BHP Billiton Iron Ore Pilbara Expansion

Strategic Environmental Assessment: Identifying and Prioritising Environmental Assets and Species

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Abbreviations

Abbreviation	Meaning
DIWA	Directory of Important Wetlands in Australia
DoE	Federal Department of the Environment
DPaW	Western Australian Department of Parks and Wildlife
DRF	Declared Rare Flora
EIA	Environmental Impact Assessment
EP Act	*Environmental Protection Act 1986*
EPA	Western Australian Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal)
INFFER™	Investment Framework for Environmental Resources
IUCN	International Union for Conservation of Nature
MNES	Matters of National Environmental Significance
NRM	Natural Region Management
PERSP	Public Environmental Review – Strategic Proposal
SEA	Strategic Environmental Assessment
SP	Strategic Proposal
TEC	Threatened Ecological Community
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WC Act	Western Australian *Wildlife Conservation Act 1950*

Glossary

Term	Definition
Adaptive Management Framework	A conceptual framework outlining the adaptive management approach, offering a structured management framework to assist in the decision-making process.
Asset	A specific component of the biophysical environment which supports one or more environmental and / or social values. Examples include the Karijini National Park and Fortescue Marsh.
Attribute	Quantifiable components that can be monitored, measured or assessed directly. Attributes contribute to environmental or social values. Examples of attributes include the abundance of a species and diversity of a population.
Derived Proposal	A Derived Proposal is a future proposal which was identified in the Strategic Proposal, which has been referred to and considered by the EPA, and which is then declared to be a Derived Proposal.
Environmental Factor	Usually broad working divisions used to compartmentalise the environment for administrative purposes. Some of these definitions may have broad similarities with the ecological definitions at higher levels. Since these factors arise from an administrative need to compartmentalise, they are imposed a priori (before study). At lower levels, they may more closely approach environmental factors, such as within proposal-specific guidelines or approved scoping documents.
Landscape	A spatially heterogeneous area, scaled relative to the process of interest. Within landscapes it is usually possible to define a series of different ecosystems, landforms, habitats and natural or man-made features.
Public Environmental Review Strategic Proposal (PERSP)	The document that outlines the potential impacts of the Strategic Proposal on factors and management strategies to address potential impacts. The PERSP is assessed by the EPA in considering whether the Strategic Proposal is environmentally acceptable.
Region	The range, area or scope relevant to a specific asset, value or factor of interest. In the SEA, the region will vary according to the asset, value or factor being examined, and may include eco-hydrogeological boundaries, ecological assets, IBRA regions, species distributions, catchments, watersheds, and air sheds.
Species[1]	A group of biological organisms consisting of individuals who are either: • Capable of interbreeding to produce fertile offspring; or • Possess common characteristics derived from a common gene pool.
Strategic Proposal	The proposal for future developments (State level).
Strategic Environmental Assessment (SEA)	The overall process for the Strategic Proposal (and Federal Strategic Assessment).

[1] We acknowledge the wide and varied scientific and philosophical discussion around the definition of species. The definition used here is based on the definition in the EPBC Act and centres on a 'common gene pool'.

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EXECUTIVE SUMMARY

The central Pilbara region supports a number of Assets and Species[2] with high environmental values. The development of a prioritised list of tiered Assets and Species of high environmental value has been undertaken to inform BHP Billiton Iron Ore's proposed Pilbara Strategic Proposal (Strategic Proposal); specifically to guide management during the implementation of future proposed operations.

The Strategic Proposal requires approval under State and Federal legislation. This document defines the process by which BHP Billiton Iron Ore will identify and manage key Assets and Species throughout the Strategic Proposal and Derived Proposal process (State approval process under the *Environmental Protection Act 1986*). At the Strategic Proposal stage, Assets and Species are identified and prioritised based on existing data and legislative protection requirements (which themselves are usually based on inherent value for Assets and threatening processes for Species). Higher ranked Assets and Species are considered by BHP Billiton Iron Ore to be a higher priority for management. The first tier of ranked species and assets are generally those which are directly protected under Federal or State Legislation or are recognised as having specific conservation value. The second tier of assets and species are those with no formal level of protection but may be of conservation interest. The third tier of species and assets are those with no formal protection (notwithstanding the general provisions of the *Wildlife Conservation Act 1950*) for conservation (or no foreseeable level of future protection).

A significant advantage exists for the use of the tiered system as it presents an opportunity to simplify ministerial conditions while ensuring that assets and species which require the most comprehensive levels of protection are taken into account. Verification over time of the Assets/Species identification and prioritisation will occur at the Derived Proposal stage by giving consideration to the contemporary legislative frameworks and data available at the time.

[2] The capitalised terms 'Asset' and 'Species' are used to refer specifically to BHP Billiton Iron Ore's tiered Assets and Species as identified and prioritised as part of the ranking process, while the terms 'asset' and 'species' are used to refer to assets or species as more general terms.

1. INTRODUCTION

BHP Billiton Iron Ore's landholdings in the central Pilbara will support a long-term sustainable presence in the region into the future. BHP Billiton Iron Ore's Charter Values, long-term presence in the bioregion, current tenure and development potential culminated in the decision to undertake a Strategic Environmental Assessment (SEA) for the proposed Strategic Proposal. This strategic approach to environmental assessment and approvals is supported by the Federal and State governments and the Western Australian Environmental Protection Authority (EPA).

The central Pilbara region supports a number of Assets and Species with high environmental and / or social values. The identification of key Assets and Species is important for the development of appropriate management approaches within the context of the Strategic Proposal and the SEA.

This document defines the process by which BHP Billiton Iron Ore will identify and manage key Assets and Species throughout the Strategic Proposal and Derived Proposal process (State approval process under the *Environmental Protection Act 1986*). Assets are defined as a specific ecological component of the biophysical environment that supports one or more environmental values. Species are defined as a group of biological organisms consisting of individuals that are either capable of interbreeding to produce fertile offspring or possess common characteristics derived from a common gene pool.

2. ASSET RANKING METHODOLOGY

BHP Billiton Iron Ore reviewed international, national and local ranking methods to identify a regionally appropriate method to identify and prioritise environmental Assets for the Strategic Proposal (refer Appendix A for a summary of each method reviewed).

There are numerous contemporary systems, ranging from international agencies such as the International Union for Conservation of Nature (IUCN) to local Natural Resource Management (NRM) groups. Contemporary asset ranking methods differ primarily as a result of the objectives that each ranking process is aiming to achieve. The methods are used by the various groups to rank priorities for the investment of conservation and management funding, as well as to rank priorities for protection.

There are three main objectives for the various methods of asset categorisation:

1. Identification of assets with higher or lower levels of inherent value (such as high biodiversity values, or landscape representativeness);
2. Identification of assets with higher or lower levels of risk from threatening processes and / or proposed developments; and
3. Identification of assets with the potential to have a higher or lower cost-benefit ratio if investment opportunities were made available.

Some methods fulfil more than one objective, usually in separate steps. For example, the NRM method considers the inherent value of the asset, followed by an assessment of threatening processes, followed by an assessment of the likelihood of the success of management actions in order to make a decision about management priorities.

Key findings of the review were that ranking assets on inherent value has an advantage of not being impacted by knowledge gaps associated with potential impacts and management measures into the future. Using inherent value to prioritise management effort assists alignment of state, national and / or international priorities. Risk-based methods for asset prioritisation work particularly well when the potential risks and impacts from all sources (e.g. multiple proponents) are well defined. A disadvantage of a cost-benefit objective in isolation is that it does not assess the environmental value inherent in the asset.

BHP Billiton Iron Ore considers that using international and Australian (both State and Federal) conventions and legislation is the most robust method for the protection of Pilbara values, because they are generally based on inherent value for Assets. Assets protected by law or recognised as

having specific conservation significance by an international convention/organisation are assigned a higher tier and are a high priority for management when potential impacts are considered.

Taking into account the desktop review of existing policy and processes and current data sources, the following categorisation methodology was developed for the SEA:

1. Tier 1: Assets that are directly protected under Federal or State legislation or recognised as having specific conservation significance under a formal international ranking system. These include Assets listed under the Ramsar convention, by the International Union for Conservation of Nature (IUCN) as a Category Ia, Ib, II, III or IV reserve[3], under the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage list, State listed Threatened Ecological Communities (TECs),or specially protected (as having specific conservation importance) under State / Federal law. BHP Billiton Iron Ore considers these Assets to have the highest priority for management;
2. Tier 2: Assets that have no direct level of legislative protection for environmental purposes but which may be of conservation interest, for which BHP Billiton Iron Ore will undertake further consideration on a case-by-case basis to determine management priority. These include Environmental Sensitive Areas (ESAs)[4], State listed Priority Ecological Communities (PECs),wetlands listed in the Directory of Important Wetlands in Australia, and the Department of Parks and Wildlife (DPaW) proposed 2015 pastoral lease excision areas. This tier may include IUCN Category V and VI depending on the values and objectives of the specific reserve; or
3. Tier 3: Assets that have no formal level of protection for conservation purposes or foreseeable level of future protection. BHP Billiton Iron Ore considers these Assets to have the lowest priority for management.

