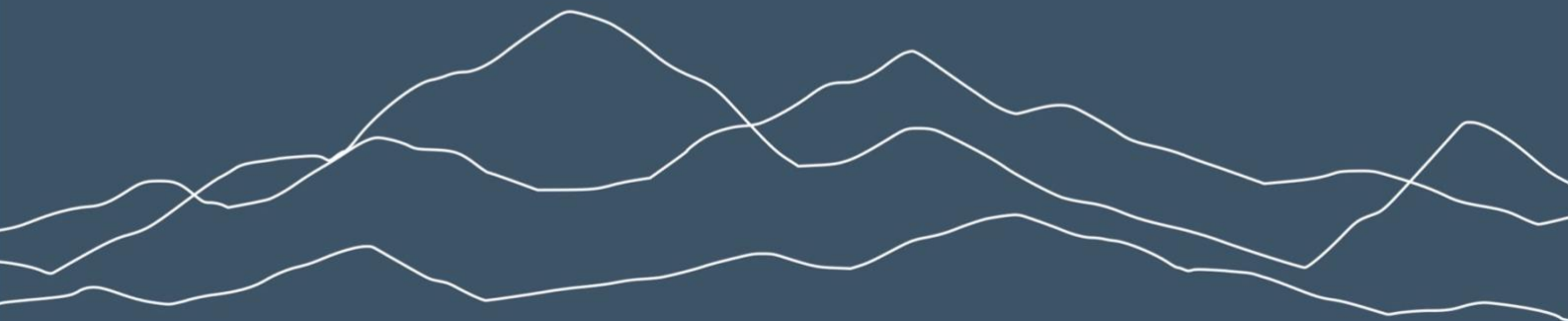


Part 5: Evaluation of the outcomes of the Plan

NWGGA Strategic Assessment Report

Public re-exhibition version



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PART 5: EVALUATION OF THE OUTCOMES OF THE PLAN

27 Introduction

In considering endorsement of the Plan and approval of the classes of actions, the Commonwealth Minister for the Environment (the Minister) must take into account various matters under the EPBC Act relating to the impacts of the development and the conservation benefits of the Plan.

This Part of the SAR:

- Analyses the Plan against the principles of Ecological Sustainable Development (ESD) (see Chapter 28)
- Evaluates the adequacy and acceptability of the Plan in the context of the impacts of the development and in accordance with the regulatory requirements of the EPBC Act (see Chapter 29)

This Chapter sets out:

- The regulatory context for evaluating the Plan
- The overall approach to the evaluation

27.1 REGULATORY CONTEXT OF THE EVALUATION

27.1.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Under the EPBC Act, the Minister:

- May endorse a policy, plan or program if satisfied that the SAR ‘adequately addresses the impacts’ on protected matters to which the agreement (to undertake a strategic assessment) relates (s146(2)(f))
- May approve the taking of actions in accordance with the endorsed policy, plan or program (s146B(1)) subject to a range of considerations under Part 10 Division 1, Subdivision C, including:
 - General considerations under s146F, including any matters relevant to MNES that the Minister considers is relevant to the approval, taking into account the principles of ESD
 - Constraints on decision-making discretion under s146 G, H, J, K, L and M, including that the Minister must not act inconsistently with the provisions of a recovery plan or threat abatement plan (s146K)

27.1.2 COMMONWEALTH TERMS OF REFERENCE

The Commonwealth Terms of Reference (ToR) under the Strategic Assessment Agreement require the SAR to:

- Evaluate the overall outcomes, commitments and outcomes for protected matters, taking into account likely impacts on protected matters under the Plan (Section 5.1). The evaluation must include (Section 5.2):
 - The extent to which protected matters are represented in the strategic assessment area*
 - The extent to which protected matters are represented in areas to be protected or managed under the Plan*
 - The extent to which any areas to be protected or managed under the Plan will ensure the long-term protection of each protected matter, and the function of key ecosystem services needed for the ongoing viability of protected matters*
 - The extent to which the outcomes, commitments and measures under the Plan address any significant vulnerabilities of protected matters under reasonable climate change scenarios*
 - The likely effectiveness of the outcomes, commitments and measures under the Plan in protecting and managing protected matters and any risks and uncertainties*
 - An assessment of how the Plan meets the Endorsement Criteria [in the Strategic Assessment Agreement]*

- Identify key uncertainties and risks associated with implementing the Plan, responses to these and proposed adaptations to changing circumstances (Section 6.1). Key uncertainties may include:
 - a) *Knowledge gaps in scientific understanding and responding to new knowledge.*
 - b) *Assumptions made in assessing potential impacts and benefits*
 - c) *How changes to Commonwealth, State and local government legislation, policies, plans and advice are to be accounted for in the management of the areas impacted by the Plan*
 - d) *The capacity to ensure the Plan is implemented*
 - e) *Differences in survey results relating to MNES and how to evaluate and resolve discrepancies*
- Include an evaluation of the adequacy of the Plan's assurance and implementation framework (Section 7.1), including for monitoring actions taken under the Plan and addressing the responsibilities of the Minister and the City in relation to these matters (Section 7.2)

27.2 APPROACH TO THE EVALUATION

Evaluation of the overall outcomes and acceptability of the Plan was undertaken at three levels:

- In relation to the principles of ESD (see Chapter 28)
- In relation to the overall adequacy and acceptability of the Plan in accordance with the requirements of the Strategic Assessment Agreement and ToR (see Chapter 29)
- For individual relevant protected matters under the EPBC Act (see Part 4)

28 Ecologically sustainable development

28.1 INTRODUCTION

Ecologically sustainable development (ESD) is defined as:

‘using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased’ (COAG, 1992).

This Chapter:

- Sets out the legal and other requirements for assessing ESD
- Provides an analysis of the Plan against each of the principles of ESD:
 - Principle 1 – integration of social, economic and environmental considerations
 - Principle 2 – precautionary principle
 - Principle 3 – intergenerational and intragenerational equity
 - Principle 4 – conservation of biodiversity and ecological integrity
 - Principle 5 – valuation, pricing and incentive mechanisms

28.2 REQUIREMENTS FOR ASSESSING ESD

28.2.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The EPBC Act incorporates the promotion of ESD within the key objectives of the Act, which states:

“The objects of this Act are ... to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources”

The Act requires that the Minister consider economic and social matters, including taking the principles of ESD into account, when considering the approval of the taking of actions in accordance with an endorsed program or plan under the EPBC Act (section 146F). The definition of ESD under Section 3A of the EPBC Act is:

Commonwealth definition of ESD – EPBC Act

Part 1 Preliminary

Section 3A Principles of ecologically sustainable development

The following principles are principles of ecologically sustainable development:

- (a) *decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;*
- (b) *if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;*
- (c) *the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;*
- (d) *the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;*
- (e) *improved valuation, pricing and incentive mechanisms should be promoted.*

28.2.2 COMMONWEALTH TERMS OF REFERENCE

The ToR (Section 2.1(e)) requires the SAR to: “...describe how the principles of ecologically sustainable development (as set out in section 3A of the EPBC Act) are considered and promoted in the development of the Plan”.

28.3 ANALYSIS OF PLAN AGAINST THE PRINCIPLES OF ESD

This section provides an evaluation of the Plan against each of the principles of ESD.

28.3.1 PRINCIPLE 1: INTEGRATION OF SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS

Principle 1 requires decisions to integrate economic, environmental, social and equitable considerations.

Specifically, the EPBC Act defines Principle 1 of ESD as “decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations” (Section 3A(a)).

GUIDANCE TO ASSIST INTERPRETATION OF PRINCIPLE

There are several matters to consider in balancing economic, environmental and social considerations (Preston, 2016):

- Environmental, economic, social and equitable considerations are interconnected and interdependent, such that changes in one can affect the capacity to achieve the goals of others
- It may not always be appropriate to accord equal weight to economic, environmental, social and equitable considerations. Doing this assumes that ecological processes can always sustain ongoing development. However, there are thresholds at which environmental processes may deteriorate
- Environmental, economic, social and equitable objectives cannot practically be balanced in all decisions made, or for each area of land. For example, some areas may be set aside completely for environmental objectives, whereas other parcels of land may be utilised for intensive economic development

EVALUATION OF PRINCIPLE

The Plan is consistent with Principle 1 of ESD as it:

- Supports the delivery of policies and strategies that integrate social, economic, and environmental considerations and objectives and that address key planning challenges for the Greater Geelong area
- Has been informed by processes that integrate social, economic, and environmental considerations

The Plan has been informed by and supports the delivery of several key planning policies and strategies that aim to address the key planning challenges facing Geelong including:

- Population growth
- Housing affordability and availability
- Protecting the natural environment and amenity

Chapter 6, Part 2 of the SAR provides a description of the key planning challenges and the planning and policy context for the identification and development Growth Areas.

The *Northern and Western Geelong Growth Areas Framework Plan* (the Framework Plan) (The City of Greater Geelong, 2021) is a key element of the City’s approach to the key planning challenges. The Framework Plan will guide the future land use and development of the Growth Areas and outlines major land use and development requirements to deliver sustainable new communities that coordinate essential infrastructure and services.

The development supported by the Plan represents the strategic prioritisation and delivery of new urban development to address the long-term growth of the Greater Geelong area and meet social, economic and environmental outcomes for Geelong and the wider region. The Growth Areas are the key focus for urban development over the coming decades and will be centres of economic and social activity.

A range of social, economic and environmental benefits will be provided to Geelong and the wider region through delivery of the Growth Areas including but not limited to:

- Sustainable and diverse mix of housing and accommodation to support future residents and visitors of Geelong
- New employment, training and education opportunities
- New public and private transport networks
- Community open spaces, including recreation reserves and local parks
- Protection and ongoing management of:

- Striped Legless Lizard and Golden Sun Moth, and habitat attributes for Victorian Grassland Earless Dragon within the Northern Conservation Area
- Natural Temperate Grassland within the Eastern Conservation Area
- Growling Grass Frog and areas of potential habitat for Adamson’s Blown-grass within the Cowies Creek Conservation Area

Chapter 8 in Part 2 of the SAR describes the conservation that will be delivered through development of the Growth Areas and Chapter 26 in Part 4 of the SAR provides a detailed analysis of the socio-economic impacts of the Plan.

By supporting the delivery of the Framework Plan and other key planning policies and documents for Geelong and Victoria, the Plan is supporting a long-term strategic planning process that integrates social, economic, and environmental considerations and addresses the key planning challenges facing the Greater Geelong area.

The Plan was also developed through several processes that ensured social, economic, and environmental considerations were effectively integrated in decisions relating to the Plan, including:

- The strategic assessment process – environmental impact assessment processes such as strategic assessments are a well-recognised mechanism to incorporate environmental considerations alongside social, economic, and equitable considerations into policies, plans and programs (Preston, 2016)
- A Structured Decision Making process (see SAR Supporting Document C) – this was applied to determine the most suitable layout for urban development and conservation within the Growth Areas. The process provides a systematic method to identify and compare a range of options available for defining the land subject to development, taking into account social, economic, and environmental considerations. It involved five steps:
 - Understanding the decision that needed to be made
 - Identifying what is important when making that decision
 - Developing a range of alternatives to compare
 - Understanding the performance of different alternatives
 - Comparing options and selecting a preferred alternative

28.3.2 PRINCIPLE 2: PRECAUTIONARY PRINCIPLE

Principle 2 is articulated in Section 3A(b) of EPBC Act as: “if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”.

GUIDANCE TO ASSIST INTERPRETATION OF PRINCIPLE

Principle 2 should be applied when two conditions are met (Preston, 2017):

- There is a threat of serious and irreversible impacts (SAII) to the environment, and
- There is scientific uncertainty as to the environmental damage associated with the threat

Where both these conditions are met, the decision-maker must:

- Assume the environmental damage associated with the threat would occur
- Put in place mitigation to address this damage, including avoidance, mitigation and offset measures

Where there is a threat of SAII, but the impacts associated with the threat are well understood and able to be predicted with certainty, the precautionary principle is not triggered, as scientific uncertainty is not present (Preston, 2017). While measures will still need to be taken to avoid and minimise damage in these cases, these measures are considered to be ‘preventative’ measures rather than ‘precautionary’ measures (Preston, 2017).

EVALUATION OF PRINCIPLE

SAII are not specifically defined at a Commonwealth level. The determination of whether the development under the Plan may result in a threat of SAII was made by applying a set of principles and guiding criteria to each protected matter that may be potentially impacted by the Plan. These principles and criteria are derived from guidance on SAII provided under the NSW *Biodiversity Conservation Act 2016* (DPIE, 2019), and are set out in Table 28-1.

Protected matters were considered to be at threat of SAII if they:

- Met at least one of the principles and criteria in Table 28-1, and
- Are potentially impacted by the development under the Plan

Table 28-2 identifies the relevant protected matters that are potentially impacted by the development under the Plan (see Chapter 18) and that are at threat of SAII because they meet one or more of the principles.

Table 28-1: Principles and guiding criteria to determine protected matters at threat of SAII

Principle	Guiding criteria
Protected matter is in a rapid rate of decline	<ul style="list-style-type: none"> • Generally critically endangered matters where the reason for the listing is a very large reduction in population size or geographic extent, or • Estimated reduction in population size or geographic extent of $\geq 80\%$ in 10 years or three generations, or $\geq 90\%$ since 1750, or $\geq 80\%$ over 50 years
Protected matter has a very small population size, or ecological community is severely degraded	<ul style="list-style-type: none"> • Generally critically endangered matters where the reason for the listing is a very small size or high degradation or disruption to biotic processes, or • ≤ 250 individuals remaining, or • $\geq 90\%$ of extent of ecological community is subject to very high degradation or disruption of biotic and ecological processes
Protected matter has a very limited geographic distribution	<ul style="list-style-type: none"> • Generally critically endangered matters where the reason for the listing is a very highly restricted geography distribution, or <p>For species:</p> <ul style="list-style-type: none"> • Area of Occupancy of $\leq 10 \text{ km}^2$ or, • Extent of Occurrence of $\leq 100 \text{ km}^2$ or, • Inhabit \leq three locations in Victoria <p>For ecological communities:</p> <ul style="list-style-type: none"> • Extent of Occurrence of $\leq 1000 \text{ km}^2$
Protected matter is unlikely to respond to habitat improvement	<ul style="list-style-type: none"> • Life history traits severely limit the ability to control threats at the site scale (in general, these are species significantly threatened by uncontrollable disease, such as frogs and chytrid fungus), or • Reproductive traits severely limit the ability to increase in abundance or occupy new habitat (in general, these are plants that are sterile or largely clonal with limited capacity to reproduce through seed), or • Relies on habitat components that are unable to be re-created at an offset site (in general this includes caves, rocky areas, or cliff lines)

Table 28-2: Relevant protected matters at threat of SAII

Protected matter	At threat of SAII?	Relevant principle triggered*
Flora		
<i>Lachnagrostis adamsonii</i> (Adamson's Blown-grass)	No	Does not meet the principles/criteria (Murphy, 2010)
<i>Pimelea spinescens</i> subsp. <i>spinescens</i> (Spiny Rice-flower)	Yes	Principle 3 – a critically endangered species with a very restricted area of occupancy that is likely to continue to decline due to land clearing and habitat degradation (TSSC, 2003)

Protected matter	At threat of SAI?	Relevant principle triggered*
Fauna		
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	No	Does not meet the principles/criteria (TSSC, 2019)
<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	No	Does not meet the principles/criteria (DCCEEW, 2024a)
<i>Calidris canutus</i> (Red Knot)	No	Does not meet the principles/criteria (TSSC, 2016a)
<i>Calidris ferruginea</i> (Curlew Sandpiper)	Yes	Principle 1 – a critically endangered species with a very large reduction in population size (an estimated reduction of $\geq 80\%$ over three generations) (TSSC, 2015)
<i>Calidris tenuirostris</i> (Great Knot)	Yes	Principle 1 – a critically endangered species with a very large reduction in population size (an estimated reduction of $\geq 80\%$ over three generations) (TSSC, 2016b)
<i>Charadrius leschenaultii</i> (Greater Sand Plover)	No	Does not meet the principles/criteria (TSSC, 2016c)
<i>Charadrius mongolus</i> (Lesser Sand Plover)	No	Does not meet the principles/criteria (TSSC, 2016d)
<i>Delma impar</i> (Striped Legless Lizard)	No	Does not meet the principles/criteria based on a review of the SPRAT profile (DCCEEW, 2022)
<i>Gallinago hardwickii</i> (Latham's Snipe)	No	Does not meet the principles/criteria (DCCEEW, 2024b)
<i>Galaxiella toourtkoourt</i> (Eastern Dwarf Galaxias) (previously <i>Galaxiella pusilla</i>)	No	Does not meet the principles/criteria (Saddler, Jackson and Hammer, 2010)
<i>Limosa lapponica baueri</i> (Western Alaskan Bar-tailed Godwit)	No	Does not meet the principles/criteria (TSSC, 2016g)
<i>Limosa limosa</i> (Black-tailed Godwit)	No	Does not meet the principles/criteria (DCCEEW, 2024c)
<i>Litoria raniformis</i> (Growling Grass Frog)	Yes	Principle 4 – life history traits severely limit the ability to control threats at the site scale (the species is threatened by chytrid fungus) (Clemann and Gillespie, 2012)
<i>Nannoperca obscura</i> (Yarra Pygmy Perch)	No	Does not meet the principles/criteria (Saddler and Hammer, 2010)
<i>Neophema chrysogaster</i> (Orange-bellied Parrot)	Yes	Principle 2 – a critically endangered species with a very small population size (about 50 remaining in the wild) (DELWP, 2016)
<i>Neophema chrysostoma</i> (Blue-winged Parrot)	No	Does not meet the principles/criteria (DCCEEW, 2023b)
<i>Numenius madagascariensis</i> (Eastern Curlew)	No	Principle 1 – a critically endangered species with a very large reduction in population size (an estimated reduction of $\geq 80\%$ over three generations) (DoE, 2015)
<i>Prototroctes maraena</i> (Australian Grayling)	No	Does not meet the principles/criteria (TSSC, 2021)
<i>Rostratula australis</i> (Australian Painted Snipe)	No	Does not meet the principles/criteria (TSSC, 2013)
<i>Sternula albifrons</i> (Little Tern)	No	Does not meet the principles/criteria (DCCEEW, 2025)
<i>Sternula nereis nereis</i> (Australian Fairy Tern)	No	Does not meet the principles/criteria (TSSC, 2011)

Protected matter	At threat of SAI?	Relevant principle triggered*
<i>Synemon plana</i> (Golden Sun Moth)	No	Does not meet the principles/criteria (DAWE, 2021a)
<i>Tringa nebularia</i> (Common Greenshank)	No	Does not meet the principles/criteria (DCCEEW, 2024d)
<i>Tympanocryptis pinguicollis</i> (Victorian Grassland Earless Dragon)	Yes	Principle 2 – a critically endangered species known from one remnant population of 29 individuals (DCCEEW, 2023a) Principle 3 – a critically endangered species with a very limited area of occupancy (4 – 8 km ²) (Zoos Victoria, 2024)
Threatened ecological communities		
Natural Temperate Grassland	Yes	Principle 1 – a critically endangered ecological community with a very large reduction in geographic extent (an estimated reduction of ≥ 90% since 1750) (DEWHA, 2008a)
Ramsar Wetlands		
Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site	Yes	Principle 3 – The Ramsar site is limited to a specific geographic location which influences ecological character (geomorphic setting, climate, and water quality guide the habitat and vegetation supported at the Ramsar site) (DEWHA, 2008b)

*Note – additional principles may also be relevant

An assessment of impacts of the development under the Plan on each of the protected matters identified at threat of SAI is provided in Part 4. For each of these matters, there is some scientific uncertainty as to the specific nature, extent and seriousness of the impacts, and therefore the precautionary principle is triggered.

