Perth and Peel Green Growth Plan for 3.5 million

Strategic Assessment of the Perth and Peel Regions

Draft EPBC Act Strategic Impact Assessment Report

Part B: Assessment Methodology

December 2015
Acknowledgements
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Part B: Assessment Methodology

4 Introduction

The assessment in this report provides an analysis of impacts of the Strategic Conservation Plan on matters of national environmental significance (MNES) protected under the EPBC Act that may be potentially present within the Strategic Assessment Area. The purpose of the impact assessment is to:

- understand the values of the Perth and Peel region for MNES;
- understand the likely impacts to these values from each of the classes of action, as well as within a cumulative context;
- help guide avoidance, mitigation and offset measures; and
- provide clarity about the long term outcomes of the Strategic Conservation Plan.

The impact assessment methodology specifically addresses:

- the strategic assessment requirements outlined in Section 146(2) of the EPBC Act;
- the Terms of Reference for the assessment (see Appendix A); and
- relevant EPBC Act policies and guidelines.

There are four key elements to the assessment methodology (shown in Figure 4-1):

1. Identification and categorisation of MNES:
   The first step in the process involved identifying all potential MNES within the Strategic Assessment Area and categorising them based on their relevance to the assessment. This initial filter ensured that an appropriate level of analysis was applied to each MNES.

2. Use of an adequate information base:
   An important focus of the assessment was the development and use of an adequate set of baseline information to understand the environmental values of the Perth and Peel regions. This was coupled with development of a detailed description and spatial understanding of the classes of action in order to identify and assess the nature and extent of potential impacts to these values over the life of the Strategic Conservation Plan.

3. Use of a conservation outcomes framework:
   The assessment is framed around conservation outcomes for MNES. This approach helps to define appropriate avoidance, mitigation and offset measures as the assessment progresses and provides clarity about what will be delivered through the Strategic Conservation Plan.

4. Systematic assessment approach for key MNES:
   The key MNES have been subject to the highest level of impact analysis. This analysis occurs on an individual MNES basis and systematically works through an assessment of the baseline values, threats, objectives, impacts, avoidance, mitigation, offsets and commitments for each matter.

The following chapters present the assessment methodology.
Figure 4-1: Overview of the assessment methodology for MNES
5 Identification and categorisation of MNES

The assessment focuses on understanding the potential impacts and outcomes to the following groups of MNES:

- World and National Heritage.
- Wetlands of international importance (Ramsar wetlands).
- Listed threatened species and ecological communities.
- Listed migratory species.

No other MNES are relevant to the assessment.

<table>
<thead>
<tr>
<th>Commonwealth land and Commonwealth marine area</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to note that other matters protected by the EPBC Act are not relevant and outside the scope of this assessment. In particular, this includes Commonwealth land and the Commonwealth marine area.</td>
</tr>
<tr>
<td>Commonwealth land is the responsibility of various Commonwealth agencies and the environmental processes of the EPBC Act will continue to apply to those areas. More broadly, ongoing State planning and approval processes will continue apply to ensure that potential indirect impacts to Commonwealth land are considered and addressed at a project scale.</td>
</tr>
<tr>
<td>The Commonwealth marine area starts at 3 nautical miles off the coast and is not deemed relevant to this assessment.</td>
</tr>
</tbody>
</table>

Given the size of the Strategic Assessment Area, a large number of individual MNES are potentially relevant to the assessment. However, for various reasons it is recognised that some of these matters are more relevant than others. This is dependent on the importance of the Strategic Assessment Area to each MNES in terms of the values it supports and the ecological function it provides. For instance, a species which is endemic or dependent on the area for its continued survival needs to be addressed more comprehensively in the assessment compared to one which has a much broader distribution and is only recorded from time to time within the Strategic Assessment Area.

It is critical to note that this approach does not discount the importance of any particular MNES. Rather it focuses the assessment on those MNES that have the potential to be significantly impacted (e.g. an endemic threatened ecological community) compared to those that have little chance of being impacted (e.g. a wide ranging migratory species that over-flies the Strategic Assessment Area).

The approach to the impact assessment presented in this report reflects these varying values for MNES. The approach ensures key MNES are identified and comprehensively assessed and involves:

- Identification of all MNES potentially present within the Strategic Assessment Area.
- Categorisation of these MNES to reflect their level of priority or relevance to the assessment.
- Use of a level of analysis in the assessment which is appropriate to each category.
The method used to identify and categorise MNES according to this approach is described below, and the results of this process are provided in the MNES Occurrence Chapter (Chapter 12).

The assessment approach for each category is described in Chapter 8.

## 5.1 IDENTIFICATION OF MNES

MNES potentially present within the Strategic Assessment Area were identified through searches of:

- the Commonwealth’s online Protected Matters Search Tool;
- NatureMap; and
- Atlas of Living Australia.

These searches were done using the Strategic Assessment Area boundary with a 10 km buffer.

To support this process, the list was reviewed by Parks and Wildlife to ensure it comprehensively identified all MNES that are potentially present within the Strategic Assessment Area.

The results of this work are provided in Chapter 12.

## 5.2 CATEGORISATION OF MNES

The list of MNES were assigned to one of four categories which reflect the relative importance of the Strategic Assessment Area to the matter. It is important to note that these categories do not relate to the level of potential impact. Rather, they relate to the values (e.g. known and potential presence, habitat values) for each MNES across the Strategic Assessment Area.

Table 5-1 outlines the four categories developed for the assessment and Table 5-2 presents the criteria that were applied to assign MNES to each category.

The results of the categorisation process are provided in Chapter 12.

**Table 5-1: MNES assessment categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>MNES within this category meet a set of criteria which indicates a high reliance on habitat within the strategic assessment area.</td>
</tr>
<tr>
<td>Category 2</td>
<td>MNES within this category meet a set of criteria which indicates a moderate reliance on habitat within the strategic assessment area.</td>
</tr>
<tr>
<td>Category 3</td>
<td>MNES within this category meet a set of criteria which indicates a low reliance on habitat within the strategic assessment area.</td>
</tr>
<tr>
<td>Category 4</td>
<td>MNES within this category are not considered to rely on habitat within the strategic assessment area.</td>
</tr>
</tbody>
</table>
### Table 5-2: Criteria for assigning MNES to categories

<table>
<thead>
<tr>
<th>Criteria for assigning MNES to categories</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>World and/or National Heritage</strong></td>
<td>Any World and/or National Heritage Place occurring within the strategic assessment area was assigned to <strong>Category 1</strong>.</td>
</tr>
<tr>
<td><strong>Ramsar wetlands</strong></td>
<td>Any Ramsar wetland within the strategic assessment area was assigned to <strong>Category 1</strong>.</td>
</tr>
</tbody>
</table>
| **Threatened species and ecological communities** | A species or community was assigned to **Category 1** where it met one of the following:  
  - the strategic assessment area supports more than 50% of all known records of a species or habitat within the strategic assessment area is known to be used by more than 50% of the total population of a fauna species; or  
  - the strategic assessment area comprises 66% or more of the distribution of the species or ecological community according to the Commonwealth’s current distribution mapping; or  
  - there is particular public interest or concern in relation to the species or community.  