For the purposes of the Strategic Proposal, a Project Definition Boundary has been established as a geographical 'limit' within which future mining operations and supporting infrastructure may be located. A precautionary approach has been applied in determining the Project Definition Boundary. Assets of relevance within the Project Definition Boundary have been identified, and tiers have been assigned accordingly. The results of this analysis (which is an example of a tier list correct at the time of writing in 2016) can be found in Appendix C. Figures B1 and B2 in Appendix B also show the location of relevant Assets, which have a static geographic location (in contrast to more mobile Species). It should be noted that Figures B1 and B2 show Assets in relation to BHP Billiton Iron Ore's proposed Full Conceptual Development Scenario. This includes third party developments by other mining proponents. It should also be noted that while the figures show the Full Conceptual Development Scenario, not all mining operations are proposed to be open at the same time. BHP Billiton Iron Ore may choose to consider a lower ranked asset in a higher tier on a case by case basis.

[3] Objectives for IUCN Category V and VI protected areas are to maintain human / environment interactions and the sustainable use of natural resources. These objectives are not wholly consistent with the conservation of environmentally significant values, hence they are not included in Tier 1 as a default position.

[4] Excluding ESAs that are TECs or PECs or those which are declared for the purposes of buffering a species (e.g. buffering the location of a single Declared Rare Flora [DRF] occurrence), as species are categorised separately.

Case study: Ranking Assets that have multiple classifications

Case study 1

Ramsar wetlands are classified as Tier 1 Assets due to their protection under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Wetlands listed under the Directory of Important Wetlands in Australia are not specifically protected under Australian legislation (unless they are also classified as Ramsar wetlands [Department of the Environment 2014]) and so are classified as Tier 2 Assets. For example, Eighty-mile Beach in Western Australia is both a Ramsar Wetland (Tier 1 trigger) and included in the Directory of Nationally Important Wetlands in Australia (Tier 2 trigger). It would be treated as a Tier 1 Asset as a function of it being Ramsar listed. Wetlands that are not Ramsar listed but are in the Directory of Nationally Important Wetlands would be ranked as Tier 2. (Eighty-mile Beach is not within the Pilbara Expansion Area and has been used here as an example only).

Case study 2

ESAs could be either Tier 1 or Tier 2 depending on the individual ESA. State listed TECs and PECs are not directly protected by State legislation (such as the *Environmental Protection Act 1986* [EP Act]) but are considered by BHP Billiton Iron Ore to be Tier 1 and Tier 2 Assets respectively. DPaW states that there is currently no Western Australian legislation that deals specifically with TECs and PECs (DPaW 2014). Possible impacts to TECs and PECs have been taken into account by State assessment bodies when applications to develop or clear land are evaluated during land use planning and environmental impact assessment processes. TECs are indirectly protected under Western Australian legislation through the EP Act 1986 and Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Under the EP Act 1986, any clearing of native vegetation requires a permit, unless done for an exempt purpose (Department of Environment and Conservation [DEC] 2007). State TECs and PECs are indirectly protected as a result of being 'native vegetation', rather than being protected explicitly under law due to their inherent conservation value. State TECs and PECs that are also protected under the EPBC Act would also be considered to be Tier 1 assets due to their specific protection as matters of national environmental significance (MNES) at the Federal level.

The timeframe of the implementation of the Strategic Proposal is expected to extend over the duration of the operations included in the scope of the Strategic Proposal. Therefore, the ranking method must be adaptive, and have built-in capacity to take into account new information, and future managers will need to consider contemporary legislation, data and operation-specific considerations (for example, a change in the level of legislative protection made by Government). This approach will be managed in accordance, with BHP Billiton Iron Ore's adaptive approach to management.

The value of the alternative ranking methodologies as found by this review (Appendix A) is noted and although not used for ranking assets, may be used for other purposes in the SEA. The ranking method that assesses the likelihood of success and the cost-benefit balance of management actions may be used as a way of identifying and investing in offset opportunities. The success of a potential offset is key to the considerations of the EPA (2009; 2008; 2006) where offsets with a higher likelihood of success are often preferred over those with a high risk of failure.

3. SPECIES RANKING METHODOLOGY

BHP Billiton Iron Ore reviewed legislative requirements, available data and international, national and local ranking methods to identify a regionally appropriate method to identify and prioritise Species for the Strategic Proposal (refer Appendix D for a summary of each method). It was found that existing frameworks for prioritising species of high environmental value tend to differ from asset ranking methodologies in that while assets are generally ranked according to inherent value, species rankings tend to be threat-based.

As with Assets, for the prioritisation of Species BHP Billiton Iron Ore considers that current legislative frameworks such as the IUCN Red List, State and Federal conservation legislation and Priority listings provide the most appropriate ranking approach. BHP Billiton Iron Ore will operate in accordance with national and international guidance in order to manage potential impacts to protected species in an environmentally responsible manner. Species that are internationally or nationally known to be under threat will be subject to the highest priority for management. Species that have no formal level of protection will be managed on a case-by-case basis to determine their management priority. State legislation on Priority flora and fauna is based on IUCN Red List categories, and BHP Billiton Iron Ore will continue to rely on the integrity of both these and Federal requirements to assign a management priority to a Species.

Flora and fauna taxa are ranked according to their priority for management consideration by BHP Billiton Iron Ore as shown below, noting that all native species are protected under the WC Act 1950 but may not necessarily be of conservation significance with threatened or specially protected status:

1. Tier 1: Species known to be under threat. At the time of writing, these are species listed under IUCN Red-list categories and / or the EPBC Act as Critically Endangered, Endangered and Vulnerable, (i.e. Threatened species), and species listed under Schedules 1 and 4 of the WC Act (e.g. Declared Rare Flora [DRF]). BHP Billiton Iron Ore considers these Species to have the highest priority for management consideration;.
2. Tier 2: Species which have no formal level of legislative protection as ‘threatened’ within Western Australia, but for which BHP Billiton Iron Ore will undertake further consideration on a case-by-case basis to determine management priority. At the time of writing, these are species listed under international conventions (e.g. JAMBA), as Marine or Migratory under the EPBC Act, in Schedule 3 of the WC Act or as a Priority species; or
3. Tier 3: Other species that have no formal level of protection as a threatened species, or foreseeable level of future protection (noting that all native species are protected under the WC Act, but not all are specially protected as Schedule species), or novel and undescribed species. BHP Billiton Iron Ore considers these species to have the lowest priority for management.

For the purposes of the Strategic Proposal, a Project Definition Boundary has been established as a geographical ‘limit’ within which future mining operations and supporting infrastructure may be located. A precautionary approach has been applied in determining the Project Definition Boundary.

Species of relevance within the Project Definition Boundary have been identified, and tiers have been assigned accordingly. The results of this analysis (which is an example of a tier list correct at the time of writing in 2016) can be found in Appendix C. Figures B1 and B2 in Appendix B also show the location of relevant species, which have a static geographic location (in contrast to more mobile Species). It should be noted that Figures B1 and B2 show species in relation to BHP Billiton Iron Ore’s proposed Full Conceptual Development Scenario. This includes third party developments by other mining proponents. It should also be noted that while the figures show the Full Conceptual Development Scenario, not all mining operations are proposed to be open at the same time. BHP Billiton Iron Ore may choose to consider a lower ranked asset in a higher tier on a case by case basis.

4. MANAGEMENT OBJECTIVES

High-level management objectives for tiered Assets and Species are defined at the Strategic Proposal stage of the SEA process to ensure that they are considered in the detailed planning and

design phases for each operation, prior to submitting a Derived Proposal. Tables 1 and 2 provide example high-level management objectives for tiered Assets and Species. Examples of both base-case and legacy management objectives have been put forward, to demonstrate the type of options available for consideration. The base-case management objectives are based on avoidance and minimisation of impacts and compliance, whereas the legacy management objectives are more pro-active in nature.

It is important to note that the high-level management objectives will be further refined and assessed prior to the Derived Proposal stage. Where required, these management objectives for Assets / Species will be developed into more specific objectives in Asset Management Plans and Species Management Plans respectively. Regional Management Strategies, Asset Management Plans and Species Management Plan will then be used at the Derived Proposal stage to identify and describe appropriate management objectives, triggers and targets that correlate directly to Assets and Species potentially impacted by the proposed operation.

Table 1: Outcome-based Objectives for Tiered Assets

TIER	MANAGEMENT OBJECTIVE
Tier 1 Asset e.g. Ramsar, Federal TECs, State TECs, Nature Reserves	BHP Billiton Iron Ore shall: • Mitigate risks to an acceptable level[5]; • Address key asset management in a Management Plan; and • Where relevant, offset residual impact in accordance with the Regional Offset Plan to the satisfaction of the CEO of the Office of the EPA.
Tier 2 Asset e.g. State PECs, excision areas of current pastoral leases	BHP Billiton Iron Ore shall: • Mitigate risks to an acceptable level[5]; • Where relevant, address key asset management in a Management Plan; and • Where relevant, offset residual impact in accordance with the Regional Offset Plan to the satisfaction of the CEO of the Office of the EPA.
Tier 3 Asset	BHP Billiton Iron Ore shall: • Mitigate risks to an acceptable level[5]; and • Where relevant, address key asset management in a management plan.