For these protected matters, the Plan is consistent with the precautionary principle as it:

- Assumes the environmental damage associated with the threat would occur
- Puts in place mitigation to address this damage, including avoidance, mitigation and offset measures

Table 28-3 summarises the avoidance, mitigation and/or offset measures that will be implemented to address the potential damage to each protected matter for which the precautionary principle is triggered.

These commitments and measures are set out in detail in Part 4.

Table 28-3: Mitigation to be implemented to address protected matters at threat of SAI

Protected matter	Potential impact		Is there scientific uncertainty about the impact's damage?	Will mitigation be implemented to address impacts that are uncertain?
	Direct	Indirect		
<i>Pimelea spinescens</i> subsp. <i>spinescens</i> (Spiny Rice-flower)	Possible	No	Yes – scientific uncertainty relates to potential occurrence/direct impacts in external infrastructure footprints	Yes – Plan includes commitment to avoid and protect any populations confirmed through surveys (see Part 4)
<i>Calidris ferruginea</i> (Curlew Sandpiper)	No	Yes	Yes – scientific uncertainty relates to indirect impacts (nature and extent of changes to water flows and quality)	Yes – Plan includes commitment to implement standard mitigation measures to address water flows and quality (see Part 4)
<i>Calidris tenuirostris</i> (Great Knot)	No	Yes	Yes – scientific uncertainty relates to indirect impacts (nature and extent of changes to water flows and quality)	Yes – Plan includes commitment to implement standard mitigation measures to address water flows and quality (see Part 4)

Protected matter	Potential impact		Is there scientific uncertainty about the impact's damage?	Will mitigation be implemented to address impacts that are uncertain?
	Direct	Indirect		
<i>Litoria raniformis</i> (Growling Grass Frog)	No	Yes	Yes – scientific uncertainty relates to indirect impacts (nature and extent of changes to water flows and quality)	Yes – Plan includes commitments to protect the population within the Cowies Creek Conservation Area. These include preparation and implementation of a CMP for the Conservation Area, as well as the broader implementation of both standard and specific mitigation measures to address water flows and quality (see Part 4)
<i>Neophema chrysogaster</i> (Orange-bellied Parrot)	No	Yes	Yes – scientific uncertainty relates to indirect impacts (nature and extent of changes to water flows and quality)	Yes – Plan includes commitment to implement standard mitigation measures to address water flows and quality (see Part 4)
<i>Tympanocryptis pinguicolla</i> (Victorian Grassland Earless Dragon)	Yes	Yes	Yes – scientific uncertainty relates to the potential occurrence and potential direct and / or indirect impacts	Yes – Plan includes commitments to protect and manage habitat for the potential recovery of Victorian Grassland Earless Dragon within the Northern Conservation Area. Commitments include preparation and implementation of a CMP for the Northern Conservation Area, as well as the broader implementation of both standard and specific mitigation measures (see Part 4)
Natural Temperate Grassland	Yes	Yes	Yes – scientific uncertainty relates to potential occurrence/direct impacts in unsurveyed areas and external infrastructure footprints	Yes – Plan includes commitments to protect and manage Natural Temperate Grassland within the Eastern Conservation Area. Commitments include preparation and implementation of a CMP for the Eastern Conservation Area, as well as the broader implementation of both standard and specific mitigation measures (see Part 4)
Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site	No	Yes	Yes – scientific uncertainty relates to indirect impacts (nature and extent of changes to water flows and quality)	Yes - Plan includes a specific commitment to minimise the indirect impacts of the development on protected matters associated with waterways, riparian areas and wetlands, including the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site (see Part 4)

28.3.3 PRINCIPLE 3: INTERGENERATIONAL AND INTRAGENERATIONAL EQUITY

Principle 3 is articulated in Section 3A(c) of EPBC Act as: “The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations”.

GUIDANCE TO ASSIST INTERPRETATION OF PRINCIPLE

Principle 3 contains two key elements (Preston, 2016):

- Intergenerational equity – this relates to equity between current and future generations

- Intragenerational equity – this relates to equity within current generations

There are three sub-principles that inform the basis of intergenerational and intragenerational equity (Preston, 2016):

- Conservation of options – this provides that each generation should conserve the diversity and robustness of the resource base to ensure future generations have the same access to alternatives and options when solving problems
- Conservation of quality – this provides that the quality of natural and cultural environments should be maintained, so they are passed on in the same or better condition than they were received
- Conservation of access – this provides that each generation has the right to reasonable and equitable access to natural and cultural resources to improve their own social and economic wellbeing

EVALUATION OF PRINCIPLE

The Plan is consistent with Principle 3 of ESD as it has an objective and strong conservation-related outcomes and establishes a comprehensive conservation program that is designed to achieve this objective and outcomes.

The Plan's objective includes providing for the protection of MNES while supporting development. The Plan's conservation-related outcomes include:

Populations of Golden Sun Moth and Striped Legless Lizard are maintained within the Northern Conservation Area

The extent and condition of Natural Temperate Grassland is maintained within the Eastern Conservation Area

Impacts to habitat for Golden Sun Moth, Striped Legless Lizard and Natural Temperate Grassland within the drainage avoidance area will be avoided and minimised

Potentially suitable habitat attributes for Victorian Grassland Earless Dragon within the Northern Conservation Area will be protected and managed to support potential recovery of the species

The long-term viability of the important population of the Growling Grass Frog along Cowies Creek is supported through the protection and enhancement of habitat

The protection and management of land outside of the Growth Areas makes an important contribution to the recovery efforts for Natural Temperate Grassland, Golden Sun Moth, and Striped Legless Lizard in Victoria

Matters of national environmental significance associated with waterways, riparian areas, and wetlands are protected from any notable adverse impacts of development under the Plan

The Plan's objective and outcomes are consistent with the three sub-principles that inform the basis of intergenerational and intragenerational equity by aiming to conserve areas of highest biodiversity value within the Strategic Assessment Area and ensure the persistence of key threatened species that occur within the Greater Geelong area.

The conservation program has been designed to achieve a strategic outcome for biodiversity and maximise ecological function and resilience at the landscape scale in the Greater Geelong area.

Offsets under the conservation program will greatly increase the level of permanent protection of threatened species and ecological communities in the Greater Geelong area, thereby contributing to the conservation of the area's natural resource base and maintenance of the quality of natural environments.

The Plan includes a range of assurance mechanisms and processes under the Plan's assurance and implementation framework to ensure the achievement of the outcomes over the life of the Plan.

It is important to note that the Plan does not address cultural resources other than areas of biodiversity value. Other cultural resources, such as archaeological, built, and Aboriginal cultural heritage are regulated in Victoria under other legislation and are subject to separate assessment and approval processes that are not part of the Plan.

28.3.4 PRINCIPLE 4: CONSERVATION OF BIODIVERSITY AND ECOLOGICAL INTEGRITY

Principle 4 is articulated in Section 3A(d) of EPBC Act as: "the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making".

GUIDANCE TO ASSIST INTERPRETATION OF PRINCIPLE

Section 528 of the EPBC Act provides the following definition of biodiversity:

Biodiversity means the variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part) and includes:

- a) *diversity within species and between species; and*
- b) *diversity of ecosystems.*

As Commonwealth legislation articulates that Principle 4 should be a ‘fundamental consideration’ in decision making, courts have recognised that Principle 4 is one to which “significant weight should be assigned” (Preston, 2016). Although it is recognised that priority is to be given to the conservation of biodiversity and ecological integrity, this does not mean that a project must be refused if it is likely to impact on these matters (Preston, 2016).

EVALUATION OF PRINCIPLE

The Plan is consistent with Principle 4 of ESD as it:

- Establishes a conservation framework to deliver a conservation program that will:
 - Avoid key areas of high biodiversity value for protected matters
 - Mitigate impacts
 - Offset residual impacts and conserve threatened species and ecological communities
 - Protect significant areas of high biodiversity value in the Greater Geelong area that will achieve a strategic outcome for biodiversity and maximise ecological function and resilience at the landscape scale
- Has been developed through a strategic assessment process that ensured biodiversity was given fundamental consideration in decisions relating to the Plan

The conservation framework, and how it considers and benefits biodiversity, is evaluated in Chapter 29.

The development of the Plan was informed by a strategic assessment process that ensured biodiversity was given fundamental consideration in decisions relating to the Plan. A strategic assessment process provides an improved mechanism to address key landscape-scale conservation challenges over a site-by-site assessment and approval process. Strategic assessments can have the following benefits:

- Enable effort to be focused on the highest biodiversity value areas of the landscape
- Address ecological function and landscape-scale ecological processes, such as habitat connectivity
- Be designed and implemented strategically by consolidating offsets into large and more viable patches
- Be implemented ahead of impacts occurring from development, to help reverse any trend of decline

The strategic assessment process substantially informed the conservation program under the Plan by:

- Providing a comprehensive information base on biodiversity values to inform the development of the Plan
- Identifying key risks to biodiversity values from the impacts of the development
- Informing avoidance, mitigation and offset measures needed to adequately manage impacts
- Informing conservation priorities, including priorities for avoidance and offsets

It is also important to note that the legislation regulating approval of the Plan requires decision-makers to provide significant consideration to biodiversity. Under the EPBC Act, the Minister can only approve the taking of actions in accordance with the endorsed Plan subject to a range of constraints on decision-making, including to not act inconsistently with a recovery plan or threat abatement plan for a protected matter (s146K).

28.3.5 PRINCIPLE 5: VALUATION, PRICING AND INCENTIVE MECHANISMS

Principle 5 is articulated in Section 3A(e) of EPBC Act as: “improved valuation, pricing and incentive mechanisms should be promoted”.

Preston (2016) notes that Principle 5 is designed to account for environmental damage caused by market failure. Market failure occurs where the output of one entity acts as a negative input into one or more other entities without accompanying payment of compensation. Negative outputs are referred to as negative externalities.

Principle 5 emphasises the promotion of mechanisms to internalise the costs of negative externalities. The rationale for this is if the real value of environmental resources is included in the total costs for using those resources, then environmental resources will be more sustainably used, and the risk of exploitation will be reduced.

GUIDANCE TO ASSIST INTERPRETATION OF PRINCIPLE

The element in relation to Principle 5 subject to most guidance relates to the 'polluter pays' principle. This principle is the best-known means for internalising external environmental costs. The principle says that those who generate pollution and waste should bear the costs of containment, avoidance or abatement (Preston, 2016).

Under this principle, the polluter should pay for the costs of (Preston, 2016):

- Preventing pollution or reducing pollution to comply with relevant laws and standards
- Preventing, controlling, abating and mitigating pollution
- Making good any environmental damage caused by pollution
- Making reparation (including compensatory damages and compensatory restoration) for irremediable injury

Evaluation of the Plan in relation to Principle 5 is based on considering whether the Plan has developed mechanisms to achieve internalisation of negative externalities associated with the development under the Plan.

EVALUATION OF PRINCIPLE

The Plan is generally consistent with Principle 5 of ESD as environmental factors have been included in the valuation of assets and services. This has been achieved through:

- Applying the polluter pays principle
- Achieving environmental goals in cost-effective ways

Polluter pays principle

The conservation framework under the Plan includes commitments to:

- Avoid areas of high biodiversity value (preventing or reducing 'pollution')
- Mitigate threats (controlling, abating and mitigating 'pollution')
- Offset impacts (making good any environmental damage caused by 'pollution')

The Plan is consistent with the polluter pays principle as the City proposes to establish funding arrangements to fully recover the costs of conservation from developers (a biodiversity levy) within the Growth Areas.

These arrangements will ensure those who generate 'pollution and waste' bear the costs of 'containment, avoidance or abatement' by imposing the costs of conservation on developers.

Cost-effective environmental goals

The Plan achieves environmental goals to minimise the costs of development and maximise benefits to biodiversity by:

- Using a strategic assessment process to assess and approve the Plan
- Using an existing market-based mechanism to help deliver the conservation framework
- Identifying priority conservation areas to maximise benefits to biodiversity at least cost

Strategic assessments provide a cost-effective mechanism to assess and seek approval for development. Access Economics undertook a cost-benefit analysis of seven strategic assessments based on net present value (NPV) over a 30 year period (2010-11 to 2039-40), comparing site-by-site assessment processes with the alternative strategic assessment process. The analysis (Access Economics, 2011) found that strategic assessments provide a net benefit of:

- \$4.5 million for the Australian Government

- \$0.57 million for State governments
- \$5.92 billion for developers, reflecting the commercial benefits from reducing uncertainty, risk and delays

Across all entities, the NPV of the net benefit for the seven programs was estimated as \$5.93 billion.

Use of market-based mechanisms

The Plan proposes to use an existing market-based mechanism under Victorian regulations to deliver a substantial part of the conservation framework through on-title biodiversity security agreements with landholders. This approach ensures efficient delivery of offsets because:

- Land is not required to be purchased – land purchase is expensive in the Greater Geelong area
- The process is competitive – the City is more likely to enter into security agreements with landholders who can deliver conservation outcomes at the least cost (where other factors are equal)
- Security agreements are voluntary, meaning that only willing landholders, who may be more likely to deliver conservation outcomes effectively, will participate in the process

Strategic offsets to maximise benefits

The City considered a number of options for delivering the offsets for the project. The approach to strategic offsetting that is incorporated into the Plan performed the best against a range of evaluation criteria. This is expected to maximise biodiversity benefits at the most cost efficient manner compared to what would happen under a normal project-by-project development scenario.

29 Evaluation of the Plan's adequacy

29.1 INTRODUCTION

The ToR includes requirements for evaluating the adequacy and acceptability of the Plan in the context of the impacts of the development and in accordance with the regulatory requirements of the EPBC Act.

The main requirements for evaluating the Plan are in clauses 5 and 7 of the ToR. These require the SAR to evaluate:

- The overall outcomes, commitments and measures for protected matters, taking into account the likely impacts on protected matters from the development under the Plan (clause 5)
- The adequacy of the Plan's assurance and implementation framework in providing best practice monitoring programs, regular review, public reporting and independent auditing processes (clause 7)

For each of these requirements, the ToR sets out specific matters that must be considered in undertaking the evaluation.

Other evaluation-related requirements of the ToR are included in:

- Clause 4.5(c)(d) – this requires an analysis of the adequacy and likely effectiveness of the outcomes, commitments and measures under the Plan in protecting MNES
- Clause 6.1(d) – this requires analysis of the capacity to implement the Plan

Table 29-1 summarises the evaluation requirements of the ToR and identifies where they are addressed in the SAR.

This Chapter addresses the evaluation requirements of the ToR, and is structured as follows:

- Extent of MNES in the Strategic Assessment Area and in areas to be protected
- How the long-term protection of MNES will be ensured
- Effectiveness of the outcomes, commitments and measures in protecting MNES
- How the Plan addresses vulnerabilities of protected matters to climate change
- Adequacy of the Plan's assurance and implementation framework
- How the Plan meets the Endorsement Criteria in the Strategic Assessment Agreement
- Conclusion

The ToR also requires the SAR to identify key uncertainties and risks associated with implementing the Plan, responses to these and proposed adaptations to changing circumstances (ToR, clause 6.1). This is addressed in Chapter 14.

