain distinguishable features such as background hills, an old and easily recognisable tree, track, buildings, or powerlines.

5. Take additional photographs to document the overall landscape within the burn cell or vegetation complex.

6. Set the camera on top of the star picket to ensure a consistent height.

7. Use the same camera and lens, and settings (ISO, shutter speed and more importantly aperture).

8. Record information in a notebook and include this in a project file where the photographs and details are kept. An example of a record sheet is listed below.

Photo points of the same site over time can be used to determine changes to the vegetation structure and fuel dynamics also when compared to the burn information (timing, intensity, weather details), can be used to analyse impacts and make changes as needed to achieve objectives.

Photo point Record Sheet		
Photo point Location & Number	**Date**	**Time**
Location Details	**Compass Bearing of photo**	**GPS** **S:** **E:**
Direction of Photo	**Direction of Photo**	
Camera details	**Lens Details**	**Settings** **ISO:** **Aperture:** **Shutter Speed:**
Insert Photograph here.		
Notes		

Appendix O Kangaroo Management on Molloy Island

Appendix P Dawn, Dusk and Nocturnal Fauna Survey Times and Observations

Survey Type	Personnel	Date and Time	Sunrise / Sunset Time	Location & Observations
Dusk / Nocturnal 1	Team 1 - KP & HD Team 2 - DC & BB	24 June 2024 4:15 pm to 9:45 pm	Sunset - 5:17 pm Last light - 5:45 pm	Dusk – Lots 258 & 231 • Approximately 23 White-tailed Black Cockatoos. • Four Forest Red-tailed Black Cockatoos. • Lots of Black Cockatoo calls heard. Nocturnal - Lots 4761, 231 & 258 • Two Quendas. • 103 Western Ringtail Possums.
Dawn 1	Team 1 - KP & HD Team 2 - DC & BB	25 June 2024 6:15 am to 8:00 am	Sunrise - 7:25 am First light - 6:30 am	Lots 231 & 4766 • Lots of Black Cockatoo calls. • Three Forest Red-tailed Black Cockatoos observed in a tree.
Dusk / Nocturnal 2	Team 1 - KP & HD Team 2 - DC & BB	25 June 2024 4:25 pm to 9:00 pm	Sunset - 5:18 pm Last light - 5:45 pm	Dusk - Lots 231, 4761 & 4766 • 33 Forest Red-tailed Black Cockatoos. o Two of which were observed roosting in a tree in private property adjacent to Lot 4761. • Lots of Black Cockatoo calls heard. Nocturnal – Lots 4766 & 4706 • 89 Western Ringtail Possums.

Survey Type	Personnel	Date and Time	Sunrise / Sunset Time	Location & Observations
Dawn 2	Team 1 - KP & HD Team 2 - DC & BB	26 June 2024 6:20 am to 7:50 am	Sunrise - 7:25 am First light - 6:58 am	Lots 4761 & 4766 • Lots of Black Cockatoo calls heard. • Four Forest Red-tailed Black Cockatoos foraging on and around the roosting tree from the dusk survey 2.
Dusk / Nocturnal 3	Team 1 - KP & HD Team 2 - DC & DP	9 October 2024 5:30 pm to 10:00 pm	Sunset - 6:28 pm Last light - 6:53 pm	Dusk - Lot 231 & 258 • Black Cockatoo calls heard. Nocturnal – Parts of Lots 258, 4706 & 4758 • One Rakali. • 26 Western Ringtail Possums.
Dawn 3	Team 1 - KP & HD Team 2 - DC & DP	10 October 2024 5:00 am to 6:30 am	Sunrise - 5:43 am First light - 5:17 am	Lots 231, 258 & 4766 • Black Cockatoo calls heard. • Forest Red-tailed Black Cockatoo foraging in private property.
Dusk / Nocturnal 4	Team 1 - KP & HD Team 2 - DC & DP	10 October 2024 5:30 pm to 8:00 pm	Sunset - 6:28 pm Last light - 6:54 pm	Dusk – Lots 4758 & 4761 • Five Forest Red-tailed Black Cockatoos – Three foraging and calling to others in distance and two foraging in private property. • Lots of Black Cockatoo calls heard. Nocturnal – Lots 231, 258, 4706, 4758 & 4766 • 16 Western Ringtail Possums.

