



Government of **Western Australia**
Department of **Water and Environmental Regulation**

Pilbara Environmental Offsets Fund

Implementation plan



November 2019

Department of Water and Environmental Regulation

Prime House, 8 Davidson Terrace
Joondalup Western Australia 6027
Telephone +61 8 6364 7000
Facsimile +61 8 6364 7001
National Relay Service 13 36 77

dwer.wa.gov.au

© Government of Western Australia
November 2019

This work is copyright. You may download, display, print and reproduce this material in unaltered form only (retaining this notice) for your personal, non-commercial use or use within your organisation. Apart from any use as permitted under the *Copyright Act 1968*, all other rights are reserved. Requests and inquiries concerning reproduction and rights should be addressed to the Department of Water and Environmental Regulation.
FIRST 115784

Acknowledgements

The Department of Water and Environmental Regulation would like to thank the following for their contribution to this publication: Clare Meredith, Danielle Griffiths, Sarah Ravensberg, Stephen van Leeuwen, Patrick Seares, Gaye McKenzie, Jan Cowan, Linda Doogibee-Dridi, Margaret Byrne, Matthew Whitting, Harriet Davie, Karin Bankin, Chris Serginson, Brett McGuire, Peter Davies, Lesley Gibson, Blair Parsons, Grey Mackay, Jo Williams, Bridget Hyder, Jelena May, Sonja Mennen, Agnes Tan, Hugh Lance and Teri O'Neill.

Picture acknowledgments: the department thanks Sonja Mennan and staff from the Department of Biodiversity, Conservation and Attractions for the supply of images in this document.

For more information about this report, contact: Pilbara Environmental Offsets Fund project manager on 08 6364 7000.

Disclaimer

This document has been published by the Department of Water and Environmental Regulation. Any representation, statement, opinion or advice expressed or implied in this publication is made in good faith and on the basis that the department and its employees are not liable for any damage or loss whatsoever which may occur as a result of action taken or not taken, as the case may be in respect of any representation, statement, opinion or advice referred to herein. Professional advice should be obtained before applying the information contained in this document to particular circumstances.

The maps included within this document are intended as a generalised interpretation of environmental issues. The information contained in these maps is to be considered indicative only and in no event shall the department be liable for any incident or consequential damages resulting from use of the material.

This publication is available at our website dwer.wa.gov.au/peof/ or for those with special needs it can be made available in alternative formats such as audio, large print, or Braille.



Minister's Foreword



Western Australia's Pilbara is one of our most important regions for its mineral wealth and rich biodiversity.

The region plays a vital economic role for Western Australia; however, it is important this is balanced with the conservation of the region's outstanding biodiversity.

The Pilbara Environmental Offsets Fund helps to enable sustainable development in the region while also protecting its unique environmental values.

We look forward to ensuring that local groups and organisations are involved in the delivery of the fund, with the aim of creating local jobs for local people, including Aboriginal Ranger groups.

While an offset framework for Western Australia has been in place since 2011, past offsets in the Pilbara were done in isolation and were difficult to implement.

The new Pilbara Environmental Offsets Fund has been co-designed by Traditional Owners, natural resource management organisations, conservation groups, industry and the research sector. It will deliver

conservation work through a strategic and coordinated offsets program that improves conservation outcomes in the Pilbara.

Conservation projects will be recommended by the Department of Water and Environmental Regulation with advice from stakeholders and a project recommendation group.

There are already fantastic partnerships between Traditional Owners, conservation agencies, industry and government that are delivering projects that improve the local environment and engage Aboriginal Rangers in work on their country.

The Pilbara Environmental Offsets Fund is an opportunity to expand on those efforts and provide a rigorous, scientific approach to protecting the region's unique biodiversity and environmental values for future generations.

A handwritten signature in dark ink, appearing to read 'Stephen Dawson'.

Hon Stephen Dawson MLC
Minister for Environment

Contents

Foreword	iii
Summary	vi
1.0 Introduction	1
1.1 Purpose of the fund	1
1.2 Purpose of this implementation plan	3
1.3 Background	5
2.0 Scope of fund	8
2.1 Fund governance	8
2.2 Environmental matters	10
2.3 Policy principles	13
2.4 Designing offset outcomes to endure in the longer term	17
3.0 Priorities for investment	20
4.0 Delivering the fund	23
4.1 Planning delivery of the fund	24
4.2 Implementing projects	26
4.3 Evaluating success of projects and the program	28

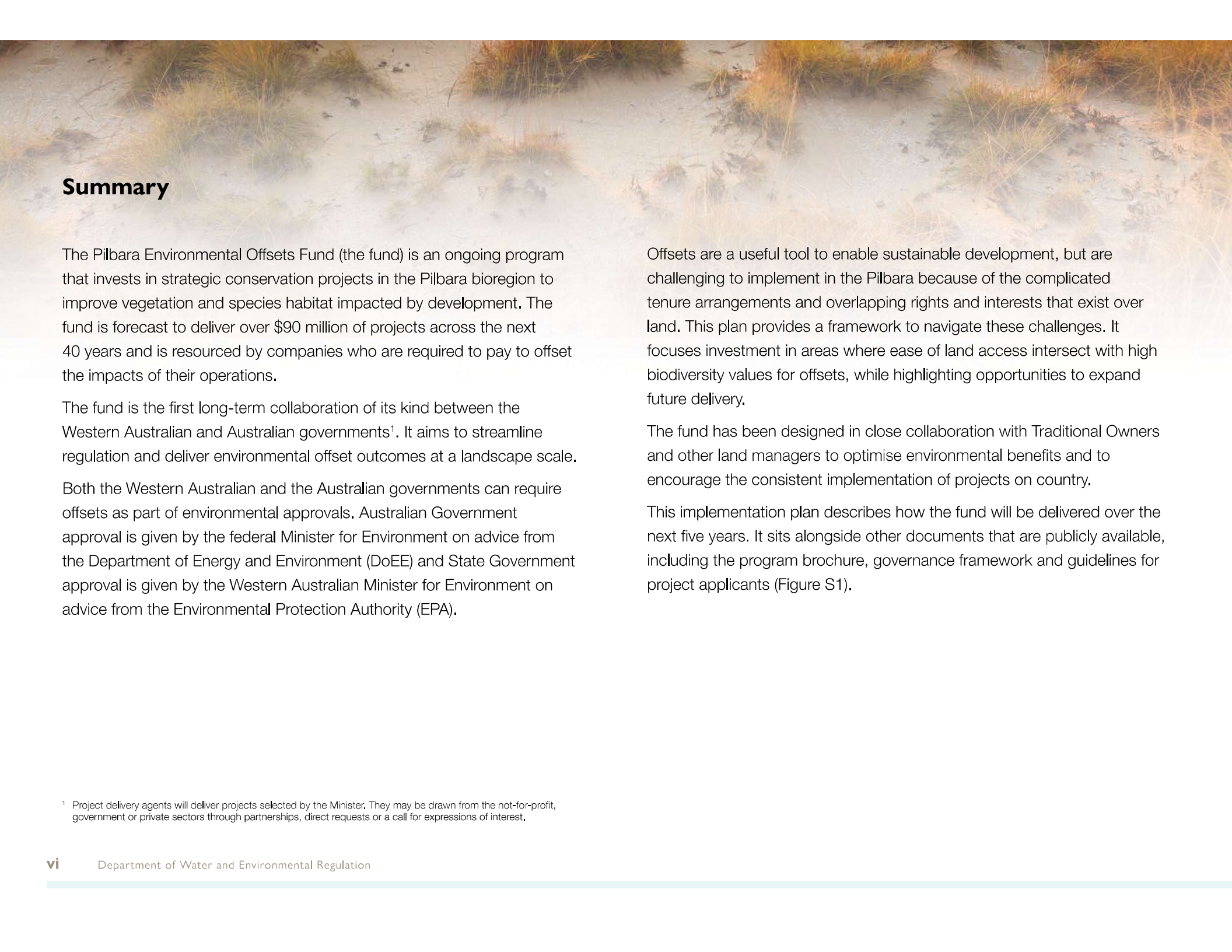
Appendix	31
Appendix 1: How money is receipted to the fund	31
Appendix 2: State and federal offset policies	33
Appendix 3: Project selection criteria	35
Appendix 4: Method to develop priority areas	40
Appendix 5: Pilbara Environmental Offsets Fund evaluation framework	43
Appendix 6: Land tenure and rights to land	50
Definitions	57
References	58
Spatial data citations	60

Figures

Figure S1: Summary of the implementation plan's five chapters	vi
Figure 1: The Pilbara bioregion	4
Figure 2: Governance framework for the Pilbara Environmental Offsets Fund	9
Figure 3: Ease of land access for offsets	19
Figure 4: High-priority areas for offset investment	21
Figure 5: Ease of access and priority environmental matters	22
Figure 6: Adaptive management framework for the Pilbara Environmental Offsets Fund	23
Figure 7: Location of priority environmental matters	37
Figure 8: Areas of constraint for offset preprojects in the Pilbara bioregion	38
Figure 9: Density of survey observations for threatened and priority fauna in the Pilbara bioregion	39
Figure 10: Native title claimant applications and determination areas in the Pilbara bioregion	54
Figure 11: National park and conservation reserves, Aboriginal reserves, unallocated crown land, proposed conservation reserves, other crown reserves and pastoral leases in the Pilbara bioregion	55
Figure 12: Mining tenements (granted and pending) in the Pilbara bioregion	56

Tables

Table 1: Environmental matters for which offsets are conditioned under Part IV of the EP Act as at August 2019	11
Table 2: Environmental matters which relate to EPBC Act offset conditions (MNES)	12
Table 3 : Matrix of overlapping rights and interest to land	18
Table 4: Purpose of six-monthly and annual reporting	27
Table 5: Summary of the annual review process	29
Table 6: Project selection criteria	41
Table 7: Land tenure, lease, tenement and reserves types in the Pilbara IBRA bioregion	52



Summary

The Pilbara Environmental Offsets Fund (the fund) is an ongoing program that invests in strategic conservation projects in the Pilbara bioregion to improve vegetation and species habitat impacted by development. The fund is forecast to deliver over \$90 million of projects across the next 40 years and is resourced by companies who are required to pay to offset the impacts of their operations.

The fund is the first long-term collaboration of its kind between the Western Australian and Australian governments¹. It aims to streamline regulation and deliver environmental offset outcomes at a landscape scale.

Both the Western Australian and the Australian governments can require offsets as part of environmental approvals. Australian Government approval is given by the federal Minister for Environment on advice from the Department of Energy and Environment (DoEE) and State Government approval is given by the Western Australian Minister for Environment on advice from the Environmental Protection Authority (EPA).

Offsets are a useful tool to enable sustainable development, but are challenging to implement in the Pilbara because of the complicated tenure arrangements and overlapping rights and interests that exist over land. This plan provides a framework to navigate these challenges. It focuses investment in areas where ease of land access intersect with high biodiversity values for offsets, while highlighting opportunities to expand future delivery.

The fund has been designed in close collaboration with Traditional Owners and other land managers to optimise environmental benefits and to encourage the consistent implementation of projects on country.

This implementation plan describes how the fund will be delivered over the next five years. It sits alongside other documents that are publicly available, including the program brochure, governance framework and guidelines for project applicants (Figure S1).

¹ Project delivery agents will deliver projects selected by the Minister. They may be drawn from the not-for-profit, government or private sectors through partnerships, direct requests or a call for expressions of interest.

Program brochure

Summary of the fund

Governance framework

Roles and responsibilities

How decisions are made

Reporting requirements

Implementation plan

Five-year strategic framework that guides operation of all aspects of the fund

The priorities for the next five years of investment

Minimum standards for projects and management

Guidelines for applicants

Periodically details priorities for a 'call for projects' that will occur once or more during a five-year period

Information for project proponents for that particular 'call'

Selection criteria

Chapter 1 – Introduction

The Pilbara Environmental Offsets Fund was created to help manage the cumulative impacts of mining development on biodiversity.

In the past, mining companies have found it difficult to access land to implement their on-ground offsets because of the complexities of working on crown land with overlapping pastoral, mining and native title rights. As a result offset projects have not always been connected or delivered where needed most.

The fund was set to up to overcome these challenges by enabling government to work with the mining industry, pastoralists and Traditional Owners to broker land access and deliver enduring outcomes across the landscape.

The success of the fund will be measured by the extent to which it achieves enduring benefits for the vegetation and species habitat (environmental matters) required to be offset, in collaboration with Traditional Owners and other regional land managers.

Figure S1: Public documents relating to the Pilbara Environmental Offsets Fund

Chapter 2 – Scope of the fund

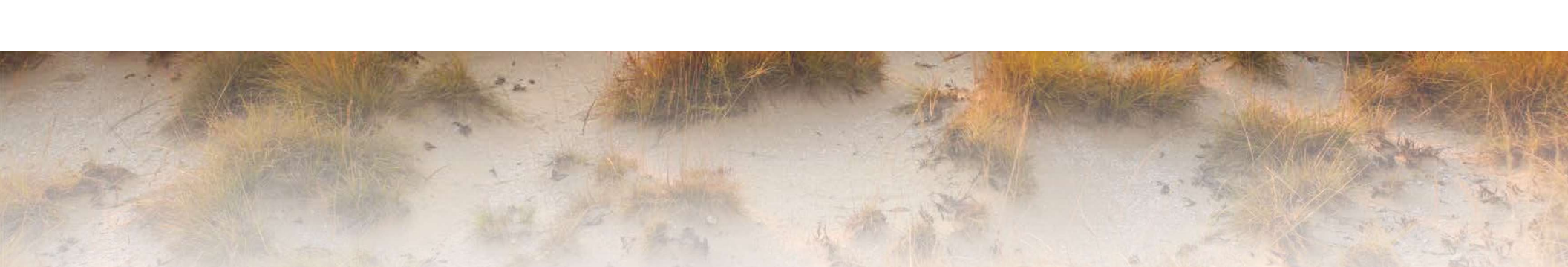
The Department of Water and Environmental Regulation (the department) has developed the fund's governance framework in close consultation with industry, government, the conservation sector and Traditional Owners. It is a transparent framework with clear roles and responsibilities for management and delivery.

The fund is different to a 'normal' natural resource management grant program. Projects to manage weeds, feral animals and fire will still be delivered, but the scope of what is able to be funded is more strict, and guided by principles in the State and commonwealth offset policies. It is important that government demonstrates the outcomes of offset investment within this policy framework so we can deliver on our regulatory obligations.

For example, projects will need to be designed so that outcomes endure in the longer term. In some cases this will require land access agreements to be established which ensure that the offset improvements are not damaged or destroyed in the future. In addition to this, projects will need to lead to tangible improvements to vegetation and/or species habitat and be in addition to what is already required to manage and/or rehabilitate land in the Pilbara.

To deliver cost-effective, landscape-scale outcomes, the department and project delivery agents¹ (organisations that deliver projects) will have ongoing engagement with an implementation advisory group (IAG). The IAG will include representatives from industry, Traditional Owner groups, State Government agencies, natural resource management groups and the Western Australian Biodiversity Science Institute (WABSI). The IAG will also help the department to identify and build on successful programs already being undertaken in the Pilbara.





Chapter 3 – Priorities for investment

The fund will target investment in areas of the Pilbara with a high density of both state and federal² environmental matters, and where there are opportunities for land access and ‘security’ for offset outcomes.

We have identified three priority areas for this five-year implementation plan based on our analysis of biodiversity, land tenure, mining and infrastructure datasets. They include:

- Area 1: Chichester sub-bioregion – area south of Port Hedland centred on the Great Northern Highway.
- Area 2: Hamersley sub-region – area to the far east of the sub-region abutting the North West Coastal Highway.
- Area 3: Fortescue sub-bioregion – the mid Fortescue Valley.

These priority areas are the starting point for the fund, based on the information available. We will focus effort in these areas over the next five years, while progressing opportunities to expand offset delivery in other parts of the Pilbara.

Chapter 4 – Delivering the fund

The fund will be adaptively managed to plan, implement, monitor, evaluate and adjust its delivery over time. The department and the IAG will design the scope of each call for projects and seek applications for projects every one to two years.

The Minister for Environment will select the projects to be funded, and the federal Minister through his/her federal agency will have a role in approving the final recommendations.

State and federal environment agencies will make recommendations on the projects to be funded through the project recommendation group (PRG). This will ensure compliance with federal and state environmental offset policies², conditions of approvals and the *Financial Management Act 2006*.

Planning documents, project and program evaluation reports and advice from the IAG and PRG will be made publicly available on our website –to show the link between offset investment and outcomes for the vegetation and species habitat impacted by development.