Table 29-1: Summary of the evaluation requirements of the ToR

ToR evaluation requirement	Section of SAR
5. EVALUATION OF THE OVERALL OUTCOMES OF THE PLAN	
<i>5.1. The Report must evaluate the overall outcomes, commitments and measures for protected matters taking into account likely impacts on protected matters from actions proposed to be taken under the Plan.</i>	
<i>5.2. The evaluation must include:</i>	
<i>a) The extent to which protected matters are represented in the Strategic Assessment Area</i>	Section 29.2
<i>b) The extent to which protected matters are represented in areas to be protected or managed under the Plan</i>	
<i>c) The extent to which any areas to be protected or managed under the Plan will ensure the long-term protection of each protected matter and the ongoing function of any key ecosystem services needed for the ongoing viability of protected matters</i>	Section 29.3
<i>d) The extent to which the outcomes, commitments and measures under the Plan address any significant vulnerabilities of protected matters under reasonable climate change scenarios</i>	Section 29.5

ToR evaluation requirement	Section of SAR
e) <i>The likely effectiveness of the outcomes, commitments and measures under the Plan in protecting and managing protected matters and any risks and uncertainties</i>	Section 29.4
f) <i>An assessment of how the Plan meets the endorsement criteria, as set out in Attachment 2 of the Strategic Assessment Agreement</i>	Section 29.7
7. ASSURANCE AND IMPLEMENTATION FRAMEWORK	
7.1. The Report must include an evaluation of the adequacy of the Plan's Assurance and Implementation Framework which describes the best practice monitoring programs, regular review, public reporting and independent auditing processes proposed to:	
a) <i>Ensure outcomes, commitments and measures for protected matters contained in the Plan are documented, delivered and adequately resourced throughout the life of the Plan</i>	Section 29.6
b) <i>Ensure the results of monitoring will be used to understand the effectiveness of commitments and measures for protected matters and improve implementation, in particular, to adapt where monitoring demonstrates delivery of commitments and measures are not leading to desired outcomes or where there are risks to protected matters</i>	
c) <i>Ensure new information relating to protected matters, including legislative changes, may be assessed and accounted for in implementation of the Plan</i>	
d) <i>Provide mechanisms that track persons who are relying on a strategic assessment approval to take an action and ensure persons undertaking actions are informed of their obligations under the endorsed Plan and approval</i>	
e) <i>Ensure compliance with the Plan will be monitored and non-compliance will be reported</i>	
f) <i>Provide for a 5-yearly assurance review and report</i>	
7.2. <i>The Report must include an evaluation of the Plan's framework for monitoring actions taken under the Plan and addressing the responsibilities of the Minister and City of Greater Geelong as to these matters.</i>	
4. ASSESSMENT OF THE IMPACTS OF THE PLAN ON PROTECTED MATTERS	
4.5. The Report must include an analysis of the conservation benefits (beneficial impacts) of the Plan, including:	
c) <i>The adequacy and likely effectiveness of the outcomes, commitments and measures under the Plan in protecting and managing protected matters, including the effectiveness of implementation, funding arrangements and who will be responsible for delivery</i>	Section 29.4 and Section 29.6
d) <i>Available evidence to support conclusions reached regarding the effectiveness of the outcomes, commitments and measures identified in the Plan</i>	Section 29.4
6. ADDRESSING UNCERTAINTY AND RISK	
6.1. The Report must identify key uncertainties and risks associated with implementing the Plan, responses to these and proposed adaptations to changing circumstances. Key uncertainties may include:	
d) <i>The capacity to ensure the Plan is implemented</i>	Section 29.6

29.2 EXTENT OF MNES

29.2.1 INTRODUCTION

The ToR requires the SAR to include an evaluation of the presence of MNES within the Strategic Assessment Area and the conservation areas to be protected under the Plan (see Table 29-1).

This section identifies the extent to which relevant protected matters occur within the:

- Strategic Assessment Area
- Areas to be protected or managed under the Plan

29.2.2 MNES OCCURRENCE WITHIN THE STRATEGIC ASSESSMENT AREA

Of the 31 protected matters relevant to implementation of the Plan, 26 occur within the Strategic Assessment Area (based on records or mapped habitat). Of these, 9 have mapped habitat or records within the Growth Areas (noting Adamson's Blown-grass only has historical records in the WGGA, and Victorian Grassland Earless Dragon has not been recorded within the Growth Areas).

Table 29-2 outlines the extent of threatened species within the Strategic Assessment Area and Growth Areas. Table 29-3 outlines the extent of TECs, Ramsar wetlands, and migratory species within the Strategic Assessment Area and Growth Areas.

Table 29-2: The extent of threatened species within the Strategic Assessment Area and the Growth Areas

Name	Cth listing	Presence within the Strategic Assessment Area		Presence within the Growth Areas	
		Records	Habitat (ha)	Records	Habitat (ha)
Threatened flora					
Adamson's Blown-grass (<i>Lachnagrostis adamsonii</i>)	Endangered	9	118.4**	2*	4.9
Spiny Rice-flower (<i>Pimelea spinescens</i> subsp. <i>spinescens</i>)	Critically Endangered	1	706	0	0
Threatened fauna					
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	Endangered	0	40.9	0	0
Australian Fairy Tern (<i>Sternula nereis nereis</i>)	Vulnerable	0	5.1	0	0
Australian Grayling (<i>Prototroctes maraena</i>)	Vulnerable	0	12.8	0	3.5
Australian Painted Snipe (<i>Rostratula australis</i>)	Endangered	0	42.4	0	0
Black-tailed Godwit (<i>Limosa limosa</i>)	Endangered, Migratory	0	24.2	0	0
Blue-winged Parrot (<i>Neophema chrysostoma</i>)	Vulnerable	0	N/A^	0	N/A^
Common Greenshank (<i>Tringa nebularia</i>)	Endangered, Migratory	0	23.6	0	0
Curlew Sandpiper (<i>Calidris ferruginea</i>)	Critically Endangered, Migratory	0	12.4	0	0
Eastern Curlew (<i>Numenius madagascariensis</i>)	Critically Endangered, Migratory	0	3.9	0	0
Golden Sun Moth (<i>Synemon plana</i>)	Vulnerable	>2000	789.9**	>2000	766.3**
Great Knot (<i>Calidris tenuirostris</i>)	Critically Endangered, Migratory	0	0	0	0
Greater Sand Plover (<i>Charadrius leschenaultii</i>)	Vulnerable, Migratory	0	0.5	0	0

Name	Cth listing	Presence within the Strategic Assessment Area		Presence within the Growth Areas	
		Records	Habitat (ha)	Records	Habitat (ha)
Growling Grass Frog (<i>Litoria raniformis</i>)	Vulnerable	54	256.3**	50	4.9
Latham's Snipe (<i>Gallinago hardwickii</i>)	Vulnerable, Migratory	0	N/A^	0	N/A^
Lesser Sand Plover (<i>Charadrius mongolus</i>)	Endangered, Migratory	0	2.2	0	0
Little Galaxias (<i>Galaxiella toourtkoourt</i>)	FPAL	0	12.8	0	3.5
Little Tern (<i>Sternula albifrons</i>)	Vulnerable, Migratory	0	17.1	0	0
Orange-bellied Parrot (<i>Neophema chrysogaster</i>)	Critically Endangered	0	2.8	0	0
Red Knot (<i>Calidris canutus</i>)	Endangered, Migratory	0	5.6	0	0
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	Vulnerable, Migratory	0	N/A^	0	N/A^
Striped Legless Lizard (<i>Delma impar</i>)	Vulnerable	46	328.3**	45	227.1**
Victorian Grassland Earless Dragon (<i>Tympanocryptis pinguicollis</i>)	Critically Endangered	0	633.5	0	213.2^^
Western Alaskan Bar-tailed Godwit (<i>Limosa lapponica baueri</i>)	Vulnerable	0	12.4	0	0
Yarra Pygmy Perch (<i>Nannoperca obscura</i>)	Vulnerable	0	31.4	0	3.5

*These are historical records of Adamson's Blown-grass in the Growth Areas and there are no current records

**The extent of habitat for these species is comprised of DELWPs modelled habitat (DELWP, 2017b) within unsurveyed areas of the Growth Areas and Strategic Assessment Area, and mapped habitat within surveyed areas (EHP, 2021)

^There is no habitat mapping available for the Blue-winged Parrot, Latham's Snipe and the Sharp-tailed Sandpiper. Refer to the detailed impact assessment in Chapter 19 for a description of potential habitat in the Study Area

^^Note that this number indicates the area of grassland with potentially suitable habitat attributes for Victorian Grassland Earless Dragon, and does not quantify known habitat for the species. Refer to the detailed impact assessment in Chapter 19 for further details

Table 29-3: The extent of TECs, Ramsar wetlands, and migratory species in the Strategic Assessment Area

Name	Cth listing	Presence within the Strategic Assessment Area
Threatened ecological communities		
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	An estimated 27– 75.5 ha of the TEC may occur within the Strategic Assessment Area and unsurveyed areas of the NGGA based on the proportion of modelled EVC 132 (DELWP, 2005) which may comprise the TEC (see Chapter 21 for details) An additional 12.7 ha of the TEC has been mapped to occur within the surveyed areas of the Growth Areas
Ramsar wetlands		
The Port Phillip Bay (Western Shoreline) and Bellarine Peninsular Ramsar site	N/A	Areas of the Ramsar site occur outside of the Strategic Assessment Area

Name	Cth listing	Presence within the Strategic Assessment Area
Migratory species		
Double-banded Plover (<i>Charadrius bicinctus</i>)	Migratory	No habitat mapping available, no records within the Strategic Assessment Area
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	Migratory	No habitat mapping available, no records within the Strategic Assessment Area
Red-necked Stint (<i>Calidris ruficollis</i>)	Migratory	No habitat mapping available, no records within the Strategic Assessment Area

29.2.3 MNES OCCURRENCE IN AREAS TO BE PROTECTED AND MANAGED UNDER THE PLAN

There are five strategic conservation areas to be protected and managed within the Growth Areas. These are in addition to offsets outside the Growth Areas and include:

- Three conservation areas in the NGGA, including the:
 - Northern Conservation Area (to be managed as an offset site)
 - Eastern Conservation Area (to be managed as an offset site)
 - Gully avoidance area
- Two conservation areas in the WGGA, including the:
 - Cowies Creek Conservation Area
 - Moorabool avoidance area

There is also one additional strategic conservation area, the Moorabool River Corridor, which will protect State and local biodiversity values within the Growth Areas under the BCS. While this area may have some benefits for MNES and will reduce impacts of development, it was not identified in the Plan as being needed for the protection of MNES.

Of the 26 protected matters which occur within the Strategic Assessment Area, 5 are known to occur within the Growth Areas (noting Adamson's Blown-grass only has historical records in the WGGA) and one (Victorian Grassland Earless Dragon) has habitat potentially important to its recovery in the NGGA. These include:

- Adamson's Blown-grass (*Lachnagrostis adamsonii*)
- Golden Sun Moth (*Synemon plana*)
- Growling Grass Frog (*Litoria raniformis*)
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Striped Legless Lizard (*Delma impar*)
- Victorian Grassland Earless Dragon (*Tympanocryptis pinguicolla*)

Table 29-4 outlines the extent of these threatened species and the TEC within the strategic conservation areas and additional avoided areas, as well as the offset targets.

Table 29-4: Extent of threatened species and TECs within the Growth Areas and offset targets

Name	Cth listing	Habitat within the Growth Areas (ha)	Habitat within strategic conservation areas (ha)	Offset targets (ha)
Threatened flora				
Adamson's Blown-grass (<i>Lachnagrostis adamsonii</i>)	Endangered	4.9	4.9	0

Name	Cth listing	Habitat within the Growth Areas (ha)	Habitat within strategic conservation areas (ha)	Offset targets (ha)
Threatened fauna				
Golden Sun Moth (<i>Synemon plana</i>)	Vulnerable	766.3	124.1	500.7
Growling Grass Frog (<i>Litoria raniformis</i>)	Vulnerable	4.9	4.9	0
Striped Legless Lizard (<i>Delma impar</i>)	Vulnerable	227.1	81.1	331.2
Victorian Grassland Earless Dragon (<i>Tympanocryptis pinguicolla</i>)	Critically Endangered	212.9	135.3*	0
Threatened ecological communities				
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	18.6	10.9	13.9

*As noted in the previous section, this number indicates the area of grassland with potentially suitable habitat attributes for Victorian Grassland Earless Dragon, and does not quantify known habitat for the species. Refer to the detailed impact assessment in Chapter 19 for further details

29.3 LONG-TERM PROTECTION OF MNES

The ToR requires the SAR to include an evaluation of how the Plan will ensure long-term protection of protected matters (see Table 29-1).

This Section provides an analysis of how the avoidance of impacts, conservation areas, and the offset sites that will be protected and managed under the Plan will ensure the long-term protection of each protected matter, and the ongoing function of any key ecosystem services needed for the ongoing viability of protected matters.

29.3.1 CONTEXT AND APPROACH

Large areas of grasslands and woodland in the Victorian Volcanic Plain bioregion, including the SAA, have been historically removed or degraded primarily for agricultural activities (DSE, 2003; EHP, 2021). The Growth Areas currently do not contain any formal conservation reserves and most native vegetation remains in areas not subject to historical clearing and within riparian corridors. Native vegetation that remains on agricultural land is typically highly modified and degraded, providing relatively low biodiversity value (EHP, 2021).

The Plan includes a number a of commitments that will help ensure the long-term protection of MNES in the Strategic Assessment Area and wider Victorian Volcanic Plain bioregion. This includes commitments for avoidance, mitigation and offsetting, and commitments to ensure that conservation under the Plan is adequately implemented. Details of the conservation framework (including the strategic conservation areas and offsets) to be implemented for the Plan are provided in Part 2 of the SAR.

In order to evaluate how the commitments relevant to conservation and offsets will ensure the ongoing protection of protected matters, a range of key factors need to be considered. These include:

- The extent of habitat for threatened species and TECs that is protected, particularly for those most at risk from development under the Plan (this is addressed in Section 29.2)
- The offsets provided and their protection, including:
 - When protection is provided
 - The size, shape and location of the areas to be protected

- Landscape connectivity including habitat corridors and riparian areas
- Management of key threatening processes and landscape scale threats, such as weeds and pests

The analysis provided in this section is therefore focussed on the following components:

- Offsets provided under the Plan
- Landscape connectivity and benefits of conservation commitments
- Management of key threats across the landscape

29.3.2 OFFSETS PROVIDED UNDER THE PLAN

The Plan's commitments for offsetting are set out in Table 29-5.

Table 29-5: Commitments for offsetting under the Plan

No.	Commitment
4	The Northern Conservation Area will be established in perpetuity to avoid and protect 77.7 ha of habitat for Striped Legless Lizard, 119.5 ha of habitat for Golden Sun Moth, and 125.3 ha of habitat potentially important for the recovery of Victorian Grassland Earless Dragon
5	A Conservation Management Plan will be prepared and implemented for the protection and ongoing management of Striped Legless Lizard, Golden Sun Moth and Victorian Grassland Earless Dragon within the Northern Conservation Area
6	The Eastern Conservation Area will be established in perpetuity to avoid and protect 6.7 ha of habitat for Natural Temperate Grassland
7	A Conservation Management Plan will be prepared and implemented for the protection and ongoing management of Natural Temperate Grassland within the Eastern Conservation Area
16	Offset sites will be established to meet the following targets: <ul style="list-style-type: none"> • 13.9 ha of Natural Temperate Grassland • 331.2 ha of known habitat for Striped Legless Lizard • 500.7 ha of known habitat for Golden Sun Moth These offsets will be delivered through a combination of: <ul style="list-style-type: none"> • The Northern and Eastern Conservation Areas (Commitments 4 and 6), and • Strategic offset locations outside of the NGGA to meet the balance of the offset targets
17	Offset delivery will keep pace with and occur ahead of impacts within the NGGA
20	Unavoidable clearing of any areas confirmed to support MNES due to development within the portion of Heales Road East subject to process based development (as shown in Figure 4-1 of the Plan) or external infrastructure development will be offset in accordance with the EPBC Act Environmental Offsets Policy and associated Offsets Assessment Guide (or equivalent)(Commonwealth of Australia, 2012; DSEWPC, 2012)

The offsets package was developed to provide strong, positive outcomes for MNES by:

- Ensuring offsets are in accordance with the principles of the EPBC Act Environment Offsets Policy (DSEWPC, 2012)
- Maximising the opportunities that are provided by taking a strategic approach to offsetting rather than the usual site-by-site approach
- Mitigating the risks associated with strategic offsetting

A full description of the offsets package is provided in Supporting Document D.

PRINCIPLES OF THE EPBC OFFSETS POLICY

The EPBC Act environmental offsets policy (DSEWPC, 2012) outlines the Australian Government’s approach to the use of biodiversity offsets under the Act. The policy establishes ten principles for offsetting.

Clause 3(d) of the endorsement criteria for the EPBC Plan states that *“The Plan must... provide for appropriate offsets in accordance with the principles of the EPBC Act Environment Offsets Policy...”*.