A species or community was assigned to **Category 2** where it met one of the following:  
- the strategic assessment area supports 25% - 50% of all known records of a species; or  
- the strategic assessment area comprises 33% - 66% of the distribution of the species or ecological community according to the Commonwealth’s current distribution mapping; or  
- habitat resources within the strategic assessment area are necessary to maintain an important population of a species listed as vulnerable under the EPBC Act, or any population of a species listed as critically endangered or endangered.  

A species or community was assigned to **Category 3** where it met one of the following:  
- no known important populations occur within the strategic assessment area; and  
- the strategic assessment area supports 5% - 25% of all known records; or  
- the strategic assessment area comprises 5% - 33% of the distribution of the species or community according to the Commonwealth’s current distribution mapping.  

A species or community was assigned to **Category 4** where it met all of the following:  
- no known important populations occur within the strategic assessment area; and  
- the strategic assessment area supports less than 5% of all known records; and  
- the strategic assessment area comprises less than 5% of the distribution of the species or ecological community according to the Commonwealth’s current distribution mapping.  

Note that where the term ‘important population’ is used in relation to threatened species, this is taken to mean:  
- any record of an endangered or critically endangered species; and  
- any population of a vulnerable species which meets the definition of an important population in the Commonwealth's Significant Impact Guidelines (Policy Statement 1.1) as follows:  
  - An ‘important population’ is a population that is necessary for a species’ long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:  
    - key source populations either for breeding or dispersal;  
    - populations that are necessary for maintaining genetic diversity; and/or  


• populations that are near the limit of the species range.”

**Migratory shorebirds**

The Commonwealth’s Significant Impact Guidelines for 36 Migratory Shorebird Species (Policy Statement 3.21) were applied in order to determine whether the strategic assessment area supports ‘important habitat’ or an ‘ecologically significant proportion’ of the flyway population of any of these species.

In general, ‘important habitat’ according to these guidelines equates to sites which have previously been identified as internationally important or which support:

• at least 0.1 per cent of the flyway population of a single species, or
• at least 2000 migratory shorebirds, or
• at least 15 shorebird species.

The definition for Latham’s Snipe is different. For this species, ‘important habitat’ occurs at sites which:

• support at least 18 individuals of the species, and
• are naturally occurring open freshwater wetland with vegetation cover nearby (for example, tussock grasslands, sedges, lignum or reeds within 100 m of the wetland).

Where these criteria were met for a listed migratory shorebird species, they were assigned to **Category 1**.

Where a species has been recorded in the strategic assessment area but does not meet the criteria for important habitat they were assigned to **Category 2**.

All other species were assigned to **Category 4**.

**Other migratory species**

Other listed migratory species were assigned to **Category 1** where the strategic assessment area supports ‘important habitat’ or an ‘ecologically significant proportion’ of a population with reference to the definition of these terms in the Commonwealth’s Significant Impact Guidelines (Policy Statement 1.1) as follows:

“An area of ‘important habitat’ for a migratory species is:

• habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
• habitat that is of critical importance to the species at particular life-cycle stages, and/or
• habitat utilised by a migratory species which is at the limit of the species range, and/or
• habitat within an area where the species is declining.

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an ‘ecologically significant proportion’ of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species’ population status, genetic distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).”

Where these terms have not been met for a listed migratory species, they were assigned to **Category 4**.
6 Information base

The following chapter discusses the information basis for the assessment. It looks at the type of information used to understand values and assess impacts. The purpose of this chapter is to provide a general overview of:

- the source and reliability of information;
- the level of information used in the assessment;
- how any uncertainty or limitations in the information have been addressed; and
- where a more detailed outline of the information used in the assessment can be found in the report, including details relating to data sources, data currency, mapping methods and interpretation.

6.1 OVERVIEW

A large volume of information has been sourced and developed to understand MNES values across the whole of the Strategic Assessment Area.

The assessment has aimed to use the most up to date information available. Information has only been used where the sources are reputable, verified and/or peer reviewed. Much of the information has been sourced or developed by Western Australian government agencies. In particular, the Department of Parks and Wildlife and Department of Water have contributed significant data and research to inform the assessment. Australian Government data, policies and reports have also been used extensively. Information sources are documented throughout this report with a complete reference list provided at the end.

Critical to the assessment has been the use of information which is fit for purpose. Given the scale and nature of the assessment, information has had to be developed and interpreted at a strategic level. For instance, where a single development proposal would undertake on-ground surveys to understand relevant environmental values, the geographic scale of this assessment precludes that approach and level of detail. Instead, the values across the Strategic Assessment Area have been identified using landscape scale approaches; for instance, using aerial photograph interpretation, existing records and GIS analysis.

There are clear benefits to this landscape scale approach. These include the ability to understand biodiversity processes and functions at this broader level, assess cumulative impacts and identify strategic conservation outcomes. Most importantly, the type and level of information that has been used is considered adequate to support the assessment and inform decision-making.

However, it is acknowledged that this assessment approach can also lead to higher levels of uncertainty compared with project-by-project assessments. This uncertainty can relate to on-ground values, the nature and extent of potential impacts, and the way in which the environment responds to these impacts. A number of measures have been incorporated into the assessment and implementation of the Strategic Conservation Plan to identify and address uncertainty and ensure the level of information that has been used is adequate.
6.2 UNDERSTANDING ENVIRONMENTAL VALUES

A set of baseline information has been developed for each of the key (category 1 or 2) MNES. This information has been used as the basis to understand current values across the Strategic Assessment Area, define objectives and identify impacts. The baseline information includes:

- Broad distribution or locality information, largely derived from data held by the Australian Government Department of the Environment.
- Information about habitat, ecology and important areas for species or communities. Key sources have included the Species Profile and Threats database, information generated by Parks and Wildlife, relevant recovery plans and policies and scientific literature.
- Details relating to existing known records for species and communities held by Parks and Wildlife.
- Ramsar and heritage site descriptions and identification of values relating to listing criteria, condition, threats and management arrangements. This information has been generated by WA State Agencies and information available from the Australian Government Department of Environment.