² The federal DoEE is already engaging in the PRG and related fund planning to confirm the fund's arrangements will meet federal requirements. Once satisfied, DoEE has confirmed it will recommend the Australian Government execute an MOU with the Western Australian Government by which proponents will be able to acquit their offset obligations at the federal level through payments to the fund.

1.0 Introduction

1.1 Purpose of the fund

The Pilbara Environmental Offsets Fund (the fund) will facilitate the coordinated delivery of environmental offset projects within the Pilbara bioregion of Western Australia (Figure 1).

The fund combines money from individual offset payments required under the *Environmental Protection Act 1986* (WA) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth)² into a special purpose account.

So far, \$90 million has been conditioned for projects anticipated over the next 40 years. This total is likely to grow as more projects are approved. Actual contributions from proponents will depend on the extent of impact to environmental matters over time (e.g. to vegetation and habitat, including Matters of National Environmental Significance).

Combining money from multiple offsets will enable the delivery of larger and more strategic landscape-scale projects than would occur if individual offset projects were delivered independently, leading to better biodiversity conservation outcomes.

Projects will be delivered at different scales, and wherever possible will be overlapping to manage multiple threats:

- *Landscape-scale programs* will address threats such as weeds, feral animals and inappropriate fire regimes across large areas.
- *Priority area programs* will build on the landscape-scale outcomes to further improve and protect species habitat and vegetation in the priority areas identified in Chapter 3.
- *Site-specific projects* will protect and improve specific environmental matters, such as Priority Ecological Communities (PECs) or specific habitat attributes like northern quoll denning habitat.

² The federal DoEE is already engaging in the PRG and related fund planning to confirm the fund's arrangements will meet federal requirements. Once satisfied, DoEE has confirmed it will recommend the Australian Government execute an MOU with the Western Australian Government by which proponents will be able to acquit their offset obligations at the federal level through payments to the fund.

Measures of success

The fund's primary measures of success will be the extent to which:

- environmental matters are improved – to the same or greater value than the development impact being offset
- delivery of the fund aligns with the:
 - environmental offset policies of the Western Australian and Australian governments
 - implementation principles in this plan
 - fund's governance framework.

The fund's secondary measures of success will be how much the offset projects:

- build on successful regional programs
- are co-designed with Traditional Owners, and implemented by Aboriginal people including ranger groups
- are developed in collaboration with other regional stakeholders involved in land management, including lessees, regional natural resource management groups, the State Government, proponents and the community.

The Department of Water and Environmental Regulation (the department) and the Department of Biodiversity, Conservation and Attractions (DBCA), with advice from the fund's IAG, will evaluate the program against the above measures.



1.2 Purpose of this implementation plan

This implementation plan sets the fund's strategic focus for the next five years. It defines:

- what success looks like in delivering the fund
- the environmental matters that need to be improved
- the fund's scope in the context of the environmental offset policies of the Western Australian and Australian governments
- the priority locations where investment will be focused
- the process to plan, implement, monitor, evaluate and improve delivery of projects and the fund over time.

Plan review

The plan will not change in the next five years unless triggered for review:

- after four years to allow for replacement after five years
- if the three-yearly evaluation of the implementation plan triggers it
- if a memorandum of understanding between the Western Australian and Australian governments is not established within 12 months of this plan's release.

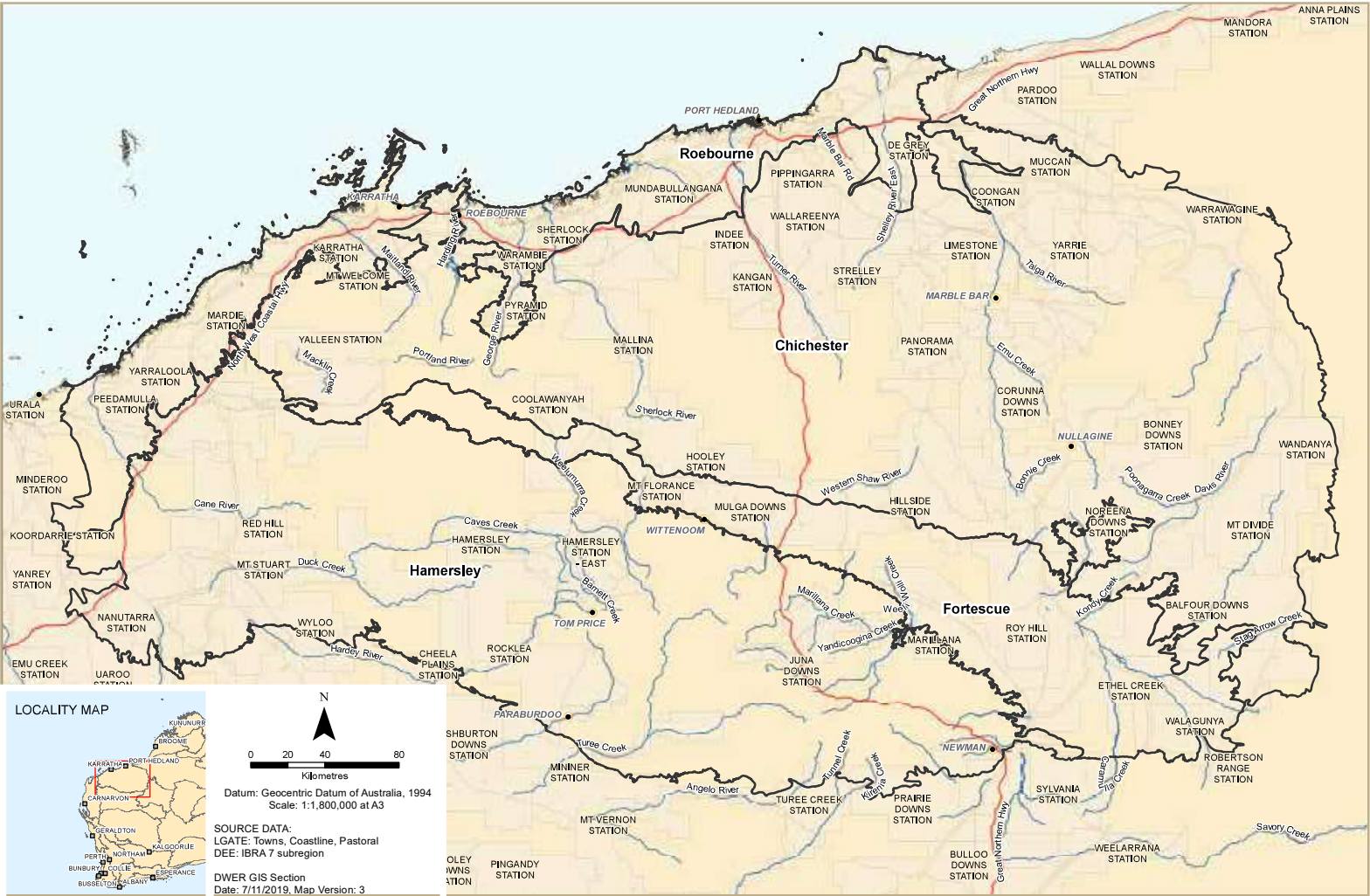
Project register

Each year the department will publish a separate project register to detail the latest:

- environmental matters required to be offset
- area of vegetation and/or habitat authorised to be impacted
- area of vegetation and/or habitat impact
- objectives, performance indicators, threats and strategies to address threats, for each environmental matter
- management actions³ to address threats for multiple environmental matters
- projects being implemented to deliver the management actions.

³ A management action is a specific and measurable action that is undertaken to manage a threat to biodiversity. For example, '20 km of fencing to exclude cattle grazing'.

Figure 1: The Pilbara bioregion



1.3 Background

The Pilbara

The Pilbara bioregion is about 179 000 square kilometres and consists of four subregions: the Fortescue, Hamersley, Chichester and Roebourne⁴.

The region is characterised by ancient and striking landscapes and has many diverse habitats, including mangroves, grassland savannahs, mountain ranges, gorges, wetlands and tropical woodlands. It is an area of very high biodiversity value, possessing high species richness and many endemic flora and fauna species. The bioregion has 150 conservation-significant flora species and the greatest reptile diversity in Western Australia. It is also an international hotspot for subterranean fauna.

The Pilbara also has a rich Aboriginal heritage. The region is home to more than 31 Aboriginal cultural groups and their culture still follows traditional lore patterns, processes and custodian duties. Beliefs that Dreamtime beings – who created the land, control the water and provide food supplies – still exist in the land features, are strongly felt throughout the Pilbara.

Significant deposits of minerals and the processing of liquefied natural gas

have turned the Pilbara into one of Australia's most important regions for mineral wealth, generating about 40 per cent of Western Australia's gross domestic product.

Because of industrial development, the region has been identified as one of 15 national biodiversity hotspots – areas with many endemic species where the levels of stress or future threat are high. While industry is vital to Western Australia's economic progress, its impacts need to be balanced with the conservation of the region's diverse natural environment and exceptional biodiversity.

Environmental offsets

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity that remain after mitigation (including rehabilitation). Offsets are usually undertaken outside of the mining activity area.

The Western Australian environmental offsets framework comprises the environmental offsets policy (2011), guidelines (2014) and register (2013). In Western Australia, environmental offsets are applied to projects subject to environmental impact assessment of significant proposals (Part IV) and as a condition of permits for clearing of native vegetation (Part V) under the Environmental Protection Act 1986 (EP Act). Only approval conditions under Part IV of the EP Act include contributions to the fund.

⁴ The Pilbara bioregion is defined the nationally agreed regionalisation was published in Thackway and Cresswell 1995, *An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves*. The "Pilbara" defined by this categorisation is based on a European classification of common climate, geology, landform, native vegetation and species information. It does not take into consideration Aboriginal cultural heritage values.

The Australian Government applies environmental offsets under Parts 9 and 10 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to protect Matters of National Environmental Significance⁵ (MNES) where these are impacted by a development or activity.

The Western Australian Government requires offsets for a range of environmental values (e.g. wetlands) and the MNES of the Australian Government are a subset of these values. Throughout this report these environmental values and MNES are collectively called ‘environmental matters’. Where there are values that overlap, State Government agencies work cooperatively with those of the Australian Government to avoid duplication in setting offsets.

While environmental and Aboriginal cultural values in the Pilbara are often inextricably linked, the environmental offsets required under both state and federal legislation do not include provisions to offset cultural heritage and therefore there are no ‘matters’ in this fund that relate to cultural heritage.

Why a strategic offsets fund for the Pilbara?

Mining companies have been delivering projects in the Pilbara to meet their environmental offset obligations since 1999. However, implementation of on-ground offset projects has been difficult, because of the complexities of working on crown land with overlapping pastoral, mining and native title rights.

Because of this, past offsets in the Pilbara bioregion have tended to be research-based or undertaken on pastoral leases owned by the mining companies themselves. Offset projects have not always been delivered where needed most.

In 2011, the Western Australian Environmental Offsets Policy was released, which included provisions to combine proponent offset contributions, to deliver more strategic offset outcomes, especially across Western Australia’s rangelands.

In 2012, the Minister for Environment began requiring proponents to pay into a ‘strategic Pilbara conservation initiative’ (now the Pilbara Environmental Offsets Fund) to fulfil their environmental offset obligations, and the federal Minister for the Environment began giving proponents the option to either implement an offset project or pay into the fund. The first proponent required to pay into the fund was the Cloud Break Life of Mine Proposal – approved in February 2012 (Ministerial Statement 899, 2012).

In a report to the Minister for Environment, *Cumulative environmental impacts of development in the Pilbara region* (EPA 2014), the EPA provided further justification for a strategic conservation initiative as a mechanism to pool offset funds to achieve broad scale biodiversity conservation outcomes for the Pilbara.

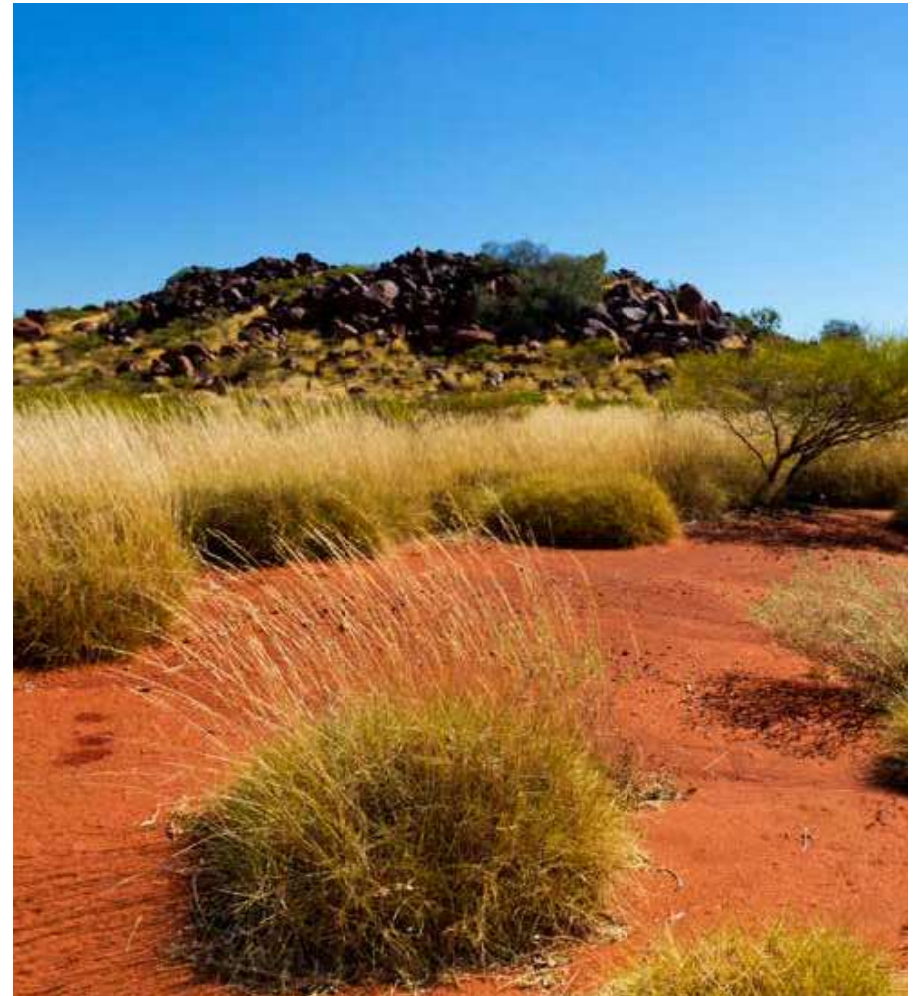
⁵ World heritage properties, national heritage places, wetlands of international importance (listed under the Ramsar Convention), listed threatened species and ecological communities, migratory species protected under international agreements, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions (including uranium mines), and water resources, in relation to coal seam gas and large coal mining development.

The Pilbara Environmental Offsets Fund account was established in 2018 to give effect to the implementation conditions in the Ministerial Statements. The conditions, issued under the EP Act, set out the rate per hectare (ha) that proponents must pay for three sub-regions in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region (Chichester, Fortescue and Hamersley).

These rates are based on impacts to environmental values, including vegetation in good to excellent condition, and habitat for conservation significant species. They are estimated based on our understanding of the cost to rehabilitate the significant residual impacts of mining.

The fund will provide data to enable review of the rates over time, to ensure they are adequate to fund the improvement of environmental matters to the extent required.

Appendix 1 gives further details on how money is receipted to the fund.



2.0 Scope of fund

Projects delivered through the fund must improve environmental matters specified for offset contributions, and align with the fund's governance framework and offset policies of the Western Australian and Australian governments.

2.1 Fund governance

The fund is administered by the chief executive officer of the department, in accordance with the special purpose statement for the account, the *Financial Management Act 2006*, the Financial Management Regulations 2007 and Treasurer's Instructions, and the fund's governance framework dwer.wa.gov.au/peof/governance.

The special purpose statement defines what money can be received and expended from the account. The special purpose account receives offset payments that proponents must make as a condition of approval under Part IV of the EP Act or Part 9 or 10 of the EPBC Act. Payments to the fund are only made through offsets approved under Part 9 or 10 of the EPBC Act¹ and under Part IV of the EP Act for biodiversity⁸. Offsets payable under Part V of the EP Act do not apply to the fund.

Contributions under Part 9 or 10 of the EPBC Act can only be receipted to the fund once the Western Australian and Australian governments have signed a memorandum of understanding which further defines how federal government offsets will be receipted and expended.