Survey Type	Personnel	Date and Time	Sunrise / Sunset Time	Location & Observations
Dawn 4	Team 1 - KP & HD Team 2 - DC & DP	11 October 2024 5:15 am to 6:30 am	Sunrise 5:41 am First light 5:16 am	Lots 231, 4761 & 4766 • Lots of Black Cockatoo calls heard. • Two Black Cockatoos flying over survey area. • Six Forest Red-tailed Black Cockatoos observed foraging in a Marri.

Appendix Q Habitat Trees

Appendix R Molloy Island Woody Weeds Control 2023 Map


Control of Sydney Golden Wattle, Sweet Pittosporum, Polygala etc on Molloy Island 2023
FRIENDS OF MOLLOY ISLAND RESERVES
Legend
woody weed control 9.2 ha
Public reserved land
Scale: 1:17400
Imagery © 2023 Google

Appendix S Shire of Augusta Margaret River Firebreaks and Access Tracks Map

Appendix T Post Fire Monitoring

Monitoring post a prescribed burn, bushfire and on a regular basis is recommended to ensure fuel loads have been adequately reduced and that the ecosystem is responding well. This monitoring should include information on the presence of weeds, dieback and native flora and fauna species to determine composition and diversity. The results from monitoring should advise the parameters chosen for future prescribed burns, to ensure the optimal outcome can be achieved for flora and fauna species as well as to limit fuel loads to protect nearby assets.

There are many monitoring practices for post burn that are possible on this Site, as outlined in Cawson and Muir (2008), however many of these can be onerous and time consuming. At a minimum, the following data should be recorded.

After a burn, ideally the area should be inspected and records kept of the burn details, including date, burn intensity, weather (at burn and prior to burn), crews in attendance, any issues observed by fire fighters at the burn, burning pattern conducted and any other facts during the implementation of the burn. This would involve discussions with the Incident Control or Fire Control Officer of the burn as soon after the burn as possible.

After this, ideally the area should be inspected to record the severity of the burn and overall impacts across the area burnt to assess the long-term outcomes and inform future burns.

This would include a series of spot assessments within the area, and observations made of a 10 m (approx.) radius of the point.:

- Site/Cell details – GPS Location
- Date of observation and observer details
- Estimates of percentage area burn over Ground Layer, Shrub layer and tree canopy layer (approximate to the nearest 10%
- Estimates of the percentage of the severity of the burn at <2m height and >2 m height

Fire Severity Assessment Page _____ of _____ Assessors: _____		
Area	Assessment Date:	Burn Date(s)

Comments:

1. Have the fuel loads been adequately reduced?
2. Has the burn resulted in a patchy mosaic of burnt and unburnt areas (using the assessment below)?
3. Were the average scorch marks below 4 m high (using the below assessment)?

If the answer to question 1 is no, further fuel reduction measures may be required which can include rake fine fuels and burn piles and/or trim understory.

If the answer to question 2 or 3 is no, then the fire may have been too intense and strategies to reduce the intensity during the next prescribed burn should be considered and noted.

The impact to fauna should also include noting any fauna deaths within or surrounding the burn area which may require communication with community members. If the fauna deaths are high, then consideration should be given to the intensity of the burn and burn pattern, to ensure animals had an escape route from the burn. A pre-burn walk through to alert and encourage animals to move on, particularly from logs and under grass trees, should also be considered and improved.