[5] Acceptable level' is defined as per the EPA's significance framework in Environmental Assessment Guideline 9 (EPA 2015b); thus, BHP Billiton Iron Ore considers an 'acceptable level' of impact to be a level of residual impact that meets the EPA's objectives for that environmental factor.

Table 2: Outcome-based Objectives for Tiered Species

EXAMPLE	MANAGEMENT OBJECTIVE
Tier 1 Species e.g. DRF, Schedule species under WC Act, EPBC species	BHP Billiton Iron Ore shall: • Mitigate risks to an acceptable level[5]; • Address significant species management in a Management Plan; and • Where relevant, offset residual impact in accordance with the Regional Offset Plan to the satisfaction of the CEO of the Office of the EPA.
Tier 2 Species e.g. Priority species, IUCN near-threatened.	BHP Billiton Iron Ore shall: • Mitigate risks to an acceptable level[5]; • Where relevant, address significant species management in a Management Plan; and • Where relevant, offset residual impact in accordance with the Regional Offset Plan to the satisfaction of the CEO of the Office of the EPA.
Tier 3 Species e.g. Any other endemic species	BHP Billiton Iron Ore shall: • Where relevant, mitigate risks to an acceptable level[5]; and • Where relevant, address species management in a management plan.

5. APPROACH AT DERIVED PROPOSAL STAGE

As discussed, BHP Billiton Iron Ore approach builds on the listing processes of international and nationally recognised organisations to identify and prioritise Assets and Species. As future Derived Proposals are developed, BHP Billiton Iron Ore recognises that the Asset and Species identification and rankings that apply to the specific Derived Proposal may be required to be amended to align with changes in the legislative frameworks. For example, a Tier 2 Species will be up- or down-graded to Tier 1 or Tier 3 Species if the State and/or Federal governments change its listing.

At the Derived Proposal stage, BHP Billiton Iron Ore will assess and undertake site-specific studies where required to understand the existing environmental values within and around the proposed operation. This will enable BHP Billiton Iron Ore to verify that the requirements of the Strategic Proposal can be met by the proposed operation.

In the event that potentially significant risks are identified, Asset-specific and Species-specific management objectives and measures will be defined and the Management Hierarchy (avoid, minimise, offset) will be applied and, in accordance with the regional approach to management and the level of management priority as afforded by the tiered system. Management Plans will be prepared at Derived Proposal stage, as per the tiered system. These plans will include thresholds.

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APPENDIX A: FRAMEWORKS FOR RANKING ASSETS

CONTEXT AND EXISTING FRAMEWORKS

BHP Billiton Iron Ore has reviewed international, national and local ranking methods and available data on values and attributes in the Pilbara Expansion area to identify a regionally appropriate method to identify and prioritise Assets. The first step in the assessment was to review the international, Federal and State policy and / or legislative context for the identification and prioritisation of assets. There are numerous systems, ranging from international agencies such as the International Union for Conservation of Nature (IUCN) down to local Natural Resource Management (NRM) groups. These lists are used by the various groups to rank priorities for the investment of conservation and management funding, as well as to rank priorities for protection. As the objective of this strategy is to identify Assets for management consideration, not all ranking methods were expected to be appropriate, having been developed for differing objectives. A description of the rankings considered is provided below.

INTERNATIONAL RANKINGS

International Union for Conservation of Nature

The IUCN was founded in 1948, as the first international environmental organisation. The IUCN comprises of over 1,200 government and non-governmental organisations with a focus on sustainable development and the environment. The organisation endeavours to find practical solutions to conservation and development challenges (IUCN 2013). The organisation is founded on knowledge, expertise and scientific research and uses these key areas to develop environmental and sustainable development policies, standards and programmes.

In addition to developing categories and criteria for classifying species at risk of global extinction (Red List Categories), the IUCN has developed IUCN protected area management categories, to define, record and classify specific aims and concerns for each protected area (IUCN 1994). Of the seven categories of protected areas, BHP Billiton Iron Ore considers that the following five categories are considered to have specific conservation importance for inherent environmental value – Category Ia, Category Ib, Category II, Category III and Category IV.

Category Ia – Strict Nature Reserve

Category Ia reserves are those that are formally protected from all but light human use in order to preserve the unique features, native ecosystems and biodiversity of the region (IUCN 2013). These pristine environments are restricted from human disturbance and may have significant spiritual heritage associations. Communities are permitted to practise their faith within the reserve provided it aligns with the management and conservation objectives of the reserve. Human influence is often limited to scientific research education. Specific threats to these reserves include climate change, air pollution and newly emerging diseases (IUCN 2013).

Category Ib – Wilderness Area

Category Ib areas are generally larger than strict nature reserves, and are areas devoid of any modern infrastructure. Human use is limited, and tourist pursuits are not supported. Human activity is generally limited to indigenous groups living wilderness-based lifestyles. They are described as largely unmodified or slightly modified protected areas. These areas are managed to maintain natural condition, with minimal human intervention (IUCN 2013).

Category II – National Park

A Category II National Park is similar to a Category Ib in size and protection objectives; however human visitation is accepted and supported with relevant infrastructure (IUCN 2013). National Parks may be promoted to the general public for both recreational and educational use, however this is encouraged in a sustainable manner that promotes conservation and protection of native species, and preserves the archaeological, historic and scientific resources and values of the park (DEC 1999).

Category III – Natural Monument or Feature

Category III areas are set aside to protect a specific natural monument, such as a landform, sea mount, submarine cavern, geological feature (such as a terrestrial cave or ancient grove). They tend to be small areas, and often have high visitor value (IUCN 2013). The objective of their protection is to protect specific outstanding features and associated biodiversity and habitats.

Category IV – Habitat / Species Management Feature

Category IV protected areas aim to protect particular species or habitats, and their management reflects this priority. Many require regular and active interventions to management the species or habitats. They usually help to protect or restore flora and fauna species of international, national, or local significance, and habitats.

Category V – Protected Landscape / Seascape

A category V protected area is one in which the interaction of people and nature over time has produced are area of distinct character that has significant, ecological, biological, cultural and scenic value. Safeguarding the integrity of that interaction is considered critical to protecting and sustaining the area.

Category VI – Protected Area with Sustainable Use of Natural Resources

Category VI protected areas are intended to conserve ecosystems and habitats together with associated cultural values and traditional management resource systems. They tend to be large areas, in which most of the area is in a natural condition, but where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources is seen as compatible with nature conservation.

Protected Area categorisations are useful for the identification and prioritisation of Assets, however the IUCN Green list has not been considered for the purposes of Asset ranking as it is an international list of well-managed areas; a methodology for ranking Assets for the Pilbara Expansion area should not be dependent on an Asset already being well managed.

Ramsar Treaty

The Ramsar treaty refers to an intergovernmental agreement adopted in 1971 at a conference in Ramsar, Iran. The treaty was designed for the maintenance of the ecological character of 'Wetlands of International Importance' and to plan for sustainable use of those listed wetlands.

The term wetland embodies swamps and marshes, lakes and rivers, wet grasslands and peat lands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fishponds, rice paddies, reservoirs, and salt pans (Ramsar 2008). Parties signed to the Ramsar treaty agree to:

- Work towards the wise use of all their wetlands through national land-use planning, appropriate policies and legislation, management actions, and public education;
- Designate suitable wetlands for the List of Wetlands of International Importance ('Ramsar List') and ensure their effective management; and
- Cooperate internationally concerning trans-boundary wetlands, shared wetland systems, shared species, and development projects that may affect wetlands (Ramsar 2008).

World Heritage Areas

World Heritage Areas are those that have been inscribed in the World Heritage List, which recognises the 'outstanding universal value' of a site. The 1972 UNESCO World Heritage Convention was formed to encourage the identification, protection and preservation of cultural and natural heritage around the world, considered to be of outstanding value to humanity (UNESCO 2007).

Natural heritage areas are those which have outstanding physical, biological and geological formations, habitats of threatened flora and fauna species, and areas with scientific, conservation or aesthetic value (UNESCO 2007).

Cultural heritage areas encompass monuments, groups of buildings and sites with historical, archaeological, aesthetic, scientific, ethnological or anthropological value (UNESCO 2007).

The World Heritage Committee is responsible for implementation of the Convention, including:

- Allocation of financial assistance from the World Heritage Fund;
- Decisions on inscription of sites to the World Heritage List;
- Examination of reports on the State of conservation of inscribed sites; and
- Decisions on inscription or removal of sites on the World Heritage List in Danger.