The roles and responsibilities for the Minister of Environment, the department and DBCA, the PRG and IAG are summarised in the fund's [governance framework](#) and [terms of reference](#) for the advisory groups dwer.wa.gov.au/peof/governance.



⁸ The Part IV offsets do not include monies required to offset greenhouse gas emissions

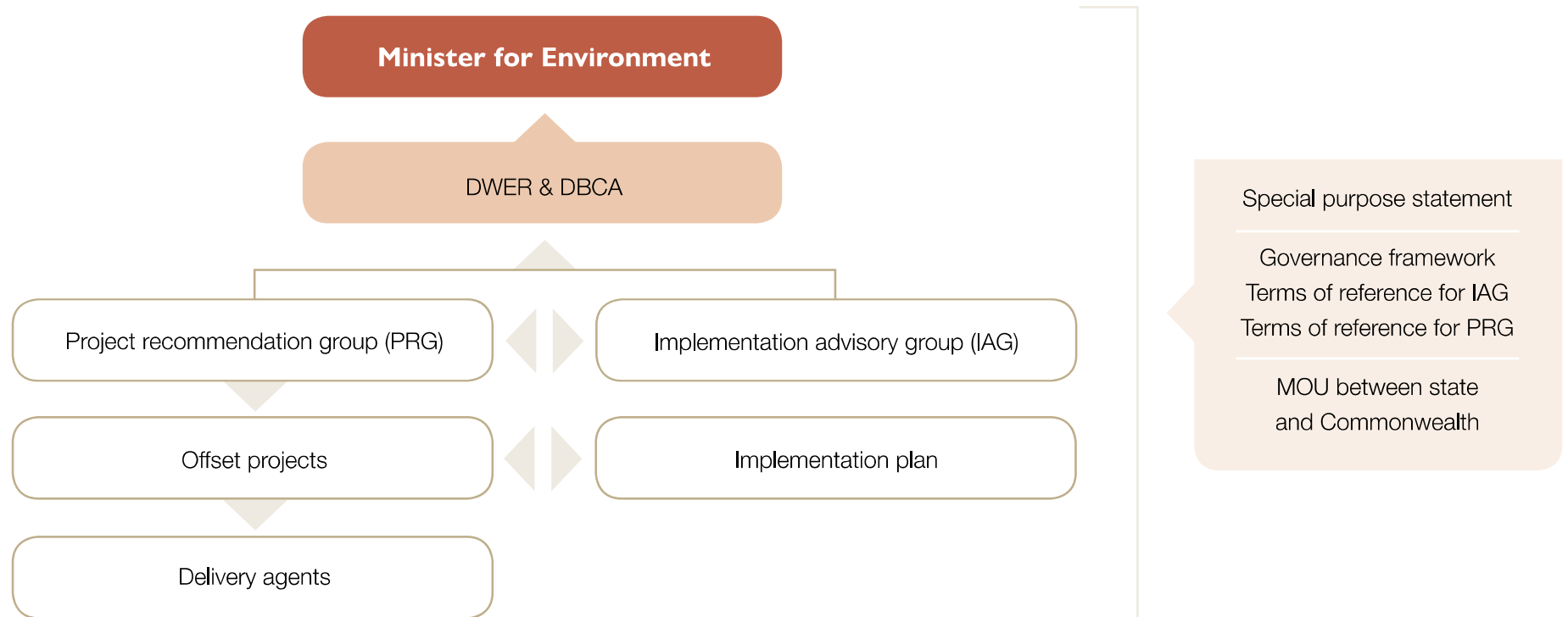


Figure 2: Governance framework for the Pilbara Environmental Offsets Fund.

2.2 Environmental matters

Projects delivered through the fund must improve one or more environmental matters specified for offset contributions. Environmental matters are those for which a significant residual impact has been identified through the environmental impact assessment process.

The environmental matters authorised to be offset so far are summarised in tables 1 and 2.

These were developed using information from the Ministerial Statements, Australian Government decision notices, and supporting environmental reports. New environmental matters will be added to the project register each year and when this plan is revised.

Aligning Western Australian and Australian government conditions relating to the fund

In some instances, the State Government matters in Table 1 and the federal Matters of National Environmental Significance in Table 2 will overlap, so it is not easy to define the area which relates to a specific approval.

Both governments are working together to improve the wording of past and future conditions relating to the fund to avoid duplication, and to streamline the process to invoice for offset contributions.

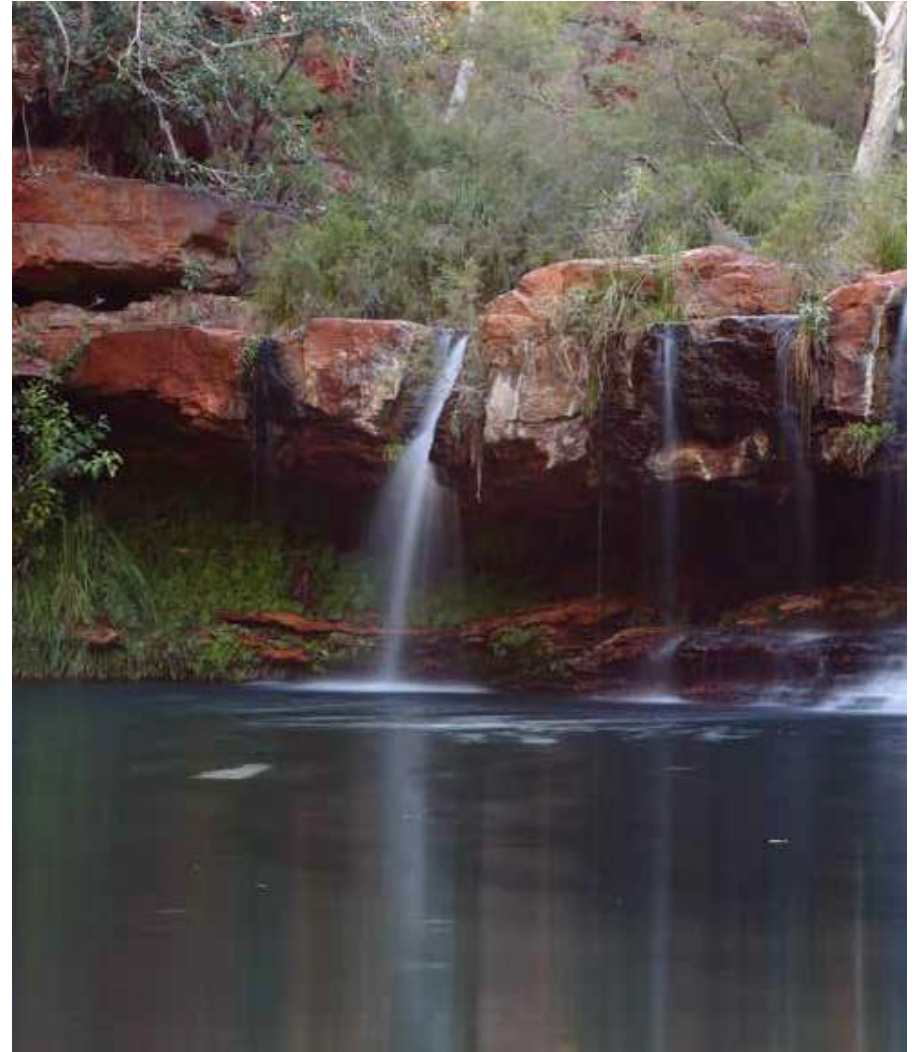


Table 1: Environmental matters for which offset conditions have been applied under Part IV of the EP Act as at August 2019

Environmental matter	Indicative ⁷ sum area for which offsets are required (ha)	Ministerial Statement number
Brockman Iron cracking clay communities of the Hamersley Range PEC	58	925, 1062, 1047
Four plant assemblages of the Wona Land System PEC	32	1006
Proposed Fortescue Marsh Conservation Reserve	3007	899
Fortescue Marsh (Marsh Land System) PEC	146	899, 915, 923, 1047
Fortescue Marsh Management Zone	440	1047
Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (Fortescue Valley Sand Dunes) PEC	6	1047
Ghost bat foraging habitat	9307	1072
Groundwater-dependent vegetation to include coolibah/river red gum – conservation significant vegetation	281	899, 915
Good to excellent vegetation which is also habitat for conservation significant fauna	12 481	999, 1072
Good to excellent vegetation	85 465	915, 923, 924, 925, 944, 947, 960, 993, 1000, 1005, 1006, 1012
Mulga - conservation significant vegetation	3137	899
Northern quoll denning/shelter habitat	50	993, 1006
Northern quoll foraging habitat	631	993
Pilbara leaf-nosed bat foraging habitat and night roosts	6013	993, 999
Pilbara olive python habitat	50	1006, 925
Riparian vegetation	168	1062, 1047

⁷ Based on information detailed in Ministerial Statements, Approval Decisions and supporting environmental reports.

Table 2: Environmental matters which relate to EPBC Act offset conditions (MNES)

– Australian Government conditions give proponents the option to undertake an activity or pay an equivalent to the fund

Matters of National Environmental Significance (MNES)	Commonwealth decision notice number
Ghost bat foraging habitat	Mining Area C
Northern quoll denning/shelter habitat	2014/7275
Northern quoll foraging habitat	2010/5696, 2011/6152, 2012/6391, 2012/6689, 2012/6423, 2015-7420, 2013-7055, 2014/7275
Pilbara leaf-nosed bat foraging habitat and night roosts	2011/6152, 2012/6391, 2012/6689, 2012/6423, 2014/7275
Pilbara olive python	2011/6152, 2012/6391, 2012/6689, 2012/6423, 2015/7420, 2014/7275
Greater bilby habitat	2010/569, 2015/742, 2013/7055
Night parrot habitat	2010/5696, 2013/7055
Greater bilby	2010/569, 2015/742, 2013/7055

2.3 Policy principles

The offset policies of both the Western Australian and Australian governments define the principles that guide implementation of their respective environmental offsets (DWER 2011, DoEE 2012) (Appendix 2).

The six policy principles listed below do not replace or contradict the policies of either jurisdiction but detail how they will apply to the fund. This helps project applicants to understand what projects will be supported for investment.

Relevant and proportionate

The fund must improve environmental matters by a value that is equal to or greater than the impact approved to be offset. The condition of species habitat and vegetation should become good to excellent. This should ideally occur in the same sub-region as where the impact occurred.

The implementation conditions in Ministerial Statements, in most cases, define the maximum area that can be impacted and the proportion of that impact which is subject to an environmental offset payment.

Cost-effective

Proponents must design offset projects to create value for money, leading to tangible, on-ground benefits. They must also have a high chance of success. Contributions under the EP Act can be spent on:

- environmental offset projects located in the Pilbara IBRA region which counterbalance the residual impacts to environmental matters
- administering the fund
- monitoring, reporting and evaluating the fund's performance.

At this stage, offset contributions specified under the EPBC Act can only be spent on projects, monitoring, reporting and evaluation.

A memorandum of understanding between the Western Australian and Australian governments will further detail how federal government offsets will be administered and reported.

Strategic and landscape scale

The program should be strategic with an emphasis on landscape-scale outcomes to:

- deliver projects that are linked and integrated across the Pilbara bioregion
- enable threats such as weeds, fire and feral animals to be addressed more cost-effectively at an appropriate scale
- build on existing successful regional programs (e.g. State Government conservation initiatives, current biosecurity management programs and ranger groups) to increase the conservation outcomes of offset activities.

Tangible improvement

Projects must lead to a tangible and measurable improvement to the environmental matters required to be offset. Of the environmental offset projects delivered through the fund, about 90 per cent will have an 'on-ground' focus and 10 per cent will have a 'research' focus.

Projects with an 'on-ground' focus may include:

- revegetation (re-establishment of native vegetation in degraded areas)
- rehabilitation (repair of ecosystem processes and management of weeds, disease or feral animals), which may include (but not be limited to):
 - weed management
 - management of inappropriate fire regimes
 - management of introduced species
 - management of total grazing pressure, including grazing by introduced herbivores
- restoration of species and their habitat (e.g. re-introduction, building of habitat structures)
- protection of high-value vegetation and habitat where it complements areas targeted for rehabilitation and revegetation
- activities that support design of successful offset projects, such as mapping of vegetation and habitat.

Monitoring, evaluation and reporting of project outputs and outcomes will be included in the delivery of all projects.

Projects with a 'research' focus may include (but not be limited to):

- testing new and innovative approaches to manage threats and conserve biodiversity to add value to the outcomes of on-ground management
- filling gaps in understanding the best strategies and management actions to address threats to environmental matters
- research that adds to the understanding of the environmental value being impacted.

Research projects nested within broader projects are preferred to create a focus on how the research improves management, rather than research projects with a purely academic focus.

Offsets that will not be implemented through the fund include:

- the development and writing of:
 - threatened species plans
 - conservation estate management plans
 - healthy country plans
- research that does not have a direct link to an on-ground outcome that improves an environmental matter
- trials, research and monitoring for best-practice rehabilitation as part of mine closure

- standalone training or capability building (training and capacity building may be funded if it is part of a broader on-ground project)
- establishment of an organisation or group.

Additional to what is already required to manage biodiversity

Activities approved by the fund must be additional to those that are already required to manage or rehabilitate land.

This includes:

- Conditions of approval under Part IV or V of the EP Act and/or Parts 9 and 10 of the EPBC Act (e.g. conditions which require proponents to manage their impacts during mine operation, rehabilitation and closure).
- Leases as defined under the *Land Administration Act 1997* (LA Act). For example, lessees must not cause, or permit contamination, pollution or environmental harm.
- Mining tenements as defined under the *Mining Act 1978* (M Act).
- Management of the conservation estate under the *Conservation and Land Management Act 1984* (CALM Act).
- Management of pests under the *Biosecurity and Agricultural Management Act 2007* (BAM Act). For example, land managers are required to manage the impact and spread of classified pests already present in Western Australia.

Enduring and secure in the longer term

The outcomes of offset projects should endure for as long as possible - ideally for at least 20 years. The likelihood of an offset being long term and enduring is largely determined by the:

- The rights and interests to land and whether they are consistent with the endurance of an offset.
- Resourcing of ongoing activities that maintain the environmental offset.
- The nature of agreements with land managers and eligible interest holders that secure offsets in the longer term. The agreements that can be put in place to 'secure' offsets largely fall into two categories:
 - Contracts: which are tenure-blind and provide security through commercial law.
 - Memorials, caveats and covenants: which allow third parties to register an interest on crown land without changing the tenure. In most cases these require landholder consent. Ownership of the land remains with the primary landholder, but the third party's rights are formally recognised.

The greatest security for offsets will result from land tenure change as it redefines both the land use and the landholder to match the intent of biodiversity offsets. Tenure change carries significant procedural requirements under various legislation including the *Land Administration Act 1997 (WA)*, the *Native Title Act 1993 (Cth)*, the *Mining Act 1978 (WA)* and the *Environmental Protection Act 1986 (WA)*.

Offset projects will be delivered where they are least likely to be impacted or degraded later on. However, if a new development proposal impacts an environmental offset, then this will be taken into consideration as part of the environmental impact assessment and approval process.



2.4 Designing offset outcomes to endure in the longer term

The biggest challenge to achieving landscape-scale offset benefits through the fund will be the extent to which the state government – working with industry, natural resource management groups and Traditional Owners – can access land with overlapping mining, pastoral and native title interests to deliver enduring outcomes for offsets.

The matrix (Table 3) and map (Figure 3) below display the different combination of rights and interests to land that apply in the Pilbara bioregion. The combinations have been coloured to represent ease of access for on-ground offset projects.

Land access, in combination with the types of agreements that apply to land to prevent destruction or degradation of an offset (e.g. contracts, caveats, covenants), define how ‘secure’ different areas may be for offsets. This information will be used by the department, IAG and delivery agents to design projects with a high chance of success and progress options to improve security for offsets.

Future work to improve security for offsets

As this is the first strategic fund of its kind in Western Australia, options to provide security for offset outcomes have not yet been fully explored. The State Government will be consulting with industry, natural resource management groups, and Traditional Owners to progress options to improve security for offsets.

Options to progress security for offsets may include:

- tenure conversion
- management of part or all of pastoral leases for biodiversity conservation
- identifying areas of mining lease where offsets would be viable – for example areas already mined where resources have been exhausted
- identifying opportunities through other government policies and initiatives, including carbon farming
- identifying areas where development impacts should be avoided to inform environmental impact assessment
- using Indigenous land use agreements which align with environmental offsets to provide non-statutory protection, such as Commonwealth Indigenous Protected Areas or Indigenous Land Use (ILUA) agreements.