Maps showing relevant values, locations and occurrences across the Strategic Assessment Area have been developed for each of the key MNES. The methods used in identifying and mapping these values are provided as part of an introduction to each of the impact assessment chapters in Part D of this report, along with specific details about information sources, currency and interpretation.

In addition, an update to the remnant native vegetation mapping was completed by the Parks and Wildlife as part of the Strategic Assessment to provide a current assessment of native vegetation extent in the assessment area. The remnant vegetation layer has been used to inform conservation planning and the development of habitat mapping for Carnaby’s cockatoo. The update was undertaken using Landgate’s aerial photography captures and Landsat imagery. Changes in vegetation extent were digitised at a scale of 1:10000, producing a vegetation extent across the Strategic Assessment Area current to December 2014.

6.2.1 Dealing with limitations or uncertainty in the environmental data

As outlined above, large-scale assessments such as this provide an important opportunity to understand and assess environmental values in a more holistic way compared with the alternative project-by-project approach. However, there is also greater uncertainty inherent in the data used at this strategic level. Potential environmental risks relating to data uncertainty therefore need to be identified and measures to address them developed and implemented.

This issue is most relevant to the assessment of species and communities. The baseline information for these matters generally focuses on existing records and mapped potential habitat associated with these records. This is considered appropriate as survey effort within the Perth and Peel region has been extensive over many years, providing a high level of confidence that important or notable areas have generally been recorded and mapped. Given the strategic level of the assessment, this existing information provides an adequate basis to understand values and assess impacts.

However, it is also acknowledged that some parts of the Strategic Assessment Area have not been surveyed for environmental values. These areas have the potential to support threatened flora.
populations, ecological communities and habitat for fauna. While the risk is considered to be low, the discovery of new occurrences of MNES in new locations may be considered important.

This issue will be addressed through the ongoing State based planning and approvals processes for each of the classes of action. These processes are explained in Action Plans A-E and incorporate:

- surveys in some instances; and
- requirements relating to further avoidance, mitigation and offsets.

It is expected that these processes will deal with risks associated with unknown occurrences of MNES.

6.3 UNDERSTANDING THE CLASSES OF ACTION

The classes of action are described in detail in Chapter 3 of the Strategic Conservation Plan and summarised in Chapter 2 of this report. In terms of the information for the impact assessment, a set of development footprints were defined by the Western Australian Government agency or agencies responsible for the planning elements of each class of action. These footprints serve two purposes:

- They set out the location and extent of the areas in which the classes of action are proposed to occur.
- They provide spatial information to intersect with the environmental values information to enable the assessment of potential impacts.

Table 6-1 summarises the type of information contained within each footprint.

<table>
<thead>
<tr>
<th>Class of action</th>
<th>Responsible agency/agencies</th>
<th>Type of information available in the footprints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban and industrial</td>
<td>Department of Planning</td>
<td>• Locations of existing zoned urban and industrial land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Locations of proposed future zoned urban and industrial land</td>
</tr>
<tr>
<td>Rural residential</td>
<td>Department of Planning</td>
<td>• Locations of existing zoned rural residential land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Locations of proposed future zoned rural residential land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Level of impact within rural residential lots generally limited to 50% by the State regulatory system</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Infrastructure Working Group (comprised of relevant infrastructure agencies)</td>
<td>• Locations of infrastructure corridors defined by infrastructure type or types</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provides an indication of the general location of future infrastructure which will be refined through detailed avoidance measures at the design phase</td>
</tr>
<tr>
<td>BRM</td>
<td>Department of Mines and Petroleum</td>
<td>• Locations of Significant Geological Nodes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Master planning areas within the Nodes showing retention areas and areas for extraction of BRM</td>
</tr>
<tr>
<td>Harvesting of pines</td>
<td>Forestry Products Commission</td>
<td>• Locations of pine harvesting areas</td>
</tr>
</tbody>
</table>
6.3.1 Dealing with limitations or uncertainty in the class of action information

The footprints for the classes of action provide broad scale information about the locations of each action. However, they do not provide a finer resolution of information such as:

- current retention areas within the footprints (except for BRM);
- local planning scheme details; or
- areas of prior approval (except for BRM).

These types of finer scale detail about the classes of action are relevant to the impact assessment as they identify current and proposed areas for retention. In the absence of any of these details, the impact assessment adopted a conservative approach assuming total clearing within the class of action footprints.

The processes for delivering outcomes at this finer scale were then incorporated into the conservation commitments where the impact assessment identified important values that needed to be retained. For instance, if the class of action footprints intersected a threatened flora population considered necessary for the long-term viability of a species, the conservation commitments for that species might require avoidance of any clearing to be delivered through the urban planning processes.

For some MNES, finer scale information was also able to be generated as part of the impact assessment. A process was developed for threatened flora, ecological communities and migratory species to analyse values against seven levels of protection. The levels refer to the comparative level of protection or development risk that an area is subject to based on aspects such as land ownership, purpose, zoning and inclusion in the class of action footprints. The process is described in Chapter 8 as part of the discussion around assessing impacts.

This combination of information incorporating broad footprints, the use of conservation commitments and levels of protection is considered to be appropriate for understanding the classes of action and assessing their impacts on environmental values.
7 Conservation outcomes framework

A key component of the Strategic Conservation Plan is the use of a conservation outcomes framework for MNES. This framework aims to clearly outline what needs to be delivered over the life of the Strategic Conservation Plan to ensure that positive outcomes for MNES are achieved.

This approach enables the State to focus on delivering real and measurable outcomes as opposed to prescriptive actions. The framework was developed around a hierarchy comprising three levels that provides a line of sight between the highest level legislative obligations of the EPBC Act to the more detailed outcomes for specific MNES.

7.1 THE FRAMEWORK

The three levels of the conservation outcomes framework are (see Figure 7-1):

1. Conservation outcome: These statements describe the overall outcomes that need to be achieved in implementing the Strategic Conservation Plan. They provide a broad framework for the assessment and address the key statutory requirements for approval under the EPBC Act. Outcome statements were developed at the level of ‘controlling provision’ for:
   a. World and National Heritage;
   b. wetlands of international importance;
   c. listed threatened species and ecological communities; and
   d. listed migratory species.

2. Conservation objectives: In addition to the conservation outcome statements, specific conservation objectives were developed on an individual MNES basis. These were developed for all Category 1 and 2 threatened species, ecological communities, migratory shorebirds, Ramsar wetlands and World and National Heritage sites.

   The conservation objectives provide detailed, specific objectives which deliver on the broader outcome statements. They were developed to reflect the conservation status of each matter and how it is represented at a site specific and regional level.