To be included on the World Heritage List, a site must meet at least one of the 10 selection criteria, which comprise cultural and natural criteria:

- To represent a masterpiece of human creative genius;
- To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);
- To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; and / or
- To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

NATIONAL RANKINGS

Nationally Important Wetlands

In 2001, 851 wetlands qualified as ‘nationally important’ against the Criteria for inclusion, with 56 of these also designated on the List of Wetlands of International Importance of the Ramsar Convention (Environment Australia 2001). Nationally Important Wetlands may be natural or man-made. The following are criteria for inclusion (Environment Australia 2001):

- It is a good example of a wetland type occurring within a biogeographic region in Australia;
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system / complex;
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail;
- The wetland supports 1% or more of the national populations of any native plant or animal taxa;
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level; and / or
- The wetland is of outstanding historical or cultural significance.

EPBC Act – Threatened Ecological Communities

The EPBC Act is the Federal Government’s principal environmental act for the protection of native species and ecological communities. Federal level TECs protected under the EPBC Act comprise of a naturally occurring group of flora and fauna that are interacting in a unique habitat, with their structure, composition and distribution determined by environmental factors such as soil type, position in the

landscape, altitude, climate and water availability (Department of the Environment 2013). These communities can include woodlands, grasslands, shrublands, forests, wetlands, marine, ground springs and cave communities.

STATE RANKINGS

WC Act – Threatened Ecological Communities

Under the WC Act, TECs can be listed as threatened at the discretion of the Minister if they are presumed to be totally destroyed or at risk of becoming so (DPaW 2013a). DPaW utilises IUCN criteria to assign threat categories to communities. The listing of TECs triggers consideration during the Environmental Impact Assessment (EIA) process, and any relevant Recovery Plans or other management plans developed for TECs should be taken into consideration and / or reviewed if relevant to future Derived Proposals.

DPaW Priority Ecological Communities

DPaW lists potential TECs that do not meet survey criteria or that are not adequately defined as PECs and assigns them Priorities 1 to 5. These categories are ranked in order of priority for survey and / or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as TECs (DPaW 2013b).

Environmentally Sensitive Areas under Part V of the EP Act

There are a number of areas around Western Australia where the exemptions under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 do not apply. Section 51B of the EP Act allows the Minister to declare ESAs. These locations are generally areas where the vegetation has high conservation value and cannot be cleared (EPA 2005). Once declared, the exemptions listed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 do not apply in these areas; this means that if a proponent wanted to clear native vegetation within an ESA, they may need to apply for a clearing permit (EPA 2005).

DEC[6] Biodiversity Audit

In 2002, the DEC reviewed the nature conservation issues that each of Western Australia's 53 biogeographical subregions was facing, at that time. The status of the species and ecosystems of lands and waterways was documented for four biogeographical subregions of the Pilbara including:

- Pilbara 1 (PIL 1 Chichester subregion);
- Pilbara 2 (PIL 2 Fortescue Plains subregion);
- Pilbara 3 (PIL 3 Hamersley subregion); and
- Pilbara 4 (PIL 4 Roebourne subregion).

The report assessed conservation priorities for watercourses and vegetation ecosystems within the four subregions. Conservation priority of watercourses was ranked based on special values such as:

- Wetlands that are identified in State or Territory lists of important wetlands;
- Significant for the maintenance of ecological processes at a subregional scale (refers to criteria 2 in the Directory of Important Wetlands in Australia [DIWA]);
- Important for breeding, feeding, roosting, moulting or nursery areas, or refugia for animal taxa (refers to criteria 3 in DIWA);
- Supports significant number of plant and animal taxa including migratory species (refers to criteria 4 in DIWA); and
- Contains rare or threatened species / ecosystems (refers to criteria 5 in DIWA).

[6] Now DPaW

Vegetation ecosystems were classified via the regional boundaries modified from the phytogeographical regionalisation devised by John Beard for Western Australia and were ranked based on their priorities for acquisition (L = low, M = medium, H = high).

The DEC Biodiversity Audit provides a valuable and detailed description of significant features in the Pilbara and assigns high to low rankings to vegetation ecosystems. This, or a future version, is likely to be an important source of input for the identification, impact assessment and management of Assets at the Derived Proposal stage where specific impacts and zones of influence are better understood than at the higher level Strategic Proposal stage. Among other things, the DEC Biodiversity Audit identifies 'assets' at the vegetation community level, so for example in Karijini National Park (which might reasonably be expected to be a Tier 1 Asset for BHP Billiton Iron Ore) there are some DEC assets that are high value, and some that are low value. At the Derived Proposal stage it is envisaged that BHP Billiton Iron Ore will be looking in detail at values within its Assets in order to develop Asset Specific Management Plans, and data at the level of the DEC Biodiversity Audit will be more appropriate at that stage.

Conservation Estate

The Conservation Commission controls the vesting of Western Australia's terrestrial conservation estate. This includes national parks, conservation parks, nature reserves, State forests and timber reserves referred to in the *Conservation and Land Management Act 1984* (Conservation Commission 2013). DPaW manages lands on behalf of the Conservation Commission. These reserves have a wide variety of purposes, but are normally related to recreation, wildlife conservation, infrastructure and historical features (Department of Mines and Petroleum [DMP] 2010a). There are six types of reserved land in Western Australia; nature reserves, national parks, conservation reserves, State forests, timber reserves and Section 5(1)(g) reserves. Nature reserves are established for wildlife and landscape conservation, and while some recreation activities may be permitted, restrictions usually apply. National parks are similar to nature reserves, but are less restricted in terms of public access and recreation. Conservation parks have the same purpose as national parks but there is usually a potential competing land use, such as mineral potential. State forests are managed for multiple purposes (e.g. water catchment protection or timber production), as are timber reserves but their status is transitional. Reserves under section 5(1)(g) includes any reserve not including any of the above, and their purpose can also be varied (e.g. conservation, recreation, mineral resource development or infrastructure). Many state reserves are also classified A, B or C under the repealed *Land Act 1933* (although Class A reserves are the only ones actively managed under the *Land Administration Act 1997*).

EPA Position Statement No. 9

A broad list of 'critical' assets has been defined in Position Statement No. 9 Environmental Offsets (EPA 2006). Within Position Statement No. 9, the EPA (2006) defines critical assets as representing the most important environmental assets in the State that must be fully protected and conserved to enable:

- The State to fulfil its statutory and policy requirements;
- The State to remain sustainable in the longer term; and
- The EPA to comply with its general principles for advice and decision-making.

In the context of Position Statement No. 9 (EPA 2006) the protection of critical assets is the priority, above the use of offsets to balance out impacts. The EPA has a presumption against recommending approval for proposals that are likely to have significant adverse impacts to critical assets.

High value assets represent those environmental assets that are in good to excellent condition, are considered valuable by the community and / or government, but are not identified as critical assets (EPA 2006). The EPA (2006) defines low to medium value assets as those assets that are in less than good to excellent condition as recognised by government agencies and / or community. The EPA provides this tiering system for environmental assets to guide the assessment process and need for mitigation and offsets for significant residual impacts.

A broad list of critical assets has been defined in Position Statement No. 9 Environmental Offsets (EPA 2006), which includes:

- Public conservation reserve system;
- Native vegetation;
- Biodiversity;

- Wetlands;
- Rivers;
- Landscape;
- Environments sensitive to emissions / discharges;
- Ecosystems vulnerable to threats; and
- Heritage.

Note that simply being an example of one of the EPA's critical categories does not automatically make an asset a critical asset. As an example, not all wetlands are defined as critical assets. The EPA utilises other categorisation methods for wetlands to trigger their inclusion into the 'critical' assets tier (e.g. Ramsar wetlands). Similarly, not all native vegetation is considered to be a critical asset by the EPA. Note that the current EPA (2006) list of assets includes geographical features, as well as species and communities, whereas the Assets being considered by BHP Billiton Iron Ore in this document are geographic locations only (rather than mobile species).

INVESTMENT RANKINGS FOR NATURAL RESOURCE MANAGERS

State NRM Office of Western Australia

The State NRM Office was established by Cabinet in 2003 and works with the State and Federal Government to facilitate the coordinated delivery of NRM in Western Australia. NRM is focused on 'taking care' of natural resources, with a particular focus on how their management affects quality of life for both present and future generations. The State NRM Program is a funding arrangement managed by the State NRM Office. The Program acts as a catalyst for change, encouraging integration and helping leverage other Government and private sector funding and in-kind investment.

The process used in 2003 to identify important assets in Western Australia was based on an approach developed by the Salinity Investment Framework (Government of Western Australia 2003). This process was seen as the first step towards identifying state-wide priorities for investment in threat management against important State assets. The process was a threat-based assessment, where value and threats were considered to identify assets of high, medium and low importance. All threatening processes were considered by a modified version of the 'value versus threat matrix' to assess assets across Western Australia. Customised value-threat assessments were developed to assess the unique nature of each asset class.