International Union of Conservation of Nature (IUCN) guidelines recognise: “Indigenous ownership and the customary laws, institutions and traditional land management practices of Indigenous communities as mechanisms that can deliver protected area management and respond to any of the management objectives of the IUCN categories.” (IUCN 2019).

Table 3: Matrix of overlapping rights and interest to land. The different combinations are coloured based on our current understanding of ease of access.

Tenure types		Class A reserve, conservation park, national park and nature reserve	Unallocated crown land	Other crown reserves ¹	Pastoral leases
Overlapping rights and interests	Infrastructure ²				
	State agreement				
	Mining lease				
	Mining licence				
	N/exclusive native title				
	Exclusive native title	N/A			N/A

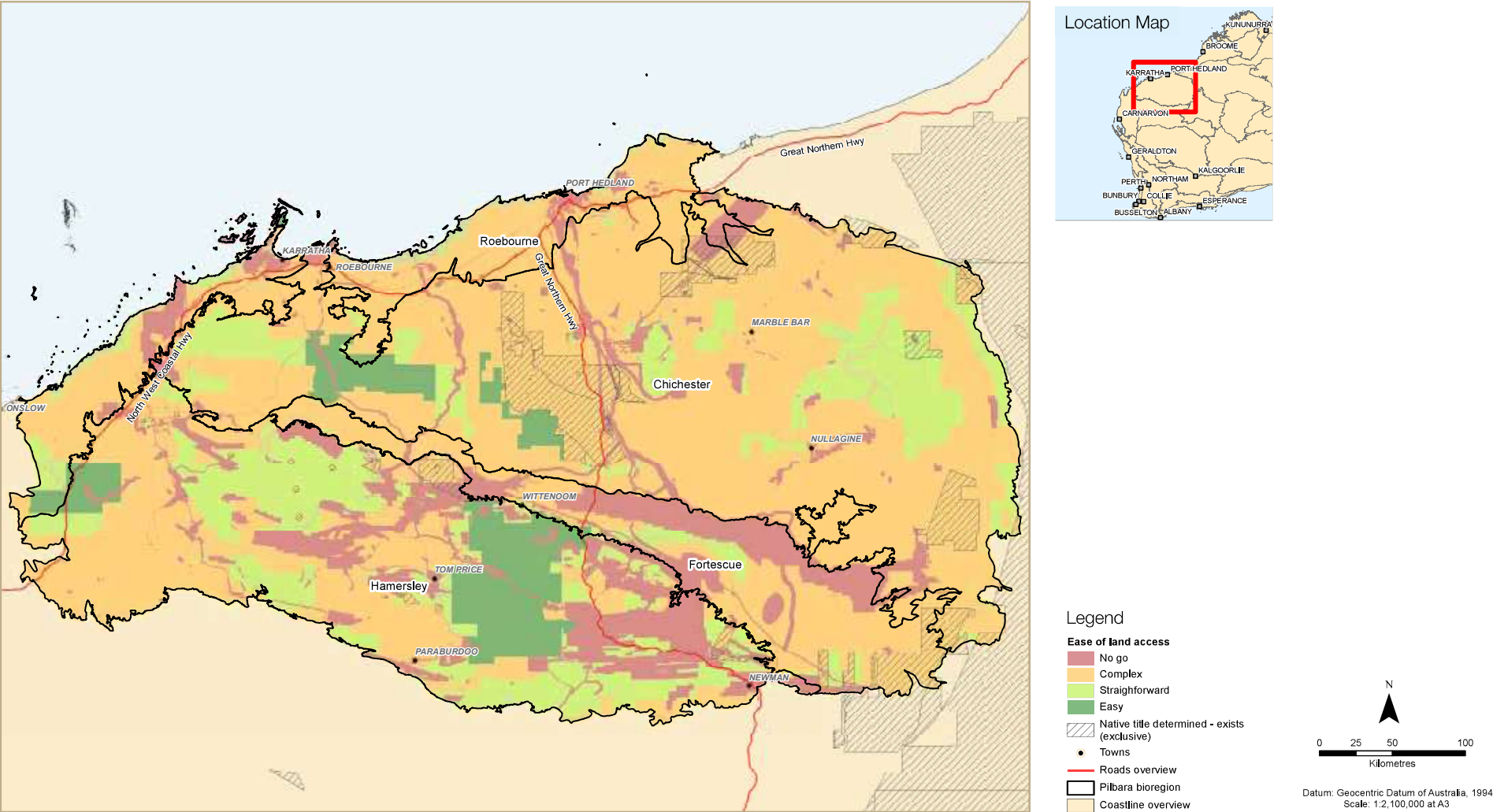
¹ For water protection, research, the use of Aboriginal people etc.

² Roads, rail, borefields, towns

The different combinations of land tenure and rights and interests are coloured based on the following:

- red - 'no go' areas.
- orange - complex but still feasible.
- light green - relatively straightforward.
- dark green - easiest to access at this stage.

Figure 3: Ease of land access for offsets



3.0 Priorities for investment

The priority areas in Figure 4 show where offset investment will be focused over the next five years. They represent locations where projects are most likely to benefit multiple environmental matters in proximity to one another, based on the data currently available.

Locations of priority environmental matters are overlain on the ease-of-access map in Figure 5 to show where high-value areas for environmental matters (the red and orange dots) intersect with areas of least constraint (areas shaded green).

This information will guide the design of offset projects so they are cost-effective and have a high chance of success.

Priority areas include:

- Area 1: Chichester sub-bioregion – area south of Port Hedland centred on the Great Northern Highway.
- Area 2: Hamersley sub-region – area to the far east of the sub-region abutting the North West Coastal Highway.
- Area 3: Fortescue sub-bioregion – the mid Fortescue Valley.

We developed the areas using the best-available information from statewide datasets and advice from stakeholders. They are a starting point, and will be updated as new information becomes available, including data from the Index of Biodiversity Surveys for Assessments (IBSA).

We are also collating datasets that represent the work of other natural resource management programs in the region (e.g. research, weed, feral animal, other offset projects) to inform the ongoing design and delivery of projects through the fund.

Our method to collate, analyse and represent the spatial information for the priority areas is summarised in Appendix 3.

Figure 4: High-priority areas for offset investment

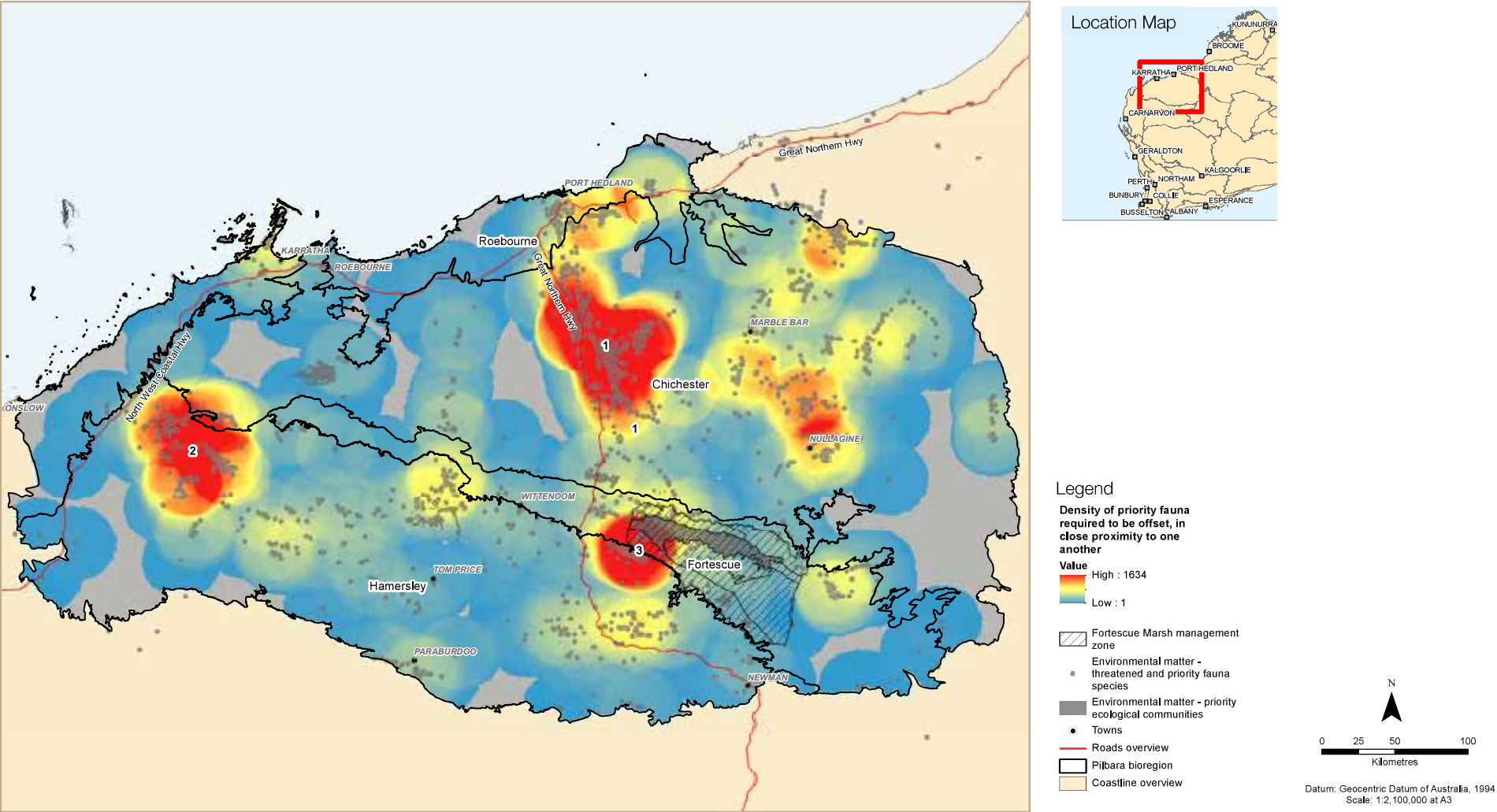
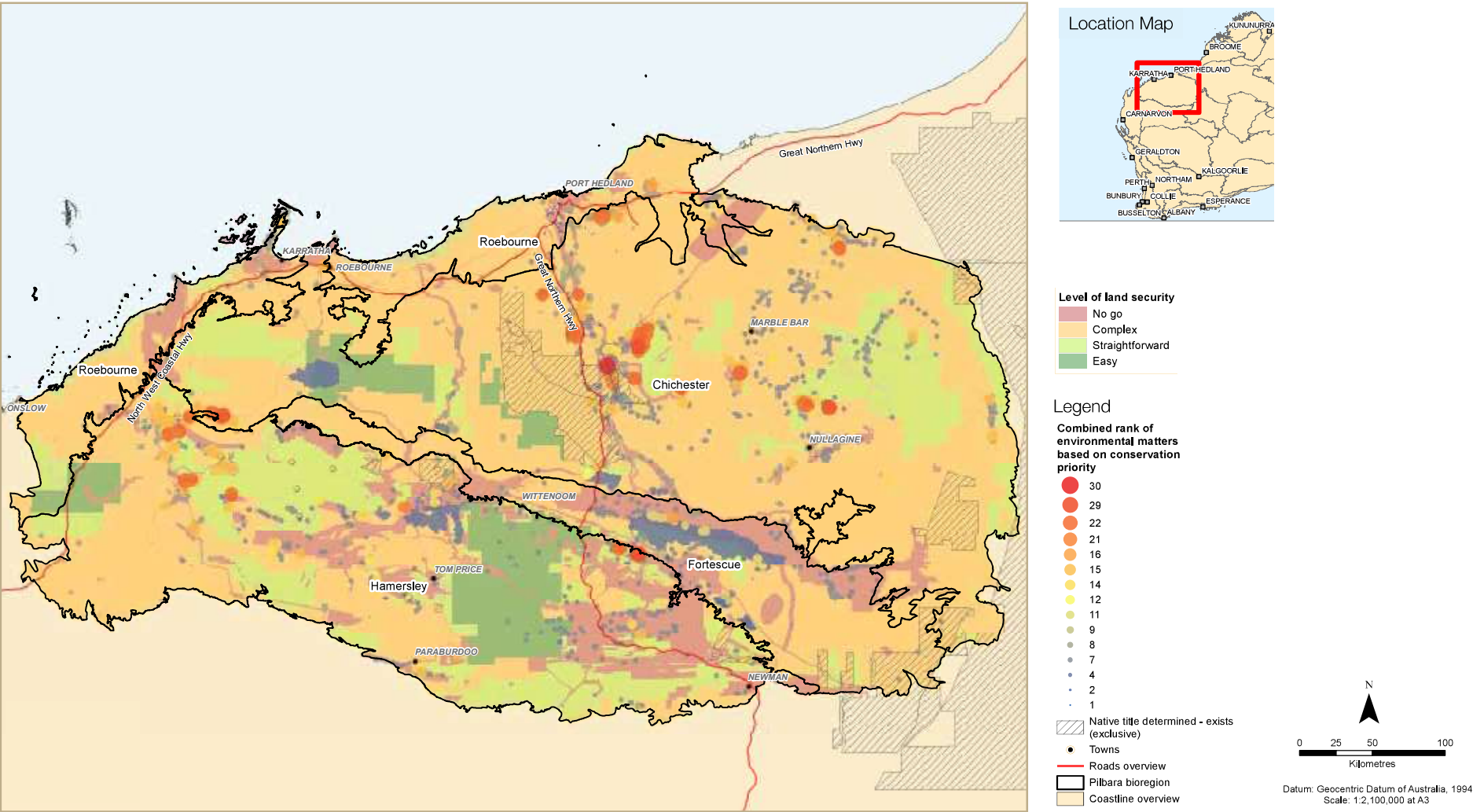


Figure 5: Ease of access and priority environmental matters



4.0 Delivering the fund

The fund will be adaptively managed to plan, implement, monitor, evaluate and adjust its delivery over time (Figure 6). The approach is consistent with the Open Standards for Conservation, see cmp-openstandards.org/.

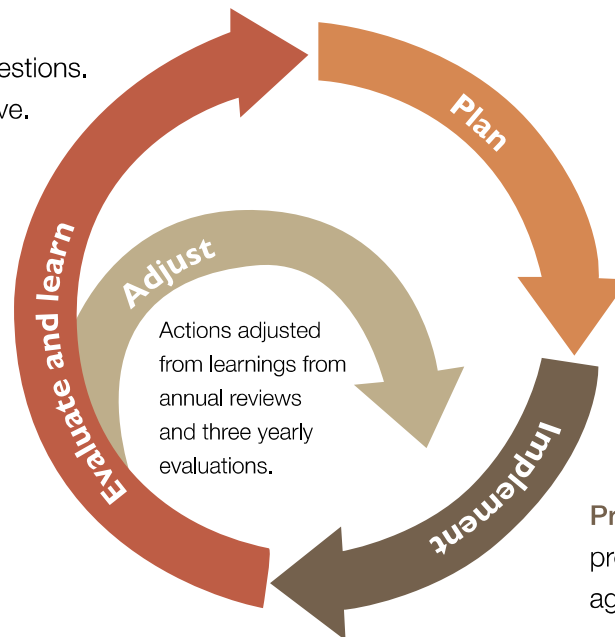
The department and DCBA, with advice from the IAG, will define the desired outcomes for each environmental matter for the longer term and each funding round. We will put out a guideline for applicants with each grant round and projects will be selected based on the selection criteria in Appendix 4.

Three-yearly external evaluation

- Assess the program against the key evaluation questions.
- Identify unintended outcomes, negative and positive.
- Cross region and cross issue learning.

Annual review process and report provides:

- Review of method and assumptions to develop management actions.
- Cross region and cross issue learning.



From the planning phase a project register will be produced which will include:

- A summary of the environmental matters and area (ha) of impact.
- Objectives and performance indicators for each environmental matter.
- Management actions.

Project plans

provide a clear link to the project register, project logic, project monitoring, reporting and evaluation.

Project six-monthly reporting

provides project accountability and an aggregation of activities/outputs completed.

Figure 6: Adaptive management framework for the Pilbara Environmental Offsets Fund.

4.1 Planning delivery of the fund

Roles and responsibilities

The department will define the total area of authorised and actual impact for each environmental matter and, with advice from the IAG define the desired outcomes for each environmental matter and the program evaluation framework (Appendix 5).

Project applicants and the department will design projects with advice from the IAG and other government departments as necessary.

Project design

The approach to design projects that the fund invests in will be tailored based on the complexity of delivery and the information available.

In some instances, where there is sufficient information, we will request applications for projects that have been pre-designed with input from the IAG.