No. fauna deaths:

Plot	GPS		Ground/Litter Layer % Estimate to 10%			Shrub Layer (<4m) % Estimate to 10%			Tree Layer) (>4m) % Estimate to 10%		
	E	N	Burnt	Scorched	Unburnt	Burnt	Scorched	Unburnt	Burnt	Scorched	Unburnt

Ongoing monitoring to determine the flora and fauna response including mass germination of reseeders, weeds, dieback and impact from feral animals should occur every two years to inform management actions. Ideally this monitoring would include fuel load records as outlined in Hines *et al* (2010) to determine specific changes in the reserves and the time required to undergo fuel reduction actions due to increased fuel loads. A simplified assessment has been provided below.

Any areas where there are limited native species returning, the area could benefit from revegetation following a burn.

At a minimum, a photo point monitoring programme should be established with a fixed-point photo point established in each burn area. This can rapidly document vegetation and fuel load changes at a site and give an overall impression of the changes at the site over time since burning. Photo point monitoring requires that photographs be taken from the same location at set intervals over time using a standardised method. This is detailed in Appendix J.

With the biological and ecological values present and known on Molloy Island and the knowledge that fuel reduction burns will occur on the Island and in the reserves, it provides a good opportunity for potential research into broad pre and post fire impacts issues. These opportunities should be made aware to educational and research facilities.

Reserve		Date	
GPS		Assessor(s)	
Surface Fuel Loads within 10 m radius – select one of the following			
Low - Moderate Thin layer <25 mm, poorly connected or some areas of bare soil/rock.	High Established leaf litter, 20 – 30 mm thick, well connected with some areas of bare soil/rock.	Very High Thick leaf litter 25 – 45 mm with litter completely connected.	Extreme Very thick layer of litter >35 mm and completely connected.
Near Surface Fuel Loads within 10 m radius (>0 to 1 m high) – select one of the following			
Low - Moderate Near-surface fuel is absent or gaps many times the size of fuel patches.	High Gaps between fuel patches are greater than the size of fuel patches. Starting to obscure logs/rocks.	Very High Fuel patches are equal to or larger than the gaps between the fuel patches.	Extreme Very small patches between fuel patches. Logs and rocks obscured.
Elevated Fuel Loads within 10 m radius (>1 to 2 m high) – select one of the following			
Low – Moderate Easy to walk through and choose a path, brush against vegetation occasionally.	High Moderately easy to choose a path through but brush against vegetation most of the time.	Very High Need to carefully select path.	Extreme Very difficult to select a path through. Need to push through vegetation.

1. Are any of the surface, near surface or elevated fuel assessments resulted in Very High or Extreme?
2. If Elevated Fuel Loads are Very High to Extreme is this dominated by one species?
3. Has the minimum fire interval been achieved, 6 to12 years?

If yes to question 1, 2 & 3, then it is recommended to reduce fuel loads through a prescribed burn. If yes to question 1 or 2 & no to question 3, it is recommended to reduce fuel loads through a low impact mechanical method (selectively removing some shrubs or raking leaf litter).

Is there a large amount of weeds?	If yes, conduct weed removal.
Is there evidence of dieback?	If yes, conduct dieback treatment and signage.
Is there evidence of feral animals	If yes, conduct feral animal control.

Appendix U Legislation Tables

Planning Acts, Standards and Policies

Title	Jurisdiction	Scope
AS3959:2018 - Construction of buildings in bushfire prone areas	Federal	Australian Standard that specifies requirements for the construction of buildings in designated bushfire-prone areas to improve resistance to bushfire attack.
Building Act 2011	State	Provides a comprehensive system of building control, sets standards for buildings and demolition work in WA and deals with building or demolition work that affects other land.
Bush Fires Act 1954	State	The Act is to make better provision for diminishing the dangers resulting from bush fires, for the prevention, control, and extinguishment of bush fires.
Shire of Augusta-Margaret River Local planning Strategy and Scheme Map 22 – Molloy Island Locality	Local	Local government plan for their local communities by that ensures appropriate planning controls exist for land use and development. A local planning scheme sets out the way land is to be used and developed, classify areas for land use and include provisions to coordinate infrastructure and development within the local government area.
State Planning Policy 3.7 - Planning in bushfire prone areas (SPP3.7), and associated guidelines	State	Directs how land use should address bushfire risk management in Western Australia. It applies to all land designated as bushfire prone by the Fire and Emergency Services (FES) Commissioner