The value–threat assessment helped identify the relative importance of each asset. Three tiers of assets are defined within the value-threat matrix:

- First Tier (Highest importance): Includes assets or groups of assets of high value and at high threat;
- Second Tier (Medium importance): Includes assets or groups of assets of high value at medium threat, assets of medium value at high threat and assets of medium value at medium threat; and
- Third Tier (Low importance): Those remaining assets or groups of assets that include: high value low threat; medium value low threat; low value low threat; low value medium threat, and low value high threat.

In 2003, First Tier assets in the Rangelands (which includes the Pilbara) included the Fortescue River, among others. Second Tier assets included the Robe River, also among others.

Since that time, the State NRM Office has published the State NRM Program Investment Priorities 2010/11–2013/14 (State Natural Resource Management Office 2010) that supersedes the 2003 version. The 2010 paper shows where the Government plans to direct the majority of its State NRM Program resources. The list of priorities includes issues such as:

- Improving rangelands productivity and condition;
- Protecting Ramsar wetlands;

- Habitat protection and mitigation of threatening processes for specific fauna and flora species;
- Strategic enhancement and connection of remnant vegetation to provide viable ecological linkages; and
- Controlling plant and animal pests that significantly threaten high value assets (e.g. Weeds of National Significance in the Pilbara).

Rangelands NRM

There are six regional NRM groups in Western Australia, with NRM boundaries based on catchments or bioregions. The Rangelands NRM region is the largest in Australia and covers 87% of Western Australia's land mass. Community engagement and activities are undertaken through six recognised subregional areas, one of which is the Pilbara. Rangelands NRM Western Australia is a non-governmental organisation that supports and encourages the sustainable use natural resources in the region, whether found in land, flora and fauna, fresh water or coastal marine environments.

Rangelands NRM announced in January 2013 that it was updating its Regional NRM Strategy and was seeking to identify important assets in the Rangelands region. The updated plan and newly-developed register of assets is now live online and consists of maps detailing special environmental areas or 'assets' within the region, as well as climate change and potential carbon sequestration opportunities. At the time of the announcement, approximately 271 assets were nominated, ranging from wetlands and individual species like the Gouldian finch to productive land systems. Currently there are 84 assets on the Pilbara asset register (Rangelands NRM 2013). Similarly to the State-wide approach in 2003 (Government of Western Australia 2003), the assessment is threat-based, rather than being based solely on the inherent value of the asset itself.

Investment Framework for Environmental Resources (INFFER™)

Similar to the NRM framework for making decisions on what programs to fund, INFFER™ is a tool for planning and prioritising public investments in natural resources and the environment (Park et al. 2010). INFFER™ originated through funding from SEWPaC (subsequently the Department of the Environment [DoE]) to the University of Western Australia as part of the Federal Environment Research Initiative. INFFER™ is endorsed by the Victorian State Departments of Primary Industries and Sustainability and Environment, Future Farm Industries and the North Central Catchment Management Authority. The framework has also been published in a special issue of the CSIRO's peer-reviewed Wildlife Research journal (Pannell et al. 2013), and has been used internationally.

INFFER™ focuses on defining assets (areas of the natural environment [or the built environment in the case of built heritage conservation]) that are considered to have significant value to the community (Future Farm Industries 2011). INFFER™ consists of a seven-step process, which begins with identifying significant assets (Step 1) and then filtering these assets into their associated levels of priority (Step 2) (Future Farm Industries 2011).

Step 1 of INFFER™ consists of developing a list of natural assets for the relevant region / State either through workshops, review of technical information or the review of existing documentation. Assets that could potentially be high priorities for investment are documented through the recording of the following information:

- Name of asset;
- Location;
- Description;
- Current condition;
- Community / social value;
- Environmental value;
- Economic value;
- Threats to asset; and
- Any other information that may be relevant (Community Creative 2013).

Assets are then defined based on the following criteria:

1. The asset must be fundamentally biological / ecological / physical in nature i.e. significant. Significance encompasses criteria such as rarity, diversity, contribution to broad ecological function, condition, heritage, aesthetics, financial benefits etc.;
2. It must be spatially delineated (single or multiple components can be mapped); and
3. It must be possible to specify a 'SMART' (Specific, Measurable, Achievable, Relevant and Time-bound) goal for the asset (Park et al. 2010).

Further filtering then occurs and assets are selected for investment based on their ability to meet the previous criteria and their associated rank of significance and threat (Pannell et al. 2009).

ASSETS PROPOSED FOR UPGRADING

The *Land Act 1933* has been repealed (replaced by the *Land Administration Act 1997*), and all pastoral leases issued under the *Land Act 1933* will expire on 15 July 2015. Under the 2015 excision process, submissions have been received from a number of State and local government agencies for the excision of areas of land (for 'public purposes') from pastoral leases when the leases reach the renewal date in 2015 (DMP 2010b). These areas range from heritage to conservation reserves and national park consolidation. Once these leases expire, land excised from the new lease will become Crown Land. As the areas for excision have not been finalised, and the vesting of new land into conservation / heritage reserves is a process with many stakeholders, it is not possible at the present time to predict which reserves will be vested in the future.

APPLICABILITY OF REVIEWED ASSET FRAMEWORKS TO THE STRATEGIC PROPOSAL

The above review revealed three main foundations in the various methods of asset categorisation. The three foundations were:

1. Identification of assets with higher or lower levels of inherent value;
2. Identification of assets with higher or lower levels of risk from threatening processes and / or proposed developments; and
3. Identification of assets with the potential to have a higher or lower cost-benefit ratio if investment opportunities were made available.

Some methods used one or more of the foundations, usually in separate steps. For example, the reviewed NRM method considered the inherent value of the asset, followed by an assessment of threatening processes, followed by an assessment of the likelihood of the success of management actions in order to make a decision about management priorities.

As the State SEA process has two main stages (high level assessment of the overall Strategic Proposal, and detailed assessment of Derived Proposals), it was considered possible that the reviewed methods might be applicable to one, both or neither stages.

INHERENT VALUE OF ASSETS

At the Strategic Proposal stage, where the details of design, magnitude, the significance of potential impacts and specific management measures are not fully defined, an approach based on inherent value is considered to be the most appropriate. An assessment of the intrinsic properties of an asset is considered the soundest method of identifying the value that an asset holds, rather than looking at external factors that may affect the asset's value in the future. Ranking assets on inherent value is not impacted by knowledge gaps associated with potential impacts and management priorities into the future.

If the Strategic Proposal was to utilise a risk-based method for Asset prioritisation, the assessment would have the potential to be flawed due to incomplete knowledge of the specific details of BHP Billiton Iron Ore's own impacts, and even larger gaps regarding the specific details of the future proposals of other proponents. As an example, BHP Billiton Iron Ore may assess a specific asset as being of low risk (and therefore not a Tier 1 Asset) based on their assumption at the Strategic

Proposal stage that their own future operation would have minimal risk to that asset. However, if one or more other proponents were also planning to develop projects with potential to disturb that particular asset, it could be that the combined impacts might result in a significant risk to that asset. This would lead to the incorrect assumption that the asset was of low importance, when in fact the risk was high and the asset should be a high priority for management consideration. Basing the methodology on inherent value reduces the consequences of these knowledge gaps. Although it may form a valuable step of an asset ranking methodology, the cost-benefit foundation on its own is also considered inappropriate at the Strategic Proposal stage because it does not assess the environmental value inherent in the asset.

Using inherent value to prioritise management consideration also assists in enabling management effort to be preferentially directed to sites that might benefit state, national and / or international management efforts.

ASSESSMENT OF THE RISK OF PROPOSALS TO ASSETS

As BHP Billiton Iron Ore's planning processes progress beyond the initial Strategic Proposal, specific future operations become better understood. At the Derived Proposal stage, as knowledge of the various zones of influence of a future operation are known (noting that the zone of influence is likely to differ between the receiving environments of land, water and air), an impact assessment becomes more appropriate, and the results more accurate than if it was undertaken and relied upon from the Strategic Proposal stage. The assessment of risks and potential impacts at the Derived Proposal stage would lead into the management hierarchy (avoid, mitigate, offset) and verification against the Ministerial conditions attached to the Strategic Proposal. Appropriate management actions that are in line with the approved Strategic Proposal means that the Asset and interactions between it and BHP Billiton Iron Ore's operations could be provided in the Derived Proposal, based on the detailed risk assessment and verification phase of the State SEA process. Such management actions should include triggers and monitoring requirements based on a detailed knowledge of the future operation.

ASSESSMENT OF THE POTENTIAL SUCCESS OF INVESTMENT

Methods that assess the likelihood of success and the cost-benefit balance of management actions could be applied at either the Strategic Proposal or Derived Proposal stages as a way of identifying and investing in management options and offset opportunities. The success of a potential offset is key to the considerations of the EPA (2009; 2008; 2006) where offsets with a higher likelihood of success are often preferred over those with a high risk of failure. Cost-benefit analysis for management actions and offsetting can also be appropriate, and is in line with the principle of ecological sustainable development. These could either be advanced offsets for residual impacts that are known to be highly likely to occur at the Strategic Proposal phase, and / or impact-specific offsets, for which the requirements associated with a specific future operation may not be known in detail until closer to the Derived Proposal stage.