In other cases, we will request project applicants take the lead to design projects, as they are more likely to have access to the most current information and have practical experience to leverage existing programs and design projects with a high a chance of success.

Either way, the logic of how a project will deliver required outcomes for environmental matters will need to be made explicit in a 'project logic' or 'results chain' in the project plan. This will enable assumptions to be challenged during refinement of project design and allow the project to be properly evaluated once complete.

Specific and measurable objectives for the project should be defined for annual and three-yearly timeframes. The outcomes of a project at a 10-year timeframe will also need to be defined because real change at a landscape scale for conservation and restoration projects may take many years, especially in highly variable, spatially heterogeneous and episodic environments like the Pilbara.

Where there are substantial gaps in knowledge about the best strategies and management actions to address threats to environmental matters, then 'informing' projects will be required to ensure that projects have a high chance of success. A higher proportion of 'informing' projects is expected in the early stages of the fund's delivery to create a solid foundation for future on-ground activities.

The design of projects should, wherever possible, build on successful regional programs, planning and research, including:

- the *Pilbara conservation strategy* (DBCA 2017)
- the *Pilbara catchment action plan* (Pilbara Corridors 2017)
- species recovery plans
- the existing environmental offset projects of mining companies
- ecologically sustainable rangeland management plans
- state government (e.g. DBCA, DPIRD) and non-state government programs to manage fire, weeds and feral animals
- *Priority threat management for Pilbara species of conservation significance* (CSIRO 2014).

Priority threats to biodiversity conservation in the Pilbara, identified through existing investigations (CSIRO 2014; Pilbara Corridors 2016), include:

- total grazing pressure from feral herbivores (e.g. cows, donkeys and camels)
- inappropriate fire regimes
- introduced predators (e.g. cats, foxes, dogs, cane toads)
- invasive plants (e.g. *Mesquite*, *Parkinsonia*, kapok, ruby dock, *Passiflora*, aquatic weeds)
- changes in hydrological regime
- mining and infrastructure development.



4.2 Implementing projects

Roles and responsibilities

The department will seek project applications by:

- developing guidelines for project proponents which define the:
 - outcome sought for environmental matters in each funding round
 - project selection criteria for the fund (Appendix 4)
 - evidence that must be provided to support a project application
- publicly advertising and/or requesting quotes from not-for-profit, government or private sectors to implement projects either annually or biennially
- holding information sessions in Perth and the Pilbara to explain the process to apply for projects and be notified of the outcome, and to encourage collaborative project design.

The department will manage and administer projects by:

- entering into contracts with project proponents to deliver against the accepted project plan
- supporting project proponents to get access to land and security for offsets

- entering into agreements with parties with rights and interests to land where offset activities are to take place (where necessary)
- managing an online portal to capture project reporting data
- evaluating project success, with advice from the PRG and IAG.

Project proponents will:

- be invited to regional information sessions or workshops to clarify requirements and foster collaborative project design
- submit project plans that address project selection criteria and are supported by project logic
- submit six-monthly project reporting on project milestones and annual reports.

The PRG will:

- assess project plans against selection criteria (Appendix 4) and recommend projects to be funded to the Minister for Environment
- provide advice on six-monthly and annual progress reports and whether projects can continue, be adjusted or discontinued.

Project reporting

Project proponents must report against agreed activities and outputs from their project plan every six months, as well as submit an annual progress report to the department via a public online portal (Table 4). The portal will capture the location of the activity and quantify project activities and outputs.

The portal will provide a link between on-ground outputs and the objectives for each environmental matter.

Indicators and measures will be defined in the portal that best capture monitoring and reporting data related to management actions. Where possible, this will include creation of data that can be used across reporting tools like MERIT. The Australian Government's Monitoring, Evaluation, Reporting and Improvement Tool (MERIT) – developed for the National Landcare Program – has activities and measures detailed in a schema. This will be used as a starting point and enables data to be fed back into regional, state and national data collection and monitoring programs if required.

Table 4: Purpose of six-monthly and annual reporting

Purpose	Audience	What information will be provided
• Accountability of projects against deliverables	• Department project staff	• Project data
• Incremental monitoring of activity against project register	• PRG	• Quantitative data to enable assessment of actual vs planned activity in the project register
	• Loaded into online portal	• Spatial data/maps to provide an overview of where activities have been carried out

4.3. Evaluating success of projects and the program

The fund's evaluation framework connects the project and program monitoring, reporting and evaluation. Evaluation of the fund will question whether:

- environmental matters can and are being improved to the extent required
- the program is being delivered consistent environmental offset policies of the Western Australian and Australian governments
- delivery of the fund is consistent with the fund's governance framework
- delivery of the fund builds on successful programs already underway, and with regional stakeholders including ranger groups.

The key evaluation questions, performance indicators and data sources that will be used to evaluate the fund's success are summarised in the evaluation framework (Appendix 5).



Roles and responsibilities

The department and DBCA, with advice from the PRG and IAG, are responsible for:

- coordinating the collection of data to support program monitoring
- undertaking an annual review of the project register
- developing annual financial reports
- providing reports to the Office of the Auditor General as required
- undertaking an initial, midterm review of operation of the fund to check it is being delivered in accordance with state and commonwealth offset policies and the governance framework.
- evaluating the implementation plan every three years with advice from the IAG taking into consideration:
 - objectives, performance indicators and monitoring data
 - project evaluation reports
 - case studies and stakeholder feedback.

The department will publish the project register on our website each year and the implementation plan evaluation report every four years.

Annual review of the project register

Ensuring that learnings from the program are fed back into its delivery will be important, particularly in the first few years. The annual reviews provide an opportunity to support this adaptive management approach and will include:

- review of progress against the register of projects with advice from the IAG and invited experts
- where appropriate, workshops to bring together project proponents to discuss progress, lessons learned and incorporate latest knowledge
- a rapid review to check whether the management framework for the fund is effective, adequately resourced, and complies with the governance framework.

This process will encourage learning to inform adaptive management. We will manage this internally (see Table 5).

Table 5: Summary of the annual review process

Purpose	Audience	What information will be provided
• Continual improvement through: - challenging assumptions on how best to improve environmental matters - sharing lessons learned across project proponents - assessment of actual against planned activity in the project register.	• Full report to: - DWER project staff - IAG - project proponents • Summary to: - DWER and DBCA DGs - DoEE - EPA - proponents that have paid to offset their environmental impacts - Minister for Environment.	• Summary of actual vs planned activity. • Map showing all reported activity. • Summary of method used to define management actions. • Summary of fund management performance.

Three-yearly program evaluation

Evaluation of the implementation plan will be completed by the third year of the five-year implementation plan cycle based on the evaluation framework in Appendix 5. This will assess whether the fund's outcomes and objectives are being delivered, and inform adaptive management of the fund.

In preparing the evaluation report, the department, DBCA and the IAG will:

- consider project evaluation reports
- consider annual financial reports from the department
- identify and evaluate whether the implementation plan achieved its stated objectives during the three-year period
- identify whether the fund was managed in accordance with the governance framework
- make recommendations on how the subsequent implementation plan should be revised
- prepare an implementation plan evaluation report.

Program monitoring

The program monitoring requirements will be developed once the objectives and performance indicators for each environmental matter have been defined. The program monitoring will provide data and information to assess objectives for each environmental matter at priority area and landscape scale, and include (but not be limited to):

- vegetation condition – remote sensing and on-ground surveys
- habitat and species surveys including abundance or occupancy and/or changes in survivorship
- mapping of weeds, fire regime, and presence/absence of introduced predators and feral herbivores.



Appendix 1:

How money is receipted to the fund

Impact Reconciliation procedures and reports

The actual area of impacts relating to each environmental matter will be defined based on the Impact Reconciliation Procedure (IRP) and biennial Impact Reconciliation Reports (IRR) submitted by proponents.

An IRP advises the chief executive officer (CEO) of the Department of Water and Environmental Regulation on the methodology that will be used to calculate the area of vegetation cleared (or the area of clearance of any other environmental values listed in the implementation conditions).

An IRP is to be submitted prior to the commencement of ground-disturbing activities and usually only once for a proposal, unless the proponent requests or the CEO requires this document to be updated. Once approved by the CEO, the IRP will be published on the Western Australian Environmental Offsets Register offsetsregister.wa.gov.au.

IRRs must usually be submitted biennially once an IRP is approved. The purpose of the IRR is to advise the CEO on the amount of clearing that has been undertaken within each year of the biennial reporting period. The IRR defines the amount to be invoiced for areas cleared and/or impacted during the biennial reporting period. In some instances, the conditions for conservation of significant fauna habitat will relate to multiple species. Where it is a requirement, proponents will submit impact data relating to each species in their reconciliation reports.

Pilbara Environmental Offset Fund rates

The amount invoiced will be based on the rate/ha set for each sub-region in the Pilbara bioregion, adjusted for consumer price index (CPI).

The rates are set based on impact to environmental values with a:

- Base rate for impacts to only native vegetation in good to excellent condition⁸, which includes impacts to fauna habitat (including threatened fauna).
- Higher rate for impacts to other important or some types of specialised environmental values. Examples of these types of values are listed in the Residual Impact Significance Model in the *WA environmental offsets guidelines*, and may include impacts to riparian vegetation, Priority Ecological Communities, important vegetation types, and specialised fauna habitat (DWER 2011).
- Case-by-case rate where there are impacts to particularly significant or sensitive environmental values that do not suit a standardised value. This may include values such as reserves, threatened or Priority Ecological Communities, threatened and priority species or ecological communities, locally endemic species or associated with a restricted habitat type, species with a restricted distribution, wetlands and significant landforms. (EPA 2016).

The rates for each sub-region in the Pilbara and information on how the rates are set are available on our website dwer.wa.gov.au/peof/.

⁸ Good to excellent condition – as defined in Environmental Protection Authority 2016, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, EPA, Western Australia, or any subsequent revisions of this guide.

Appendix 2:

State and federal offset policies

This table summarises the offset policies of the Western Australian and Australian governments.

WA offset policy principles
Environmental offsets will: • only be considered after avoidance and mitigation options have been pursued • be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted • be based on sound environmental information and knowledge • be applied within a framework of adaptive management • be focused on longer-term strategic outcomes • are not appropriate for all projects.
Commonwealth offset policy principles
Suitable offsets must: • deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action • be built around direct offsets but may include other compensatory measures • be in proportion to the level of statutory protection that applies to the protected matter • be of a size and scale proportionate to the residual impacts on the protected matter • effectively account for and manage the risks of the offset not succeeding • be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action) • be efficient, effective, timely, transparent, scientifically robust and reasonable • have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. In assessing the suitability of an offset, Western Australian Government decision-making will be: • informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty • conducted in a consistent and transparent manner.

Offset policies explained in the context of the Pilbara Environmental Offset Fund

Offset projects must be:

Relevant and proportionate:

- Environmental matters are improved – to the same or greater value than the development impact being offset.
- The improvement of species habitat and vegetation should, ideally, occur in the same sub-region as where the impact occurred.

Cost effective:

- Offset projects must be designed to create value for money and have a high chance of success.
- Delivery of the program must focus on tangible, on-ground benefits for environmental matters.

Strategic and landscape scale:

- The program should be designed so it is strategic and has landscape-scale outcomes. It should be linked and integrated, build on other successful regional programs, and be delivered at the scale appropriate to the threat being addressed.

Enduring and secure in the longer term:

- The outcomes of offset projects should be designed to endure for as long as possible, ideally for at least 20 years.
- The department will enter into agreements with parties with interests and rights to land where appropriate, to define the arrangements to guarantee offset security and longevity. The scope of agreements will depend on the degree to which environmental offset projects align with, or affect rights and interests to land.

Tangible:

- Environmental matters must be tangibly improved and lead to a measurable improvement to vegetation and/or habitat.
- Of the environmental offset projects delivered through the fund, approximately 90 per cent will have an on-ground focus and 10 per cent will have a research focus.

Additional to legislative obligations:

- Environmental offset projects must be in addition to activities already required as a condition of approval or lease, or a legislative requirement.



Appendix 3:

Method to develop priority areas

High-value areas for environmental matters

The Department of Water and Environmental Regulation has analysed statewide datasets to inform the planning and management of offsets deployed through the Pilbara Environmental Offsets Fund.

The environmental matters specified for offset into the fund (up to February 2018) were extracted from Threatened and Priority Fauna (DBCA 2019) and Threatened and Priority Ecological Communities (DBCA 2019), and used to identify priority focus areas for the initial phase of offset projects.

Within each 1 km by 1 km area within the Pilbara bioregion, environmental matters were analysed according to their location, species presence and conservation priority. The cumulative rank of these attributes in each 1 km by 1 km area was summed to highlight areas where projects would be expected to achieve offset value (Figure 8).

Not all environmental matters could be captured through the use of these statewide datasets. The Wona Land System is not represented in its entirety as it is not yet available as part of the Threatened and Priority Ecological Communities (DBCA 2019) dataset. Good to excellent vegetation, the environmental matter most impacted under the EP Act, has also not been represented as no datasets currently exist that represent vegetation type or quality for the extent of the Pilbara bioregion.

The priority areas identified as significant for environmental matter presence were then further analysed using neighbourhood analysis to weight the locations of interest by their distance, or ‘closeness’ to other surrounding locations of interest. This analysis formulated the three boundaries identified as focus areas for offset projects.

The mapping focuses on datasets that are complete and region-wide, to illustrate a consistent and objective distribution of environmental matters across the entire Pilbara bioregion. This approach endeavours to reduce the potential bias to any specific environmental matter or location within the region. The density of data available to represent and rank environmental matters is shown in Figure 10.

The resulting priority area map (Figure 5) identifies areas of environmental priority by both conservation significance and proximity to other environmental matter locations.

Areas constrained for offsets

Several features constrain land access and ‘security’ for offsets. The list of statewide features that have been initially identified as ‘no-go’ areas for offset projects include:

- building infrastructure (built structures and towns) (LGATE 2019)
- project development and activity areas for mines (DWER 2019)
- mining lease, mineral lease and general purpose lease (current and pending) tenements (DMIRS 2019)
- State Agreements (DMIRS 2017)
- petroleum pipelines (DMIRS 2019)
- railway corridors (DMIRS 2019)
- road corridors (LGATE 2019)
- 3C hazardous/industrial waste priority sites (DPLH 2019).

The resulting ‘no go’ constraint map (Figure 9) was used as an input to develop the land access categories in Table 3.