   A critical part of the process was that conservation objectives for Category 1 and 2 MNES were defined prior to the assessment of impacts. The rationale was to define appropriate objectives to ensure that MNES are maintained or improved over the life of the Strategic Conservation Plan.

   Conservation objectives were not defined for Category 3 or 4 matters.

3. Conservation commitments: A set of conservation commitments was also defined as a product of the impact assessment for all Category 1 and 2 MNES. They comprise the management measures and strategies (e.g. avoidance measures, establishment of reserves, management of reserves, offsets) that will be delivered under the Strategic Conservation Plan.

   They are the key actions that will deliver the conservation outcomes and objectives.

The conservation outcomes and objectives are presented in Chapter 4 of the Strategic Conservation Plan and throughout relevant sections of Part D of this report.
The conservation commitments are presented in Action Plan F of the Strategic Conservation Plan and throughout relevant sections of Part D of this report.

**Figure 7-1: Conservation outcomes framework**
7.2 APPROACH TO CONSERVATION OBJECTIVES

A detailed set of work was undertaken to define the conservation objectives for Category 1 and 2 MNES. The methodology for this is described below.

7.2.1 Threatened species and ecological communities

In preparing the conservation objectives for threatened species and ecological communities, background information for each matter was reviewed to identify the key issues relevant to ensuring that the “viability and conservation status” of each species or community could continue to be maintained or improved within the Perth and Peel region. The key issues identified were:

- Is it possible to maintain or improve viability of the species/ecological community?
- Are there specific threats that need to be managed and/or abated?
- Is the species/ecological community inadequately protected in secure conservation tenures?
- Do specific populations or occurrences need to be protected (i.e. for genetic diversity, extent of occurrence)?
- Does protection of the species/ecological community need to be focused on important populations or occurrences?
- Is there known and supporting habitat critical to the survival of the species/ecological community?
- Does the species/ecological community have a very restricted distribution?
- Are there key recovery plan actions that need to be reflected in the conservation objective?

A key concept that applies to many of the conservation objectives is one of ‘long-term viability’. This is defined for threatened species and ecological communities in Table 7-1.

Table 7-1: Definition of long-term viability

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened species - definition of ‘long-term viability’</td>
<td>Long-term viability occurs where a threatened species continues to persist and where remaining populations have the following aspects:</td>
</tr>
<tr>
<td></td>
<td>• successfully reproducing individuals and maintenance of population size;</td>
</tr>
<tr>
<td></td>
<td>• maintenance of genetic diversity;</td>
</tr>
<tr>
<td></td>
<td>• an extent of occurrence comparable (or improved) to present conditions; and</td>
</tr>
<tr>
<td></td>
<td>• available habitat comparable (or improved) to present conditions.</td>
</tr>
<tr>
<td>Threatened ecological communities - definition of ‘long-term viability’</td>
<td>Long-term viability occurs where a threatened ecological community continues to persist and where remaining areas have the following aspects:</td>
</tr>
<tr>
<td></td>
<td>• key defining biological characteristics of that community;</td>
</tr>
<tr>
<td></td>
<td>• functioning abiotic processes affecting the condition/extent/nature of the community (e.g. hydrological processes, fire regimes);</td>
</tr>
<tr>
<td></td>
<td>• an extent of occurrence comparable to present conditions; and</td>
</tr>
<tr>
<td></td>
<td>• available habitat comparable to present conditions.</td>
</tr>
</tbody>
</table>
7.2.2 Approach to other MNES

The conservation objectives for other MNES are based around:

- meeting the requirements of the associated conservation outcome; and
- the important characteristics for each MNES within the Strategic Assessment Area.

For migratory shorebirds, the objectives are based around protection of habitat (particularly important habitat) and the ongoing presence of the 29 species that have been recorded in the Strategic Assessment Area.

For Ramsar sites, the objectives are based on the key aspects that define ecological character.

For World and National Heritage, the objectives have deliberately been written at a higher level in order to focus on maintaining the heritage values of the two sites.

7.3 APPROACH TO CONSERVATION COMMITMENTS

As outlined above, the conservation commitments are the key actions that will deliver the conservation outcomes and objectives. They are comprised of a mixture of:

- Measures to avoid potential impacts to specific sites (e.g. an important threatened flora population).
- Mitigation approaches to further reduce potential impacts (e.g. application of Water Sensitive Urban Design to reduce potential disturbance to adjacent wetlands).
- Offsets (as delivered through the Conservation Program as described in Action Plan H) where significant residual impacts need to be addressed.
8 MNES assessment approach

This chapter presents the overall assessment approach applied in understanding and analysing impacts to MNES.

The level of impact analysis undertaken for each matter reflects the category to which it has been assigned. This ensures that the matters with the most relevance to the strategic assessment area have been identified, subjected to the greatest level of assessment, and specifically targeted with commitments for their protection under the Strategic Conservation Plan.

Matters assigned to categories 1 and 2 have therefore been assessed in the greatest detail. The assessment approach used to understand and assess impacts to these matters is the focus of this chapter.

8.1 CATEGORY 1 AND 2 MATTERS

8.1.1 Approach

The analysis of impacts to matters assigned to categories 1 and 2 has generally been undertaken on an individual MNES basis (for example, at the species level). A systematic approach has been applied to each matter which involves a stepwise progression through the impact assessment narrative, as follows.

**Step 1: Understanding baseline values**

Understanding baseline environmental values within the Strategic Assessment Area was the first step in the assessment process. The purpose of this step was to define the importance of the Strategic Assessment Area to each matter through an understanding of factors such as occurrence or distribution, values, condition, function and threats. The information generated as part of this step includes the following:

- EPBC and WA conservation or listing status.
- Description of the matter.
- Whole of range distribution, occurrence and population estimate (as relevant).
- Habitat and ecology (as relevant).
- Key threats.
- Outline of relevant Recovery Plans and/or Threat Abatement Plans.
- For species, a description of their occurrence and use of the Strategic Assessment Area, including aspects such as extent of habitat, importance of populations and connectivity or patch size.
- For Ramsar and heritage sites, site descriptions and identification of values relating to listing criteria, condition, threats and management arrangements.
- Maps showing relevant values, locations and occurrences across the Strategic Assessment Area.
This baseline information is presented as:

- profiles at Appendix B for threatened species;
- profiles at Appendix C for threatened ecological communities;
- condition statements at Appendix D for Ramsar wetlands; and
- profiles at Appendix E for migratory shorebirds.

Background information for Carnaby’s cockatoo, and World and National heritage is incorporated into the relevant impact assessment chapters.