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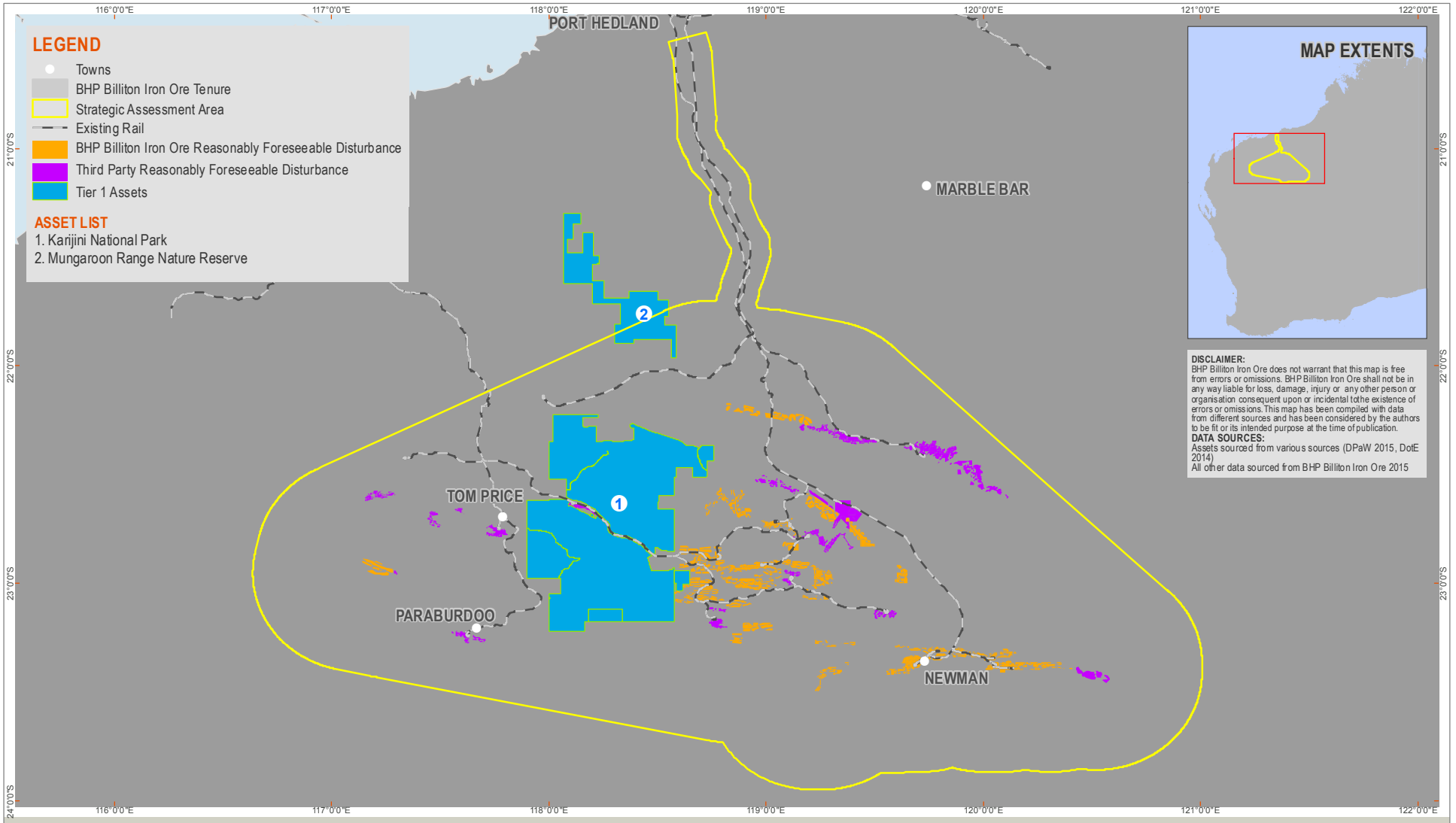
APPENDIX B: FIGURES



Pilbara Expansion
Strategic Environmental Assessment
Identifying and Prioritising Environmental Assets and Species

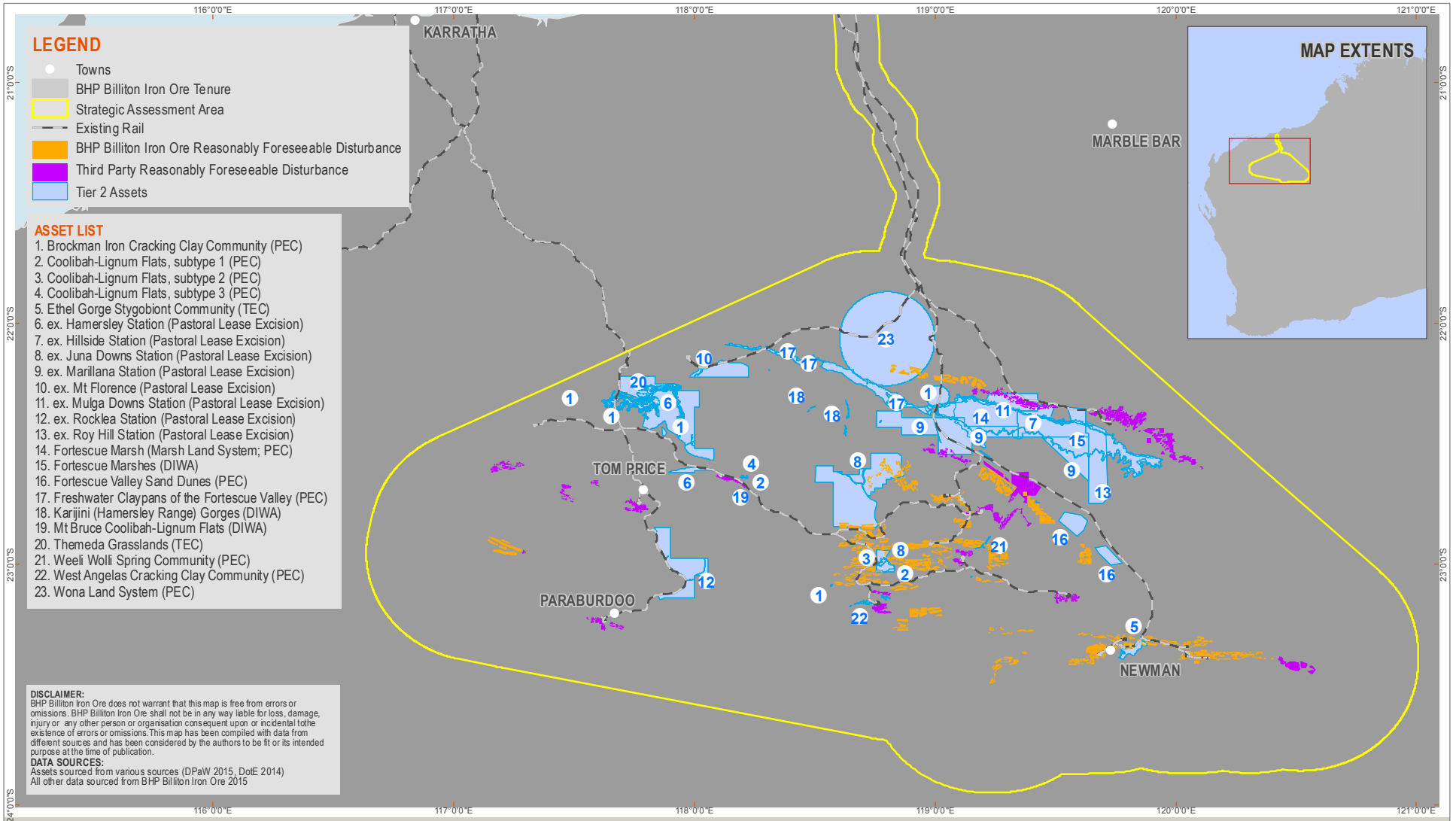
Figure 1 Tier 1 Assets, BHP Billiton Iron Ore and Third Party Reasonably Foreseeable Disturbance

N

0 10 20 40 60 80 100
Kilometers

bhpbilliton
resourcing the future

DATE: 18-Aug-15
DRAWN: J.N. Rao
CHECKED: F. Jones
APPROVED: B. Skarratt



Pilbara Expansion
Strategic Environmental Assessment
Identifying and Prioritising Environmental Assets and Species

Figure 2 Tier 2 Assets, BHP Billiton Iron Ore and Third Party Reasonably Foreseeable Disturbance

APPENDIX C: DATA AND ASSET / SPECIES RANKINGS

DATA TO INFORM RANKING AND MANAGEMENT OBJECTIVES

A review of data availability to support Asset and Species assessments now and in the future was undertaken, noting that further data is being generated by BHP Billiton Iron Ore, other proponents, scientists, researchers and regulators in the region.