The offset package meets the principles of the EPBC offset policy. An analysis of how the offset package meets these principles is set out in Table 29-6 (this table is taken and adapted slightly from Supporting Document D).

Table 29-6: Evaluation of the offset package against the principles of the EPBC offset policy

EPBC offset principles	How the offsets package meets each principle
Suitable offsets must:	
<p>1. Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action</p>	<p>The offset package will help deliver an overall conservation outcome that improves or maintains the viability of NTG, SLL and GSM. This is based on:</p> <ul style="list-style-type: none"> • The focus on direct offsets (as per Principle 2) which provides the most tangible conservation gains for MNES • Delivery of the offsets by the City as part of a coordinated program (as per Principle 8) which will ensure efficient, effective, timely, and transparent outcomes (as per Principle 7) • Appropriate area targets for each MNES that: <ul style="list-style-type: none"> ○ Consider conservation status (as per Principle 3) ○ Are proportionate to the size and scale of residual impacts (as per Principle 4) ○ Account for the risk of offsets not succeeding (as per Principle 5) • Consideration of the predicted average quality of the offset sites • Delivery of offsets that are additional to what is already required (as per Principle 6) • The landscape nature of the offset package which improves the conservation outcome of offsets. This includes focusing on sites that: <ul style="list-style-type: none"> ○ Will protect areas of habitat that would be considered large for each MNES ○ Are located within a key biodiversity corridor and improves connectivity across the landscape ○ Connect to an existing conservation reserve • Ensuring that the delivery of offsets remains ahead of the level of impacts over the life of the Plan • The fact that testing and validation of the offset targets using the offset calculator showed that the targets are appropriate and sit within the range of what would be potentially required if the strategic assessment was not in place and offsets were applied under Part 9 of the Act <p>This meets Principle 1.</p>
<p>2. Be built around direct offsets but may include other compensatory measures</p>	<p>The offset package is entirely based on direct offsets. This meets Principle 2.</p>

EPBC offset principles	How the offsets package meets each principle
3. Be in proportion to the level of statutory protection that applies to the protected matter	<p>The offset targets were developed using a modified EPBC calculator, which incorporates a multiplier for conservation status. This method is inherently proportional to the conservation status of each MNES.</p> <p>In addition, the offset calculator was used to validate the targets. This analysis found that the targets will lead to equivalent or better conservation outcomes than can be achieved through site-by-site assessments.</p> <p>This meets Principle 3.</p>
4. Be of a size and scale proportionate to the residual impacts on the protected matter	<p>The offsets are proportionate in size and scale to the residual impacts to NTG, SLL and GSM. This is reflected by the area targets for each MNES which were developed against the criteria set out in Supporting Document D. These criteria included:</p> <ul style="list-style-type: none"> • The scale and quality of the residual impacts to each MNES. These impacts are described and assessed fully in the SAR • The conservation status for each MNES • The conservation outcome that is required to improve or maintain the viability of each MNES <p>This meets Principle 4.</p>
5. Effectively account for and manage the risks of the offset not succeeding	<p>The offsets package accounts for and manages the risks of the offsets not succeeding. These risks are set out in Supporting Document D and are mitigated through the design of the package. In particular, key aspects of risk mitigation include:</p> <ul style="list-style-type: none"> • An appropriate funding framework and program to ensure the offsets can be purchased • Analysis of the availability of offsets that provides confidence in the ability to implement the package, combined with a set of contingency steps to ensure offsets are delivered if challenges arise in implementation • An appropriate governance framework to ensure implementation is successful • Mechanisms to maintain the values of the Northern Conservation Area and the Eastern Conservation Area prior to them being secured <p>This meets Principle 5.</p>

EPBC offset principles	How the offsets package meets each principle
<p>6. Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see section 7.6)</p>	<p>The proposed offsets are all additional to what is already required. This includes:</p> <ul style="list-style-type: none"> • The Northern Conservation Area and the Eastern Conservation Area which will be protected and managed as conservation reserves in-perpetuity. This was not planned prior to the commencement of the strategic assessment • The external offset sites which will only be selected where they don't have an existing level of protection <p>This meets Principle 6.</p>
<p>7. Be efficient, effective, timely, transparent, scientifically robust and reasonable</p>	<p>The offset package is designed to be efficient, effective, timely, transparent, scientifically robust and reasonable as follows:</p> <ul style="list-style-type: none"> • The package is based on scientifically robust information about each MNES (as set out in the SAR) and about the potential offsets sites. Further scientific information will be collected during implementation to help establish, monitor and manage sites • The commitments and measures to deliver the offsets package meet the SMART principle (Specific, Measurable, Achievable, Relevant, and Time-Bound). This ensures that there is clarity around the implementation of the package and that the offsets will be efficient, effective and timely • The process to develop the offset package is transparent (as discussed for Principle 10) and implementation of offsets will be based on transparent governance, monitoring and reporting (as discussed for Principle 8) • The offset package is designed to provide a positive conservation outcome for MNES and be reasonable to fund and deliver. Testing and validation of the offset targets using the offset calculator showed that the targets are appropriate (and reasonable) and sit within the range of what would be potentially required if the strategic assessment was not in place and offsets were applied under Part 9 of the Act <p>This meets Principle 7.</p>
<p>8. Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced</p>	<p>As discussed in Supporting Document D, implementation of the offset package is supported by appropriate governance, monitoring, and reporting arrangements. This meets Principle 8.</p>

EPBC offset principles	How the offsets package meets each principle
In assessing the suitability of an offset, government decision-making will be:	
9. Informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty	This principle is largely a matter for DCCEEW as it relates to government decision-making. However, preparation of the documents for the strategic assessment (including the offsets package) is based on scientifically robust information and processes. In addition, the precautionary principle has been applied appropriately to the project as set out in Part 5 of the SAR. This meets Principle 9.
10. Conducted in a consistent and transparent manner	This principle is largely a matter for DCCEEW as it relates to government decision-making. However, the City is working with stakeholders throughout the strategic assessment to ensure transparency and the project will meet all of its statutory obligations around consultation. This meets Principle 10.

STRATEGIC OFFSETS

Strategic assessments offer a range of opportunities to design and implement an offset package that achieves better conservation outcomes than can be achieved through site-by-site assessments. The EPBC Act Guide to Undertaking Strategic Assessments (DSEWPC, 2011) states that the advantages of strategic assessments include the:

- *“Capacity to achieve better environmental outcomes and address cumulative impacts at the landscape level*
- *Coordinated establishment and management of offsets”*

Conservation planning science supports the potential benefits of strategic approaches to offsetting. In particular, improved conservation outcomes (compared to site-by-site projects) that are driven by the opportunities to secure offsets:

- Earlier than would be delivered through site-by-site assessments which helps promote greater improvements to biodiversity (e.g., by the earlier management of threats)
- With better landscape context which also improves conservation outcomes. For example, larger sites and/or sites that are located strategically to enhance biodiversity (e.g., within a biodiversity corridor or adjacent to an existing reserve)

These two factors lead to improved conservation outcomes over time. For example, modelling of the potential benefits of strategic offsetting (early, well located) in a grassland context similar to Geelong showed approximately a 40% better conservation outcome when compared to normal site-by-site offsetting (Gordon *et al.*, 2011). It is important to note that this assumed all offsets being delivered at the commencement of the modelling period.

The offsets package was developed with an emphasis on both:

- Coordinated offset delivery
- Spatially planned offsets

Coordinated offset delivery

The Plan will provide for the coordinated delivery of offsets. The City, as the approval holder, will:

- Ensure the offset targets will be delivered ahead of impacts
- Coordinate the funding, delivery and ongoing monitoring of offset sites
- Provide for opportunities for some advanced offsetting
- Potentially facilitate Works in Kind offsetting from landholders, providing further opportunities for advanced offsets

In addition, the offset package under the Plan includes a component of local offsetting within the Growth Areas. The coordinated delivery of the Northern Conservation Area and Eastern Conservation Area is a key outcome of the strategic avoidance planning process. These offsets provide in-situ protection and management of known MNES values, local to the areas impacted by development under the Plan.

Spatially planned offsets

Strategic offsets also offer an advantage as they can be spatially planned as one combined offsets package. Establishing the offsets as one package allows the offset site locations to be chosen in a complimentary way, both in relation to each other and the surrounding region. This can lead to landscape benefits that may not be achieved through status quo delivery of offsets as these offsets are typically determined individually, over a long period of time, without or with little consideration of the broader landscape. Landscape factors that can be considered during spatial planning of strategic offsets include:

- Size of the offset land
- Location of the offset site in relation to biodiversity corridors
- Connection of the offset site to existing conservation areas

Each of these factors and their potential benefits is discussed below.

Size of the offset land

There are well established relationships between the size of a patch of native vegetation and the size and persistence of populations, with large patches generally supporting more persistent populations than smaller patches (Margules and Pressey, 2000). There are also relationships between the size of a patch and species richness, species dispersal, genetic diversity, persistence of large vertebrates, maintenance of near-natural disturbance regimes, and other important ecological functions (Lindenmayer *et al.*, 2007; Hodgson *et al.*, 2009).

Although some species can maintain function between patches of habitat, other less mobile species benefit from larger patches of retained vegetation. Additionally, larger sites are often less impacted by fragmentation and edge effects, and therefore are at a reduced risk of degradation and loss, which in turn improves ecological outcomes and long-term protection of environmental values.

Location of the offset site

Location of the offset sites can also influence the overall environmental outcomes. If offset sites are strategically placed within the landscape, they can help maintain or even improve connectivity across the landscape. Landscape connectivity benefits genetic diversity and dispersal of fauna across the landscape, leading to wider improvements in population and ecosystem health and improving the long-term protection of environmental values.

Connection of the offset site to existing conservation areas

In some cases, offset sites can be located adjacent to existing conservation areas, such as state reserves or national parks. This improves ecological outcomes as it increases the patch size of the vegetation and allows for existing species and ecosystems within the conservation area to populate the offset site. Management and protection of the offset site may also be more immediate and effective as the site can be consolidated into the existing conservation area that is already subject to greater protection and management.

Strategic site selection

The City's approach to strategic site selection is designed to address these factors.

The Northern Conservation Area was designed to capture larger habitat patches in strategic locations in the landscape to maximise likely benefits to biodiversity values (see Part 2). This included habitat patches adjacent to existing patches, or patches connecting or contiguous with other patches of habitat.

While the Eastern Conservation Area is smaller, it provides important protection to Natural Temperate Grassland and is connected to the gully avoidance area in Elcho Road East.

Additionally, when determining the offset sites outside the SAA to secure the remaining offsets, sites will be selected that meet at least one of the following strategic landscape criteria:

- Protection of areas of habitat that would be considered large for each MNES
- Located within a key biodiversity corridor and improves connectivity across the landscape
- Connection to an existing conservation reserve

Therefore, by undertaking strategic site selection, the long-term protection of MNES, and the ongoing function of key ecosystem services are maximised.

The City will coordinate offset delivery on behalf of developers, which will help ensure that the offsets are delivered in a strategic manner. The City will also develop strategic landscape criteria to guide the targeting of land suitable for strategic offsets, identify priority offset locations that meet at least one of these criteria, and establish a work program to engage with landholders within those areas to seek agreement to establishing offset sites on their land.

29.3.3 LANDSCAPE CONNECTIVITY OF COWIES CREEK CONSERVATION AREA

As discussed above, offset sites including the Northern Conservation Area are strategically planned within the landscape to help maximise landscape connectivity. Improved landscape connectivity can lead to population and ecosystem health benefits and improve the long-term protection of environmental values.

Although the Cowies Creek Conservation Area does not function as an offset for the Plan, it still provides for the long-term protection of MNES and ecosystem function. The avoided land contained within the Cowies Creek Conservation Area was selected following the same strategic site selection processes for the offset sites.

Cowies Creek Conservation Area is comprised of a riparian corridor that contains vegetation and various habitat values to MNES. By avoiding and protecting this area, connectivity across the landscape is maintained. Connectivity between populations of Growling Grass Frog is vital for their long-term protection and persistence in the region (see Chapter 19). Riparian corridors are also used by several other species which will therefore also benefit from the ongoing protection of these areas and the ecosystem services they provide.

Additionally, the Plan commits to undertaking habitat enhancement works for Growling Grass Frog in Cowies Creek downstream of the WGGA. This may include:

- The creation of one or more off-line wetlands to create habitat for the species
- Vegetation management to improve habitat quality for the species
- Infrastructure changes to improve connectivity for the species under the Bluestone Bridge along Cowies Creek

29.3.4 MANAGING KEY THREATS

The Victorian Volcanic Plain bioregion is subject to range of existing landscape scale threats that will continue to be exacerbated if not adequately managed. The threatening processes that are impacting biodiversity values within the Strategic Assessment Area and surrounding landscape include:

- Habitat loss and fragmentation – given the large amount of historical clearing, protecting and/or restoring remaining areas of native vegetation is important for any future conservation efforts (DSE, 2003)
- Invasive weeds – the Growth Areas contain a high density of weeds and introduced pasture which pose a threat to multiple threatened species either through habitat competition or habitat degradation (DELWP, 2020; EHP, 2021)
- Pest animals – pests including rabbits, hares and foxes are present within the region and pose a threat to multiple threatened species, either through predation, competition or habitat degradation (DELWP, 2020; EHP, 2021)
- Water system modification – all the major watercourses within the Geelong region have experienced environmental impacts from development. These impacts include barriers to movement, changes to hydrological flows, decreased water quality, erosion and degradation of riparian vegetation (Corangamite CMA, 2014; DELWP, 2021)
- Recreational disturbance – recreational activities in estuarine and coastal environments can impact these environments, particularly waterbirds and migratory birds which occur in coastal environments and within the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar site (DELWP, 2020)
- Climate change – impacts of climate change are likely to increase in the future, affecting biodiversity through processes such as more intense and longer bushfire seasons and increased drought and flooding (DELWP, 2019)

The impacts and threats identified under the Plan have also been considered with regards to Key Threatening Processes (KTPs) identified under the EPBC Act. The KTPs relevant to the Plan include:

- Competition and land degradation by rabbits
- Competition and land degradation by unmanaged goats
- Fire regimes that cause declines in biodiversity
- Infection of amphibians with chytrid fungus resulting in chytridiomycosis
- Land clearance
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants
- Novel biota and their impact on biodiversity
- Predation by European red fox
- Predation by feral cats
- Predation, habitat degradation, competition and disease transmission by feral pigs

The Plan recognises that the effective management of landscape scale threats and KTPs is critical to the success of the conservation program under the Plan and the long-term protection of MNES. A range of commitments are therefore provided under the Plan to reduce threats to conservation areas and offsets secured within the bioregion, including:

- Continuing to implement standard mitigation measures to minimise the indirect impacts of the development in accordance with the requirements of the Greater Geelong Planning Scheme
- Implementing specific mitigation measures to minimise the indirect impacts of the development on protected matters associated with waterways, riparian areas and wetlands including:
 - EPBC listed threatened and migratory birds
 - *Galaxiella toourtkoourt* (Little Galaxias)
 - *Litoria raniformis* (Growling Grass Frog)
 - *Nannoperca obscura* (Yarra Pygmy Perch)
 - *Prototroctes maraena* (Australian Grayling)
 - *Lachnagrostis adamsonii* (Adamson's Blown-grass)
 - Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site
- Implementing specific mitigation measures to minimise the indirect impacts of the development on the two NGGA Conservation Areas and the Cowies Creek Conservation Area, including:
 - Establishing a conservation interface for the conservation areas
 - Designing and baffling public lighting to prevent light spill and glare within the Cowies Creek Conservation Area
 - Preparing and implementing Construction Environmental Management Plans for construction works on land immediately adjacent to the conservation areas

The mitigation processes under these commitments will be undertaken throughout the implementation of the Plan and will help ensure threats to MNES across the landscape are effectively managed in the long term and ensure the success of conservation areas and offsets established under the Plan.

29.3.5 CONCLUSION

The analysis provided in this section suggests that the commitments and approach to conservation under the Plan will ensure the long-term protection of protected matters and the ongoing function of key ecosystem services needed for the ongoing viability of protected matters. The key mechanisms to ensure this are:

- Protection of offset sites in perpetuity
- The use of strategic offsets to maximise ecological benefit and protection as early as possible
- Maintaining long-term connectivity of high-ecological value riparian zones in the Cowies Creek Conservation Area
- Managing threats to protected matters across to landscape

29.4 EFFECTIVENESS OF THE OUTCOMES, COMMITMENTS AND MEASURES

The ToR requires the SAR to include an evaluation of the adequacy and likely effectiveness of the outcomes, commitments and measures in protecting MNES.

The outcomes, commitments and measures are considered adequate and likely to effectively protect MNES as they:

- Set a high standard of protection for MNES
- Are set within a program logic framework
- Are consistent with the offset mitigation hierarchy

This section addresses the requirements of the ToR under these headings.

29.4.1 SET A HIGH STANDARD OF PROTECTION FOR MNES

The outcomes of the Plan are considered adequate because they set a high standard of protection for MNES consistent with the objectives of the EPBC Act as well as the draft National Environmental Standards for MNES recommended in the Final Report of the Independent Review of the EPBC Act (Professor Graeme Samuel AC, 2020).