**Step 2: Identification of conservation objectives**

The conservation outcomes framework (described in Chapter 7) was applied to each Category 1 and 2 matter.

Based on the understanding of baseline values generated through step 1, a set of conservation objectives were developed to reflect the conservation status of each matter and how it is represented at a site specific and regional level. These objectives aim for an overall outcome of maintain or improve over the life of the Strategic Conservation Plan and are designed to be consistent with and deliver on the overarching outcomes statement.

They have an important function of helping to identify and define the need for specific conservation commitments as part of subsequent steps in the process.

**Step 3: Impact analysis**

Potential impacts associated with the classes of action were assessed against the baseline values for each MNES. This assessment included consideration of planning avoidance outcomes and the potential effects of direct and indirect impacts.

In general, the analysis focussed on direct impacts associated with the location of proposed development, with an emphasis on impacts to long-term viability.

A more detailed outline of the impact analysis and approach to assessing different types of impacts is presented in the following section of this Chapter.

**Step 4: Identifying the need for conservation commitments**

This step considered the status of the species following the impact analysis. It aimed to identify the need for specific conservation commitments in order to meet the objectives defined in step 2.

The identification of suitable conservation commitments involved the application of the mitigation hierarchy. This involved preferentially identifying commitments focused on avoidance, followed by mitigation and then offsets.
Step 5: MNES outcome

The final step provided an outline of the overall outcome (or conclusion) for each MNES taking account of potential impacts associated with the classes of action and the implementation of conservation commitments under the Strategic Conservation Plan. The aim was to present a brief snapshot of the impact assessment narrative for each matter.

This step draws conclusions about the acceptability of the outcome for each matter based on the ability to:

- Achieve the conservation objectives.
- Not be inconsistent with any relevant Recovery Plans and Threat Abatement Plans. Outcomes were generally considered not inconsistent where they supported, aligned or did not undermine the Plan’s objectives or criteria for success (as relevant).
- Deliver on the conservation outcome statements.

Finally in considering the outcome, additional conservation measures outside of the scope of the Strategic Conservation Plan that are more broadly relevant to the conservation of each matter were identified and documented. These measures were seen to be important for consideration by decision makers, agencies and conservation groups involved in the ongoing protection of each matter.

8.1.2 Understanding and addressing impacts

The impact analysis involved consideration of the range of potential impacts relevant to the classes of action including:

- Direct and indirect impacts.
- The severity of the impacts and whether they are expected to be short term, long term or irreversible.
- The extent of impacts and whether they are likely to operate on a local, regional, discrete or cumulative level.
- Whether the impacts are expected to exacerbate the effects of future climate change or other threatening processes.

The following sections identify the different types of impacts relevant to the assessment and describe how each of these impacts have been addressed as part of the analysis.

Identification of impacts

There are a number of direct and indirect impacts associated with the proposed classes of action. For the purpose of this assessment, direct impacts are defined as: “impacts associated with the direct loss of habitat as a result of clearing for development”. Loss of habitat connectivity where it leads to the isolation of habitat patches to the extent that they are no longer accessible to a species has also been incorporated into this definition of direct impacts.

All other types of impacts associated with the classes of action are identified here as indirect impacts. These include other potential impacts arising from construction, operation and (where relevant) decommissioning activities covered by the classes of action. Indirect impacts are only relevant to the
analysis where they have the potential to affect habitat areas which are not subject to the direct impact of habitat clearing.

Table 8-1 below identifies the types of activities associated with the classes of action and the range of potential direct and indirect impacts which may arise as a consequence of these activities. A description of the direct and indirect impacts is also provided.
Table 8-1: Activities associated with the classes of action and the range of potential direct and indirect impacts which may arise as a consequence of these activities

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<thead>
<tr>
<th>COA</th>
<th>Activities</th>
<th>Direct impacts</th>
<th>Indirect impacts</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Loss of habitat</td>
<td>Loss of habitat connectivity</td>
</tr>
<tr>
<td>Urban and industrial</td>
<td>Construction: Examples including clearing; building and demolition; installation of utilities and essential infrastructure; and increased construction traffic.</td>
<td>X</td>
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<tr>
<td></td>
<td>Residential living: Examples include installation of buildings and hard surfaces; recreation; increased traffic; pet ownership; planting of gardens; and controlled burns and fire management for asset protection.</td>
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<td>COA</td>
<td>Activities</td>
<td>Direct impacts</td>
<td>Indirect impacts</td>
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<td></td>
<td></td>
<td>Loss of habitat</td>
<td>Loss of habitat connectivity</td>
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<tr>
<td>Industrial use:</td>
<td>Examples include installation of buildings and hard surfaces; increased traffic; manufacturing or other industrial activity; controlled burns and fire management for asset protection; and disposal of industrial waste.</td>
<td>X</td>
<td></td>
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<tr>
<td>Commercial use:</td>
<td>Examples include installation of buildings and hard surfaces; increased traffic; and commercial activity.</td>
<td>X</td>
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<tr>
<td>Rural residential</td>
<td>Construction: Examples include clearing; building and demolition; installation of utilities and essential infrastructure; and increased construction traffic.</td>
<td>X</td>
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## Strategic Impact Assessment Report for the Perth and Peel Regions

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<th>COA</th>
<th>Activities</th>
<th>Direct impacts</th>
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<td></td>
<td></td>
<td>Loss of habitat</td>
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<td>X</td>
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</table>

**Residential use:**
Examples include installation of buildings and hard surfaces; on-site effluent disposal; recreation; pet ownership; planting of gardens; increased traffic; rainwater collection for domestic and agricultural use; hobby farming; and controlled burns and fire management for asset and livestock protection.

**Infrastructure**
Examples include clearing; building and demolition; and increased traffic.
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<th>COA</th>
<th>Activities</th>
<th>Direct impacts</th>
<th>Indirect impacts</th>
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<td>Loss of habitat</td>
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<td>Direct mortality</td>
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<td>Spread of disease</td>
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<td>Weeds</td>
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<td>Pests</td>
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<td>Fire and altered fire regimes</td>
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<td>Linear barriers</td>
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<td>Disturbance</td>
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<td>Noise and vibration</td>
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<td>Artificial lighting</td>
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<td>Alterations to surface water</td>
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<td>Alterations to groundwater</td>
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<td></td>
<td>Alterations to air quality</td>
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</table>

**Transport infrastructure use:**
Examples include installation and maintenance of rail lines, major roads, tunnels, or, freight terminals; installation of fences or sound barriers; increased traffic and maintenance.

|     |                                                                           | X | X | X | X | X | X | X | X |

**Power infrastructure use:**
Examples include installation and maintenance of power transmission lines, terminals or substations; and installation of maintenance tracks.