It is important to note that data should be reviewed for currency and that newly available data must be identified prior to undertaking each prioritisation process for a Derived Proposal, impact assessment and management discussions. In addition to BHP Billiton Iron Ore data, there are a number of other sources that should be considered (as detailed below) during the review and revision of Asset and Species rankings.

STATE GOVERNMENT BIODIVERSITY DATA

In 2014, DPaW is responsible for the management and conservation of the State's biodiversity, and for maintaining the State's biological data management systems. Proponents are able to draw upon information held within DPaW's various data management systems, to identify important environmental Assets, Species and communities, so appropriate avoidance, mitigation and offset measure can be considered for proposed operation. State government managed data consulted in the development of the Strategic Proposal documentation includes:

- DPaW database TECs and PECs;
- FloraBase;
- NatureMap;
- Pilbara Biological Survey database; and
- Western Australian Herbarium.

These or similar (if not more extensive) databases are anticipated to continue to be provided by the State into the future of the Pilbara Expansion.

DPAW PILBARA REGIONAL SURVEY

Historically, there has been limited information on the diversity of flora and fauna in the Pilbara region. In addition to the lack of knowledge on diversity, the ecosystems and ecological processes of these species have been poorly understood. In recognition of this lack of data, DPaW undertook a Pilbara Region Biological Survey between 2002 and 2013. According to DPaW (2013) the survey has:

- Counted, sampled and documented the flora and fauna communities in the Pilbara region;
- Investigated the inter-relationships, composition and patterns of these communities within the Pilbara region; and
- Documented the way communities are distributed in relation to soil, vegetation, climate, landforms and geology.

The survey was comprised of six main components, specifically:

- Terrestrial flora including weeds;
- Terrestrial vertebrates;
- Terrestrial invertebrates;
- Wetland flora;
- Wetland fauna; and

- Stygofauna.

Data from the regional survey adds to the understanding BHP Billiton Iron Ore has at the Strategic Proposal stage, and supplements data collected from its own baseline surveys.

OTHER PROPONENTS

Land within and surrounding the Pilbara Expansion is dominated by mineral exploration and mining. Many of these mining projects have been subject to an EIA assessment for approval, and as such, various surveys and technical studies have been undertaken. Information from these studies may become publically accessible to BHP Billiton Iron Ore once a project undergoes the formal public review process under Part IV of the EP Act. Data from these studies can be used by BHP Billiton Iron Ore to build more robust and indicative models (e.g. aquifer drawdown), as well as provide a useful insight into potential cumulative impacts.

As examples, the Hamersley Iron Yandicoogina Junction South West and Hope Downs 4 Projects have generated relevant surface and groundwater information for the Pilbara region, which can be used to identify overlaps with the Pilbara Expansion, and be used to predict cumulative impacts. There are however, limitations to the amount of information that is available through the formal public review process, as it is often the subject of commercial sensitivity.

ASSET AND SPECIES RANKING

The list of tiered Assets / Species at the time of writing and based on the area of influence (Appendix B) is set out in Table C1.

Table C1: Tiered Assets / Species at the Time of Writing

Tier	Assets	Species[7]
1	Karijini National Park Mungaroona Range Nature Reserve Brockman Iron Clay Communities P2 PEC (2) Coolibah - Lignum Flats, sub type 1 P3 PEC (9) Coolibah - Lignum Flats, sub type 2 P1 PEC (1) Coolibah - Lignum Flats, sub type 3 P1 PEC (3) Ethel Gorge Stygobiont Community (State TEC) Fortescue Marsh P1 PEC (1) Fortescue Valley Sand Dunes P3 PEC (14) Freshwater claypans of the Fortescue Valley P1 PEC (5)	Flora - *Thryptomene wittweri* (Mountain thyryptomene) (EPBC Vulnerable, WC Act Vulnerable) Flora - *Lepidium catapycnon* (Hamersley lepidium) (EPBC Vulnerable)[8] Fauna - *Dasycercus cristicauda* (Crest tailed Mulgara) (EPBC Vulnerable) Fauna - *Dasyurus hallucatus* (Northern Quoll) (EPBC Endangered, WC Act Endangered) Fauna - *Falco hypoleucos* (Grey Falcon) (WC Act Vulnerable) Fauna - *Falco peregrinus* (Peregrine Falcon) (WC Act Other Specially Protected) Fauna - *Liasis olivaceus barroni* (Pilbara Olive Python) (EPBC Vulnerable, WC Act Vulnerable)Fauna – *Macroderma gigas* (Ghost Bat) (WC Act Vulnerable) Fauna - *Macrotis lagotis* (Greater Bilby) (EPBC Vulnerable, WC Act Vulnerable) Fauna - *Pezoporus occidentalis* (Night Parrot) (EPBC Endangered, WC Act Critically Endangered) Fauna - *Rhinonicteris aurantia* (Pilbara leaf-nosed bat) (EPBC Vulnerable, WC Act Vulnerable) Fauna – *Trichosurus vulpecula arnhemensis* (Northern Brushtail

[7] For flora (and to a lesser extent fauna), this list should be considered to be a minimum list as surveys have not been undertaken across the entire area of influence, and the results of surveys by other organisations (e.g. other proponent iron ore explorers) are not always made public.

[8] *L. catapycnon* is also listed as a Priority 4 species under the WA Wildlife Conservation Act.

Tier	Assets	Species[7]
		Possum) (WC Act Vulnerable)
2	ex Hillside Station ex Juna Downs Station ex Marillana Station ex Mulga Downs Station ex Roy Hill Station Fortescue Marshes (DIWA)[9] Karijini (Hamersley Range) Gorges (DIWA)[10] Mt Bruce Coolibah-Lignum Flats (DIWA) Weeli Wolli Spring Community P1 PEC (2) West Angelas Cracking-Clays P1 PEC (13) Wona Land System P1 PEC (3)	Flora - *Acacia bromilowiana* (P4 Flora) Flora - *Acacia effuse* (P3 Flora) Flora - *Acacia kenneallyi* (P3 Flora) Flora - *Acacia subtiliformis* (P3 Flora) Flora - *Aristida jerichoensis* var. *subspinulifera* (P3 Flora) Flora - *Aristida lazaridis* (P2 Flora) Flora - *Brachyscome* sp. Wanna Munna Flats (P1 Flora)*Bulbostylis burbidgeae* (P4 Flora) Flora - *Calotis latiuscula* (P3 Flora) Flora - *Crotalaria smithiana* (P3 Flora) Flora - *Dampiera metallorum* (P3 Flora) Flora - *Eremophila magnifica* subsp. *magnifica* (P4 Flora) Flora - *Eremophila magnifica* subsp. *velutina* (P3 Flora) Flora - *Eremophila rigida* (P3 Flora) Flora - *Eremophila spongiocarpa* (P1 Flora) Flora - *Eremophila youngii* subsp. *lepidota* (P4 Flora) Flora - *Euphorbia australis* var. *glabra* (P2 Flora) Flora - *Euphorbia clementii* (P2 Flora) Flora - *Euphorbia inappendiculata* var. *inappendiculata* (P2 Flora) Flora - *Euphorbia inappendiculata* var. *Queenslandica* (P1 Flora) Flora - *Fimbristylis sieberiana* (P3 Flora) Flora - *Goodenia hartiana* (P2 Flora) Flora - *Goodenia lyrata* (P3 Flora) Flora - *Goodenia nuda* (P4 Flora) Flora - *Goodenia pedicellata* (P1 Flora) Flora - *Goodenia purpurascens* (P3 Flora) Flora - *Goodenia* sp. East Pilbara (P3 Flora) Flora - *Gymnanthera cunninghamii* (P3 Flora) Flora - *Heliotropium muticum* (P1 Flora) Flora - *Indigofera* sp. Gilesii (P3 Flora) Flora - *Indigofera ixocarpa* (P2 Flora) Flora - *Isotropis parviflora* (P2 Flora) Flora - *Isotropis winneckei* (P1 Flora) Flora - *Josephinia* sp. Marandoo (P1 Flora) Flora - *Nicotiana umbratica* (P3 Flora)

[9] Assets that are listed in multiple existing ranking systems (e.g. DIWA and State PEC Listings) appear twice in this list (e.g. Mt Bruce Coolibah-Lignum Flats [DIWA] and Coolibah - Lignum Flats, sub type 1 P3 PEC [9] etc.).
[10] Assets that appear in two or more tiers, are managed according to the higher tier (e.g. Karijini [Hamersley Range] Gorges [DIWA] will be managed as Tier 1 due to Karijini National Park being a Tier 1 Asset.).