The Plan includes four outcomes for MNES that are known to occur in the Growth Areas and that will be directly impacted by the development. They include:

- *Populations of Golden Sun Moth and Striped Legless Lizard are maintained within the Northern Conservation Area (Outcome 1)*
- *The extent and condition of Natural Temperate Grassland is maintained within the Eastern Conservation Area (Outcome 2)*
- *Impacts to habitat for Golden Sun Moth, Striped Legless Lizard and Natural Temperate Grassland within the drainage avoidance area will be avoided and minimised (Outcome 3)*
- *The protection and management of land outside of the Growth Areas makes an important contribution to the recovery efforts for Natural Temperate Grassland, Golden Sun Moth and Striped Legless Lizard in Victoria (Outcome 6)*

The Plan also includes:

- Two outcomes for MNES that may be indirectly impacted by the development. These are:
 - *The long-term viability of the important population of the Growling Grass Frog along Cowies Creek is supported through the protection and enhancement of habitat (Outcome 5)*
 - *Matters of national environmental significance associated with waterways, riparian areas and wetlands are protected from any notable adverse impacts of development under the Plan (Outcome 7)*
- One outcome relating to the protection of habitat attributes for the Victorian Grassland Earless Dragon. This is:
 - *Potentially suitable habitat attributes for Victorian Grassland Earless Dragon within the Northern Conservation Area will be protected and managed to support potential recovery of the species (Outcome 4)*

The Plan's outcomes are consistent the draft recommended National Environmental Standards for MNES (Professor Graeme Samuel AC, 2020). The overall outcome of the draft standard for threatened species and ecological communities is that these matters are protected, conserved, managed and recovered over time.

The Plan's outcomes are consistent with this standard because they aim to promote the survival and/or enhance the conservation status of threatened species and ecological communities by:

- Maintaining and improving habitat by avoiding impacts and ensuring no net reduction of habitat
- Maintaining and improving populations by avoiding impacts likely to result in the loss of populations of highly restricted and small/declining species and ensuring no net reduction in populations
- Maintaining and improving ecological communities by ensuring no net reduction of the ecological community

The overall outcome of the draft standards for Ramsar wetlands is that the ecological character of these wetlands is maintained through the conservation, management and wise use of the wetlands.

The Plan's outcomes are consistent with this standard because they aim to prevent detrimental change to the ecological character of the Ramsar site through a commitment that will lead to the identification of risks associated with changes to water quality and hydrology as a result of the development, and the implementation of appropriate measures, standards or targets to avoid and minimise adverse impacts on the Ramsar wetland.

29.4.2 SET WITHIN A PROGRAM LOGIC FRAMEWORK

Clear, measurable and achievable outcomes, commitments and measures are critical for effective implementation of the Plan to allow delivery bodies to understand their obligations under the Plan, allow regulators and the public to understand what is intended to be delivered by the Plan, and enable the success of the Plan to be properly evaluated.

The Plan has a clear and measurable set of outcomes, commitments and measures. These are framed within a program logic or 'outcomes framework' that underpins the Plan. The outcomes framework describes broadly how the Plan will be implemented and the relationships between outcomes and commitments and measures, and how the commitments and measures are expected to lead to the outcomes.

The key components of the outcomes framework are:

- Objective – Articulates the reason the Plan is being undertaken and the broad goal it is intended to support
- Outcomes – The impacts or changes to environmental and socio/economic conditions that are expected to be achieved because of the delivery of the commitments and that are needed to achieve the overall objective of the Plan

- Commitments – The direct results of implementing the measures that are expected to lead to the outcomes
- Measures – The specific actions that will be undertaken to meet the commitments

By framing the outcomes within a program logic, the Plan provides a way to structure what it will deliver for protected matters in a clear and logical way. A key part of this structure is the categorisation of commitments (and their relevant measures) into categories that relate to the specific components of MNES protection and management under the Plan and their effective implementation. The categories of commitments under the Plan are:

- Delivery of development
- Conservation
- Process based development
- Governance
- Funding
- MERI
- Compliance
- Data sharing

These categories make it clear which commitments are relevant to different components of the Plan and its implementation and provide a way to monitor the effectiveness of each component. This supports accountability and transparency by providing the basis and set of benchmarks for monitoring, reporting, and ongoing evaluation and adaptive management of the Plan (DEWHA, 2009c). It allows assumptions about the relationships between the outcomes, commitments and measures to be identified and tested so that implementation can be adaptively improved over time where necessary under changing circumstances (see below).

ADAPTIVE IMPLEMENTATION

In order for the outcomes, commitments and measures to be effective, they need to be adaptive to changing circumstances. The outcomes and commitments are provided in the Plan which will not be changed once the Plan is endorsed under Part 10 of the EPBC Act. In order to provide adaptive implementation of the commitments to achieve the outcomes, three implementation documents are provided for the Plan. The implementation documents are:

- The Northern and Western Geelong Growth Areas Commitments and Measures
- The Northern and Western Geelong Growth Areas Biodiversity Conservation Strategy (BCS)
- The Northern and Western Geelong Growth Areas Funding Program

The measures for the commitments are set out in the Commitments and Measures document and described where relevant in the BCS. These documents may be updated from time to time over the life of the Plan through an adaptive management process in accordance with the Plan's MERI framework. The improvement step of the MERI framework provides the opportunity to adaptively manage implementation of the Plan to ensure the commitments are successfully delivered and the Plan's objective and outcomes are achieved and effective.

Commitments and Measures document

As discussed above, the Plan objectives and outcomes will be achieved through the delivery of a set of commitments and measures that have been developed through an outcomes framework.

Although the outcomes and commitments are set out in the Plan and will not be changed once the Plan is endorsed, the measures to implement the commitments may be updated from time to time over the life of the Plan through an adaptive management process in accordance with the Plan's MERI framework. The measures are set out in the Commitments and Measures document, including the following details for each measure are also provided:

- Responsibility
- Key support partner/s (if relevant)
- Timing

Additionally, the BCS identifies another broad objective focusing on state and local biodiversity, and identifies state level outcomes, commitments and measures to support this objective. Some of the Plan's outcomes are also relevant to the BCS. The commitments and measures for the BCS are also detailed in the Commitments and Measures document.

Key performance indicators (KPIs) have also been established for each outcome and commitment in the Plan and BCS. The KPIs are provided in the Commitments and Measures document and may be updated over the life of the Plan through the adaptive management process under the Plan's MERI framework.

Biodiversity Conservation Strategy

The purpose of the BCS is to:

- Identify the national, state and local biodiversity values that are present in the Strategic Assessment Area and set out a conservation program for providing genuine, long-term positive results for those biodiversity values
- Set out how the conservation elements of the EPBC Plan for the Strategic Assessment Area will be implemented including through avoiding and minimising, mitigating, and offsetting residual impacts in accordance with the mitigation hierarchy (DSEWPC, 2012; DELWP, 2017a)
- Guide the preparation of Precinct Structure Plans (PSPs) and subsequent development within the Strategic Assessment Area to ensure the outcomes are consistent with State biodiversity policy

Funding Program

The Plan includes a funding framework that will ensure the Plan is adequately funded throughout its life. The funding framework is described in the Plan. The measures that describe how the commitment for funding in the Plan will be implemented are provided in the Commitments and Measures document.

The City is also developing a Funding Program that sets out how the funding framework will be implemented. It describes how measures to achieve the commitments for funding will be implemented. The key commitments that will require funding are those that relate to:

- Offset establishment, management, monitoring and audit
- Securing and managing the conservation areas within the Growth Areas
- Implementing conservation measures
- Implementing the MERI framework and compliance framework

29.4.3 CONSISTENT WITH THE OFFSET MITIGATION HIERARCHY

A conservation framework has been developed for the Plan. The purpose of the conservation framework is to ensure:

- Development within the Plan area avoids and minimises, mitigates, and offsets impacts to MNES in accordance with the requirements of the EPBC Act and the Endorsement Criteria set out in Attachment 2 of the Strategic Assessment Agreement
- The Plan's outcomes, commitments and measures to protect and manage MNES are achieved and effective

The conservation framework has been developed in accordance with the offset mitigation hierarchy. The mitigation hierarchy requires impacts on MNES to be firstly avoided and minimised to the greatest extent practicable, and then mitigated. The remaining residual impacts can then be offset (DSEWPC, 2012).

The conservation framework sets out commitments that will be delivered for each of the components of the hierarchy:

- Avoiding and minimising impacts to MNES
- Mitigating impacts to MNES
- Offsetting residual impacts to MNES

AVOIDANCE AND MINIMISATION OF IMPACTS

The commitments for avoidance and minimisation under the Plan include the avoidance and protection of five areas of avoided land in the Growth Areas:

- The Northern Conservation Area in the NGGA which will lead to the avoidance and protection of:
 - 119.5 ha of habitat for the Golden Sun Moth
 - 77.7 ha of habitat for the Striped Legless Lizard
 - 125.3 ha of potentially suitable areas for the recovery of Victorian Grassland Earless Dragon

- The Eastern Conservation Area in the NGGA which will lead to the avoidance and protection of 6.7 ha of mapped native vegetation (Plains Grassland EVC 132) which meets the conditions thresholds for Natural Temperate Grassland
- The Cowies Creek Conservation Area in the WGGGA which will lead to the avoidance and protection of all habitat in the WGGGA for Growling Grass Frog
- The gully avoidance area in the NGGA which will lead to the avoidance and protection of:
 - 4.6 ha of habitat for Golden Sun Moth
 - 3.4 ha of habitat for Striped Legless Lizard,
 - 3.7 ha of habitat for Natural Temperate Grassland
- The Moorabool avoidance area in the WGGGA which will lead to the avoidance and protection of 7 ha of areas assumed to support potentially suitable habitat attributes for Victorian Grassland Earless Dragon

These avoidance areas were selected through a strategic approach to ensure landscape connectivity and benefits for MNES were maximised (as explained in Section 29.3.1).

MITIGATION OF IMPACTS

Development under the Plan has the potential to indirectly impact habitat and populations of MNES within the Growth Areas and within the Plan area outside the Growth Areas. These indirect impacts relate to:

- Altered fire regimes
- Changes to water flows and water quality
- Disturbance due to noise, dust, or light
- Disturbance from increased public access to natural areas
- Fauna mortality and barriers to movement
- Inadvertent impacts on adjacent habitat or vegetation
- Predation or competition by pest or domestic fauna
- Spread of infection or disease
- Spread of weeds

The Plan includes commitments to ensure each of these indirect impacts is mitigated and to ensure effective management of landscape scale threats and KTPs (as explained in Section 29.3.4). These commitments include:

- Continuing to implement standard mitigation measures to minimise the indirect impacts of the development in accordance with the requirements of the Greater Geelong Planning Scheme
- Implementing specific mitigation measures to minimise the indirect impacts of the development on protected matters associated with waterways, riparian areas and wetlands
- Implementing specific mitigation measures to minimise the indirect impacts of the development on the NGGA Conservation Area and Cowies Creek Conservation Area

OFFSETTING RESIDUAL IMPACTS

Development under the Plan will result in residual impacts in the NGGA to Natural Temperate Grassland, Golden Sun Moth and Striped Legless Lizard. The Plan includes commitments to offset these residual impacts which have been designed through a strategic offset approach (as explained in Section 29.3.2). These commitments include the establishment and management of offsets within the NGGA (the Northern Conservation Area and the Eastern Conservation Area) and offset sites outside of the SAA within the wider Victorian Volcanic Plain bioregion.

EFFECTIVENESS OF CONSERVATION OUTCOMES, COMMITMENTS AND MEASURES

The mitigation hierarchy is recognised as a best practice standard for addressing the impacts of development on biodiversity at international (OECD, 2016) and national levels (DSEWPC, 2012). By developing the conservation framework in accordance with the mitigation hierarchy, the Plan has ensured the most appropriate and effective outcomes, commitments and measures to protect and manage MNES.

29.5 CLIMATE CHANGE

29.5.1 INTRODUCTION

The ToR requires the SAR to include an evaluation of the extent to which the Plan addresses significant vulnerabilities of MNES to climate change.

This section discusses:

- Observed impacts and projected climate change scenarios in the region
- The method used to assess the vulnerability of MNES to climate change impacts
- The results of the vulnerability assessment
- The extent to which the plan addresses significant vulnerabilities of protected matters

29.5.2 OBSERVED IMPACTS AND PROJECTED CLIMATE CHANGE SCENARIOS IN THE REGION

Climate change is emerging as one of the most significant threats to biodiversity and ecosystems. The impacts of climate change on biodiversity have been observed globally and include species loss, increases in disease, mass mortality events, climate driven extinctions, and declines in key ecosystem services. In the absence of urgent emission reductions, a wide range of biodiversity values are likely to experience temperatures beyond their natural range. Threatened or unique species are at particular risk in the near term (IPCC, 2022).

The 2020 State of the Climate Report (Commonwealth of Australia, 2020) concluded that Australia's climate has warmed by 1.44 °C (± 0.24 °C) on average since 1910. Some of the observed impacts of climate change in Australia include a measured decline in rainfall in southeast and southwest Australia, and an increase in extreme fire weather since 1950 in large parts of the country (Commonwealth of Australia, 2020). Various changes to Victoria's climate have been recorded in recent decades, including increased temperatures, drier conditions, decreased snow cover, and more extreme weather events (DELWP, 2019).

Climate predictions by CSIRO (Clarke *et al.*, 2019) for the Barwon region considered potential climate change impacts under two plausible climate change scenarios*. They projected the following for the region:

- Increases in maximum temperature by a median of 1.4 °C to 1.9 °C by mid century
- Variable rainfall that is declining in winter spring and autumn
- Extreme rainfall events will become more variable and intense
- Sea level is likely to continue rising by 4 mm annually (under high emissions scenario)
- An increase in high fire danger days to 9 days annually (under high emissions scenario)

*The scenarios are based on two of the four Representative Concentration Pathways (RCPs). RCPs are pathways for emissions which are consistent with broad climate outcomes used by the climate modelling industry. The pathways consider land use change, and greenhouse gas and aerosol concentrations. The RCPs are characterised by the level of radiative forcing produced by the end of the 21st century. Radiative forcing refers to the additional heat in the lower atmosphere caused by greenhouse gas emissions (Australian Climate Change Science Program, 2020). The projections for the Barwon region consider possible impacts under two plausible climate scenarios: medium emissions (RCP 4.5), and high emissions (RCP 8.5) (Clarke *et al.*, 2019).

29.5.3 METHOD FOR IDENTIFYING AND ASSESSING THE VULNERABILITY OF MNES TO CLIMATE CHANGE IMPACTS

This section outlines the methods used to identify and assess the vulnerability of MNES to climate change impacts. This includes:

- The vulnerability assessment method for:
 - Threatened species and ecological communities
 - Other MNES including:
 - Migratory species
 - Ramsar Wetlands
- The principles used to evaluate the extent to which the Plan addresses significant vulnerabilities

THREATENED SPECIES AND ECOLOGICAL COMMUNITIESLiterature review

There are no studies which consider the vulnerability of threatened species and ecological communities in the Geelong region to Climate Change. In the absence of targeted research, the vulnerability of threatened species and communities to climate change can be assessed using a variety of frameworks. Broadly, these frameworks aim to capture three major components of vulnerability: exposure, sensitivity and adaptive capacity (Wheatley, Beale et al., 2017). Exposure refers to the extent of climate change likely to be experienced by a species or locale. Sensitivity refers to the degree to which the survival of a species is dependent on the prevailing climate (particularly climatic variables which are likely to be impacted by climate change). Adaptive capacity is the capacity of a species to cope with climate change, through shifting in range, or migrating to more suitable regions (Dawson, Jackson et al., 2011).

Pacifici, Foden et al., (2015) categorised three main approaches to assessing vulnerability to climate change, including:

- Correlative - relate observed geographic distribution of a species to the current climate, and use this to infer the potential climate-suitable areas for the species under future climate change scenarios
- Mechanistic – uses taxon-specific parameters which provide information on the behaviour of individuals, and the mechanisms they use to cope with a changing climate
- Trait-based – uses species biological characteristics as predictors of extinction risk due to climate change

A review of the strengths and weaknesses of these approaches indicated that trait-based approaches are able to be effectively applied more widely (Pacifici, Foden et al., 2015).

A number of studies have applied a trait based assessment of climate change vulnerability to study groups, including but not limited to birds, amphibians and corals (Foden, Butchart et al., 2013), crayfish (Hossain, Lahoz-Monfort et al., 2018), and sharks and rays (Chin, Kyne et al., 2010). Given that a number of these studies relate to specific taxa, a literature review was conducted to identify a set of traits for use in the vulnerability assessment relevant to a diversity of taxa.

Method used in the assessment

The method used to assess the vulnerability of threatened species and communities relevant to the Plan is a qualitative approach which considers sensitivity and adaptive capacity to climate change. This approach is considered appropriate to identify any significant vulnerabilities of threatened species and communities to climate change because it:

- Captures a range of factors including historical and current population trends and specific habitat or environmental requirements
- Is informed by key policy documents such as Conservation Advices and Recovery Plans
- Can be applied across the diversity of taxa relevant to the Plan

Table 29-7 outlines the traits used in the climate vulnerability assessment.