|     |                                                                           | X | X | X | X | X | X | X | X |

8-8
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<th>COA</th>
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<td></td>
<td>Water infrastructure use:</td>
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<td></td>
<td>Examples include installation of sewage and potable water pipelines, pumping stations, water treatment facilities, inflows and outflows, bores, or reservoirs; controlled burns and fire management for asset protection; and installation of maintenance tracks.</td>
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<td></td>
<td>Clearing of pines:</td>
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<td></td>
<td>Examples include clearing; construction of access tracks; and increased traffic.</td>
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<td>Revegetation:</td>
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<td></td>
<td>Examples include replanting of pines; facilitated revegetation; controlled burns for weed and wilding pine management; recreation; and management of groundwater recharge.</td>
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<td>COA</td>
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<td>Post clearing use for Urban and Industrial activity.</td>
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<td>See Urban and Industrial activities</td>
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<td>Post clearing use for BRM extraction.</td>
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<td>See BRM activities</td>
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<tr>
<td>BRM</td>
<td>Construction: Examples include clearing; construction of access roads and other essential infrastructure; and increased traffic.</td>
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<td></td>
<td>BRM extraction: Examples include excavation and blasting; extraction and transportation of materials; onsite processing, weighing and stockpiling; installation of fences; and increased traffic.</td>
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<td>X X X X X X X X X X X X X X X</td>
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<tr>
<td>COA</td>
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<td>Loss of habitat</td>
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<td></td>
<td>BRM site decommissioning: Examples include excavation and site stabilisation, placement of batters; facilitated revegetation; and installation of fences.</td>
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<td>Post extraction use for Urban and Industrial activity.</td>
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<td>Post extraction use for Infrastructure activity.</td>
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</table>
Direct impacts

Clearing for development can lead to the loss of suitable habitat areas for flora, fauna and ecological communities.

Loss of habitat connectivity where it leads to the isolation of habitat patches to the extent that they are no longer accessible to a species has also been addressed in the assessment as an impact associated with clearing for development.

There are a number of other potential impacts associated with loss of connectivity, or fragmentation. These include an increase in the risk and severity of edge effects, decrease in foraging efficiency, reduction in genetic diversity, and increase in the possibility of local extinction. These types of indirect impacts are discussed below.

Indirect impacts

Direct mortality of individuals of listed flora or fauna species

This typically occurs as a result of collision with vehicles or buildings, shooting, poaching and trampling. Population growth and increased development in the Perth Peel region is likely to increase the risk of direct mortality as traffic increases and more human activity occurs in areas of species habitat.

Spread of disease

This impact relates to the increased risk of disease to fauna, flora and their habitat. Disease can directly affect listed species or cause loss or degradation of habitat.

For instance, Phytophthora dieback is a risk to many native flora species in the Perth Peel region and is commonly spread by soil transportation on contaminated vehicles, clothing and equipment; runoff from roads; and soil movement. This risk is likely to increase as a result of construction, development, fire management and recreation activities under the classes of action.

Spread of weeds

Development and subsequent fragmentation of habitat areas can introduce new pathways for weed transportation. It can also increase the boundaries of habitat patches along which weed infestation can occur. The expansion of urban and rural residential areas increases the risk of garden varieties escaping into areas of habitat for listed species. Construction, development, fire management and recreation activities under the classes of action all increase the likelihood of weed transportation and infestation. Changes to fire regimes for safety and asset protection can also change the composition of vegetation communities and clear the understorey, increasing the probability of weed infestation.

Introduction of feral animals

Feral animals are a threat to a range of listed flora and fauna. Development and clearing introduce pathways for feral animal movement, while loss of habitat connectivity allows feral species to access areas of habitat that they would not otherwise reach. The expansion of urban and rural residential areas has the potential to increase predation from domestic and feral animals, especially cats.
Increased risk of fire

Fire and altered fire regimes are a potential consequence of development in the Perth Peel region. Increased human activity within and adjacent to listed species habitat including construction; residential, commercial and industrial use, and increased traffic can increase the risk of fire. Controlled burns and fire management will be used to protect people, assets and livestock. These practices can change natural fire regimes and reduce habitat suitability for flora, fauna and ecological communities.

Introduction of linear barriers

Linear barriers such as fences, sound barriers and roads can influence fauna movement and predation by feral species. Fauna can also become entangled in fences.

Disturbance

Disturbance relates to a range of impacts caused by human activity near sensitive flora and fauna. Flora can be affected by soil compaction or trampling caused by vehicles or people. Fauna are likely to move to avoid vehicles and people, which can reduce foraging efficiency or consume energy stores for migratory species. Areas that are frequently disturbed by human activity may be avoided by sensitive fauna altogether, resulting in an effective loss of habitat.

Noise and vibration

Noise and vibration from construction, industrial, infrastructure and BRM extractive activities can have a range of impacts. Low volume noise and vibration can interfere with hunting or foraging behaviours; mask the sound of predators and reduce their chance of detection; interfere with communication; and cause disturbance. At high levels, noise and vibration can cause physical distress and temporary or permanent loss of hearing.

Artificial lighting

Artificial lighting is a likely impact in urban, industrial, and commercial areas; around infrastructure; or near BRM sites that use outdoor artificial lighting. Artificial light can affect the behaviour of nocturnal and diurnal species. Impacts from increased light levels include disorientation, attraction to artificial light sources, and effects on light-sensitive cycles of species (e.g. flowering, breeding, and migration). Attraction to light sources can lead to collisions and fauna mortality. Increased light can also influence the abundance, behaviour and movement of some predator species.

Alterations to surface water

Alterations to surface water can affect surface water quality and hydrology. Impacts to water quality include changes to turbidity and sedimentation; salinity; pH; dissolved nutrients, oxygen, and metals; and other contamination. Impacts can occur through increased erosion during clearing or construction, spills or leaching of contaminants from industrial or BRM activity, contamination with wastewater from rural residential areas or water infrastructure, or transportation of nutrients and metals from elsewhere in the catchment.

Impacts to surface water hydrology affect the extent of catchments, runoff characteristics, the intensity of flood flows, and stream stability. Impacts can occur through stormwater runoff from buildings and hard surfaces, diversion or alteration of drainages for construction, reduced stability and increased erosion from clearing of vegetation, diversion of surface water for domestic use in rural residential areas, and construction and operation of water infrastructure.
Changes to surface water quality and hydrology can impact a range of listed species. Reductions in water quality can influence the diversity and biomass of aquatic species, which in turn affects other species that rely on aquatic environments for habitat. Changes to hydrology can alter the composition of flora communities, particularly in swamps and riparian areas, with resulting effects on species that are dependent upon those habitats.