Tier	Assets	Species[7]
		Flora - *Olearia mucronata* (P3 Flora)
		Flora - *Paspalidium retiglume* (P2 Flora)
		Flora - *Pilbara trudgenii* (P3 Flora)
		Flora - *Ptilotus mollis* (P4 Flora)
		Flora - *Rhagodia* sp. Hamersley (P3 Flora)
		Flora - *Rhynchosia bungarensis* (P4 Flora)
		Flora - *Rostellularia adscendens* var. *latifolia* (P3 Flora)
		Flora - *Scaevola* sp. Hamersley Range basalts (P2 Flora)
		Flora - *Sida* sp. Barlee Range (P3 Flora)
		Flora - *Sida* sp. Hamersley Range (P1 Flora)*Stylidium weeliwolli* (P2 Flora)
		Flora - *Swainsona thompsoniana* (P3 Flora)
		Flora - *Themeda* sp. Hamersley Station (P3 Flora)
		Flora - *Triodia* sp. Mt Ella (P3 Flora)
		Flora - *Vittadinia* sp. Coondewanna Flats (P1 Flora)
		Fauna - *Anilios ganei* (Pilbara Flat-headed Blind-snake) (DPaW P1)
		Fauna - *Apus pacificus* (Fork tailed swift) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Ardea alba* / *Ardea modesta* (Great egret) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Ardea ibis* (Cattle egret) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Chalcites basalis/Chrysococcyz basalis* (Horsefields Bronze cuckoo) (EPBC Marine)
		Fauna - *Charadrius veredus* (Oriental Plover) (EPBC Migratory/Marine, WC Act Migratory)
		Fauna - *Dasycercus blythi* (Brush-tailed Mulgara) (DPaW P4)
		Fauna - *Leggadina lakedownensis* (Lakeland Downs Mouse) (DPaW P4)
		Fauna - *Merops ornatus* (Rainbow bee-eater) (EPBC Migratory/Marine, WC Act Migratory)
		Fauna - *Pandion haliaetus* (Osprey) (EPBC Migratory/Marine, WC Act Migratory)
		Fauna - *Pseudomys chapmani* (Western pebble-mound mouse) (DPaW P4)
		Fauna - *Tringa hypoleucos* (Common Sandpiper) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Tringa glareola* (Wood sandpiper) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Tringa nebularia* (Common greenshank) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Tringa stagnatilis* (Marsh sandpiper) (EPBC Migratory / Marine, WC Act Migratory)
		Fauna - *Underwoodisaurus seorsus* (Pilbara barking gecko) (DPaW P2)

Tier	Assets	Species[7]
3	All other	All other

REFERENCES

Department of Parks and Wildlife (DPaW) 2013, Pilbara Region Biological Survey 2002-2013, accessed November 2013 from http://www.dpaw.wa.gov.au/about-us/science-and-research/biological-surveys/115-pilbara-biological-survey

APPENDIX D: FRAMEWORKS FOR RANKING SPECIES

CONTEXT AND EXISTING FRAMEWORKS

In much the same way as for Asset ranking, ranking and assessment processes are used by various regulatory bodies and organisations to define important Species. These lists are being used to rank priorities for the investment of conservation and management funding, as well as to rank priorities for protection. The following desktop assessment ranged from rankings that are regionally specific through to rankings that are internationally used.

INTERNATIONAL RANKINGS

IUCN Red List

The IUCN Red List is a global approach to evaluating the conservation status of flora and fauna species and classifying species at high risk of global extinction. It was introduced in 1994 to determine risks of extinction as applicable to all species, and its objective is to provide information and analyses on the trends and threats to species in order to inform and catalyse action for biodiversity conservation (IUCN 2013). It is essentially a checklist of taxa that have undergone an extinction risk assessment against the IUCN Red List Categories and Criteria. The structure of the categories is shown below in Figure D1.

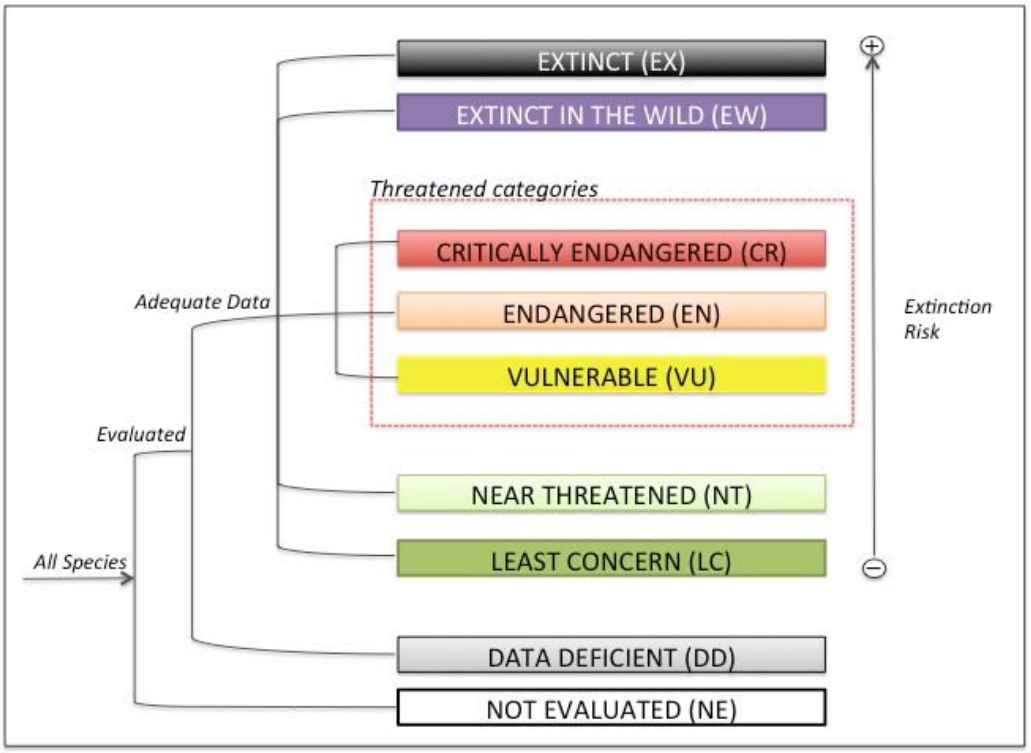


Figure D1: Structure of IUCN Red List Categories (Reproduced from IUCN 2013)

STATE AND NATIONAL RANKINGS

The Wildlife Conservation (WC) Act

The WC Act provides for the conservation and protection of wildlife. It is administered by DPaW and facilitates the listing of threatened native plants and threatened native animals that need to be specially protected because they are under identifiable threat of extinction, are rare, or otherwise in need of special protection. The Minister for Environment may list an ecological community as being threatened if it is presumed to be, or is at risk of becoming, totally destroyed. DPaW uses IUCN criteria for assigning species and communities to threat categories. It uses different codes for flora and fauna set out in Table D1.

Table D1: Conservation Codes for Western Australian Flora and Fauna

Code	Schedule under the WC Act	Description
T	Schedules 1-4	**Threatened species** - Published as Specially Protected under the *Wildlife Conservation Act 1950,* and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora). ***Threatened fauna*** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act. ***Threatened flora*** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
CR	Schedule 1	**Critically endangered species** Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EN	Schedule 2	**Endangered species** Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
VU	Schedule 3	**Vulnerable species** Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EX	Schedule 4	**Presumed extinct species** Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially

		Protected under the *Wildlife Conservation Act 1950,* in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
IA	Schedule 5	**Migratory birds protected under an international agreement** Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
CD	Schedule 6	**Conservation dependent fauna** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
S	Schedule 7	**Other specially protected fauna** Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950,* in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

Threatened flora and fauna are further recognised according to their level of threat using the IUCN Red List criteria (Critically Endangered, Endangered or Vulnerable). Species that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora and Fauna Lists under Priority 1, 2 or 3. These three categories are ranked in order of priority for survey or evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna. Species that are adequately known, are rare but not threatened, or meet the criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons are placed in Priority 4. Conservation Dependent species are placed in Priority 5. These Priority listings are set out in Table D2.

Table D2: Priority Listings for Flora and Fauna under the WC Act

Priority	Description
P1	Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
P2	Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
P3	Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
P4	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
P5	Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

EPBC Act Categorisations

As described in Appendix A, the EPBC Act is the Australian Government's central piece of environmental legislation, providing a legal framework by which to protect and manage nationally important flora and fauna as MNES. EPBC Act Categorisations are set out in Table D3.

Table D3: Categories of Threatened Flora and Fauna Species under the EPBC Act

Conservation Code	Description
Ex	**Extinct** Taxa which at a particular time if, at the time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild** Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and / or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered** Taxa which at a particular time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered** Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
V	**Vulnerable** Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

APPLICABILITY OF REVIEWED SPECIES FRAMEWORKS TO THE PILBARA EXPANSION

For the ranking of Species, BHP Billiton Iron Ore considers that in line with current ranking frameworks such as the IUCN Red List and State and Federal Priority Listings, legislative thresholds or protection requirements are the most appropriate ranking methodology. Species that are internationally or nationally known to be under threat will be subject to the highest priority for management. Species that have no formal level of protection will be managed at a lower level on a case-by-case basis to determine management priority. State legislation on Priority flora and fauna is based on IUCN Red List categories, and BHP Billiton Iron Ore will continue to rely on the integrity of both these and Federal requirements to assign a management priority to a Species.

REFERENCES

International Union for Conservation of Nature (IUCN) 2013, website accessed October 2013 from http://iucn.org/