Figure 7: Location of priority environmental matters

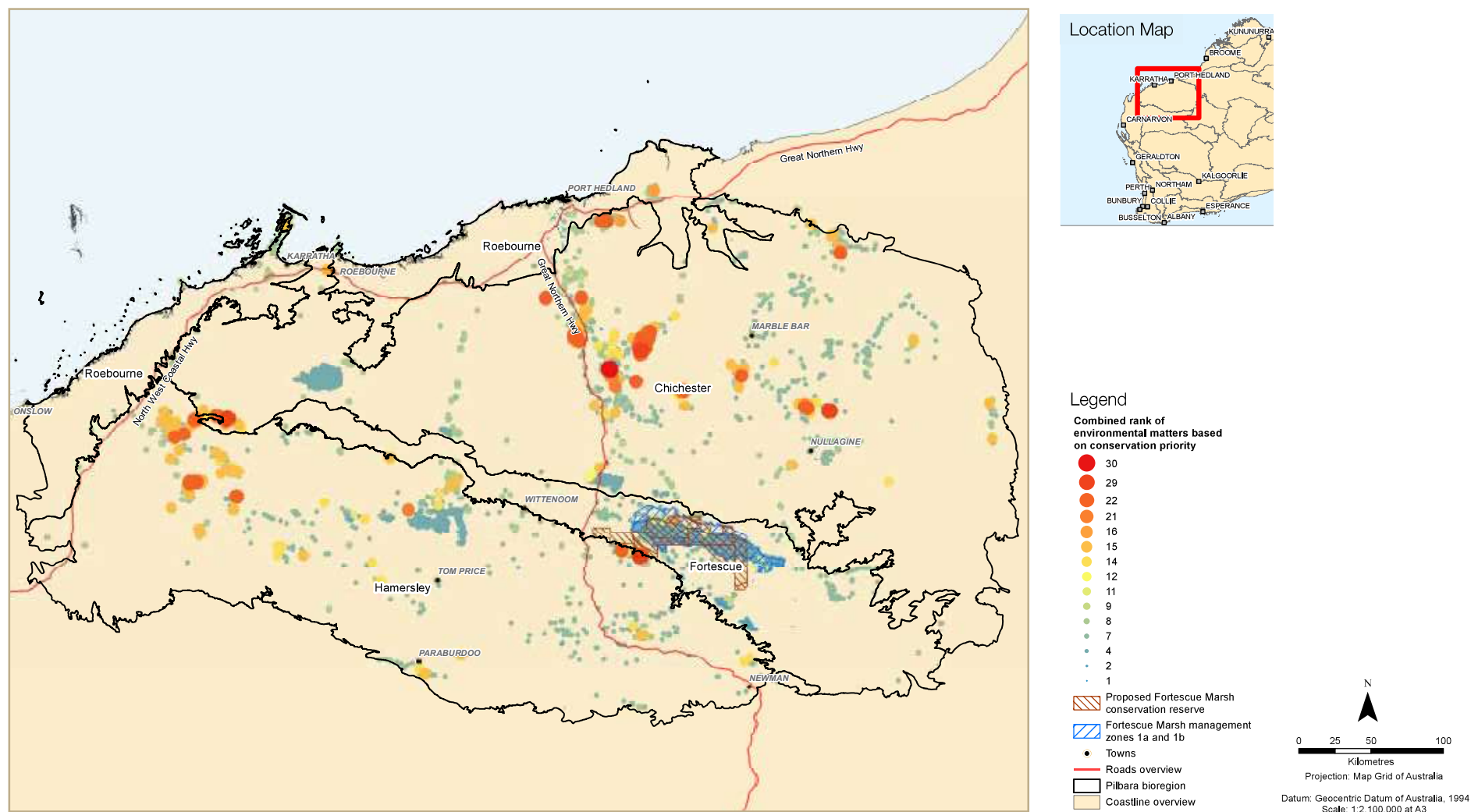


Figure 8: Areas of constraint for offset projects in the Pilbara bioregion

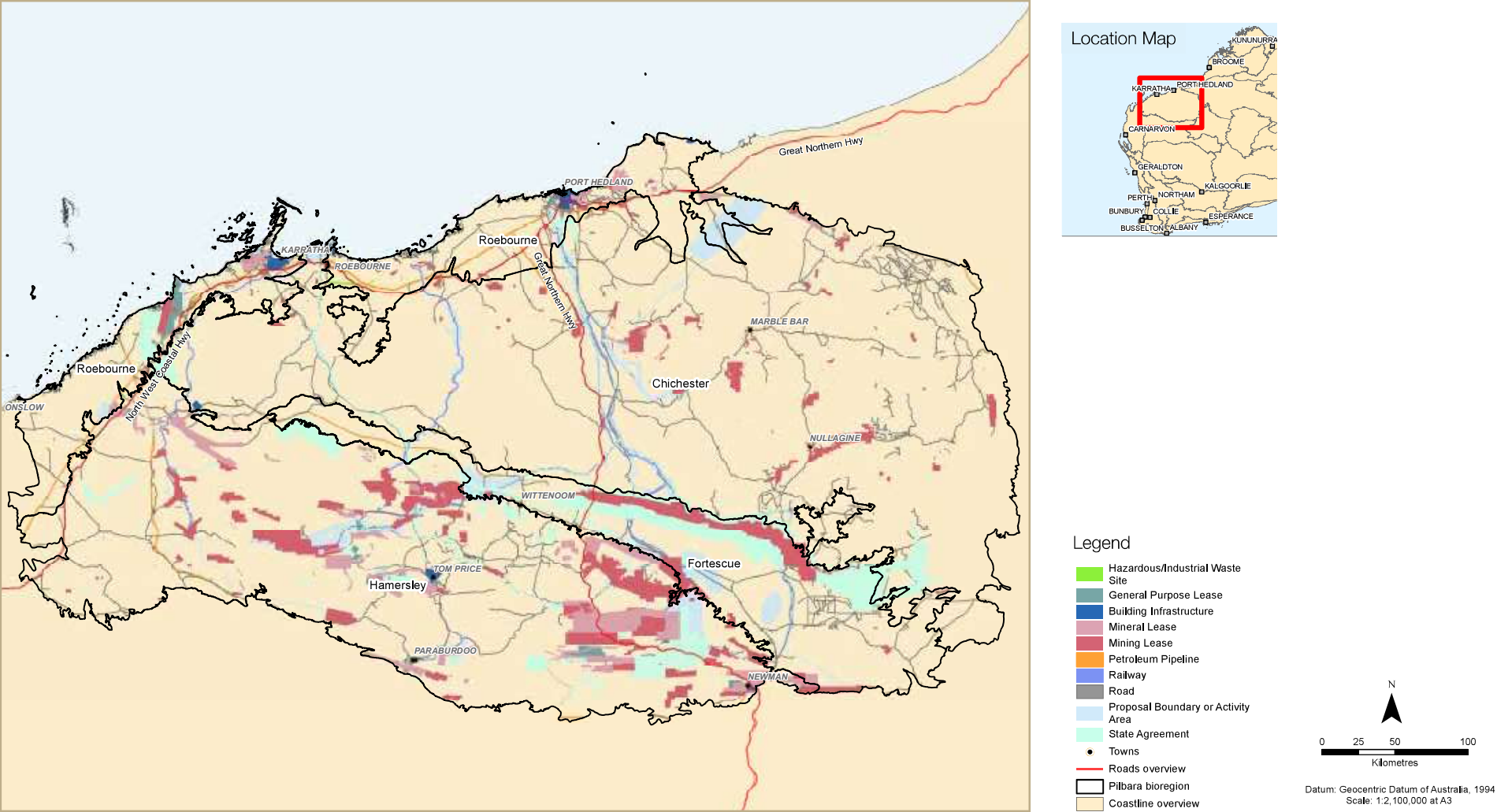
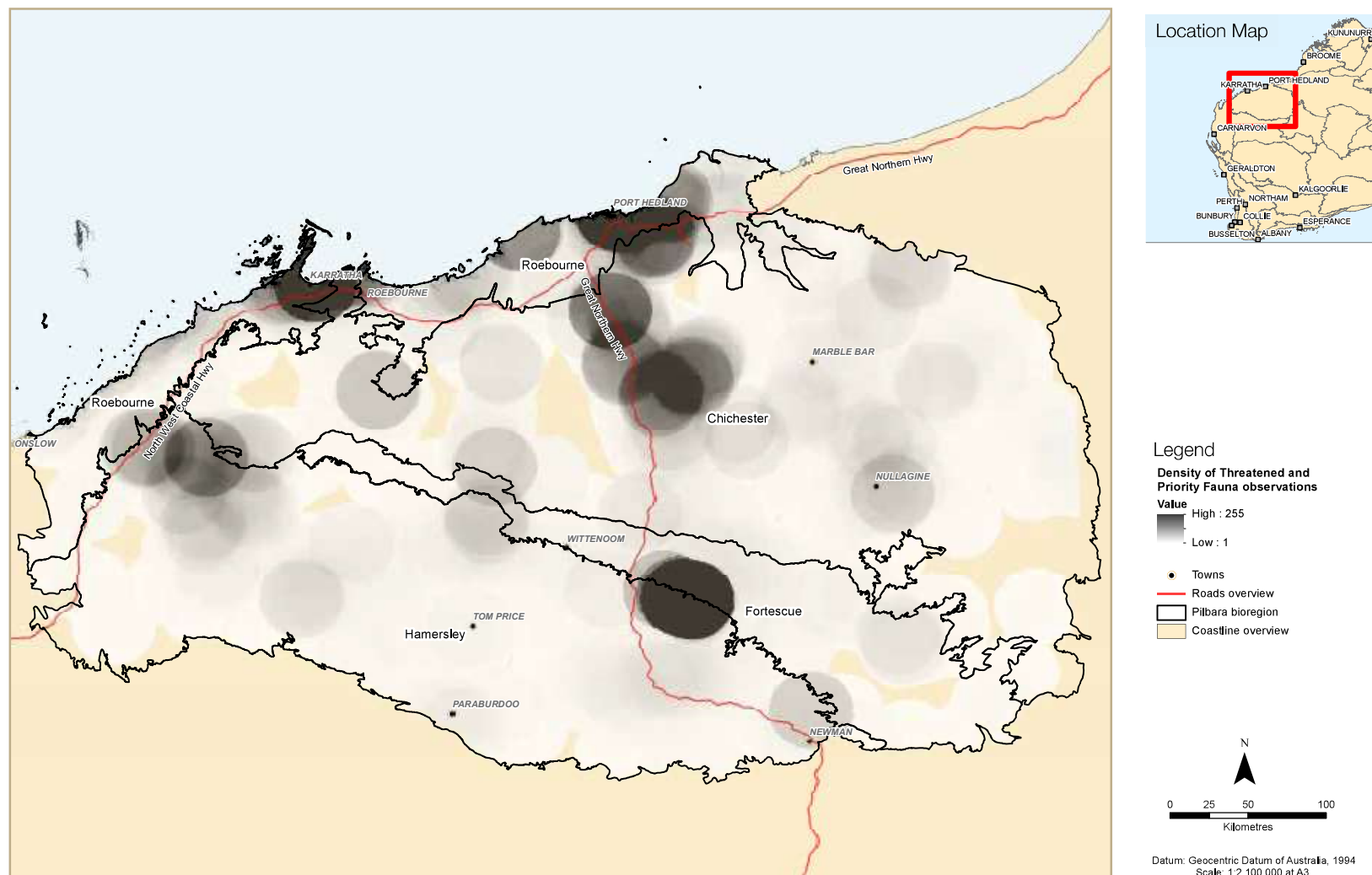


Figure 9: Density of survey observations for threatened and priority fauna in the Pilbara bioregion





Appendix 4: Project selection criteria

The Department of Water and Environmental Regulation will release a guidance for projects as part of each round of project funding. We will run regional information sessions to explain the project selection criteria and process to submit applications for funding and to support the collaborative design of projects.

In most instances, the process to seek project plans will be staged to promote collaboration, leverage against existing successful regional programs, and establish the viability of projects before they are fully funded. Staging project applications will be particularly important when offset projects are proposed in areas involving multiple stakeholders with rights and interest to land.

Table 6: Project selection criteria

Projects must: (primary fund outcomes)
• Improve at least one of the environmental matters listed in the project register to the Pilbara Environmental Offset Fund's implementation plan. • Be designed to align with the offset principles of the Western Australian and Australian governments and the implementation principles in Chapter 2 so that the outcomes of projects: • tangibly and measurably improve environmental matters • are value for money and have a high chance of success • are strategic and have landscape-scale outcomes where achievable • are long term and enduring (ideally outcomes will endure for at least 20 years) – in some cases this will require agreements to be established between the department and parties with interests or rights to the land • are additional to activities that are already required as a condition of approval or lease or a legislative requirement.
Projects should: (secondary fund outcomes)
• Benefit multiple environmental matters (as per Table 1) and other species of conservation significance. Projects that address matters with high conservation status will be given priority. • Be connected to other areas of conservation significance and/or create corridors across the landscape. • Be guided by the high-priority areas for environmental matters and the land access mapping. Where practicable, these datasets will be made accessible to project proponents. • Build on successful programs already underway to improve environmental matters. The department will support project proponents to identify regional programs already underway. • Be co-designed and co-delivered with Traditional Owners, and implemented wherever possible with Aboriginal people and ranger groups. This includes aligning offset projects with healthy country plans and including Aboriginal people as part of project development and site visits. • Be developed in collaboration with other regional stakeholders involved in land management, including lessees, regional natural resource management groups, state government agencies, not-for-profit and community organisations. • Provide regional employment outcomes including opportunities for Traditional Owners and inclusion of local knowledge and expertise.

Once the viability of a project is established against the outcomes listed above, applicants will need to:

1. Prepare a project plan that outlines, at a minimum:

- a) Project title.
- b) Project objectives and intended outcomes.
- c) Description of area and management actions to be undertaken. Actions may be staged to reflect the order of information required and to take into consideration time required to establish land access and security arrangements.
- d) Description of leverage of in-kind and/or monetary support.
- e) Timelines and milestones, including the timelines to establish agreements for land access and offset longevity.
- f) Specific and measurable project success criteria.
- g) Monitoring to assess project success, building on other regional programs and methods, e.g. WARMS, AusPlots, and/or EPA guidelines.
- h) Risks to project delivery, and contingency measures.
- i) Stakeholders that have been consulted as part of development of the project plan, what their views are and how these have been addressed. The project plan should identify what approvals and notifications will need to be in place to enable land access and longevity for the outcomes of the project.
- j) Checklist summarising how a project is consistent with the implementation principles (e.g. value for money; provides landscape-scale outcomes; is secure, additional and direct).
- k) Risks to implementing project consistent with implementation principles and contingency measures.
- l) Promotion, publicity, publication and data ownership arrangements, aligning with the specifications in the fund's governance framework.
- m) Reporting and finances required for the project.
- n) Qualifications and previous performance to deliver projects.

2. If successful, enter into a contract with the chief executive officer of the Department of Water and Environmental Regulation which complies with the State Government procurement policy (http://www.finance.wa.gov.au/cms/State_Supply_Commission/Procurement_Policy/Procurement_Policy.aspx) and the Aboriginal procurement policy (https://www.finance.wa.gov.au/cms/Government_Policies/Aboriginal_Procurement_Policy.aspx) to contract projects

3. Upload reporting data to an online portal

Project proponents must report to the department against agreed activities and outputs in their project management plan via an online portal that is publicly available. This includes a six-monthly and annual report in a form specified in the project contract(s) that enables the department and the IAG to track progress against the milestones in the project plan.

Appendix 5:

Indicative Pilbara Environmental Offsets Fund evaluation framework

Timeframe	Summary (explaining the objectives)	Outcome/impact (Evaluation questions)	Indicators (how to measure the achievements)
Long-term outcomes (10+ years)	Primary outcomes - Outcomes are being met for the cumulative area of impact for each environmental matter. - Activities have led to a discernible difference in the landscape. - Program has met offset policy requirements.	To what extent have cumulative environmental matters been met? - Are mangement action targets being met? - What impact are we seeing at a landscape scale (Priority Area scale)?	Preliminary (as per implementation plan): - Predicted % outcomes met as per results chains for cumulative environmental matter and associated key threats. Program evaluation: - Actual % outcomes met as per results chains for cumulative environmental matter and associated key threats (compare with predicted; were results chains valid?). % activities completed (summarising from projects).
		Has the program met the expectations set out in the state and Commonwealth policy? For example, is it: - Relevant (equivalent)? - Proportionate? - Additional? - Permanent (enduring, enforceable, longer term)? - Timely?	Preliminary (as per implementation plan): - Tangible and on-ground, including consideration of: - like-for-like (gains of the same kind of species, habitats, ecosystems or ecological functions as those impacted) - proximity (how close to original SRI, geographic distance) - likelihood of success (what is the chance of it working? Is success possible?) - effectiveness (demonstrated logic or results chain to show how activities will affect environmental matter and relevant threats). - Proportionate? - effectiveness (how big will be impact be? + 5 Northern Quolls or + 1000 Northern Quolls) - geographic scope (how big an area will be affected?). - Additional? (Will the program achieve conservation outcomes above and beyond results that would have occurred if the program had not taken place?) - Permanent? (Enduring, enforceable, longer term) - duration of positive impact against development impact and predicted long term 'net impact'. - Timely? Degree of alignment of positive impact against development (negative) impact.

Means of verification (how to collect the information for the indicators)	Process evaluation Questions and data sources
• Results chains review at program level (annual; expert panel with IAG). • Full program evaluation (combined meta-analysis of Priority Area evaluations; three-yearly). • Project register summarising delivered outputs from projects.	Is the program being delivered in line with government policy and the governance structure? • Transparent and accountable fund administration, documentation and communication. • Cost efficiency, including leverage opportunities. • Effective performance evaluation and continual improvement, informed by sound science, including an appropriate consideration of traditional knowledge. • Clear roles and responsibilities. Evaluation method:
• Project plans, six-monthly and annual project reports. • Project evaluations.	• Ongoing review of three-yearly (the first one will be after two years of the fund operating and then every three years after that) process evaluations with the plan evaluations – are issues and recommendations being implemented?