OTHER MNES

Other MNES which occur within the Study Area include:

- Migratory shorebirds
- Wetlands of International Importance (Ramsar) – The Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site (the Ramsar site)

A desktop review was undertaken to assess the vulnerability of migratory shorebirds and the Ramsar site to climate change. This involved a review of scientific literature, and policy documents and guidelines. The method used to assess the vulnerability of other MNES relevant to the Plan is a qualitative approach. This is considered to be appropriate for the following reasons:

- There are a number of recent, detailed, and specific studies which consider the vulnerability of migratory shorebirds and wetlands to climate change

- The key policy documents for the Ramsar site, the Ecological Character Description and Ramsar Site Management Plan (DELWP, 2018, 2020), are relatively recent documents which consider the implications of climate change as a threat

The results of this review are discussed below.

PRINCIPLES USED TO EVALUATE THE EXTENT TO WHICH THE PLAN ADDRESSES SIGNIFICANT VULNERABILITIES

The goal of adaptation can be defined as reducing the risk of adverse impacts by enhancing the ‘resilience’ or ‘resistance’ of ecosystems to change. Resilience strategies attempt to enhance the ability of a system to recover from change, while resistance strategies attempt to enhance the ability of a system to resist change (Heller and Zavaleta, 2009).

Scientists and practitioners have proposed a wide range of principles or strategies to manage the impacts of climate change on biodiversity (Heller and Zavaleta, 2009). A set of commonly recommended key principles can be derived from the literature. These principles are:

- Ensure representativeness and replication
- Protect the largest and most viable areas of biodiversity
- Maintain and improve habitat connectivity
- Reduce the impacts of other threats
- Manage uncertainty through adaptive management

Most of these principles are consistent with general conservation planning principles, and scientists often argue that many conservation planning principles remain robust under a changing climate (e.g., see (Hodgson *et al.*, 2009). Despite this, there are major barriers to implementing conservation planning principles that address the impacts of climate change. These include (Reside, Butt and Adams, 2018):

- Limited understanding of the impact of climate change on key ecosystems, processes, and species
- A lack of guidance on incorporating knowledge into practice
- Insufficient funding for implementing climate change adaptation strategies

Further, in identifying this set of key principles, it is recognised that:

- Measures to facilitate adaptation of biodiversity to climate change are likely to be regional and species-specific
- There may not be scientific consensus on all of these key principles and the relative importance of each

These principles are used to evaluate the extent to which the Plan addresses significant vulnerabilities of MNES.

Table 29-7: Traits used in the vulnerability assessment of relevant threatened species and communities (Steffen *et al.*, 2009; Chin *et al.*, 2010; Foden *et al.*, 2013; Hossain *et al.*, 2018)

Trait	Rationale	Low risk	Medium risk	High risk
1. SENSITIVITY				
1.1 Specialised habitat and/or microhabitat requirements	Species that are less tightly coupled with specific conditions and requirements are more likely to demonstrate resilience as they have a wider range of habitat options available (Foden <i>et al.</i> , 2013)	Species has general habitat and/or microhabitat requirements	Species has a low level of specialised habitat and/or microhabitat	Species has highly specialised and/or microhabitat requirements
1.2 Population dynamics, including rarity of species and generational length	The vulnerability of a species will be influenced by the generation length of the species, and the rarity of species (small populations, or small geographic ranges) (Foden <i>et al.</i> , 2013). Rarity may also measure a species reproductive capacity, growing times, and recovery times (Chin <i>et al.</i> , 2010)	Species has an abundant population, a large geographic range, or non-restrictive generation length	Species has a level of restriction in population size, geographic range, or generation time	Species has a high level of restriction in population size, geographic range, or generation time
1.3 Level of tolerance to environmental thresholds or trigger factors such as temperatures, water availability, and fire	Many species rely on physiological tolerances which are closely related to specific environmental conditions. Further, changes to climate driven triggers may lead to asynchrony and uncoupling with environmental factors (Foden <i>et al.</i> , 2013)	Species is not reliant on environmental conditions or triggers for physiological behaviours	Species has a level of reliance on environmental conditions or triggers for physiological behaviours	Species is highly reliant on environmental conditions or triggers for physiological behaviours
2. ADAPTIVE CAPACITY				
2.1 Dispersal capacity	Species with low dispersal rates have a lower adaptive capacity as they are unable to remain within a shifting climate envelope (Foden <i>et al.</i> , 2013)	Species has high dispersal rates	Species has moderate dispersal rates	Species has very restricted dispersal rates
2.2 Population trends – historical or recent decline in population, levels of genetic variation	The evolvability of a species will be influenced by the level of genetic diversity, and the size, or fragmentation of populations (Foden, Butchart <i>et al.</i> , 2013)	Population is relatively stable, connected, and exhibits a high level of genetic diversity	Population has experienced decline, fragmentation or exhibits limited genetic diversity	Population has experienced significant decline, fragmentation or exhibits extremely limited genetic diversity

29.5.4 RESULTS OF THE CLIMATE VULNERABILITY ASSESSMENT

This section presents the results of the climate change vulnerability assessment for:

- Threatened species and ecological communities
- Migratory species
- Ramsar wetlands

THREATENED SPECIES AND ECOLOGICAL COMMUNITIES

The assessment of the vulnerability of relevant threatened species and ecological communities within the Strategic Assessment Area to climate change impacts indicated that:

- Natural Temperate Grassland is at high risk to climate change impacts
- Two threatened flora species are at high risk to climate change impacts
- Twenty threatened fauna species are at high risk to climate change impacts
- Four threatened fauna species are at medium risk to climate change impacts

Table 29-8, Table 29-9 and Table 29-10 detail the vulnerability assessment.

Table 29-8: Vulnerability of threatened ecological communities to climate change impacts

Name	Cth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically endangered	<ul style="list-style-type: none"> The ecological community has a very restricted distribution There is less than five per cent of the grassland remaining The composition and appearance of the TEC is influenced by weather patterns, seasonal variation and land management (TSSC, 2008; Vranjic, 2008)	No	High risk

Table 29-9: Vulnerability of threatened flora to climate change impacts

Scientific name	Common name	Cth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	Endangered	<ul style="list-style-type: none"> The species has specific habitat requirements (slow moving creek, depressions and drainage lines that are seasonally inundated or waterlogged) Geographic range is limited to the south-west of Victoria Many historical populations have been lost, likely due to extensive vegetation loss in the species range (Murphy, 2010; DCCEEW, 2022)	Yes	High risk
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	Critically Endangered	<ul style="list-style-type: none"> The species is slow growing and may live up to 100 years Seed dispersal distances are limited Geographic range is limited to the central west of Victoria Remaining populations are now substantially fragmented and depleted (DEWHA, 2009a; TSSC, 2016f)	No	High risk

Table 29-10: Vulnerability of threatened fauna to climate change impacts

Scientific name	Common name	Commonwealth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	<ul style="list-style-type: none"> The species is able to travel over hundreds of kilometres between wetlands, and is able to move between habitats as suitability changes Total population is estimated at 1,000 mature individual and the species has experienced declines (Garnett, Szabo et al., 2011; TSSC, 2019) 	Yes	Medium risk
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Vulnerable, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Calidris canutus</i>	Red Knot, Knot	Endangered, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered, Migratory	Migratory shorebird (see below for details)	No	High risk
<i>Calidris tenuirostris</i>	Great Knot	Critically Endangered, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Charadrius leschenaultii</i>	Greater Sand Plover	Vulnerable, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Charadrius mongolus</i>	Lesser Sand Plover	Endangered, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Galaxiella toourtkoourt</i>	Little Galaxias	FPAL	<ul style="list-style-type: none"> The species has been substantially fragmented and depleted due to wetland modifications Localised extinctions and severe declines have been noted in a number of systems The distribution and abundance of populations fluctuates, and may be influenced by habitat connectivity of hydrological systems (Saddler, Jackson and Hammer, 2010) 	Yes	High risk

Scientific name	Common name	Commonwealth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
<i>Delma impar</i>	Striped Legless Lizard	Vulnerable	<ul style="list-style-type: none"> The species has specialised habitat requirements (grassland specialist, only found in areas of native grassland and nearby grassy woodland and exotic pasture, uses rocks, soil cracks and grass tussocks as shelter) Distribution has declined, and the species range within Victoria has contracted to the southern part of the state The species cannot disperse over long distances Remaining populations are small and isolated (TSSC, 2016e; DCCEEW, 2022)	No	High risk
<i>Gallinago hardwickii</i>	Latham's Snipe	Vulnerable, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Limosa lapponica baueri</i>	Western Alaskan Bar-tailed Godwit	Vulnerable, listed Migratory at species level	Migratory shorebird (see below for details)	Yes	High risk
<i>Limosa limosa</i>	Black-tailed Godwit	Endangered, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Litoria raniformis</i>	Growling Grass Frog	Vulnerable	<ul style="list-style-type: none"> The species is highly mobile, travelling up to 1 km within 24 hours Where populations are restricted to small, permanent waterbodies, the species has limited dispersal indicating high levels of site fidelity. However, when the species occupies ephemeral waterbodies, there is significantly higher levels of dispersal with individuals moving larger distances The species has suffered a substantial decline in abundance and range The spatial arrangement (matrix) and level of connectivity amongst waterbodies within the landscape is one of the most important factors which influences the presence of the species at a given site (DEWHA, 2009b; Clemann and Gillespie, 2012; DCCEEW, 2022)	No	High risk

Scientific name	Common name	Commonwealth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
<i>Nannoperca obscura</i>	Yarra Pygmy Perch	Vulnerable	<ul style="list-style-type: none"> The species has a low dispersal ability, and there is low genetic diversity between sites It has experienced decline in abundance and distribution Remaining habitat is fragmented, and the species is vulnerable to local extinctions Remnant populations are substantially fragmented and depleted (Saddler and Hammer, 2010; DELWP, 2015; DCCEEW, 2022) 	Yes	High risk
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	Critically Endangered	<ul style="list-style-type: none"> The species has demonstrated low lifespan and survival rates The remaining population is extremely small, comprised of 50 individuals in the wild Genetic analysis suggests the wild population has suffered a significant genetic decline (DELWP, 2016) 	Yes	High risk
<i>Neophema chrysostoma</i>	Blue-winged Parrot	Vulnerable	<ul style="list-style-type: none"> The species is a partial migrant between Tasmania and mainland Australia Habitat requirements are relatively broad The population is thought to have declined by 30 – 50 per cent in the past three generations (DAWE, 2020) 	Yes	High risk
<i>Numenius madagascariensis</i>	Eastern Curlew	Critically Endangered, Migratory	Migratory shorebird (see below for details)	No	High risk
<i>Prototroctes maraena</i>	Australian Grayling	Vulnerable	<ul style="list-style-type: none"> Juveniles of the species disperse widely The species migrates between rivers, their estuaries and coastal seas. It is reliant on free access to a range of freshwater, estuarine and marine habitats for its survival The species has a wide distribution and uses a range of habitats throughout its lifecycle 	Yes	Medium risk

Scientific name	Common name	Commonwealth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
			<ul style="list-style-type: none"> A lack of genetic diversity has been observed in coastal rivers of Victoria Due to the species' high fecundity, it has been suggested that the population can undergo large fluctuations, and has potential to recover following declines in population size (Backhouse, O'Conner et al., 2008; DCCEEW, 2022; TSSC, 2021)		
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	<ul style="list-style-type: none"> Relatively little is known about the ecology of this species, as it has few records, unpredictable movements, cryptic habits, and often occurs in reasonably inaccessible areas The species breeds all year round depending on available suitable wetland conditions, although breeding habitat requirements may be quite specific Geographic distribution is widespread across Australia (DSEWPaC, 2013; DoEE, 2019; DCCEEW, 2022)	Yes	Medium risk
<i>Sternula albifrons</i>	Little Tern	Vulnerable, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Sternula nereis nereis</i>	Australian Fairy Tern	Vulnerable	<ul style="list-style-type: none"> The species has general habitat requirements (including offshore, estuarine or lacustrine (lake) islands, coastal wetlands, beaches and sand spits) The population of the Australian Fairy Tern is estimated at 7,450, of which approximately 100 – 150 occur in Victoria There has been a decline in breeding pairs within Victoria (DAWE, 2020)	Yes	Medium risk
<i>Synemon plana</i>	Golden Sun Moth	Vulnerable	<ul style="list-style-type: none"> The species has specific habitat requirements (areas containing, or having once contained, native grassland, open grassy woodlands, and secondary grasslands which retain a component of larval food sources) The species has limited dispersal abilities 	Yes	High risk

Scientific name	Common name	Commonwealth status	Physiological and life history traits	Climate change identified as a threat in species Recovery Plan or Conservation Advice	Vulnerability to climate change impacts
			<ul style="list-style-type: none"> Many known subpopulations are confined to small areas of remnant grassland (DAWE, 2021) 		
<i>Tringa nebularia</i>	Common Greenshank	Endangered, Migratory	Migratory shorebird (see below for details)	Yes	High risk
<i>Tympanocryptis pinguicollis</i>	Victorian Grassland Earless Dragon	Critically Endangered	<ul style="list-style-type: none"> The species was presumed to be extinct until rediscovery in January 2023. There is now one known population of the species. This population may be the last remnant population of the species The species has specialised habitat requirements (grassland specialist, with specific habitat attribute requirements) Lives for less than two to three years in the wild Rarely disperse further than 40 m, and usually remain within one metre of a burrow Requires access to burrows to retreat from very cold or hot temperatures (DCCEEW, 2023c, 2023a; Zoos Victoria, 2024)	Yes	High risk

MIGRATORY SHOREBIRDS

Thirty-seven species of migratory shorebirds regularly visit Australia during their non-breeding season (from the Austral spring to autumn). The majority of those breed in the northern hemisphere and use the East Asian-Australasian Flyway which stretches from Siberia and Alaska, through east and south-east Asia, to Australia and New Zealand. They depend upon a range of sites along the flyway for breeding, staging, feeding, and roosting. In Australia, coastal and freshwater wetlands provide important habitat (Commonwealth of Australia, 2015). Refer to Chapter 23 for the complete detailed assessment of Migratory shorebirds.

A number of studies have assessed the vulnerability of migratory shorebirds to climate change (Reese and Skagen, 2017; Wauchope *et al.*, 2017; Steen, Skagen and Noon, 2018; Koleček *et al.*, 2021). Potential impacts to migratory shorebirds from climate change may relate to:

- The migratory phase
- Northern breeding ranges
- Non-breeding habitat in the southern hemisphere

The migratory phase

The annual survival of migratory shorebirds is reliant on the migratory period of their lifecycle. During this phase, migratory birds are more frequently exposed to unavoidable or unknown threats and energetic requirements are higher. The reduced availability of resources at stopover sites on the migration route may influence reduced reproduction, body condition, and migration speeds. This will ultimately contribute to population decline (Steen, Skagen and Noon, 2018). There has been a measured decline in populations of migratory shorebirds across Australia associated with the documented loss and degradation of East Asian habitats along the migratory route (Clemens, Rogers *et al.*, 2016).

Migration is an inherently risky process and climate change may cause further complications. The impacts of climate change pose new challenges during species migration. This may include changes to inundation patterns and the functioning of wetland habitats, and the increased strength of tropical storms (Reese and Skagen, 2017; Steen, Skagen and Noon, 2018).

Northern breeding ranges

Many migratory shorebirds occupy northern regions for the breeding phase of their life cycle. These regions are experiencing climate change at a rate of twice the global average. The majority of species are expected to respond to climate change through a shift in distribution typically towards higher elevation or the poles. The shifting distribution of migratory species utilising northern breeding grounds will likely be constrained by the Arctic coastline (Wauchope *et al.*, 2017).

Non-breeding habitat in the southern hemisphere

Non-breeding habitat for migratory shorebirds in the southern hemisphere is also expected to be impacted by climate change. Coastal wetlands and saltmarsh provide important roosting and feeding habitat prior to northern migration. There is evidence that Australian coastal wetlands are showing signs of climate change impacts such as the rapid change in distribution of saltmarsh and mangrove along the Australian Coastline (Saintilan, Rogers *et al.*, 2019).

Potential impacts to migratory shorebirds in the Study Area

The Study Area includes three sections of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site (the Ramsar site). The Ramsar site meets the EPBC guidelines for internationally important wetland habitat (DoE, 2017) in that it has supported greater than 20,000 waterbirds annually since 1981 and supports > 1 per cent of the population for 15 species of waterbirds (DELWP, 2020). The Ramsar site provides a diversity of habitat for waterbirds, including important habitat for foraging, roosting, moulting and breeding (DELWP, 2020).

Climate change has been identified as a threat to the Ramsar site in the Ecological Character Description. There are three stressors related to climate change, sea level rise, increased temperature, and increased frequency of storms. Climate change is considered to be a serious threat to the Ramsar site, and adaptation strategies are required (DELWP, 2020). Refer to Chapter 22 for the complete detailed assessment of the Ramsar site.

WETLANDS OF INTERNATIONAL IMPORTANCE (RAMSAR)

Wetlands are recognised as one of the most vulnerable ecosystems to climate change (Finlayson *et al.*, 2017). Studies within Australia have demonstrated the potential for significant impacts on wetlands as a result of climate change over the coming century (Dunlop & Grigg, 2019). Further, the impacts of climate change are considered likely to lead to the significant degradation and loss of wetlands in Victoria (Jin, Cant *et al.*, 2009).