**Alterations to groundwater**

Alterations to groundwater can affect groundwater quality, including salinity and contamination, and hydrology, including recharge and groundwater levels. Activities that can impact groundwater include clearing for construction; clearing of pines; construction works involving large excavations, dewatering or structures buried below the water table; diversion of surface water including installation of buildings and hard surfaces; excavation for BRM activities; spills or leaching of contaminants from industrial or BRM activity; and abstraction of groundwater for potable water supply. Alterations to groundwater can affect a range of groundwater sensitive species and habitats.

**Impacts to air quality**

Potential impacts to air quality include increased dust and particulate pollution, contaminants from vehicle activity, and contamination from industrial activity. Air quality can impact listed species and communities directly by covering foliage and interfering with photosynthesis and disturbing fauna. It can also indirectly impact listed species by affecting water quality or degrading habitat. The activities most likely to impact air quality include clearing, construction, BRM operations, industrial activity and increased traffic.

**Addressing impacts**

The impact analysis addressed the range of direct and indirect impacts identified above. As part of this analysis, planning avoidance outcomes were also considered. The approaches used to analyse and address avoidance and impacts are presented below.

**Direct impacts and planning avoidance**

The greatest focus of the analysis across all MNES was on direct impacts associated with habitat loss. This was considered appropriate given habitat availability within the Strategic Assessment Area is one of the most important factors for continued use and long-term viability of populations or occurrences within the area.

Direct impacts were assessed based on an intersect of the class of action footprints with the baseline mapping developed for all category 1 and 2 MNES. The analysis considered:

- The extent or scale of loss in terms of hectares, number of occurrences or individuals within a population (as appropriate).
- The distribution of impacts, including whether they were broadly distributed or localised.
- Whether the impacts were discrete or contributed to the loss of other habitat areas through fragmentation or breaks in habitat connectivity (where relevant).

As described in Chapter 6, the footprints for the classes of action provide broad scale information about the locations of each action. However, they do not provide a finer resolution of information relating to areas of retention within the footprints, which are identified through more detailed planning processes (for instance, local planning schemes for proposed expansion areas).
In the absence of these details, the impact assessment adopted a conservative approach assuming total clearing within the class of action footprints. This loss of habitat was assumed to be permanent or irreversible (noting that facilitated revegetation associated with decommissioning of some sites was identified as mitigation).

The avoidance outcomes achieved through planning and design of the class of action footprints were also considered as part of this analysis. Protected areas equivalent to IUCN I-IV or within land managed by Parks and Wildlife was generally considered to be protected for the purpose of the assessment. These areas are retained and managed for conservation and have the highest level of security.

Areas outside the class of action footprints and outside of protected areas were then broadly identified as avoided as part of the analysis. In doing this, it was recognised that these areas:

- Would not be subject to the direct impacts associated with the classes of action.
- Would likely experience some level of decline over time due to a lack of current or proposed management for conservation.
- Could expect to be retained to a large extent.

For some MNES, finer scale information was able to be generated as part of the impact assessment. A process was developed for threatened flora, ecological communities and migratory species to analyse values against seven levels of protection. The levels refer to the comparative level of protection or development risk that an area is subject to based on aspects such as land ownership, purpose, zoning and inclusion in the class of action footprints. They include:

- **Level 1:** Protected areas equivalent to IUCN I-IV or within land managed by Parks and Wildlife. These areas are retained and managed for conservation. They have the highest level of security and are considered protected for the purpose of this assessment.
- **Level 2:** Bush Forever or Crown reserve with conservation listed in its purpose. These areas are intended for protection. Where they are reserved and managed for conservation they are considered to provide good long term outcomes. A proportion of these sites have the intent for protection but not yet the reservation or management status.
- **Level 3:** Reserved in a region scheme for ‘Parks and Recreation’ or ‘Regional Open Space’. These areas are set aside at the Region Scheme level for conservation and/or recreation and are broadly sympathetic to the retention of vegetation.
- **Level 4:** Land potentially sympathetic to conservation within a Local Structure Plan and may be zoned Public Open space, Conservation, State Forest or Recreation/Conservation in Local Planning Schemes. Also includes Crown reserves with recreation listed in its purpose. Similar to level 3, these areas are set aside at the local planning level for conservation and/or recreation and are broadly sympathetic to the retention of vegetation.
- **Level 5:** Land which falls outside of a class of action footprint and outside of levels 1 – 4. These areas represent the remaining land within the Strategic Assessment Area. Predominately comprised of rural zoned land it is broadly expected that some level of decline in vegetation will occur over time, but also that large portions will remain.
- **Level 6:** State owned land within a class of action footprint. These are areas of State owned land that occur within a class of action footprint. These areas are likely to be developed.
- **Level 7:** All other land within a class of action footprint. These are areas of privately owned land that occur within a class of action footprint. These areas are likely to be developed.
Indirect impacts

The approach to addressing indirect impacts generally involved the following:

- Identification of the indirect impacts relevant to groups of MNES. For instance for groups of listed threatened flora rather than individual flora species or single populations.
- Using a qualitative approach, rather than a quantitative approach to understanding indirect impacts.
- Dealing with indirect impacts through ongoing planning, approval and implementation processes and through the management of protected areas.

For some individual MNES, relevant indirect impacts have been identified and discussed where they are notable or represent an exception to the impacts identified at the group level. For instance, indirect impacts associated with edge effects (such as weed incursion and disturbance) are relevant to the assessment for all threatened ecological communities, while impacts to groundwater will only be relevant to those communities that are groundwater dependent.

The use of a qualitative approach to describe impacts is considered appropriate at this strategic level. Detailed quantitative methods for understanding indirect impacts are practical and necessary at a site level. For instance, modelling noise, air quality or ground water impacts from a proposed mine. However, at the geographic and temporal scale of this assessment and current stage of planning, this type of information cannot be generated.

Instead, the assessment defers to Western Australia's ongoing planning, approval and implementation processes which apply at the site level to obtain this detailed information and define suitable, best practice measures for managing the impacts. Critically, Action Plan F includes a number of over-arching commitments that require indirect impacts to be addressed. These commitments are:

- **Ensure direct and indirect impacts to conservation category wetlands (CCWs) are avoided** (including through the application of appropriate buffers) within urban, industrial, and rural residential areas.
- **Implement the infrastructure impact assessment process** (which includes planning, avoidance, mitigation, and offsets) to achieve the outcomes and objectives for MNES and State factors (see Action Plan C).
- **Implement environmental assessment and management measures**, controls and standards for all development to reduce direct and indirect impacts. This will include, but is not limited to, controls on vegetation clearing, water quality and use, stormwater, dust, noise, emissions, public access. **This process will involve:**
  - ensuring controls / conditions placed on existing approvals continue to be implemented; and
  - ensuring that new proposals that are approved incorporate at a minimum the existing standard and expectations for control / mitigation / management of direct and indirect impacts.