Environmental Acts and Guidelines

Title	Jurisdiction	Scope
Biodiversity Conservation Act 2016 (WA) ('BC Act')	State	Administrated by the Department of Biodiversity, Conservation and Attractions (DBCA) and is a legislative framework that provides greater protection and limits impacts to biodiversity, particularly listed species, and ecological communities, which have been identified as under threat of extinction or collapse.

Title	Jurisdiction	Scope
Environmental Protection Act 1986 (WA) ('EP Act')	State	The Act provides for "the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing". Note: Under the EP Act there are Environmental Protection Regulations, such as Environmental Protection (Clearing of Native Vegetation) Regulations 2004.
Environment Protection and Biodiversity Conservation Act 1999 (Cth) ('EPBC Act')	Federal	Australia's main national environmental law. They provide a way to protect and manage nationally and internationally important plants, animals, habitats, and place which are known as 'protected matters'.
Referral Guidelines for 3 WA Threatened Black Cockatoos' Species (2022)	Federal	Provides guidance on considerations, information and what actions are likely and unlikely to require referral to the Minister for the Environment because they could have a significant impact on black cockatoos.
Significant Impact Guidelines for the Vulnerable Western Ringtail Possum (*Pseudocheirus Occidentalis*) in the Southern Swan Coastal Plain, Western Australia (2009)	Federal	Guidelines to assist in determining whether a proposed action is likely to have a significant impact on the western ringtail possum.

Appendix V Shire of AMR and State Government Departments Contact Details Tables

Shire of Augusta-Margaret River Contact Details

Team/Position	Responsibilities	Contact Details
Margaret River and Augusta Shire Office and Customer Service Staff	Assist with general enquires or be directed to the appropriate department or person.	amrshire@amrshire.wa.gov.au Margaret River Office - (08) 9780 5255 Augusta Office – (08) 9780 5660
Shire Rangers	Assist with services and maintain community law and public safety.	(08) 9780 5695
Community Emergency Services Manager (CESM)	Manages the delivery and implementation of preparedness, prevention, response, and recovery services.	amrshire@amrshire.wa.gov.au (08) 9780 5285
Environment and Landcare Team/Officers	Assist with general enquires relating to environment and associated landcare works.	environment@amrshire.wa.gov.au (08) 9780 5221

State Government Department Contact Details

Department	Responsibilities	Contact Details
Department of Biodiversity and Conservation (DBCA)	Promote biodiversity and conservation through sustainable management of Western Australia's species, ecosystems, lands and the attractions.	www.dbca.wa.gov.au/ Blackwood District Email: blackwood@dbca.wa.gov.au Phone: (08) 9752 5555
Department of Planning, Lands and Heritage (DPLH)	State level land use planning and management, and oversight of Aboriginal cultural heritage and built heritage matters.	www.wa.gov.au/organisation/department-of-planning-lands-and-heritage Perth Office Phone: (08) 6551 8002 Bunbury Office Phone: (08) 9791 0577
Department of Water and Environmental Regulation (DWER)	Manage and regulate the states environment and water resources.	www.wa.gov.au/organisation/department-of-water-and-environmental-regulation Geographe Capes District Office Email: busselton.admin@dwer.wa.gov.au Phone: (08) 9781 0111
Department of Fire and Emergency Services (DFES)	Manage and deliver services to coordinate incident response and control, state hazard and special risk planning.	www.dfes.wa.gov.au Lower South West Region 58-60 Giblett Street, Manjimup WA 6258 Email: vmso.lowersouthwest@dfes.wa.gov.au Phone: 9771 6800