Wetlands are likely to be impacted by climate change through altered hydrological regimes, higher temperatures and evaporation, sea level rise, and increased frequency and intensity of weather events (Jin, Cant and Todd, 2009; DCCEEW, 2021). Climate change impacts may interact with and exacerbate the threat of existing human induced impacts on wetlands including land clearing, water extraction, and urban development (DCCEEW, 2021). As a result, wetlands which have been highly modify or degraded will generally be more vulnerable to climate change impacts (Finlayson *et al.*, 2017).

Coastal wetlands are thought to be particularly vulnerable to climate change given their low-lying positioning at the land-sea interface (Osland *et al.*, 2016; Finlayson *et al.*, 2017). Coastal wetlands are often characterised by the role of foundation plant species which influence ecosystem function. Climate change is likely to have larger effects on ecosystems which have a strong dependency on a small number of foundation species such as salt marshes, mangroves, or kelp beds. Further, coastal wetlands may be particularly vulnerable to climate change due to the more frequent level of abrupt ecological transitions. In coastal wetlands, these macroclimatic thresholds are generally more sensitive to small differences in abiotic conditions. Changes to foundation species and macroclimatic thresholds as a result of climate change will have implications for coastal wetland ecosystem services and resilience (Osland *et al.*, 2016).

As outlined above, climate change has been identified as a threat to the Ramsar site and is considered to be a serious threat (DELWP, 2020). A detailed assessment of the Ramsar site is provided in Part 4.

29.5.5 EXTENT TO WHICH THE PLAN ADDRESSES SIGNIFICANT VULNERABILITIES

This section considers the extent to which the Plan addresses significant vulnerabilities of MNES to climate change against the set of key principles identified in Section 29.5.3. The focus of the analysis is the MNES that are known to occur within the Growth areas. This includes:

- Adamson's Blown-grass (*Lachnagrostis adamsonii*)
- Golden Sun Moth (*Synemon plana*)
- Growling Grass Frog (*Litoria raniformis*)
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Striped Legless Lizard (*Delma impar*)

As outlined in the detailed impact assessments for MNES in Part 4 of the SAR, implementation of the Plan is not expected to put additional pressure on MNES which are not subject to direct impacts. Although it is recognised that many of these matters may have significant vulnerabilities to climate change, the commitments and measures under the Plan are considered appropriate to address any additional pressures related to potential indirect impacts.

ENSURE REPRESENTATIVENESS AND REPLICATION

Representativeness and replication are well established principles of conservation planning. Representativeness refers to the need to protect the full range of biodiversity (e.g., vegetation types). Replication refers to the need to protect multiple examples of each unit of biodiversity in order to spread risk (Margules and Pressey, 2000).

These two principles will continue to be important in facilitating adaptation of biodiversity to climate change (Dunlop and Brown, 2008; Heller and Zavaleta, 2009). Dunlop and Brown argue:

By sampling a diversity of communities...[we] are also sampling the underlying geographic diversity of the landscape...Thus, a set of areas that samples a high diversity of communities now will probably also capture a high diversity of communities under future climates, even if the composition of the communities is different in the future.

The Plan supports the implementation of this principle in the region through avoiding a number of MNES which may occur within the Strategic Assessment Area and protecting and conserving habitat for MNES subject to direct impacts.

Of the 31 MNES that are assessed within this Strategic Assessment Report, potential habitat and records of 26 MNES are avoided completely. For the MNES at risk from development within the Growth Areas, the strategic conservation areas

protect known locations and/or habitat for Golden Sun Moth, Striped Legless Lizard, Growling Grass Frog, Victorian Grassland Earless Dragon, Blue-winged Parrot and Natural Temperate Grassland. Additional habitat for these MNES will be protected in offset areas outside of the Strategic Assessment Area.

The offset package for MNES will contribute to representativeness and replication within the NGGA, and the broader Victorian Volcanic Plain, for the threatened species and TEC subject to direct impacts under the Plan.

PROTECT THE LARGEST AND MOST VIABLE AREAS OF BIODIVERSITY

Another well-established principle of conservation planning is to focus conservation efforts on protecting and restoring large areas of biodiversity. There are well established relationships between the size of a patch of native vegetation and the size and persistence of populations, species richness, species dispersal, genetic diversity, persistence of large vertebrates, maintenance of near-natural disturbance regimes, and other important ecological functions (Lindenmayer *et al.*, 2007; Hodgson *et al.*, 2009).

Scientists argue this principle will continue to be important in facilitating adaptation of biodiversity to climate change. Because habitat loss remains the key threat to biodiversity and relationships between patch size and biodiversity value is well-established, protecting areas of high quality native vegetation and habitats should remain the primary focus of conservation efforts under climate change (Heller and Zavaleta, 2009; Hodgson *et al.*, 2009).

The Plan supports the implementation of this principle in the region by applying a strategic approach to the avoidance, mitigation and offsetting of MNES. Strategic assessments under Part 10 of the EPBC Act provide an opportunity to contribute to this principle by considering the potential impacts and relevant offsetting at the landscape scale.

The strategic conservation areas within the Growth Areas provide avoidance and protection for the key MNES and broader biodiversity values at landscape scale. For example, the Northern Conservation Area contributes to this principle because it:

- Focuses on the areas of native vegetation and habitat within the NGGA that are the most viable
- Provides one contiguous conservation area with a minimised edge to area ratio
- Protects a significant area of native vegetation within the NGGA
- Protects large and connected areas of Golden Sun Moth and Striped Legless Lizard habitat, and areas of the most important habitat attributes for Victorian Grassland Earless Dragon

Further, the strategic offsetting approach will provide offset areas of large and well connected threatened species habitat and native vegetation.

HABITAT CONNECTIVITY

Maintaining and improving habitat connectivity is often considered the most important strategy to manage the impacts of climate change on biodiversity (Dunlop and Brown, 2008; Heller and Zavaleta, 2009). Despite this, there is much uncertainty about the importance of habitat connectivity in managing the impacts of climate change. Some scientists argue that other, more certain strategies, such as protecting the largest patches of high quality native vegetation, should be prioritised over habitat connectivity (Hodgson *et al.*, 2009):

As uncertainties about connectivity tend to be high, and increases in habitat quantity and quality coincidentally improve connectivity, we conclude one should generally provide higher weight in decision-making to actions that increase area and quality [of habitat] Theoretically, we know that populations will sometimes benefit more from a small, well-connected piece of habitat than a larger, more isolated one, but the relative uncertainties and the probability of worse-than-expected outcomes [from improving habitat connectivity] should also affect our decision making...

The Plan is not considered to significantly disrupt habitat connectivity in the region. The Growth Areas are highly modified due to past and current land use and the level of existing threats in the area (EHP, 2021). MNES values within the Growth Areas are largely fragmented and isolated, and modelled habitat (DELWP, 2017b) and native vegetation (DELWP, 2005) suggests that this is consistent across the broader Strategic Assessment Area. Further, the Growth Areas occur near to urbanised areas including Greater Geelong and Lara which are thought to disrupt connectivity in nearby areas.

The Plan is considered to contribute to habitat connectivity by:

- Protecting and managing the connected Growling Grass Frog (*Litoria raniformis*) habitat mapped within Cowies Creek and a riparian corridor that will support connectivity at a landscape scale
- Protecting and managing the Moorabool River corridor
- Avoiding and managing a connected area of known Striped Legless Lizard (*Delma impar*) and Golden Sun Moth (*Synemon plana*) habitat within the Northern Conservation Area
- Providing a strategic offset package which aims to contribute to connectivity in the broader landscape

REDUCE THE IMPACTS OF OTHER THREATS

Some scientists argue that given the uncertainty about the impacts of climate change on biodiversity and how best to facilitate adaptation, focusing on reducing key existing threats to biodiversity provides a robust strategy to address climate change. For example, Steffen et al (Steffen *et al.*, 2009) state:

A central strategy is giving ecosystems the best possible chance to adapt by enhancing their resilience. Approaches to building resilience include managing appropriate connectivity of fragmented ecosystems... [and] implementing more effective control of invasive species, and developing appropriate fire and other disturbance management regimes

The Plan recognises that the effective management of landscape scale threats is critical to the success of the conservation program under the Plan and to manage the impacts of climate change on biodiversity. The key threats that the Plan is potentially contributing to in the region are largely related to indirect impacts. The Plan includes a range of commitments to address these potential indirect impacts in the Growth Areas and the broader Strategic Assessment Area and Study Area. A detailed assessment of potential indirect impacts is provided in Part 4.

ADDRESS UNCERTAINTY THROUGH ADAPTIVE MANAGEMENT

Adaptive management is an iterative process that seeks to improve management over time by testing hypotheses and learning from the results, and then incorporating lessons learnt into future management actions.

Many scientists argue that given the uncertainty about the impacts of climate change on biodiversity and how best to facilitate adaptation, management within an adaptive framework will be critical to facilitating adaptation.

The Plan will be implemented adaptively to ensure the commitments and actions are delivered and the outcomes are achieved efficiently and effectively. Adaptive management will be triggered on the basis of the findings of the evaluations undertaken as part of the monitoring, evaluation and reporting program under the Plan. The approach to adaptive management under the Plan is described in Chapter 7 of the Plan.

29.5.6 CONCLUSION

This section considered the vulnerability of MNES relevant to the Plan in relation to impacts associated with climate change. It is clear that threatened species and communities, migratory species, and Ramsar wetlands are vulnerable to the known and predicted impacts of climate change.

The Plan is not expected to put additional pressure on the MNES which are not subject to direct impacts under the Plan. Although it is recognised that these matters may have significant vulnerabilities to climate change, the commitments and measures under the Plan are considered appropriate to address any additional pressures related to potential indirect impacts.

The extent to which the Plan addresses the vulnerabilities of MNES which occur within the Growth Areas has been assessed against a set of key principles. The key outcomes of this evaluation include that the Plan:

- Supports representativeness and replication of biodiversity by protecting and managing conservation areas within the Growth Areas and providing strategic offsets outside the Growth Areas
- Provides avoidance within the Growth Areas which focuses on the larger and more viable areas of biodiversity and applies a strategic offsetting approach outside of the Growth Areas
- Is not expected to disrupt habitat connectivity within the Strategic Assessment Area, and will contribute to this principle by avoiding and protecting connected areas of habitat within the Growth Areas
- Includes a number of measures to address potential indirect impacts (threats) under the Plan
- Incorporates adaptive management to ensure that outcomes are achieved efficiently and effectively

29.6 ASSURANCE AND IMPLEMENTATION

29.6.1 INTRODUCTION

The ToR requires an evaluation of the effectiveness of the implementation arrangements for the Plan, including the Plan's assurance and implementation framework.

This section addresses these requirements of the ToR under the following headings:

- Effectiveness of implementation and funding arrangements
- Documentation and delivery of commitments
- Improving implementation and accounting for new information
- Monitoring actions taken under the Plan
- Monitoring and reporting on compliance
- Independent 5-yearly assurance review and report

29.6.2 EFFECTIVENESS OF IMPLEMENTATION AND FUNDING ARRANGEMENTS

Key elements of effective implementation of the Plan include:

- Clear delivery framework for implementation
- Robust governance arrangements
- Adequate funding of commitments and measures

CLEAR DELIVERY FRAMEWORK FOR IMPLEMENTATION

An appropriate framework to deliver the Plan is imperative to ensure that development and conservation actions under the Plan are consistent with regulatory requirements. The Plan is a high-level framework that needs to be given effect through delivery mechanisms that turn the high-level requirements of the Plan into specifics. If the delivery framework is unclear or unsuitable, developers will not understand what they need to do at a site or project level to meet the requirements of the Plan and implementation will be ineffective.

The Plan sets out a clear delivery framework for implementation. This will occur primarily through the Victorian planning system established under the P&E Act, and in particular the planning system hierarchy. This includes:

- The Planning Policy Framework
- The Framework Plan
- Urban Growth Zone (UGZ)
- PSPs and Native Vegetation Precinct Plans (NVPPs)
- Planning permits

Several other regulatory frameworks will also support the implementation of the Plan.

The planning system has a key role in supporting the implementation of many of the commitments in the Plan, including relating to avoidance and minimisation, mitigation and offsets. The Plan clearly sets out how each part of the planning system hierarchy is proposed to be used to implement the Plan.

Implementing the Plan through existing regulatory frameworks means the delivery framework for the Plan is well established and understood by stakeholders and legally robust and supports effective compliance.

ROBUST GOVERNANCE ARRANGEMENTS

Governance can be considered as the systems and structures which are in place to ensure compliance, transparency and accountability during implementation of the Plan. Robust governance arrangements are necessary to ensure the Plan is delivered efficiently and effectively and complies with any Commonwealth approval conditions.

The Plan establishes a clear organisational structure for its implementation. This includes:

- The approval holder (The City of Greater Geelong)

- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)
- Victorian Government Department of Energy, Environment and Climate Action (DEECA)
- Victorian Government Department of Transport and Planning (DTP)
- Northern and Western Geelong Growth Areas EPBC Plan Executive Committee
- City Implementation Group
- Support partners
- A process of ongoing-stakeholder engagement

The Plan establishes the EPBC Plan Executive Committee as the primary body responsible for overseeing and making key decisions about the implementation of the Plan. The City will prepare Terms of Reference (ToR) to clarify the purpose, responsibilities, membership and decision-making processes for the Executive Committee.

The Plan also establishes an Implementation Group within the City as the primary body responsible for day-to-day implementation of the Plan and to support the EPBC Plan Executive Committee.

The governance structure includes all relevant organisational levels needed for effective implementation, including:

- Regulatory oversight
- Decision-making
- On-ground delivery and implementation
- Stakeholder interests and perspectives
- Dispute resolution

The Plan clearly defines the roles and responsibilities for each key governance body, including in relation to the Plan's other implementation arrangements, such funding, MERI and compliance.

ADEQUATE FUNDING OF COMMITMENTS AND MEASURES

Lack of funding certainty is a key risk for the successful delivery of strategic assessments. It is critical that the approach and mechanisms for funding the implementation of the commitments and measures over the life of the Plan are clear, feasible and legally robust to provide certainty that the Plan will be successfully implemented.

The City is considering a range of options for funding the Plan and has identified a proposed funding framework informed by initial consultation with key stakeholders, including developers.

The Plan includes a commitment to establish funding arrangements to fund the implementation of the Plan's commitments and measures over the life of the Plan, consistent with the Plan's funding framework.

The key elements of the proposed funding framework are:

- Establishment of an implementation fund to fund the costs of implementing the commitments and measures, including securing and managing offsets for MNES required under the Plan in perpetuity
- Full cost recovery of the costs incurred by the City of implementing the commitments and measures, through a biodiversity levy payable by developers in the Growth Areas
- Establishment of governance and administrative arrangements to administer the implementation fund and the collection and application of the biodiversity levy
- Processes to review the costs throughout implementation and adjust the levy as required

A Funding Program developed to give effect to the funding framework is available as part of the package of documents for public exhibition. The Funding Program will be finalised before any development within the Growth Areas proceeds.

29.6.3 DOCUMENTATION AND DELIVERY OF COMMITMENTS

Some previous strategic assessments undertaken in Australia have suffered from unclear, unmeasurable or unfeasible outcomes, commitments and measures. This has resulted in poor conservation outcomes or delays during implementation. Clear and measurable commitments are critical for effective implementation of the Plan to allow delivery bodies to understand their obligations under the Plan, allow regulators and the public to understand what is intended to be delivered by the Plan, and enable the success of the Plan to be properly evaluated.

The Plan has clear and measurable outcomes, commitments and measures. These are framed within a program logic or 'outcomes framework' that underpins the Plan. The outcomes framework describes broadly how the Plan will be implemented and the relationships between outcomes and commitments and measures, and how the commitments and measures are expected to lead to the outcomes.

The Plan includes a MERI framework and a commitment to implement this over the life of the Plan. This will ensure progress in implementing the commitments and measures are documented and reported on.

The outcomes framework underpins the Plan's MERI framework. The outcomes framework supports accountability and transparency by providing the basis and set of benchmarks for monitoring, reporting, and ongoing evaluation and adaptive management of the Plan (DEWHA, 2009c).

Key elements of the MERI framework relevant to the documentation and delivery of commitments are:

- Monitoring over the life of the Plan of both:
 - Implementation of measures and the delivery of commitments
 - Achievement of the Plan's outcomes
- Annual progress reports to report publicly on progress in implementing the commitments and measures and compliance with the Plan and Commonwealth approval conditions

29.6.4 IMPROVING IMPLEMENTATION AND ACCOUNTING FOR NEW INFORMATION

Strategic assessments represent complex, long term programs for managing both development and conservation. Ongoing decisions over the life of a policy, plan or program are necessary to ensure successful implementation.

Given the spatial and temporal scale of the Plan, it is important that it retains sufficient flexibility to ensure that implementation can adapt to changing circumstances over time and still deliver the Plan's outcomes. Monitoring and ongoing evaluation and adaptive management of the Plan is critical for ensuring that:

- Changes to the environmental context, including planning or development priorities, conservation priorities and ecological processes, and legislation and policies, are considered and addressed during implementation of the Plan
- Assumptions about the relationships between the outcomes, commitments and measures, and how measures will deliver the commitments, can be identified and tested so that implementation can be improved
- New information on MNES can be accounted for, such as:
 - New listings of species or threatened ecological communities
 - The re-discovery of a previously considered extinct (in the wild) species
 - New knowledge that changes the understanding about MNES and how to best protect them

The Plan includes a MERI framework and a commitment to implement this over the life of the Plan. The MERI framework will ensure monitoring is used to understand the effectiveness of commitments and measures for MNES and improve implementation where monitoring demonstrates these are not leading to the Plan's outcomes.