The types of indirect impacts which will be managed as part of later planning and approval processes include:

- **Direct mortality**, which may be managed through restrictions on traffic speed, or use of signage and fencing.
- Spread of disease, which may be managed through vehicle hygiene conditions and awareness programs.
- Noise and vibration, which may be managed through the use of sound barriers or restrictions on operating hours.
- Artificial lighting, which may be managed through the use of directional lighting or restrictions on the location of lighting at night.
- Alterations to surface water, which may be managed using measures to divert or capture runoff from construction and through the use of water sensitive urban design and other measures to avoid erosion from inappropriate water, sewer and stormwater management.
- Alterations to groundwater, which may be managed through restrictions on the scale of clearing or excavations, the use of bores or the use of particular chemicals.
- Impacts to air quality, which may be managed through dust suppression measures or the type of activity or processing permitted in sensitive locations.

There are a number of other indirect impacts which have been identified in the assessment as ‘edge effects’ to be dealt with broadly through requirements for ongoing management of protected areas. These include issues such as:

- the introduction of weeds and exotic species;
- the spread of rubbish;
- the increased risk of fire;
- the introduction of feral and domestic animals; and
- increased disturbance from pedestrian access.

Land areas protected for conservation by local and state agencies are managed to address the issues relevant to each area, such as with weed control, restrictions on access or recreational use and feral animal control. The environmental values across the Strategic Assessment Area that are needed to achieve the conservation objectives for MNES have been identified for protection in the impact assessment. Management of edge effects will be undertaken as needed in relation to these values. This is considered an adequate approach to addressing these types of impacts for the purpose of this assessment.

Further details about how indirect impacts are specifically addressed for the different types of MNES are provided throughout Chapters 15-21.

**Cumulative impacts**

Cumulative effects may arise where multiple impacts are operating at the same time, in the same region and/or on the same environmental value.

Cumulative impact assessments are particularly relevant to decisions relating to site-by-site projects, as these are often proposed within the context of a developing landscape with multiple projects contributing to pressures or declines on the same environmental value. Conducting these assessments effectively is often challenging, as an individual proponent rarely has access to the type of information necessary to understand and analyse the impacts of a third party’s proposal.
Strategic assessments under the EPBC Act provide the mechanism to consider cumulative impacts of proposed development over geographical scales and timeframes that cannot reasonably be assessed at a site-by-site level.

The Strategic Assessment of the Perth and Peel regions is especially effective at addressing cumulative impacts for the following reasons:

- It is a very large assessment, dealing with city growth for an estimated 1.8 million new residents over 30 years within an area of roughly 10,000 km².
- The assessment area supports 91 key MNES, including a large number which are endemic to the area or mostly occur there.
- The assessment area intersects with the majority of the Perth, Dandaragan Plateau and Northern Jarrah Forest sub-bioregions (DoE, 2014).

Given these specific attributes of the assessment, and the fact that strategic assessments by design address cumulative impacts, the impact assessment for key MNES did not report against cumulative impacts on an individual basis.

**Dealing with climate change and other threatening processes**

Climate change and other threatening processes have the potential to exacerbate impacts associated with the classes of action.

Understanding the potential effects of future climate change on MNES within the Strategic Assessment Area provides relevant context for the detailed impact assessments presented in this report. This context was developed as part of the assessment and is presented in Chapter 13 with:

- a summary of the findings of some of the previous studies that have been undertaken to understand the risks of climate change to the Strategic Assessment Area;
- a description of the method used to in this report to assess the vulnerability of MNES to climate change impacts;
- determination of the vulnerability of category 1 and 2 MNES to climate change; and
- an outline of the responses to climate change including the:
  - Western Australian Government policy context for climate change and biodiversity; and
  - adaptation measures being implemented through the Strategic Conservation Plan.

There are a number of other threatening processes operating within the Strategic Assessment Area that are relevant to the assessment. Many of these are registered as key threatening processes under the EPBC Act and include threats associated with:

- feral animals including rabbits, cats, foxes and pigs; and
- disease including beak and feather disease and *Phytophthora cinnamomi*.

The impact assessment considered the potential for these threats to be exacerbated as a result of the classes of action. This was generally considered in terms of relevant indirect impacts (as described above). Broad approaches are being and will continue to be adopted to address key threatening processes throughout the Strategic Assessment Area. The consistency of these approaches and likely
outcomes was analysed against the Commonwealth’s Threat Abatement Plans. The result of this analysis is presented in Chapter 14.

**Significant impact analysis**

The likely significance of impacts is a key concept under the EPBC Act. It defines a threshold for projects around the need to refer, conduct a full assessment and provide biodiversity offsets. The concept is not used in relation to Strategic Assessments. For this reason, the impact analysis in this report did not seek to systematically assess the likely significance of impacts to MNES.

The Commonwealth have published a range of policies clarifying the meaning of significance under the EPBC Act and how to apply it to a number of different MNES. In defining significance, these documents identify the key issues for each MNES at a national level. These issues are broadly relevant to any EPBC Act impact assessment. These policies were used in this way and provided an important resource for this assessment.

**8.2 CATEGORY 3 AND 4 MATTERS**

MNES assigned to categories 3 and 4 are considered to have low to no reliance on habitat within the strategic assessment area and have therefore had less of a focus in the impact assessment. These matters generally have broad ranges or potential distributions within the region, with no known occurrences within the strategic assessment area.

Category 3 matters are identified in Chapter 12, with a brief discussion of the potential risk of impacts presented at the end of the Chapter.

Category 4 matters are also identified in Chapter 12, along with a justification for why they have been assigned to the lowest category.

**8.3 POTENTIAL FUTURE LISTINGS**

In addition to MNES assigned to one of these four categories, a number of matters have also been identified as potential future listings and assessed separately in this report. These include:

- all matters included in the final priority assessment listing (FPAL) or which have been otherwise recommended to the Minister for listing by the TSSC; and
- matters which have been nominated by the State for EPBC Act listing.

A risk based approach has been adopted for the assessment of these potential matters. The aim of this assessment is to identify if any of these potential matters may be further threatened within the strategic assessment area and the measures which will need to be undertaken as part of the Strategic Conservation Plan to help protect them.

The assessment of potential future listings is provided in Chapter 22 of this report.