Timeframe	Summary (explaining the objectives)	Outcome/impact (Evaluation questions)	Indicators (how to measure the achievements)
	Secondary outcomes	What environmental co-benefits have been achieved?	Preliminary (as per implementation plan): - Predicted % outcomes met as per results chains for each environmental matter. Program evaluation: - Actual % outcomes met as per results chains for cumulative environmental matter (compare with predicted; were results chains valid?). - Quantification/documentation of unforeseen benefits.
		Has the program contributed to social co-benefits, particularly local jobs?	- Increase/decrease of environmental/agricultural business in Pilbara region. - Increase/decrease of people employed in environmental/agricultural industry in Pilbara region. - Increase/decrease of Indigenous people employed/working on country. - Number of projects involving two or more organisations.
Short / medium-term outcomes (3 – 10 years)	Outputs and short-term outcomes are being met for each cumulative environmental matter as determined by results chains	To what extent have cumulative environmental matters been improved? - Have cumulative environmental matters been addressed? To what extent? - Have threats been addressed? To what extent? - Have relevant management actions been undertaken? To what extent? - Has the program achieved synergy or co-benefit for environmental matters? Are the assumptions in the results chains for each asset correct? (Are we seeing the impact that we expected?)	Preliminary (as per implementation plan): - Environmental matters (specific targets/assets) to be addressed and relevant metrics – e.g. ha, number of habitats (e.g. caves), populations, individuals. - Threats to be addressed and relevant metrics – e.g. ha, frequency, populations, individuals. - Management actions to be undertaken. - Assessment of activities of benefit to multiple cumulative environmental matter. - Roll-up of explanation/justification for sum of proposed actions? Monitoring (post project; roll-up of project outputs) - Cumulative environmental matters (specific targets/assets) addressed and relevant metrics – e.g. ha, number of habitats (e.g. caves), populations, individuals. - Threats addressed and relevant metrics – e.g. ha, frequency, populations, individuals. - Management actions undertaken. - Assessment of activities benefiting multiple cumulative environmental matter.

Means of verification (how to collect the information for the indicators)	Process evaluation Questions and data sources
• Methodology to be informed through program design. • Remote sensing framework likely to be useful.	
• ABS Statistics and program procurement statistics. • ABS Statistics, project management plans and three yearly evaluations including case studies. • Program/project management plans. Three-year evaluation including case studies. • Program/project management plans. Three-year evaluation including case studies.	
• Results chains review for Priority areas and themes (annual, expert panel with IAG?).	Is the program being delivered in line with defined principles and governance structure? • Transparent and accountable fund administration. • Cost efficiency, including leverage opportunities. • Effective performance evaluation and continual improvement. • Clear roles and responsibilities. Is the program adhering to relevant policies and guidelines? Has the program followed adaptive management principles in terms of process and delivery? Is the program being delivered effectively and in line with good management processes?
• Monitoring/survey info from projects (synthesis of project data using MERI fields).	Evaluation method: Three-yearly external evaluation drawing on information including but not limited to: • Financial reports. • Organisational charts, TORs and minutes. • Results chains from design team. • Project plans. • Project evaluation reports. • Case studies. • Stakeholder feedback (qualitative).

Timeframe	Summary (explaining the objectives)	Outcome/impact (Evaluation questions)	Indicators (how to measure the achievements)
		Has the program met the expectations set out in the state and Commonwealth guidelines? • Relevant. • Proportionate. • Additionality. • Permanence (enduring, enforceable, longer term). • Timeliness.	Preliminary (as per implementation plan): • Relevant – tangible link between proposed offset project/activity(s) and the cumulative environmental matter, including consideration of: - like-for-like (gains of the same kind of species, habitats, ecosystems or ecological functions as those impacted) - proximity (how close to original SRI, geographic distance?) - likelihood of success (what is the chance of it working? Is success possible?) - effectiveness (demonstrated logic or results chain to show how activities will affect cumulative environmental matter and relevant threats). • Proportionate? - effectiveness (how big will be impact be? + 5 northern quolls or +1000 northern quolls) - geographic scope (how big an area will be affected?). • Additional? (Will the program achieve conservation outcomes above and beyond results that would have occurred if the program had not taken place?) • Permanent? (Enduring, enforceable, longer term) - duration of positive impact against development (negative) impact and predicted long term 'net impact'. • Timely? (Degree of alignment of positive impact against development (negative) impact?)
	Projects in Priority Areas are generating social co-benefits.	Has the program delivered local jobs and achieved social co-benefits?	Preliminary (as per implementation plan): • # of proposed projects. • % of proposed projects to be contracted to local orgs. • % of proposed projects to be contracted to Indigenous orgs. • # of cross-sector partners on proposed projects (as per project proposals). Evaluation (post project): • # of projects successfully executed. • % of projects contracted to local orgs. • % of projects contracted to Indigenous orgs. • # of cross-sector partners on projects.

Means of verification (how to collect the information for the indicators)	Process evaluation Questions and data sources
• Collation of proposed project information from project plans.	• Results chains from design team. • Project plans. • Project evaluation reports. • Case studies. • Stakeholder feedback (qualitative).
• Collation of ACTUAL project information (standard dataset as per agreed indicators).	
• Collation of actual project information (standard dataset as per agreed indicators).	

Activities and Outputs Data Collection			
Activities of program	Outputs	Data collected	Evaluation Question that the data feeds into
Program design - Area of impact for each environmental matter aggregated - Priority Areas are mapped and documented - Results chains for assets/combined assets are developed and tested - Management actions for Priority Areas are assigned	- Cumulative environmental matters summary table - Priority area map - Results chains - Cumulative environmental matter summary table (Table 1 & 2)	- Cumulative environmental matter summary table - Maps - Documentation of process # results chains - Documentation of process - Cumulative environmental matter summary (Table 1 and 2, updated each year)	- All outcome questions - All outcome questions - Process evaluation - All outcome questions - Process evaluation - All outcome questions - Short/med-term outcome questions - Short/med-term social co-benefit questions
Project development & contracting - Projects are designed - Projects are assessed and contracted	Project plans	# project plans # project extents mapped # cross-sector partnerships planned - Activities planned	
Projects are delivered and report Projects report on activities and outputs as per project plans	- Projects contracted # activities/outputs - Projects completed and acquitted	# Projects contracted - Assessment process documented # contracts awarded to local organisations # contracts awarded to Indigenous organisations - Activity data (via reporting tool) - Project acquittal statistics (on time, on budget) - Lessons learned - Qualitative data – written report on impact of project	- Process Evaluation - Short/med-term social co-benefit questions

Appendix 6:

Land tenure and rights to land

Rights and interest to land in the Pilbara bioregion

Figures 10, 11 and 12 show the land tenure and rights to land that apply in the Pilbara bioregion.

Native title

Understanding native title rights and interests to land in the Pilbara bioregion is important to support engagement of Aboriginal people in regard to co-design of projects, negotiation to enable land access, and to develop agreements to provide security for environmental offset outcomes.

Native title as defined under the Commonwealth *Native Title Act 1993* (NT Act) has been recognised across most of the Pilbara bioregion (see Figure 14), and exists over all tenure, lease and tenement types listed in Table 7.

Proposed actions or developments that affect native title are classed as 'Future Acts' under the NT Act and will require development of an Indigenous Land Use Agreement (ILUA) (NNTT 2019).

On unallocated crown land and crown reserves vested for the benefit and/or use of Aboriginal people, native title can be determined to be exclusive possession (the right to possess and occupy an area to the exclusion of all others). Everywhere else, native title is non-exclusive; that is, Aboriginal people have the right to live on the area, hunt, fish, gather food or teach lore and custom on Country (NNTT 2010).

The native title claims that have been determined and registered in the Pilbara include.

- Banjima (native title recognised in 2014)
- Eastern Guruma (native title recognised in 2007)
- Eastern Guruma – Area B (native title recognised in 2012)
- Jurruru People #3 (native title recognised in 2018)
- Jurruru People Part A (native title recognised in 2015)
- Kariyarra (native title recognised 2018)
- Kuruma Marthudunera (KM) (Part A) (native title recognised in 2016)
- Kuruma Marthudunera (KM) (Part B) (native title recognised in 2018)
- Martu (Part B), Karnapyrri, and Martu #2 (native title recognised in 2013)
- Martu and Ngurrara (native title recognised in 2002)
- Ngarla and Ngarla #2 (native title recognised 2007)
- Ngarla Overlap Proceeding (native title recognised 2013)
- Ngarla People (native title recognised 2010)
- Ngarlawangga People (native title recognised in 2016)
- Ngarluma People (native title recognised in 2015)
- Ngarluma/Yindjibarndi (native title recognised in 2005)
- Nharnuwangga (native title recognised in 2000)
- Njamal (native title recognised in 2019)

- Njamal People #10 (native title claim registered in 2010)
- Nyangumarta People (Part A) (native title recognised in 2009)
- Nyiyaparli and Nyiyaparli #3 (native title recognised 2018)
- Palyku (native title recognised in 2019)
- Puutu Kunti Kurrama and Pinikura (PKKP) (native title recognised in 2015)
- Thalanyji (native title recognised 2008)
- Thudgari People (native title recognised 2009)
- Yaburara & Mardudhunera People (native title recognised 2018)
- Yindjibarndi #1 (native title recognised in 2017)
- Yinhawangka People Part A and B (native title recognised in 2017).



Table 7: Land tenure, lease, tenement and reserves types in the Pilbara IBRA bioregion.

These interests and rights to land overlap – because rights to land are overlapping, the area calculations in the table will not add up to 100 per cent.

Legislation	Tenure and rights to land	Who manages the land?	Area (ha) of Pilbara bioregion (IBRA region = 17 823 126 ha)	% of the Pilbara bioregion	Current mechanism(s) to provide offset security	Likelihood the offset will be impacted, or degraded in future.
Crown land as determined under Part 4 of the <i>Land Administration Act 1997</i>	Formal conservation reserve – as determined under Part 2 of the <i>Conservation and Land Management Act 1984</i> .	DBCA.	1 136 461	6.4%	Part 2 of the <i>Conservation and Land Management Act 1984</i> . MOUs with DBCA.	Reserves are very unlikely to be developed in future.
	Unallocated crown land (UCL) – DBCA interest.	DPLH (on behalf of the Minister for Lands). DBCA has an MOU with the Minister for management of fires, feral animals and weeds.	664 659	3.7%	Endorsement from DPLH.	The land has been excised from the pastoral estate, either through land reform processes or direct purchase for addition to the conservation estate.
	Unallocated crown land (UCL).	DPLH (on behalf of the Minister for Lands).	4 345 006	24.4%	Endorsement from DPLH.	The land has not been leased or reserved so far for a purpose that misaligns with offsets, but may be in the future.
	Crown reserves (including for Aboriginal people, water supply and/or agriculture).	Depends on the purpose of vesting.	2 695 069	15.1%	Determined on a case-by-case basis depending on the purpose of the vesting.	Depends on whether the land has been reserved for a purpose which aligns with offsets.
	Mining Act tenure.	Depends on land tenure and rights that exist where mining tenements exist.	163 681	91.8%	Projects only viable where there are non-exclusive mining rights ⁹ . Non-exclusive rights holders need to be notified of offset activities. File notations can trigger conditions of programs of work to require the licenceholder to avoid and mitigate impacts to the offset.	Most land covered by Mining Act lease is not viable for environmental offsets, however some areas within a lease, outside a development envelope and the area of mineralisation may be suitable for offsets. Land covered by Mining Act licence have not been leased or reserved so far for a purpose that impacts offset actions, but may be in future. A file notation of offset areas can trigger the inclusion of conditions on programs of work associated with a mining licence, to require licensees to avoid and mitigate impacts to environmental offsets.

⁹ Part IIIA and Part IV of the *Mining Act 1978* defines rights to land granted under the *Mining Act 1978*. Generally, exclusive mining rights relate to mining leases, and non-exclusive mining rights relate to licences.

Table 7: Land tenure, lease, tenement and reserves types in the Pilbara IBRA bioregion.

These interests and rights to land overlap – because rights to land are overlapping, the area calculations in the table will not add up to 100 per cent.

Legislation	Tenure and rights to land	Who manages the land?	Area (ha) of Pilbara bioregion (IBRA region = 17 823 126 ha)	% of the Pilbara bioregion	Current mechanism(s) to provide offset security	Likelihood the offset will be impacted, or degraded in future.
	Pastoral lease ¹⁰ .	Pastoral lessee for term of the lease.	109 413	62.4%	Land access agreements between the Department of Water and Environmental Regulation and pastoral lessee.	Pastoral leases give the lessee the right to graze authorised livestock on the natural vegetation, and lessees are required to manage the soil, water and environment on their pastoral lease to maintain the sustainability of grazing, which may align with biodiversity offset objectives.
<i>Aboriginal Affairs Planning Authority Act 1972</i> Part III — Reserved lands – Lands reserved for the use and benefit of Aboriginal people	Mining Act tenure.	Aboriginal Lands Trust/AAPA/Minister for Aboriginal Affairs.	7314	4.1%	Aboriginal Lands Trust/AAPA/Minister for Aboriginal Affairs to endorse any MOU. MOU or agreement between DWER and Aboriginal entity. Indigenous Land Use Agreement where exclusive native title rights exist.	Depends on what the reservation purpose is as defined in the Act and whether this purpose is consistent with an environmental offset.

¹⁰ <https://www.dplh.wa.gov.au/information-and-services/pastoral-land/pastoral-leases>.

Figure 10: Native title claimant applications and determination areas in the Pilbara bioregion

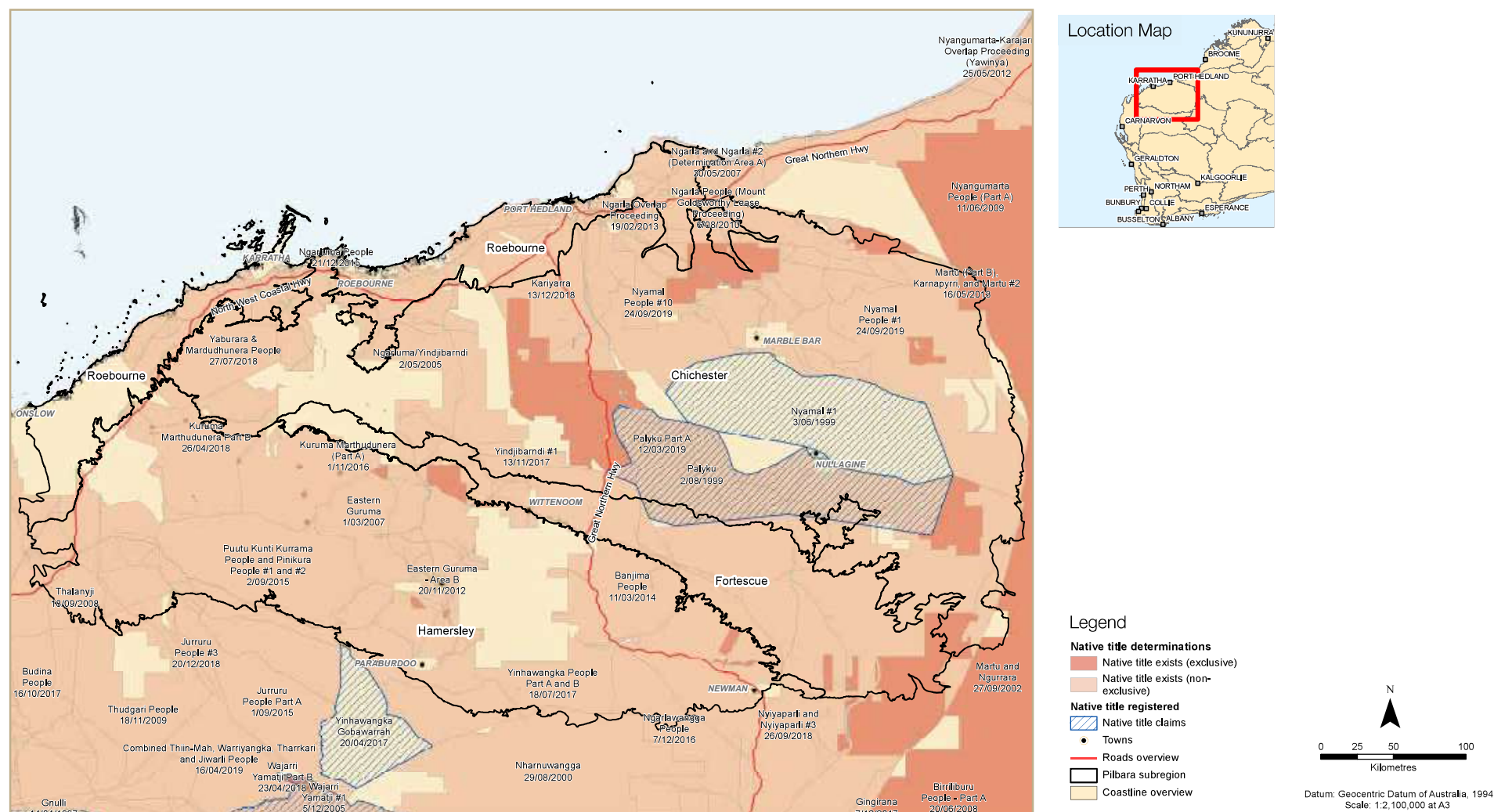


Figure 11: National parks and conservation reserves, Aboriginal reserves, unallocated crown land, proposed conservation reserves, other crown reserves and pastoral leases in the Pilbara bioregion