Key elements of good adaptive management are (DEWHA, 2009c):

- Clearly defining outcomes
- Undertaking regular data collection/monitoring to track progress
- Completing regular evaluations to investigate cause and effect, efficiency and effectiveness, and test assumptions
- A clear process to consider improvements and adaptive management

The Plan's outcomes framework ensures the Plan's outcomes are clear and measurable, and the Plan's MERI framework includes these other key elements of good adaptive management. It includes:

- Key Performance Indicators (provided in the Commitments and Measures document) to provide a framework for understanding whether outcomes are being achieved and each commitment is being delivered efficiently and effectively
- Establishing monitoring protocols to ensure monitoring is effective and consistent over the life of the Plan
- Independent five-yearly evaluations and assurance reviews over the life of the Plan
- Trigger points and a clear process to decide adaptive management actions

The independent five-yearly evaluation and assurance review will be the primary trigger point and basis for any necessary adaptive management of the Plan to ensure the outcomes of the Plan are achieved.

Adaptive management may also be triggered by the City on an ad hoc basis in response to issues or opportunities that arise and that need to be addressed immediately. The City will establish criteria to determine when adaptive management should be considered outside the independent five-yearly evaluation and assurance review.

Following completion of the report on the five-yearly assurance review, the City will prepare an adaptive management report that includes recommendations for adaptive management actions for endorsement by the NWGGA EPBC Plan Executive Committee. Recommendations endorsed by the Executive Committee will form the basis of the adaptive management program to be commenced over the following five-year implementation period of the Plan.

The adaptive management process provides a mechanism to ensure new information relating to MNES can be accounted for in implementing the Plan, as it:

- Is undertaken on a regular basis (5-yearly), and can also be triggered on an ad hoc basis
- Includes an investigation into how effective implementation is at protecting MNES and achieving the Plan's outcomes, including consideration of:
 - Are the commitments the best way to achieve the outcomes of the Plan?
 - Are there alternative measures that would better deliver commitments or achieve additional benefits?
 - Do the measures continue to meet best practice standards?
- Requires recommendations to be made to improve implementation, that may take into account any new knowledge that changes the understanding about MNES and how to best protect them

29.6.5 MONITORING ACTIONS TAKEN UNDER THE PLAN

Ensuring compliance is critical to the success of any regulatory process, including the implementation of the Plan.

The Plan includes a compliance framework and a commitment to implement this over the life of the Plan. A key part of the Plan's compliance framework is a development registration system to monitor the taking of actions by regulated third-parties under the endorsed Plan and associated EPBC Part 10 approval.

The Plan includes a commitment to develop this registration system during implementation of the Plan. The development registration system will use an appropriate step in the Victorian planning system as the trigger for registration. This will ensure that the registration system integrates effectively with existing planning and compliance processes for development in the Growth Areas. The registration system will require developers to provide information to the City about their action, including how it is consistent with the requirements of the Plan.

The registration system is an important part of the Plan's compliance framework. It will ensure that:

- The City can monitor developments that are relying on the Part 10 approval
- Regulated third-parties are aware of their responsibilities under the Plan

Consistent with best-practice, the City's primary focus for compliance will be on prevention and avoidance of non-compliance. The development registration system will provide the key mechanism for informing regulated third-parties of their responsibilities under the Plan and supporting this preventative approach to non-compliance.

The compliance framework, along with the Plan's governance framework, also clarifies roles and responsibilities for compliance across DCCEEW and the City. The framework clarifies that:

- DCCEEW is ultimately responsible for ensuring the City achieves the Plan's outcomes and implements the commitments in accordance with the Plan or causes these to be implemented through support partners. DCCEEW can potentially take action to enforce compliance with the Plan under the EPBC Act
- As approval holder, the City is responsible for ensuring regulated third-parties taking approved actions under the endorsed Plan take these actions in accordance with the Commonwealth approval conditions. The City or other appropriate regulatory authority can potentially take action to enforce compliance under the regulatory frameworks used to implement the Plan, including the P&E Act

29.6.6 MONITORING AND REPORTING ON COMPLIANCE

Monitoring and reporting on compliance is important to give regulators and the public confidence that the City is implementing the Plan as it has committed to doing, and that regulated-third parties are complying with Commonwealth approval conditions. It is also important for understanding whether non-compliance may be contributing to any delays or progress in delivering commitments and achieving the Plan's outcomes.

The Plan includes a compliance framework and MERI framework and commitments to implement these over the life of the Plan. The Plan's compliance framework provides for:

- Monitoring compliance and detecting non-compliance
- Notifying DCCEEW of non-compliances
- Reporting on compliance

Monitoring and reporting on compliance will be undertaken in accordance with the Plan's MERI framework. Key Performance Indicators provide a framework to consider the extent of compliance with Commonwealth approval conditions, and detailed monitoring protocols will be developed for each compliance indicator to ensure monitoring is effective and consistent over the life of the Plan.

The Plan's compliance framework includes a process for notifying DCCEEW about non-compliances in relation to both the delivery of commitments by the City or support partners and regulated third-parties taking approved actions under the endorsed Plan. The notification process ensures:

- DCCEEW is informed of non-compliances as soon as practicable
- The steps to rectify significant non-compliances are clearly set out and agreed between DCCEEW and the City – under the process, the City must provide a plan to DCCEEW setting out the compliance actions proposed to be taken to rectify the non-compliance for those determined to be high-risk under the compliance framework
- DCCEEW is kept up to date about progress in taking any compliance actions – under the process, the City must report to DCCEEW regularly on progress in implementing compliance actions

The City will undertake regular reporting on compliance to ensure transparency and accountability. Reporting on compliance will be undertaken in accordance with the MERI framework. The MERI framework requires compliance to be reported in annual progress reports and five-yearly assurance reports (these will be prepared to report on the results of the five-yearly evaluations and assurance reviews).

29.6.7 INDEPENDENT 5-YEARLY ASSURANCE REVIEW AND REPORT

The Plan includes a MERI framework and a commitment to implement this over the life of the Plan. The Plan's MERI framework provides for an independent evaluation and assurance review to be undertaken every 5 years over the life of the Plan. The five-yearly evaluation and assurance review will determine:

- Compliance with the Commonwealth conditions of approval
- Whether the outcomes of the Plan are being achieved, and if not, the reasons for this
- Progress of the implementation of each commitment and an evaluation of how efficiently and effectively the commitments are being implemented

The results of the independent evaluation and assurance review will be reported in five-yearly assurance reports. These will be made publicly available on the City's website following their preparation.

The Plan's evaluation and assurance review will give regulators and the public confidence that the City is implementing the Plan as it has committed to doing and that this is being done as efficiently and effectively as possible, as it:

- Will be undertaken by an independent party to ensure an impartial assessment
- Will be undertaken regularly over the life of the Plan at intervals appropriate (5-yearly) for monitoring of environmental-related outcomes, such as the status of MNES populations in the NGGA Conservation Area
- Includes an investigation into the level of compliance with Commonwealth approval conditions
- If the Plan's outcomes are not being achieved, includes an investigation into the reasons for this
- Includes an investigation into the efficiency and effectiveness of the implementation of the commitments and provides a mechanism and primary trigger point for any necessary adaptive management of the Plan

29.7 HOW THE PLAN MEETS THE COMMONWEALTH ENDORSEMENT CRITERIA

The Strategic Assessment Agreement provides that, in determining whether to endorse the Plan, the Minister will consider the Plan against the Endorsement Criteria in the agreement to ensure the Plan meets the requirements of the EPBC Act and is able to be adequately implemented.

The ToR requires the SAR to include an assessment of how the Plan meets the Commonwealth endorsement criteria set out in Attachment 2 of the Strategic Assessment Agreement.

Table 29-11 shows where each of the endorsement criteria are addressed in the Plan.

Table 29-11: Where the Plan addresses the endorsement criteria

Endorsement criteria section	Endorsement criteria requirement	Chapter of the Plan
General 1. The Plan must:	a) describe how the Plan is to operate;	1.2 – Purpose of the Plan 1.3 – Overview of the Plan and supporting documents
	b) use plain English and be written in a way that assists readers who do not have background in or detailed knowledge of the requirements of Part 10 of the EPBC Act;	Entire Plan 1.6 – Regulatory context and legal effect of the Plan
	c) provide clarity about legal responsibilities affected by the Plan following endorsement and approval;	1.6 – Regulatory context and legal effect of the Plan 1.7 – Responsibilities for implementing the Plan 7.3 – Governance framework
	d) incorporate an agreed outcomes framework that uses a consistent hierarchy and language to clearly specify what the Plan (and any supporting documents) will deliver for protected matters. For the purposes of this Agreement and the Terms of Reference (noting that a different framework may be used for the Plan) these include: i) 'outcomes' which represent the highest level of what the Plan will deliver for protected matters, commitments, and measures' ii) 'commitments' which represent what the approval holder (or holders) will do over the life of the Plan to deliver the outcomes iii) 'measures' which represent the specific activities that the approval holder (or holders) will undertake to meet the commitments	3 – Objective and outcomes of the Plan
	e) should allow for flexibility and adaptive management with respect to matters of development and conservation to deal with changes over the timeframe of the approval. This flexibility may be in relation to:	4.5 – Changes to the boundaries of land subject to development 7.5 – MERI framework

Endorsement criteria section	Endorsement criteria requirement	Chapter of the Plan
	i) spatial matters and where approved actions may be undertaken; ii) conservation measures, including which areas of land may be used to meet the approval holder's conservation commitments and how developments in scientific information will be incorporated by the approval holder into the conservation measures; and iii) how the City of Greater Geelong will administer and implement the Plan in the future in conjunction with existing Local Government mechanisms which may change over time;	7.8 – Process for changing the implementation documents
	f) be clear about what aspects of the Plan cannot be altered.	1.3.2 – Supporting documents 7.8 – Process for changing the implementation documents
Scope 2. The Plan must:	a) provide an approval holder (or holders);	1.7.1 – Approval holder
	b) describe the role and responsibilities of the approval holder (or holders) and the Commonwealth;	1.7 – Responsibilities for implementing the Plan 7.3 – Governance framework
	c) define the action or class of actions that are included in the Plan;	4.3 – Development classes of actions
	d) define persons who can take an action under the Plan;	4.4 – Persons who can undertake development and their obligations
	e) define the timeframe of the Plan;	1.5 – Timing for implementation of the Plan
	f) define the spatial area of the strategic assessment;	1.4 – Area covered by the Plan
	g) define the class of action boundaries;	4.2 – Location of development
	h) describe the funding arrangements for implementation; and	7.4 – Funding framework
	i) define matters excluded from the scope of the Plan, including but not limited to: i) actions that have already been found not to be controlled actions under section 75(1) of the EPBC Act; ii) actions that have already been approved under section 133(1) of the EPBC Act; and iii) actions not assessed or specifically excluded from the Plan.	4.3.6 – Development not covered by the Plan
Environmental management 3. The Plan must:	a) identify the Protected matters that are relevant to the Plan (relevant protected matters);	5.3 – Relevant protected matters
	b) summarise the expected duration, extent and likely severity of the Impacts to which this Agreement relates;	5.4 – Avoidance and minimisation of impacts 5.5 – Mitigation of impacts 5.6 – Residual impacts and offsets
	c) describe how the Impacts to which this Agreement relates will be avoided or mitigated and may refer to enhancement or management activities relating to these Protected Matters;	5.4 – Avoidance and minimisation of impacts 5.5 – Mitigation of impacts

Endorsement criteria section	Endorsement criteria requirement	Chapter of the Plan
		<p>6.5 – Avoidance and minimisation of impacts</p> <p>6.6 – Mitigation of impacts</p>
	<p>d) provide for appropriate offsets in accordance with the principles of the EPBC Act Environment Offsets Policy, in the event that impacts to protected matters cannot be fully avoided or mitigated;</p>	<p>5.6 – Residual impacts and offsets</p> <p>6.7 - Offsets for residual impacts</p>
	<p>e) define clear and measurable outcomes and commitments for the achievement of administrative and regulatory efficiencies, including specific, measurable, achievable, relevant and timely performance indicators to demonstrate progress towards achieving these outcomes and commitments</p>	<p>3.4 – Outcomes of the Plan</p> <p>3.5 – Commitments</p>
	<p>f) define clear and measurable outcomes and commitments for the management and conservation of protected matters that are relevant to the Plan, including specific, measurable, achievable, relevant and timely performance indicators to demonstrate progress towards achieving these outcomes and commitments.</p>	<p>3.4 – Outcomes of the Plan</p> <p>3.5 – Commitments</p>
<p>Implementation</p> <p>4. The Plan must include at a minimum, a commitment to develop and outline:</p>	<p>a) an assurance and implementation plan that includes the best practice monitoring programs, regular review, public reporting and independent auditing processes proposed to:</p> <p>i) ensure outcomes, commitments and measures for protected matters contained in the Plan are, documented, delivered and adequately resourced throughout the life of the Plan.</p>	<p>7 – Assurance and implementation framework</p>
	<p>ii) ensure the results of monitoring will be used to understand the effectiveness of outcomes, commitments and measures for protected matters and improve implementation, in particular, to adapt where monitoring demonstrates delivery of the commitments and measures are not leading to the predicted outcomes or where there are risks to protected matters.</p>	<p>7.5 – MERI framework</p>
	<p>iii) ensure new information relating to protected matters, including legislative changes, may be assessed and accounted for in implementation of the Plan.</p>	<p>7.5 – MERI framework (Improvement (adaptive management))</p>
	<p>iv) provide mechanisms that track persons who are relying on a strategic assessment approval to take an action and ensure persons undertaking actions are informed of their obligations under the endorsed Plan and approval.</p>	<p>7.5 – MERI framework (Monitoring)</p>
	<p>v) detail all governance arrangements including the roles and responsibilities of the Parties and the named approval holder (or holders), including in the post approval phase, for the implementation of the Plan and Part 10 approval</p>	<p>7.3 – Governance framework</p>
	<p>vi) describe how the named approval holder (or holders) will demonstrate and adaptively manage</p>	<p>7.5 – MERI framework (Improvement (adaptive management))</p>

Endorsement criteria section	Endorsement criteria requirement	Chapter of the Plan
	the effectiveness of proposed regulatory, administrative and protected matter outcomes	
	vii) ensure compliance with the Plan will be monitored and non-compliance will be reported.	7.6 – Compliance framework
	viii) provide for a 5-yearly assurance review and report.	7.5 – MERI framework (five-yearly evaluation and assurance review)
	b) governance processes to ensure that all activities are undertaken in accordance with the Plan;	4.4 - Persons who can undertake development and their obligations 7.3 – Governance framework
	c) outcomes and commitments for regulatory and administrative efficiencies including for governments and third-party developers	7.3 – Governance framework
	d) a conservation plan which implements the 'avoidance, mitigation, offset' hierarchy approach;	5 – Conservation framework 6 – Process based development
	e) a process for data management and sharing of data; and	7.7 – Data management process
	f) a process for stakeholder engagement (including with the Commonwealth).	7.3.4 – Stakeholder engagement strategy
Implementation	5. The information provided for these commitments should be of sufficient detail to enable an assessment of the suitability and effectiveness of the proposed approach.	Entire Plan <i>(see below)</i>

Table 29-11 shows that all the endorsement criteria have been addressed by the Plan. It is important to note that for section 4 of the endorsement criteria the plan is only required to, “...include at a minimum, a commitment to develop and outline” an implementation process for each of the relevant criteria. However, for section 5, the endorsement criteria require that, “The information provided for these commitments should be of sufficient detail to enable an assessment of the suitability and effectiveness of the proposed approach”.

The Plan addresses these endorsement criteria as it not only provides commitments to develop and outline these implementation processes, it also provides the frameworks that will be implemented through the Plan’s implementation documents. These frameworks provide the details of the proposed approach that will be undertaken to address the commitments of the Plan.

The Plan’s implementation documents are:

- The Northern and Western Geelong Growth Areas Commitments and Measures
- The Northern and Western Geelong Growth Areas BCS
- The Northern and Western Geelong Growth Areas Funding Program

The three implementation documents do not form part of the Plan to be endorsed by the Minister under Part 10 of the EPBC Act. These documents, including the detailed measures they contain that describe how each of the commitments in the Plan will be implemented, may be updated from time to time over the life of the Plan. While the commitments will not be changed once the Plan is endorsed, the measures set out in the BCS and the Commitments and Measures document may be updated. Part 1 of the SAR provides further details of these implementation documents and their relationship to the Plan.

29.8 CONCLUSION

The Plan is designed to protect MNES while supporting delivery of the development objectives of the NWGGA Framework Plan. It meets the requirements of the EPBC Act including the Strategic Assessment Agreement and the evaluation components of the ToR. In particular, the Plan:

- Is consistent with the principles of ESD
- Includes commitments that:
 - Achieve substantial avoidance of impacts to MNES
 - Adequately mitigate the potential indirect impacts of development
 - Will lead to the protection and management of significant areas of land as part of a strategic approach to both avoidance and offsets. This includes commitments to significant early offsetting in the life of the Plan
- Incorporates a robust assurance and implementation framework to ensure that the outcomes and commitments are delivered successfully

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