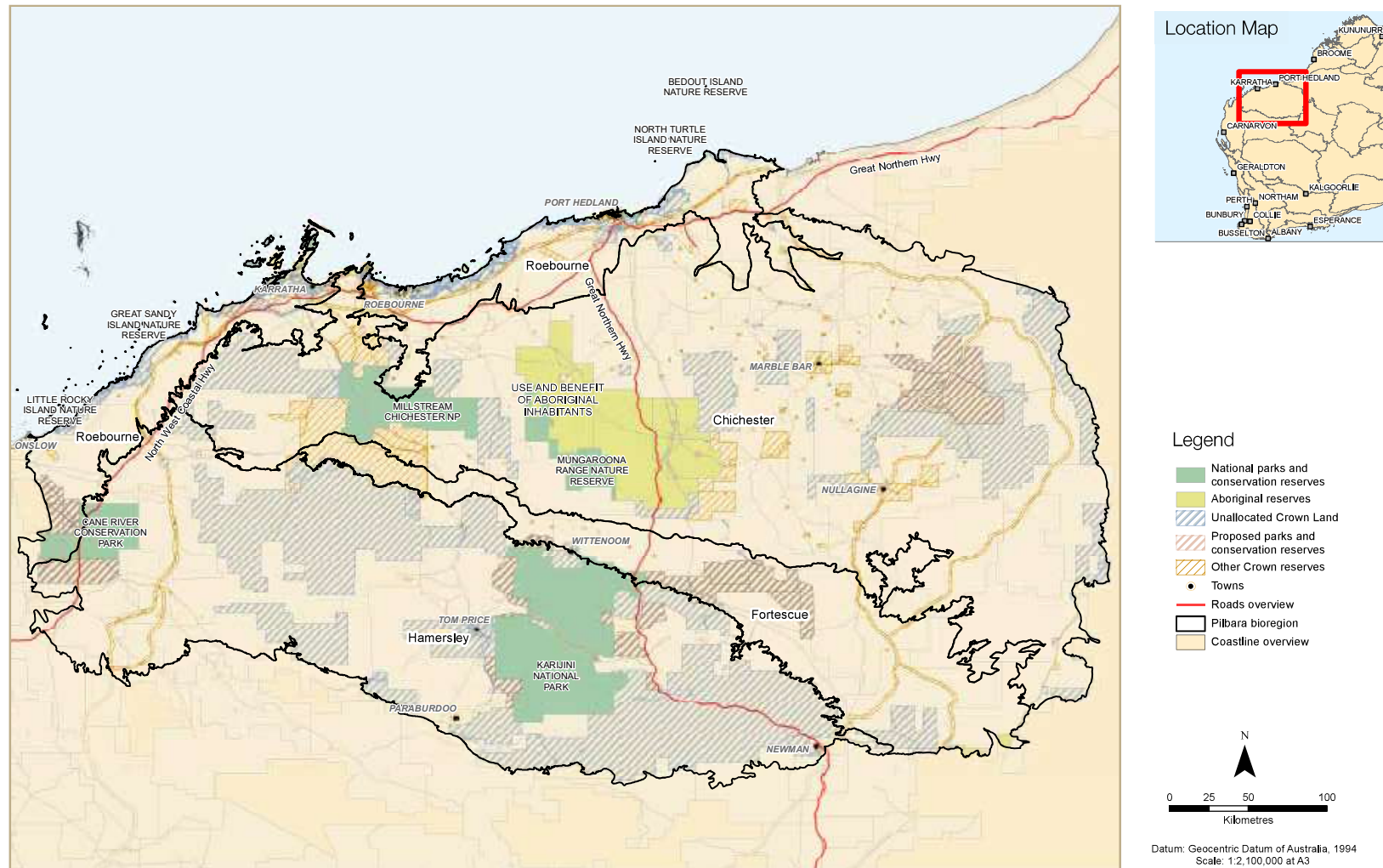
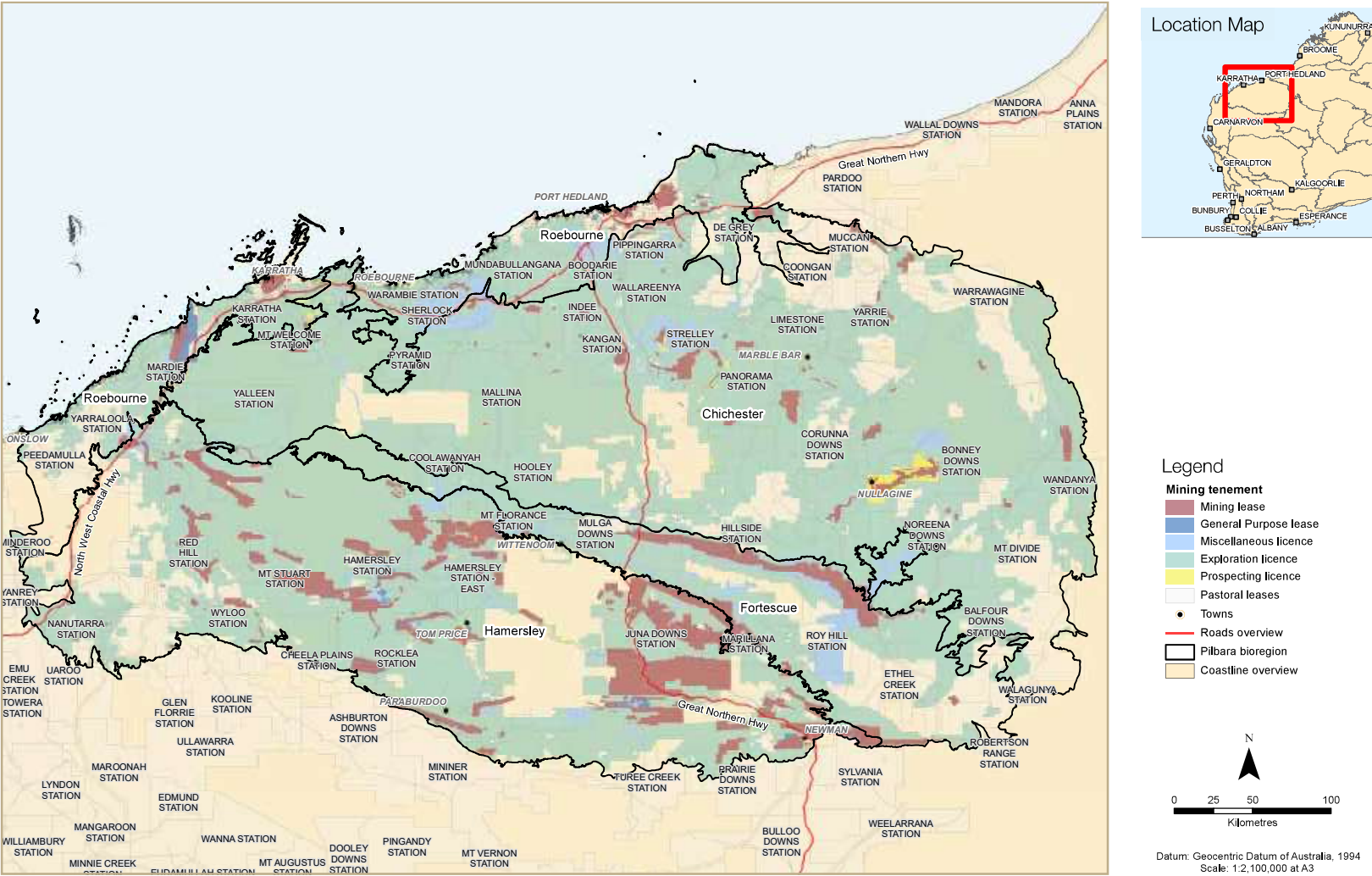


Figure 12: Mining tenements (granted and pending) in the Pilbara bioregion



Definitions

Term	Definition
IBRA	Interim Biogeographic Regionalisation for Australia (referred to as the 'bioregion').
CEO	The chief executive officer of the department of the public service of the state responsible for the administration of the <i>Environmental Protection Act 1986</i> . Currently the Director General of the Department of Water and Environmental Regulation.
CPI	Consumer Price Index.
CSIRO	The Commonwealth Scientific and Industrial Research Organisation.
DBCA	The Department of Biodiversity, Conservation and Attractions.
Delegate	Person or public authority who, by instrument of delegation made under sections 18, 19 or 20 of the EP Act, is authorised to perform all or any of the powers or duties under the EP Act of the decision-maker (being either the Minister, the EPA or the chief executive officer).
Delivery agent	Delivery agents will deliver projects selected by the Minister. They may be drawn from the not-for-profit, government or private sectors through partnerships, direct requests or a call for expressions of interest.
DMIRS	The Department of Mines, Industry Regulation and Safety.
DWER	The Department of Water and Environmental Regulation.
Environmental Matters	Significant residual impacts of development conditioned to be offset under Part IV of the EP Act (in a Ministerial Statement) or Parts 9 and 10 of the EPBC Act (in a Decision Notice) – e.g. good to excellent vegetation, ghost bat habitat, riparian vegetation).

Term	Definition
EP Act	<i>Environmental Protection Act 1986</i> .
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> .
EPA	Environmental Protection Authority, defined as the Authority in Part I s.3 of the EP Act, or their delegate.
IAG	Implementation Advisory Group.
Impacts	Relating to the direct or indirect impact to environmental matters. Direct impact notes vegetation loss as a result of clearing. Indirect is vegetation clearing as a result of direct impact elsewhere. For example, vegetation degradation caused due to the impact of dust from a crusher plant or road activities.
Minister for Environment	The Western Australian state government Minister for Environment, or their delegate.
Ministerial Statement	Statement issued under s 45 (or under s 45 as applied by section 46(8)) of the EP Act (which may include implementation conditions).
PRG	Project Recommendation Group.
WA Environmental Offsets Guidelines	<i>WA Environmental Offsets Guidelines</i> (Government of Western Australia, 2014) or any subsequent updates or replacements.
WA Environmental Offsets Policy	<i>WA Environmental Offsets Policy</i> (Government of Western Australia, 2011) or any subsequent updates or replacements.

References

DBCA 2017, *Pilbara Conservation Strategy*, Department of Biodiversity, Conservation and Attractions, Government of Western Australia, Kensington, Australia. Available from: https://www.dpaw.wa.gov.au/images/documents/conservation-management/pilbara/pilbara_conservation_strategy.pdf

DPIRD 2018, *Nominal Gross Regional Product 2018*, Department of Primary Industries and Regional Development, Government of Western Australia, Perth, Australia. Available from: https://catalogue.data.wa.gov.au/dataset/gross-regional-product/resource/f6db354a-ff5a-448d-95ba-25526ba8df2f?view_id=d7d4ff0b-9306-41de-82f8-d8ed09af61ec

DoEE 2012, *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*, Department of Energy and the Environment. Government of Australia, Canberra, Australia. Available from: <https://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy>

DoEE 2019, *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*, Department of Energy and the Environment. Government of Australia, Canberra, Australia. Available from:

<https://www.environment.gov.au/epbc/publications/significant-impact-guidelines-1.1-matters-national-environmental-significance>

DWER 2011, *WA Environmental Offsets Policy*, The Department of Water and Environmental Regulation, Government of Western Australia, Joondalup, Perth. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/WAEnvOffsetsPolicy-270911.pdf

EPA 2014, *Cumulative environmental impacts of development in the Pilbara region*, Environmental Protection Authority, Government of Western Australia, Joondalup, Australia. Available from: www.epa.wa.gov.au/cumulative-environmental-impacts-development-pilbara-region

EPA 2019, *Instructions for preparing Impact Reconciliation Procedures and Impact Reconciliation Reports*, Environmental Protection Authority, Government of Western Australia, Joondalup, Australia. Available from: www.epa.wa.gov.au/forms-templates/instructions-preparing-impact-reconciliation-procedures-and-impact-reconciliation

International Union for Conservation of Nature www.iucn.org, 2019

McKenzie et al 2009, *Introduction to the Pilbara Biodiversity Survey 2002-2007, Records of the Western Australian Museum*, Supplement 78: 3-89, Perth, Australia

NNTT 2010, *Native title, an overview*, National Native Title Tribunal, Government of Australia, Perth, Australia. Available from: <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=2ahUKEwiE6WZzdfIAhXu73MBHYNDeQQFjACegQIARAC&url=http%3A%2F%2Fwww.nntt.gov.au%2FInformation%2520Publications%2FNative%2520Title%2520an%2520overview.pdf&usg=AOvVaw08LacPQ7SkhLnloaENU7J0>

NNTT 2019, *About Indigenous Land Use Agreements (ILUAs)*, National Native Title Tribunal, Government of Australia, Perth, Australia. Available from: www.nntt.gov.au/ILUAs/Pages/default.aspx.

OAG 2017, *Management of Pastoral Lands in Western Australia*, Report 17: October 2017. Office of the Auditor General, Government of Western Australia, Perth, Australia. Available from: <https://audit.wa.gov.au/reports-and-publications/reports/management-pastoral-lands-western-australia/auditor-generals-overview/>

PMC 2019, *Indigenous Protected Areas (IPAs)*, Department of Prime Minister and Cabinet, Australian Government, Canberra, Australia. Available from: <https://www.environment.gov.au/land/indigenous-protected-areas>

Thackway and Cresswell 1994, *Toward an Interim Biogeographic Regionalisation for Australia: a framework for setting priorities in the national reserves system cooperative program*. Australian Nature Conservation Agency: Canberra, Australia.

Wangkamaya 2019, *Wangka maya Pilbara Aboriginal Language Centre*, South Hedland, Australia. Available from: <http://www.wangkamaya.org.au/pilbara-history-and-culture/02-introduction>

AIATSIS 2019 Australian Institute of Aboriginal and Torres Strait Islander Studies, <https://www.native-title.org.au/learn/native-title-and-pbcs/interaction-cultural-heritage-and-native-title>

Australia's bioregions (IBRA) - <https://www.environment.gov.au/land/nrs/science/ibra>

Spatial data citations

Department of Mines, Industry Regulation and Safety (DMIRS) 2019, Current (Live and Pending) Mining Tenements, Creative Commons Attribution Non-Commercial 4.0 Licence, Current as at 4 February 2019, Western Australia.

Department of Mines, Industry Regulation and Safety (DMIRS) 2019, State Agreement Act Boundaries, Creative Commons Attribution Non-Commercial 4.0 Licence, Current as at 2007, Western Australia.

Department of the Environment and Energy 2018, *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions)*, Creative Commons Attribution 4.0 International, Current as at 18 April 2012, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2019, *Threatened and Priority Ecological Communities*, Creative Commons Attribution Non-Commercial 4.0 Licence, Current as at 19 October 2018, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2019, *Threatened and Priority Flora*, Creative Commons Attribution Non-Commercial 4.0 Licence, Current as at 12 April 2018, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2019, *Threatened and Priority Fauna*, Creative Commons Attribution Non-Commercial 4.0 Licence, Current as at 18 October 2018, Western Australia.

National Native Title Tribunal 2019, *National Native Title Register (Determination Outcomes)*, Current at 16 October 2019, Creative Commons Attribution 3.0 Australia Licence, Australia.

National Native Title Tribunal 2019, *Register of Native Title Claims*, Current at 16 October 2019, Creative Commons Attribution 3.0 Australia Licence, Australia.

Western Australian Land Information Authority (Landgate) 2019, *Cadastre*, Current as at 5 March 2019, Western Australia.

Department of Agriculture and Food WA 2019, *Western Australia Pastoral Land Tenure - Pilbara Region*, Department of Agriculture and Food, Western Australia.

Department for Planning and Infrastructure 2005, *3C Hazardous/Industrial Waste Priority Sites*, Western Australia.

Department of the Environment and Energy 2009, *Australian Coastline*, Australia.

Landgate 2019, *Townsites*, Western Australia.

Landgate 2019, *Road Centrelines*, Current as at 1 February 2016, Western Australia.

Department of Water and Environmental Protection 2019, *Fortescue Marsh Management Zones*, Office of the Environmental Protection Authority, Western Australia.

Department of Water and Environmental Regulation

Prime House, 8 Davidson Terrace

Joondalup Western Australia 6027

Telephone +61 8 6364 7000

dwer.wa.gov.au/peof/

